ETAP Enterprise Solution

ETAP is the most comprehensive analysis platform for the design, simulation, operation, control, optimization, and automation of generation, transmission, distribution, and industrial power systems.

ETAP offers a suite of fully integrated software solutions including arc flash, load flow, short circuit, relay coordination, cable ampacity, transient stability, optimal power flow, and more. Its modular functionality can be tailored to fit the needs of any company, from small to large power systems.

Quality Assurance Commitment

ETAP is Verified and Validated (V&V) against field results, real system measurements, established programs, and hand calculations to ensure its technical accuracy. Each release of ETAP undergoes a complete V&V process using thousands of test cases for each and every calculation module.

ETAP Quality Assurance program is specifically dedicated to meeting the requirements of:

- ISO 9001:2008 A3147 UL
- 10 CFR 50 Appendix B
- 10 CFR 21
- ANSI/ASME N45.2
- ASME NQA-1
- ANSI/IEEE 730.1
- CAN/CSA-Q396.1.2
- ANSI N45.22
Release 7.0 of the ETAP Enterprise Solution brings design and analysis innovation to a new level of advancement and provides the platform upon which future ETAP innovation will follow. This release adds new powerful analysis modules and time-saving capabilities to the ETAP suite. This brochure highlights key functionality in Release 7.0 of ETAP, which encompasses a broad and robust set of new features and enhancements.

**New Templates**
- One-Line Diagram
  - Auto-Select
  - Keyboard Shortcuts
  - Symbol Library

**New Load Analyzer**
- Single-Phase Arc Flash
- Arc Flash Analyzer
- Switching Management

**New Libraries**
- Solid State Trip Devices
- Cable
- Transmission Line
- Relay
- Battery

**Enhanced Modules**
- Base Package
- Load Flow Analysis
- Arc Flash Analysis
- Transient Stability
- Harmonic Analysis
- Star Device Coordination / Selectivity
- Star Sequence-of-Operation
- Data Exchange

**Enhanced ETAP Real-Time**
- Real-Time Server
- Advanced Monitoring
- Real-Time Simulation
- Automatic Generation Control
- Energy Accounting
- Load Forecasting
- Intelligent Load Shedding

View the brochure online at etap.com for details on all ETAP Real-Time modules.
ETAP One-Line Diagram is a user-friendly interface for creating and managing the network database used for schematic network visualization. You can interactively model, monitor, and manage the electrical network as well as execute simulation scenarios and analyze their results in a simple and intuitive manner. This can be accomplished by using features such as the intelligent one-line diagram, multi-level nesting of sub-systems, multi-color symbols, interfaces for management of switching devices, and a unique multidimensional database.

ETAP 7.0 adds an extensive list of new features to the intelligent one-line diagram propelling day-to-day system modeling and design tasks to a new level of speed, ease, and accuracy more than ever before.

**New**

**Auto-Select**

One of the new innovations to the one-line diagram is the inclusion of the Graphical Auto Selection tool. Graphical Auto Selection provides the capability to move the associated components with a simple mouse stroke (shortcut Alt+Click). For example, selecting a Motor Control Center (MCC) bus automatically selects the loads and protective devices connected to that bus. These related elements are intuitively grouped for quicker one-line layouts.

**Features**

- Intelligent load & feeder selection designed for electrical systems
- Works with bus, branch, loads, & protective devices
- Auto-grouping & ungrouping

Let ETAP Auto-Select
Da the Work for You
This upgrade provides the ability to create and recall unlimited graphical templates. Create template versions of common electrical network configurations such as **breaker-and-a-half**, **secondary selective substation**, and **spot network**. Utilize templates to quickly construct an entire electrical network faster than ever before with a single-click. Create new online diagram templates or select from more than 40 pre-built ANSI and IEC templates.

The templates library can be globally accessed by any ETAP project.

**Features**
- Create & utilize unlimited one-line templates
- Share templates created by other ETAP engineers
- Use default project ID or template ID
- Use properties from the default project or templates
- Instant preview of templates

New templates provided with ETAP include commonly used transmission and distribution substation schemes such as:

- Breaker-and-a-Half
- Main & Transfer
- Double Bus Double Breaker
- Primary & Secondary Selective
- Double Bus Single Breaker
- Ring Bus
- Spot Network
ETAP 7.0 includes a large array of keyboard shortcuts, which saves time and effort in creating and editing. Listed below are the most commonly used shortcuts:

**Shortcut Key Symbols Legend**

- ⌘: Shift Key
- ^: Control Key

**Files**
- New Project: ^N
- Open Project: ^O
- Save: ^S
- Save As: ^S
- Print Preview: ^P
- Print: ^P
- Close Project: ^Q

**Edit**
- Graphical Undo: ^Z
- Graphical Redo: ^Y
- Copy: ^C
- Cut: ^X
- Paste: ^V
- Delete (Dumpster): [Delete]
- Permanently Delete: [Delete]

**View**
- Find Tool: ^F
- Increase Symbol Size: +
- Decrease Symbol Size: -
- Fit in Window: ^Ø
- Options/Preferences: ^K
- Switch Windows: ^F6
- Previous Window: ^F6
- Close Window: ^F4
- Pan: Space Bar + Drag

**Zoom**
- Zoom In: ^+
- Zoom Out: ^-
- Zoom In Center: Scroll Up
- Zoom Out Center: Scroll Down

**Select**
- Select All: ^A
- Deselect All: ^⇧A
- Group: ^G
- Ungroup: ^U
- Auto-Select: Alt+Click

**Working with Elements**
- Rotate 90° CW: ^R
- Rotate 90° CCW: ^R
- Move in Large Increments
  - Left: ←
  - Right: →
  - Up: ↑
  - Down: ↓
- Move in Small Increments
  - Left: ^←
  - Right: ^→
  - Up: ^↑
  - Down: ^↓
- Copy to Another Window: ^⇧Drag

**Dumpster**
- Open: ^D
- Restore: ^⇧V
Symbol Library

Substitute default one-line diagram symbols with an alternative symbol set for individual device types. Need a SCADA look for your circuit breakers? Launch the symbol substitution tool and swap symbol sets with the press of a button. Symbol substitution allows you to store and recall the default symbols at any point in time.
ETAP 7.0 brings you new and enhanced capabilities which allow for faster and easier performance of arc flash hazard analysis. Identify and analyze high risk arc flash areas in your electrical system with greater flexibility by simulating various incident energy mitigation methods.

Arc Flash is a completely integrated module that solves multiple scenarios to determine worst case incident energy levels and it also produces professional reports and high quality arc flash labels at a press of a button.

**Features**

- Three-phase & single-phase systems
- Cubic box & open air calculations
- Integrated with ANSI & IEC Short Circuit
- Integrated with Star device coordination

**Capabilities**

- Automatic consideration of generator AC decay & decrement curve
- AC motor short circuit current decay handling
- Time varying fault clearing time calculation short circuit current decay
- Arc flash calculations for 3-phase & 1-phase panel / UPS systems
- Radial & multiple source system handling
- Extended search beyond the point of multiple upstream source
- Automatic or user-defined source protective device search algorithm option
- Modeling of differential relays, maintenance mode switches, & arc flash photo-sensors
- Zone Selective Interlock Protection [ZSIP] representation
- Generate IEEE 1584 & NFPA 70E look-up table results for different working distances & generate simple summary reports to communicate the results to personnel
- Alerts for PPE ATPV rating violations [maximum allowable PPE arc rating alerts]
- Comprehensive library of protective devices
NFPA 2009 Standard

ETAP gives the option of user-defined categories or to use categories defined by NFPA 70E-2000, 2004, or 2009 standard.

Compliance with Latest Standards & Calculation Methods

Complies with Standards . . .

- IEEE 1584a 2004
- IEEE 1584 2002
- NEC 110.6
- NESC
- NFPA 70E 2009
- CSA Z462 2008
- OSHA 29 CFR 1910
- ASTM D 120-02a

Single-Phase Arc Flash Calculations

In addition to 3-phase systems, ETAP 7.0 allows you to perform arc flash calculations for 1-phase panel / UPS systems.
The Arc Flash Result Analyzer is a time-saving tool that allows you to compare and analyze different reports coming from different projects, within the same directory, in a single display. You can compare the results of general information about the project or more specific information such as the results contained from buses, protective devices, or load terminals in an arc flash study.

**Features**
- Sort results from different studies by multiple criteria
- Find the worst-case incident energy results
- Quickly isolate & identify arc flash mis-coordination
- Find which protective devices failed to operate
- Filter out & analyze only the higher hazard category results
- Filter out all equipment with % $I_a$ variation problems
- Locate slow responding protective devices
- Export customized arc flash results to Excel reports
- Analyze the results in Metric or English units
- Color code & filter results by category

*Understand & Evaluate Results of Multiple Studies in One Glance*
According to NFPA 70E guidelines, permits are required when performing work on energized equipment. Work permits include shock hazard and arc flash analysis results. The work permit needs to be generated for individual bus arc flash results in addition to other pertinent information.

- Customize to fit the requirements of each project
- Customizable energized electrical work permits
- Find the safest mode of operation for maintenance work

The data sheet is an enhanced version of the arc flash analysis report. It gives a detailed description of what selections were made in the short circuit study case and how the bus results were obtained.

Data sheets can be customized to communicate arc flash study parameters.

ETAP has a wide variety of professional quality arc flash labels in multiple languages including English, Spanish, French, and Portuguese. Automatically batch print arc flash labels based on highest incident energy from all operating modes.

Calculate Arc Flash Energy & Generate Labels for 3-Phase & 1-Phase Panel / UPS Systems
Global Data Entry for Equipment

Speed up data entry for your arc flash projects by globally applying arc flash analysis data based on equipment type and voltage rating.

- Global definition of arc flash analysis data eliminates the need to specify this information in each bus
- Global definition of working distance, bus gaps, approach boundaries, & voltage-rated glove classes
- Specify Arc Flash Analysis Data based on IEEE 1584 2002 or user-defined values
- Globally select Shock Hazard Analysis Data based on NFPA 70E 2004, 2009 or user-defined settings
- Globally change the class settings given by ASTM D 120-02a Standard for voltage-rated protective gloves
- Updates can be made globally without having to modify each bus editor individually

Motor Contributions & Low Voltage Equipment Handling

ETAP makes it easier to specify considerations that should be applied to low voltage equipment such as motors and transformers based on NFPA 70E 2009 & IEEE 1584.

- Consider motor fault current decay during the arc flash calculation
- Automatically exclude small motor contributions entirely from the simulation
- Automatically identify & exclude transformers with relatively low voltage & kVA
- Assign a hazard category to these types of equipments automatically based on fault current ranges
Enhanced

Generator Circuit Breaker
IEEE Standard C37.013

The ETAP Short Circuit module has enhanced duty calculations for generator circuit breakers per the latest version of IEEE Standard C37.013, “IEEE Standard for AC High-Voltage Generator Circuit Breakers Rated on a Symmetrical Current Basis”. The generators are modeled by the sub-transient dynamic model to represent AC and DC decay of short circuit contributions from the generator. It calculates both system-source and generator-source short circuit currents and considers no-load, lagging PF load, and leading PF load for pre-fault conditions.

Features

- Generator sub-transient model to represent AC & DC decays
- Generator-source & system-source short circuit currents with no-load, leading PF, & lagging PF
- Symmetrical, asymmetrical, & peak kA at 1/2 cycle
- Symmetrical, asymmetrical, peak, & DC kA as well as degree of asymmetry at generator CB contact parting time

Enhanced

HVCB & Bus Momentary Duty

ETAP provides several options for ANSI multiplication factor (MF) for high-voltage circuit breaker and bus momentary duty calculations. The options include MF calculated based on system X/R, fixed values at 1.6/2.6, or use of 1.6/2.6 as minimum values. These options allow the user to obtain accurate results as well as to ensure conservativeness in short circuit calculations.
ETAP 7.0 includes an extensive list of enhancements for the ETAP Star module. Using these new user-oriented capabilities, the process of design and evaluation of protective device coordination is significantly faster and easier. Among them is the Star Sequence-of-Operation with new short circuit fault types: Line-to-Line, Line-to-Line-to-Ground in addition to 3-phase and Line-to-Ground.

Enhancements

- Sequence-of-Operation
- Device Settings Report
- Panel System Protective Device
- Relay Current Summation
- Relay Test Interface
Sequence-of-Operation

Star Sequence-of-Operation evaluates, verifies, and confirms the operation and selectivity of the protective devices for various types of faults for any location directly from the one-line diagram and via normalized TCC curve views.

Sequence-of-Operation provides a system wide solution for an accurate and realistic operating time and state of protective devices, such as relay, fuse, circuit breaker, trip devices, contactor, etc. The operation time is calculated for each protective device based on its settings, time current characteristic, and interlocks for a specified fault location and type.

ETAP 7.0 enhances this invaluable tool by including Line-to-Line and Line-to-Line-to-Ground Drag-and-Drop Faults in addition to 3-phase and Line-to-Ground Faults.
Star Device Coordination Report Manager provides comprehensive and customizable device settings reports. The manager allows you to preview and print the protective device settings data using Crystal Reports format or Microsoft® Excel format.

Device Settings Report

Star Device Coordination Report Manager provides comprehensive and customizable device settings reports. The manager allows you to preview and print the protective device settings data using Crystal Reports format or Microsoft® Excel format.

Panel System Protective Device

ETAP 7.0 provides the capability to plot the time current characteristic curves for the main disconnect circuit breaker and fuse as well as the branch circuit protective device curves.
Relay Current Summation

Relay element includes a new feature for summing flows through current transformers that can be utilized in arc flash evaluation and sequence-of-operation analysis.

Similar to the differential relay, the summation function sums up the short circuit contribution vectors through the connected CTs according to the CT’s polarity and the direction of current flow.

Additional Enhancements
- Partial differential relay modeling
- Ring bus protection
- Multiple source systems protection

Relay Test Set Interface

In addition to ARTTS-6 relay hardware test set interface, ETAP Star now provides an interface to Megger® MPRT Protective Relay Test System via AVTS software.
Load Analyzer

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.

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

Load Analyzer Reports

- Bus Feeder Loading
- Bus Loading Summary
- Equipment Loading
- Equipment Load List
- Loading Schedule
- Cable Schedule
- Transformer Schedule
Switching Management

Switching Management allows the dispatcher to build a complete switching program using a graphical user interface and execute the switching plan all in one step.

Switching Sequence Builder
The switching sequence builder contains a list of switching devices and time of execution for circuit breakers, load disconnects, and ground disconnects. The switching builder allows the operator/engineer to specify interdependencies and also rearrange switching order.

Breaker Interlocks
A switching sequence simulation can be conducted in Auto Mode and Step Mode using interlock logic entered in the circuit breaker editor. In each switching step, load flow calculations are executed to verify operating conditions and check interlock logic preconditions as well as post conditions.

Execution & Verification of Switching Plans
Verify whether the sequence is compliant with safety switching procedures. Confirmations are required for each step before proceeding in order to avoid inadvertent switching.
The latest edition of ETAP provides the following new capabilities to transient stability, making it the most powerful transient stability program in the industry hands-down.

**Features**

- State-of-the-art Governor-Turbine models used in the majority of large industrial power systems
- Isochronous / Droop switching capability for Gas Governor-Turbine with GE Mark IV, V & VI model (GGOV3)
- Solar Gas Governor-Turbine with DLN combustion system model (SGOV1)
- Westinghouse Gas Governor-Turbine with jump rate limiter model (WGOV1)
- Ability to simulate the new Governor-Turbine dynamics including manufacturer unpublished details
- Governor-Turbine models are fully verified and validated by field measurements / benchmark tests
- Higher order integration solution method for synchronous machine swing equation
- Synchronous machine typical data
**Harmonic Analysis**

The Newton-Raphson method for initial load flow provides an improved convergence for larger systems with small impedances.

**Libraries**

ETAP 7.0 engineering libraries include many new devices based on user feedback and popularity. ETAP libraries provide complete verified and validated data based on equipment manufacturer’s published data.

**Enhanced Libraries**

- Solid State Trip Devices
- Cable
- Transmission Line
- Relay
- Battery

etap.com
ETAP Data Exchange (DataX) is used to import, export, and synchronize data between external data sources and ETAP. DataX provides many utilities including:

- Legacy data transformation into ETAP
- Interface with external architecture databases
- Customizable data mapping
- Intelligent error checking
- Automatic one-line diagram generation

DataX includes several new conversion programs that allow for conversion of third party electrical power system databases to ETAP. The conversion program will automatically generate a multi-layered graphical one-line diagram. A list of available conversion programs are available upon request.

**Open-Format Excel DataX**

- Import from an Excel spreadsheet with any input data, layout, format, & field names
  - Sync Motor
  - Induction Motor
  - Lumped Load
  - Static Load
  - 2-Winding Transformer
  - Cable
  - Bus
- Intelligent equipment mapping
  - Recognize the type of equipment up front
  - Map equipment as new or existing
- Customizable equipment mapping
  - Change the default mapping for equipment already mapped
  - Skip importing selective equipment in the user-interface
- Customizable data mapping
  - Change the equipment data mapping in the mapping table
- Customizable logic for data dictionary
  - Recognize input data based on the default logic provided in XML file
  - Add customized logic to the default logic in the XML file for more import flexibility
- Add customized captions & headers to the spreadsheet
The ETAP-SPEL Data Exchange Interface provides data synchronization between ETAP and Intergraph’s SmartPlant Electrical (SPEL). This bidirectional interface allows joint users to utilize ETAP for design, analysis and automation, and then integrate that data into SPEL to increase electrical efficiency for the construction, operation, and maintenance for the life cycle of the plant.

- Import data from a SPEL-published XML file
- Export data into an XML file for importing into SPEL
- Import cable library data from a SPEL-exported Microsoft database
- Export cable library data to a Microsoft database for importing into SPEL
- Data mapping between SPEL equipment and ETAP elements
- Synchronization of the ETAP cable library with the SPEL cable reference

The SPEL XML file contains the electrical data for equipment and connectivity information in the SPEL project. The ETAP data exchange interface uses information available in SPEL to add, modify, and delete elements. The interface not only auto creates one-line diagrams, it also facilitates multiple data transfers (synchronization) between ETAP and SPEL. As a result, data in ETAP and SPEL are kept consistent without going through the time-consuming manual process of recording additions and modifications in both systems.

The ETAP-SPEL cable library data synchronization is bridged by a Microsoft Access database. Users can import or export ETAP project cable library data into or from the Microsoft Access database using the ETAP Lib Utility. Through the SPEL Lib Utility, users can also export or import cable library data into or from the Microsoft Access database.
ETAP Real-Time is a true client-server configuration designed for Microsoft Windows platforms. The ETAP Real-Time server is the central processing unit that manages the communication between the system, consoles, and controllers.

**Server Redundancy**
System availability is crucial to the reliable operation of a power management system. In addition to hardware redundancy and failsafe software features, ETAP Real-Time offers redundant client-server setup. Two levels of system redundancy are offered:
- **Centralized Redundancy**
- **Distributed Redundancy**

**Server Status / Health Monitor**
Server Monitor is a tool that monitors the health, availability, and hierarchy of ETAP Real-Time Servers in a communication complex. Continuous logging provides historical record of server status changes.

**Initialization & Setup Configuration Wizards**
The system Initialization Wizard is intended to simplify the steps for connecting the consoles to the real-time system. User-friendly status and progress indication are added for operator convenience and simplicity. The Setup Configuration Wizard is a powerful tool that allows the system integrator administrator to configure the system for commissioning maintenance.

**Composite Tags**
Composite tags provide the system integrator with the ability to write simple and complex mathematical expressions. Commonly used functions are provided as part of the expression builder function library.
Advanced Monitoring

Provides intuitive and integrated real-time monitoring via an intelligent graphical user interface. Monitoring functions include checking the condition of the network, estimating missing system states, detecting network abnormalities, and annunciating alarms based on operating conditions and status changes.

**Represent Composite Networks Using Images**
Composite networks can be represented with graphic files (EMF, WMF) in order to easily identify the location or function of the sub-network.

**Ground Switch Element**
Ground switch is a new element that provides a visual status of the grounding condition on the one-line diagram.

**Operator Launch Pad**
Operator Launch Pad provides quick access to all essential views such as annunciation, automatic generation control, energy accounting, etc. from one convenient location on any console.

**Region Classification & Graphical Assignment of Area, Zone, & Region**
Assign region classification for buses in addition to area and zones. ETAP propagates the appropriate area, zone, and region information to all connected equipment. Graphically assign area, zone, and / or region classification using the one-line diagram.

**Trend Views**
Trending is a user-friendly and flexible application that supports unlimited real-time as well as archived data trending.

**State Estimation Comparator**
Raw Data Checking (RDC) algorithms have been enhanced for improved error checking in the system model and issues with metering devices such as incorrect polarity, units, etc.

**Display Options**
Real-time data display options have been enhanced to show ground switch status as well as individually show / hide the units / values for real-time measurements.

**Theme Manager**
Theme Manager has been enhanced to include color coding based on area classification on the one-line diagram.
Real-Time Simulation

A key factor to the successful operation of a power system is the operator’s ability to handle scheduled as well as unforeseen changes in the system condition. With the ETAP Real-Time Simulator, the operator gains knowledge about the electrical system and anticipates the system response before taking an action such as closing / opening a circuit breaker or starting a large motor.

**Event Based Auto-Run**

In simulation mode Load Flow Auto-Run is triggered whenever a proposed action is taken on the system (i.e., change in breaker status) providing a step-by-step picture of how the system will react to each change.

**Alerts Classification**

For large systems, a number of critical and marginal alerts may be generated after a real-time simulation study. Filtering based on area, zone and region is included in order for the operator to quickly pinpoint the location of the problem or investigate potential alerts in key locations.

**Display Options**

ETAP display options allow you to customize the one-line presentation in multiple ways. The most commonly used display options are provided as a quick-pick menu for easy customization of one-line presentations.
Automatic Generation Control

The objective of the Automatic Generation Control (AGC) is to maintain the frequency of a Power Distribution System and to keep tie-line power close to the scheduled values. AGC also calculates the required parameters to optimize the operation of the generation units under the AGC action based on economic dispatch and interchange commitments.

Load Frequency Control
Utilizes system frequency and interchange flows to determine the dispatch from each of the generating units under load frequency control (LFC).

Economic Dispatch
Economic Dispatch allows generation facilities to produce energy at the lowest cost to reliably serve consumers while recognizing any operational limits of generation and transmission facilities.

Interchange Transaction Schedule
Interchange Transaction Scheduling (ITS) provides the capability to schedule energy transfer from one control area to another while considering wheeling, scheduling ancillary services, and financial tracking of energy transactions.

AGC View
The AGC view is a user-friendly operator / dispatcher tool for displaying operating values and calculated generator set points.

Generator Controller
Manually control generators to start, stop, change set points, as well as switch between various generator operating modes.
Energy Accounting

Energy Accounting provides energy consumption and cost information for individual power system components for the entire system. ETAP can track energy related costs based on user-definable cost functions.

**Energy Accounting Viewer**

The Energy Accounting Viewer displays the interchange, generation, and consumption meters listed under their respective area. For each meter the energy usage, demand, and charges are displayed.

**Detailed Rate Schedule / Tariffs**

Define energy tariffs with detailed rates for each season demand, TOU, etc. Multiple tariffs can be created and assigned to interchange meters through the Interchange Transaction Scheduling module.

**Generator Fuel Cost**

Specify the schedule for a specific fuel contract associated to a generation point in the system.

**Flexible Tariff Assignment**

Multiple tariffs can be created and assigned to interchange meters to calculate cost for buy or sell. Tariffs may also be assigned to load meters in order to track energy usage and cost allocation for various business units within the same facility.

**Energy Accounting Reports**

Flexible energy accounting reports are available such as reporting current viewer results, energy usage for each period or usage reports between a time range.
Short-Term Load Forecasting (STLF) is a tool to reliably and accurately forecast future short term loading in the system. STLF can be used to generate a forecasting model for various loads or interchange lines. STLF is set up to allow the user to train and forecast multi-meters on a continuous basis on hourly increments for a span of one week ahead.

**Pattern Library**

Graphically define unlimited patterns such as MW and Mvar loading, temperature, and humidity. The Pattern Library is useful for load forecasting in the event sufficient historical data is not available to train the forecast model.

**Load Sector Library**

The Profile Library connects to the Pattern Library and allows the user to select patterns and build a yearly profile. The yearly profile can be compromised of many individual 24-hour pattern shapes for loading, temperature, as well as humidity with special considerations for holidays.

**Weekly Forecast & Revised Forecast**

Select individual or group of locations for which a forecast is required. ETAP generates a continuous load forecast up to a week ahead. The weekly forecast is revised on an hourly basis based on present operating conditions.

**Load Forecasting Viewer**

Displays the load forecast up to one week ahead, as well as the revised forecast calculated each hour. The viewer also allows you to superimpose week-ahead forecast and revised forecast with actual demand, thereby giving the system operator/engineer a metric as to the quality of the forecast. Appropriate offsets may be utilized for future forecasts or measures may be taken to improve the accuracy of the forecast.
Intelligent Load Shedding

Intelligent Load Shedding (ILS) provides optimal, fast load shedding for electrical disturbances and loss of generation.

**Load Shedding Logic Editor**

The Load Shedding Logic Editor allows the system integrator to start from ETAP predefined event handling logic and customize it for each individual project. This time based logic can be based on equipment properties and settings, real-time measurements, alarms, and status. Post event logic can also be considered.

**Equipment Overload Handling**

Implements optimized load shedding techniques to eliminate overloads on equipments such as generators, transformers, lines, etc. It monitors equipment capabilities such as Max MVA, Line Ampacities, etc. and determines the loads to shed to bring the power flows to safe operating conditions. Users can define the maximum duration time of overloads before executing actions.

**Subsystem Handling**

Utilizes advanced techniques to detect network islanding. Within the overall electrical network, ILS tracks the location of the triggers, generation points, sheddable loads as well as status of switching devices. Triggers are auto associated with loads and generation. When a trigger is executed, only the load in the same sub-system is shed. Spinning reserve, total generation, and all other parameters are calculated per subsystem.

**Graphically Display Loads to be Shed**

Automatically display the loads to be shed for each one of the triggers directly on the ETAP one-line diagram.

**Fast Trigger Transient Stability Validation**

Minimize the validation time of the load shedding system. With a click of a button, take the intelligent load shedding triggers and generate transient stability cases. This allows for a complete validation of the load shedding schemes.
Keep Up-to-Date with ETAP Products

Improving and expanding our products is a continual process for the ETAP development team. These ongoing product updates ensure that ETAP continues to not only meet, but exceed our customer requirements.

ETAP Upgrade & User-Support Maintenance Contract (UUC)

The ETAP Upgrade and User-Support Contract (UUC) is the most cost-effective way to protect your ETAP investment by providing product upgrades and technical support for your ETAP software. Extending your maintenance support agreement will allow you the opportunity to apply ETAP’s unique features and sophisticated analysis techniques to all your power system analysis projects. With a valid UUC maintenance support agreement, you receive:

- Free version upgrades including automatic shipment of new releases
- Unlimited access to user / technical support
- Latest device libraries updates
- Full access to ETAP User FTP and download sites
- Access to prerelease and beta versions of new products and upgrades

Contact sales@etap.com or (949) 900-1000 today to receive more information and a quote to receive all these great benefits offered in the ETAP Upgrade and User-Support Contract.

Feedback

Operation Technology, Inc. is dedicated to providing our customers with a superior product experience, and user feedback is one of the central elements of this commitment. In fact, ETAP is designed based on 95% of user suggestions and requests! Tell us how we are doing by:

- Filling out a short survey at etap.com (click on User Feedback Form)
- E-mailing ETAP Technical Support at support@etap.com
- Sharing your comments with your local ETAP Authorized Representative

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The ETAP web site is your best resource for up-to-the minute information about ETAP products and services. The site includes the latest product update announcements, a worldwide training calendar, video tutorials, frequently asked questions, archived webinars, ETAP downloads, white papers and articles, information about ETAP User Groups, and much more. Click on the “Request ETAP News” link to receive periodic e-mails informing you of what’s new in ETAP.

ETAP 7.0 System Requirements

Operating System (32-bit or 64-bit)

- Microsoft® Windows Vista®
  [Home Premium, Business, Enterprise]
- Microsoft® Windows® XP [SP3]
  [Professional or Home Edition]
- Microsoft® Server 2008
- Microsoft® Server 2003 R2 [SP2]
- Microsoft® Server 2003 [SP2]

Other Software Requirements

- Microsoft® Internet Explorer® 5.01 or higher (or minimum version level as specified by the operating system in use)
- Microsoft® .NET Framework v1.1 (SP1)
- Microsoft® .NET Framework v2.0 (SP1)

Hardware Requirements

- USB port [for stand-alone license]
- Ethernet port with network access [for network license]
- DVD drive
- 5 to 80 GB hard disk space [based on project size, number of buses]
- 19” monitors recommended [dual monitors highly recommended]
- Minimum display resolution - 1024x768

Recommended Hardware

100 Bus Projects:
- Intel® dual/quad core - 2.0 GHz [or equivalent]
- 2 GB RAM

500 Bus Projects:
- Intel® dual/quad core - 2.0 GHz [or equivalent]
- 4 GB RAM

1,000 Bus Projects:
- Intel® dual/quad core - 3.0 GHz with hyper-threading with high speed bus [or equivalent]
- 8 GB RAM [high speed]
- 64-bit operating system

10,000 Bus Projects and Higher:
- Intel® dual/quad core - 3.0 GHz with hyper-threading with high speed bus [or equivalent]
- 12 GB RAM [high speed]
- 64-bit operating system

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