ENMAC™

Network Solutions

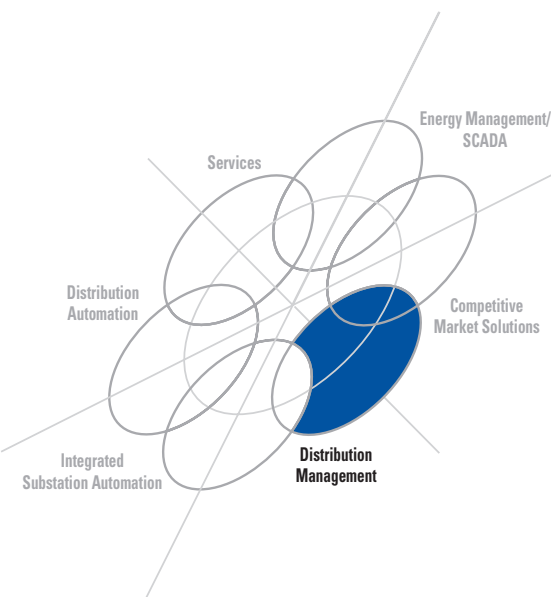*State-of-the-art information tools to optimize distribution.*

The Business Case

Privatization, deregulation, and reregulation initiatives have had sweeping effects on the worldwide electric utility business. Deregulation is allowing more and more competitors into the market, and as a distribution utility, you must now compete aggressively for each and every customer. In order to do so, you're facing pressures to substantially improve productivity, reduce operating and maintenance costs, and increase the reliability and breadth of your customer service offerings. Effective use of Information Technology is key to your success under the new regulatory regime.

The GE Network Solutions ENMAC™ System is the distribution management solution delivering state-of-the-art information tools that enable control room staff and management of the next generation utility to efficiently and effectively manage the real time operation of dispersed distribution assets. ENMAC™ covers more than 90% of the UK landmass, a leading edge area for deregulation.

- Reduced Operating & Maintenance Costs
- Improved Operational Efficiency
- Improving Asset Utilization

ENMAC™ is designed to reduce total operating and maintenance costs, including costs of ownership. ENMAC™ gives you the ability to substantially improve operational efficiency, providing the potential to consolidate existing control centers. Alternatively, existing control center locations and communication facilities can be integrated, allowing for the sharing of data and leveraging a common support infrastructure.

Unlike the all too common 'islands of automation' so prevalent in today's marketplace, ENMAC™'s seamless interoperability with other corporate systems such as Customer Information Systems, Geographic Information Systems, and Call Centers can lead to significant reductions in support cost, while maximizing access to current system information. ENMAC™ also can help to reduce power losses and improve asset utilization, allowing costly capital expenditures to be deferred.

Energy Management/
SCADA

Services

Distribution
Automation

Competitive
Market Solutions

Integrated
Substation Automation

Distribution
Management

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By Improving Decision Support – Information Versus Data

ENMAC™ presents a consistent, real-time view of the entire electrical network to operators and management. Operators are provided with valuable information regarding the most likely cause of a disturbance rather than a simple summary of raw data. The capability to analyze alternate operating strategies based on current or postulated system conditions provides valuable insight into possible courses of action. ENMAC™ is designed to ensure that timely, accurate information is available when you need it most.

By Focusing on the Bottom Line

Reduced outage rates, improved power quality, and a competitive price are the keys to customer satisfaction, retention, and attraction in today's competitive energy market.

In addition, the emergence of performance-based rates has fundamentally changed the way utilities view service performance.

ENMAC™'s field proven distribution applications enable the next generation utility to significantly improve service performance where it counts most and thereby recognize its true revenue and earnings potential.

Base features

The ENMAC™ distribution management system is a modular and flexible client-server architecture comprising a number of collaborative software applications At the foundation of this architecture are the following modules which provide the basic framework for the day-to-day operation and maintenance of the distribution grid:

Advanced Graphical User Interface (AGUI)

- Provides a powerful, intuitive interface to ENMAC™ applications
- Renders information in both schematic and geographic form
- Allows the user to effectively navigate large networks.

Supervisory Control and Data Acquisition (SCADA)

- Acquires measurement data via remote terminal units or data links
- Validates data for reasonability
- Performs checks on process variable limits and executes user-defined calculations
- Provides remote supervisory control capability

Network Management System (NMS)

- Provides an up-to-date connectivity model of the entire electrical network for other applications using
  - As-built configuration
  - Available-telemetry
  - Operator entries
- Provides extensive circuit tracing capability
- Manages day-to-day maintenance of the electrical network
- Commissioning of new equipment
- De-commissioning of existing equipment
- Temporary re-configuration of the network (jumpers, cuts, and grounds)
- Development of switching plans
- Electronic creation of associated work permits and safety documentation
- Validation of planned switching with respect to safety and operational rules
- Real-time validation, execution, and recording (audit trail) of all switching procedures

33 KV - 11 KV Primary Substation

11 KV Feeders

6.6 KV Feeders

Advanced Features

Trouble Call System

- Interfaces to call center to gather customer trouble calls
- Uses network connectivity in conjunction with customer call locations to predict source of trouble and event scope
- Identifies and groups related calls into a single trouble ticket
- Manages assignment of trouble tickets to field crews
- Considers crew location, workload, equipment, and experience level
- Interfaces to telephony system (IVR) or call center to update status of event
- Provides complete electronic history of event

Distribution Power Analysis

ENMAC™'s Distribution Power Analysis provides the operator with the capability to analyze and optimize the operation of the electrical network under current and postulated system conditions. Whether directed at the current real-time network or a future planned network or supporting the development of switching plans, ENMAC™'s Distribution Power Analysis provides the operator with clear and concise information with respect to system vulnerabilities and opportunities.

The ENMAC™ Distribution Power Analysis Suite is comprised of the following applications:

- Feeder Load Estimation
- Powerflow
- Short Circuit Analysis
- Volt/VAr Optimization
- Topology Optimization

Web Applications

ENMAC LV WebView™

ENMAC LV WebView™ integrates LV network diagrams and GIS data with network management and customer connection features. It can be linked to ENMAC™ to enable operators to have a fast and easy method of viewing both schematic and geographic diagrams. In addition the location of customer trouble calls and transformers off supply are shown. It provides high availability and presents geospatial networks at speeds normally achieved by operational schematic diagrams, these factors combine to make it a highly desirable tool for operational, real-time environments. Its web-based interface is ideal for use on mobile devices and for remote viewing.

ENMAC Call Taker™

The ENMAC Call Taker™ is a web-based call logging system designed for large-scale distribution in a call center. The logged calls are then managed within ENMAC TCS™. It allows call takers to find customer data quickly by means of a search engine and a wizard can help to categorise the problem. Previous calls and faults along with up-to-date status on existing faults are displayed to ensure all parties are kept informed.

Reports

The ENMAC™ System was conceived to provide cost-effective yet secure dissemination of near real-time and historical operations information throughout the utility enterprise and beyond, without compromising the responsiveness or security of the mission critical system. Separated from the core ENMAC™ Distribution Management System via a firewall, the ENMAC™ Business Information Gateway leverages the power of web-based technology in order to provide secure information access to utility executives, planners, and engineers as well as key commercial customers.

Corporate Data Exchange

Corporate Data Exchange provides a seamless interface between the Distribution Management System and other corporate business systems such as Geographic Information Systems, Customer Information Systems, and Call Center that allows each system to administrate its own data and the relevant data items to be shared electronically with the Distribution Management System as it changes. Corporate Data Exchange eliminates costly and error prone manual transfer of data and ensures that the Distribution Management System always has the latest up to date information regarding network and customer connectivity.

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ENMAC™ Architecture

Technology

ENMAC™ is a completely open and highly configurable distribution management solution incorporating the following technologies:

- Client/Server
- Relational Database
- Object Oriented Database
- Object Oriented Design
- Expert Systems
- Web
- Hypertext.

Standards

Standards benefit the vendor as well as the customer. ENMAC™ is built on a foundation of industry and de-facto standards:

- UNIX® and Windows NT®
- ANSI® C, C++, Visual Basic®
- X Windows Systems
- OSF/MOTIF®
- ORACLE® relational database
- DNP 3.0
- IEC 870-5
- ICCP
- ELCOM 90
- TCP/IP-based networking
- Postscript 2
- DXF and NTF 2 graphics exchange formats.

Characteristics

As a result of its adherence to standards and innovative use of technology, the ENMAC™ Distribution Management System exhibits the following characteristics:

- Inherent flexibility to adapt to changing business needs
- Cost effective scalability
- High availability/fault tolerance
- Deterministic responsiveness
- Data-driven, Object Oriented design
- Ease of integration with other systems
- Secure, reliable operation
- Integrity of data
- Paperless work environment.

ENMAC™ Hardware Environment

ENMAC™ is supported on the following major hardware platforms:

Hardware/OS Environment	Client	Server	Front End Processor
Compaq®/UNIX®		•	
Intel®/Windows NT®	•		•

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