GE Substation Automation Solution

“The Power of the GE Package”

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1. Have we Understood your Situation, Issues and Challenges?
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• Undesirable operating situations

• Concerns about reliability

• Limited system flexibility

• Lack of availability of useful and timely information

• Need to improve customer satisfaction

Have we understood your Situation, Issues & Challenges?
Short Term Objectives

- Improve network reliability
- Improve network wide data access
- Identify faults instantaneously
- Reduce operating costs

Long Term Objectives

- Position for deregulation
- “Power Marketing” ready
- Manage network assets
Total Substation Automation Business Solution

GE Capabilities

- Consulting Services
- Application Design and Engineering
- Automation Software
- Manufacturing
- Integration Services
- Overall Project Management
- Training
- Startup & Commissioning
- Maintenance Services
- Diagnostic Services
- Technical Support
- Project Financing
- Partnerships
System Architecture

Substation Automation Components
Energy Management System (EMS)

- Completely Open System
- User friendly advanced graphics HMI
- Flexible & Scalable system architecture
- Data configurable and customisable
- Ease of integration with other systems
**GESA 2000 HMI Software**

- Specifically designed for station automation
- Multi-site supervision & control capability
- Password protection
- One line diagrams
- Data Displays
  - Diagnostics
  - Status
  - Alarms
  - Events
  - Fault records
  - Oscillography
  - Trends
- Relay programming
- Upload and download of data
- Training and testing
- HTML wizards
System Architecture

**HMI Software**

**GESA 2000 HMI Software......Cont.**

- Load information demand patterns
- Power Quality information
- Operating information tap changers, capacitor banks, etc.
- Relay operations reclose statistics
- Capacitor fuse status
- Relay & breaker self - test / diagnostics
- Real time system status and control execution
- Remote view nodes and web browser compatible HMI interface
System Architecture

Choice of Bay Level HMI’s
URPC

- Windows® based
- Access to any specific IEDs
- Local / Remote access capability
- View/edit settings on-line/off-line
- View actual values
- View relay status
- View event recorder for trouble shooting
- Field upgradable relay firmware
- Oscillography
- Single line diagram capabilities
- HMI interface for monitoring purposes
- URPC tutorial for step by step help
Optical Communication

- SONET based
- Self healing redundant optical WAN
- Redundant optical LAN
- Field proven in utility applications
System Architecture

Ethernet LAN

• Redundant
• 10Mbps redundant fiber optic LAN
Internet

- Optional remote access over Internet
Peer to Peer Communications

- UCA/MMS compliant
- High Speed Communications
- GOOSE message format
Multifunction IEDs (UR Relays)

- Protection
- Control
- Metering
- Monitoring
- Interlocking
- Sequencing
- Peer to Peer communication
- FlexLogic™
- TCP/IP ISO Network Layer Protocol
- MMS/UCA2 compliant
- High speed communications
System Wide Synchronization

- GPS clock
- ±1 millisecond time resolution
Other IED Support

- Gateways for legacy relays
- Interface to station monitoring IEDs
Customer Benefits

- **Flexible, scalable, upgradable and integrated solutions**
  - Flexible Modular Architecture
  - An end to stranded relay investments
  - Upgradable software and plug in cards reduces obsolescence and accommodates changes
  - Design standardization

- **Speed of knowledge for increased productivity**
  - Network wide information at the corporate level
  - Conversion of data into knowledge
  - Improved management capability
  - Better planning capability

- **Network optimization**
  - Tighter network control
  - Minimize outages by faster troubleshooting
  - Reduced spacing
  - Additional years of service from existing equipment

- **Improved customer satisfaction**
  - Customer retention
  - Limit outage impact

- **Financial savings**
  - Increased revenues
  - Reduces initial and operating costs
  - Meeting power marketing information requirements
The Power of the GE Package

- Business knowledge & industry commitment to substation automation
- Tremendous strength thanks to our vast global resources
- Great experience over a broad range of industries
- Corporate commitment to six sigma quality
- Financial strength
- Partnerships & Trust
- Complete system solution and implementation

Why GE?
Our company culture empowers us through our values.

- Vision
- Accountability
- Excellence
- Empowerment/Involvement
- Teamwork/Diversity
- Receptivity to change
- Quality
Europe & Africa
- Spain
  - ERZ,
  - Iberdola
  - Red Electrica de Espana
- Scotland
  - Scottish Hydro Electric
- South Africa
  - Nelspruit

South America
- Peru
  - Electroperu
- Brazil
  - Furnas
  - Inepar
  - Rio Light
  - RGE/CEEE
  - Chesf
  - Electronorte
- Argentina
  - EDENOR

North America
- USA
  - ConEd
  - PSE&G
  - PECO
  - Salt River Project
  - Kema Consulting
  - Springfield CWLP
  - City of Richland
  - Tacoma Power
  - Cinergy
  - PG&E
  - Los Angeles DWL
  - Commonwealth Edison
  - Westvaco Corp.
  - AEP Services
  - City of Burbank
- Mexico
  - COPEL
- Canada
  - Niagara Mohawk
  - Ontario Hydro

Why GE?
**System Overview:**
GE Substation Automation,
GESA World Tour Launch,
DDS Integrated Protection and Control System,
Communication Protocols, Substation Automation and the UR Technology
EMS
**Sonet/WAN, Ethernet LAN**
Communication Protocols and Standards
Utility Communications Architecture
MMS/UCA2 and Substation Automation
**GESA 2000 (HMI)**
GE Substation Automation Solutions
PMCS 6.0 Enhancements
**URPC (Engineering Tool)**
**Bay Control**
**IEDs**
Universal Relay Architecture
Universal Relay features
Universal Relay “The engine for Substation Automation”
Universal Relay Meeting the challenges of the new millenium
**URF60**
**URL90**
**UR Selling Features**
**Technical Publications**
Find more than 70 technical publications on our Web Site