

# VERMONT ELECTRIC POWER BUILDS SECURE NETWORK USING ETHERNET

## An Industrial Ethernet Application

### TECHNOLOGY TODAY

VELCO is a transmission-only power company that interconnects all Vermont electric utilities. VELCO's large territory and the need for rapid, secure exchange of information among the substations and operations areas caused the company to consider a broadband standards-based solution to its communications needs. VELCO's emphasis on a secure management system over Ethernet for strictly internal device management was paramount in the decision process.

### ABOUT VELCO

VELCO, the representative for all Vermont utilities in the New England Power Pool, has provided nondiscriminatory access to generators and shippers for over 40 years.

The Vermont Electric Power Company (VELCO) is one of the leading users of Ethernet technology in substations in New England. In September 1958, the initial power system included 224-miles of 115 KV transmission lines. Today, VELCO's facilities and services include over 600 miles of transmission lines, and many substations. VELCO's communication network includes more than 400 miles of fiber optic cable to control and monitor the power network.

### THE CHALLENGE

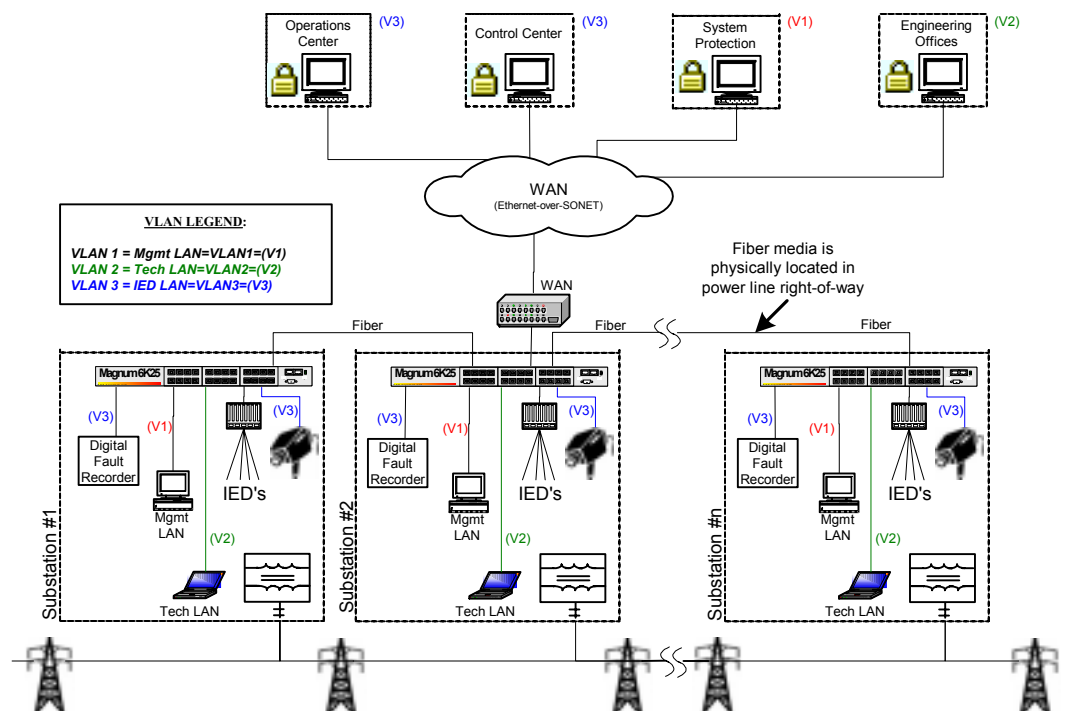
In 2001, VELCO installed two T1 lines at a worksite in one of its substations to provide direct transfer of information, drawings and other documents to crews. The program worked so well that crew demand for direct access soon spread throughout the system. Initial access was through dial-up modems within the substations, but roaming crews could also utilize Wide Area Networks (WAN) connectivity.

VELCO recognized that their operations center also needed direct access to substation information such as fault recorder and protective relaying, to provide the company's targeted high levels of customer satisfaction. By allowing appropriate personnel throughout the utility to access substation information, the company could assess any new situation and respond rapidly. Faster access to information would increase customer satisfaction, enhance security, and reduce costs.

High-speed access, however, is not without its concerns. The accessibility of information over long distances means that communications are vulnerable to eavesdropping and attack. VELCO needed not only a cost-effective high-speed connection, but also a secure one.

### THE SOLUTION

VELCO chose to add 100 Mb Ethernet connectivity between the substations with remote connectivity via its wide area communications network, an OC48 SONET ring. Ethernet between the substations provided an easier, faster and less expensive solution than extending the WAN to each substation.



## VELCO, Substations

### THE SOLUTION (continued)

Three VLANs provide secure access over dedicated and discrete pipelines between substation devices and centralized management, engineering and operations departments in the corporate campus. The VLANs operate over the secure Ethernet/IP network, separated from the Internet by firewalls. VLANs ensure that each group gets the information it needs, but does not have access to sensitive information that is not relevant to its tasks.

Magnum 6K25 Managed Fiber Switches are installed in substations throughout VELCO's service area, and are tied into the communications network through a WAN port dedicated to substation automation. Magnum 6K Switches have the powerful, highly secure and robust remote access management capability that VELCO needed to protect its resources and customers. GarrettCom's Magnum MNS-6K Managed Networks Software runs on all Magnum 6K-Series Managed Switches with Secure Web Management (SWM) providing encrypted authentication and access over Ethernet from remote locations.

The Magnum 6K25 Switches are durable, hardened for the substation environment. They are configurable and flexible, which ensure customers such as VELCO of an upgrade path capable of supporting future growth.

### THE RESULTS

Today, VELCO has immediate, secure access to information gathered in each of its substations. An event in a substation can be detected within milliseconds and relayed to the responsible department within seconds for analysis and action. The flexibility inherent with broadband access enables VELCO to contemplate additional capabilities, such as video monitoring of water flow over dams, to manage aesthetic concerns as well as internal and perimeter surveillance at remote substations.

### ABOUT MAGNUM PRODUCTS

The **Magnum™ 6K25 Managed Switch** supports up to 24 built-in fiber ports with optional 1 Gb fiber uplink capability in a compact footprint suitable for tight spaces in utilities substation.

### ABOUT MAGNUM PRODUCTS (continued)

Unlike other managed switches available with industrial specifications, the Magnum 6K25 offers per-port configurability for copper and fiber connectors, and all Gigabit connector types. Like all Magnum Plant-wide LAN Ethernet products, the Magnum 6K25 Managed Switch features extended operating temperature range, rack-mounting for IT centers, conformal coating optional to protect circuitry from exposure to high humidity and dust, high reliability, and high availability with a choice of AC worldwide power, and DC power from 125 VDC, 24 VDC, or -48 VDC sources.

**Magnum MNS-6K Managed Network Software** provides basic switch management, monitoring, and security. It is based on network standards and is easily integrated into existing networks. Among its features are standards-based redundancy support and **Secure Web Management (SWM)**. SWM offers users a safe and secure method for accessing and managing mission-critical Magnum 6K Switches from remote and local users. A convenient graphical browser interface and Internet-proven authentication and encryption technology support remote monitoring and configuration of port and user settings without concern for eavesdropping or malicious interference.

### ABOUT GARRETTCOM

GarrettCom, Inc. is the leading manufacturer of industrial and carrier class-class Ethernet LAN products. GarrettCom offers a comprehensive line of hardened switches and media converters as well as hubs for use in industrial, telecommunications, power utility, transportation, COTS military and hardened factory automation environments. Industry standard software applications that are embedded in the company's MNS-6K Managed Networks Software support self-healing redundant rings and secure web-based access to local and remote networks. GarrettCom markets its products through a network of resellers, OEMs, system integrators, and distributors worldwide. For more information on GarrettCom and its products, visit [www.garrettcom.com](http://www.garrettcom.com).



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