



## VA Hospital Automates JCAHO Testing

Arduous switching, testing and recording of generator test results are almost a distant memory for the VA's operations people at the Veteran Affairs Medical Center in Nashville, Tennessee. Using the VA's new POWERLOGIC power monitoring system, Herschel Flannery, the VA's electrical engineer, now can expediently



and accurately prove the reliability of their Emergency Power Supply System (EPSS) and recently upgraded electrical system. Not only does the system eliminate time-consuming steps, but it also automates the generator testing sequence to provide JCAHO documentation showing compliance with minimum JCAHO loading criteria throughout the test cycle. The POWERLOGIC system with generator JCAHO testing automation was installed recently in conjunction with a three million-dollar electrical system improvement project at the Nashville VA.

### Electrical System Ready for the Future

The VA Medical Center in Nashville was constructed in the mid 1960s with a 480Y/277 volt electrical service from four network connected 1000 KVA transformers. The network transformers were owned and maintained by the Nashville Electric Service (NES) and fed from 2 NES 13.8 KV feeders. The transformer network, which had provided reliable power for well over 30 years was old, fully loaded and land-locked in an inaccessible vault. Concerns about future growth and possibility of a transformer failure prompted the VA to budget \$3 million to replace transformers, service, service switchboards and other old and obsolete distribution equipment.

Nash Lipsey Burch advised the hospital that replacing the "spot network" service with a conventional service (even a dual 480volt double-end service) would not be satisfactory to the medical staff, who had experienced over 30 years of virtually uninterrupted service. NES, however, no longer provided network transformers to its customers. So, with the VA's approval, Nash Lipsey Burch designed two new "spot networks", each consisting of two 2000 KVA transformers owned by the VA. Network protection for each "spot network" was provided by two 2500 amp solid-state microprocessor trip circuit breakers equipped with directional current relays and a ground-fault scheme that totalizes zero-sequence currents flowing through the two mains. The two "spot networks" feed



opposite ends of a double-ended 5000-amp switchboard, providing additional redundancy.

### **Power Monitoring Selection**

Not only did the project upgrade the VA's essential electrical system, but also it gave them the chance to include a computerized power monitoring system for the entire facility. Since the POWERLOGIC system met the VA's criteria, a request was then presented to the VA management--Ray Richards, Chief of Building Maintenance and Operations and Kenyon Dupre, Chief of Facility Management Services. Both agreed that the power monitoring system would benefit the hospital and they proceeded to secure additional project funding for installing the power monitoring system.

#### **Highly Desired Power Monitoring Features:**

1. Graphical and tabular accuracy of generator test run data.
2. Historical logging to maintain database records and hard copy reports for JCAHO documentation.
3. Document power system anomalies to determine whether internally generated or from the utility source.
4. Automation for more hands-free operation during the generator test runs in order to vastly reduce manual hand reading of instrumentation for JCAHO records.
5. Provide internal energy usage monitoring to enable managing costs by load subdivision. (i.e. MRI and medical equipment, parking garage lighting, etc.)
6. System flexibility for expansion so as to include other system points and miscellaneous status inputs as future improvements are added.
7. Monitor harmonic content of the power systems.

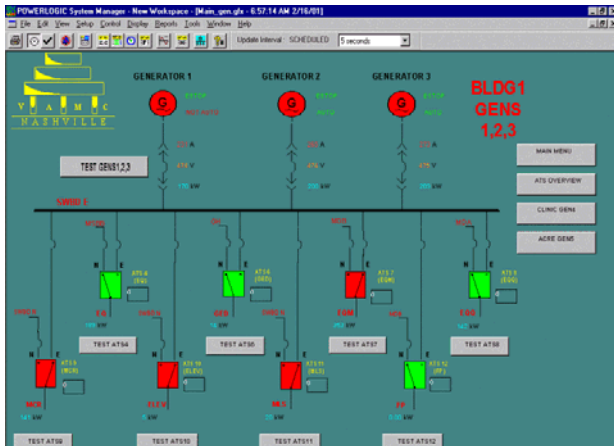
### **Fully Commissioned Power Management System**

Now, the VA's vision has been realized and the POWERLOGIC power monitoring and control system has been installed on both the new Square D electrical equipment and retrofit on older systems. Throughout the installation, Mike Hurst, the VA's chief electrician has been working with Square D's power management application engineer, Dan Mayberry, thereby ensuring that the system implementation met the VA's requirements.

The POWERLOGIC system was deployed in two phases – monitoring first then control. Square D's Power Management Engineering Services supplied all of system design, build and system integration required for both phases. The scope of work entailed, installing meters and communicating breakers on the two mains and seventeen branch breakers as well as several feeder circuits. Square D also designed and built 18 enclosure panels and provided wiring diagrams, PLC programming, interfacing with generator controls, system configuration, graphical one-line diagram development and system commission and startup. The end result is a complete functioning POWERLOGIC system that monitors the incoming utility supply, provides status and test results for five generators, interfaces with all automatic transfer switches, monitors power and breaker status of the switchgear feeders, as well as includes JCAHO generator test automation and EPSS monitoring capabilities.

## Productivity Improvements & Other Benefits

Before the POWERLOGIC system, a generator could be running or not running without an operator being aware of it and was nearly impossible to determine actual generator loading during the entire test. Since commissioning the POWERLOGIC system, “we have found that we do a more efficient job of testing” stated Mike Hurst. Since the POWERLOGIC system continuously monitors KW loading throughout the generator testing, the VA is confident that they are fully complying with the JCAHO EC 2.10.4.1 loading requirements, adequately exercising their EPSS and verifying its readiness in the event a power outage occurs.



*One of many screens showing the one-line electrical diagram with control buttons and real time values.*



*Graph of paralleling system Generator 1 run: Friday morning June 8, 2001*

Through simple one-line diagram computer screens, automatic transfer switches are tested, generators are started and actual switch position and power is monitored. The diagrams are also helpful since they depict real-time status. One screen shows all automatic transfer switches in the three divisions of the entire facility. Detailed circuit information can also be retrieved quickly from POWERLOGIC System Manager instantaneous tables. Flannery has already circumvented testing inaccuracies and cites one example, “The graphs and event logs that automatically document generator test runs show us when tests start, stop, and if completed correctly. During the annual inspection,

a generator paralleling service technician accidentally pushed an emergency stop button and the unit was left off-line for the remainder of the run. This type of inaccuracy may not have been caught without the power monitoring system recording the results.”

Flannery sums it stating, “Our experience with the POWERLOGIC system has been positive. We use the system regularly and are now finding more things that we want the system to monitor. Over the next few months, other generator monitoring points such as water and oil temperatures will be incorporated to complete the JCAHO testing requirements. We also just finished adding Square D PowerLogic devices to determine garage and parking lot energy consumptions.” Located in LaVergne, Tenn., the Power Management Organization was created within Square D in 1989 to develop, design and market power monitoring and control systems and analytical services. The Power Management Organization offers a full range of products and services, including power monitoring hardware and software, lighting control hardware and software and a variety of engineering services.