



## JEA avoids costly transformer failures



### Application:

- > Improve T&D network reliability
- > Analyze and isolate the source of power quality problems
- > Power quality compliance reporting
- > Enhance customer service

### PowerLogic system:

- > PowerLogic® ION Enterprise™ software
- > PowerLogic® ION® EEM (with PQ module) software
- > PowerLogic® ION8000 series meters
- > PowerLogic® ION7600 series meters
- > PowerLogic® ION7700 meter

### PowerLogic® in utilities

#### JEA avoids costly transformer failures

As the largest community-owned utility in Florida and the eighth largest in the United States, JEA serves 360,000 customers in Jacksonville and parts of three adjacent counties. JEA has net generating capability of over 2,300 MW and owns and operates a combination of generation, transmission and distribution assets. Water and sewer systems are also part of its utility service offerings.

As a part of efforts to maximize reliability across this extensive service area, JEA installed an automated energy analysis system. The system helps engineering personnel isolate and correct power quality issues and equipment risks throughout their network.

The solution has repeatedly proven its value, identifying degradation in a number of load tap changer (LTC) units. The early discovery of these problems has avoided failures that could have cost JEA millions of dollars in associated transformer replacements, as well as avoiding service interruptions for commercial, industrial and residential customers.

#### The system

The energy analysis system currently includes 17 advanced power quality meters at generation sites, 73 at transmission and distribution substations, and 92 at important industrial customer sites. The meters track power quality conditions and monitor the performance of equipment including relays and transformers. All real-time and historical data is uploaded automatically over hard line modems, Ethernet, or wireless links to a set of central servers that run the energy analysis software. Meters also connect directly with the RTU/SCADA system.

JEA personnel receive local and web-enabled remote access to data, including standardised SARFI 80 reports that regularly summarise all events in the system. Monthly PQ reports are also offered to customers as a value-added service. Extensive data analysis tools are used by the Systems Analysis Group to help reveal and address any power quality issues throughout the T&D network. Information also benefits managers and engineers in other departments, including electric delivery, customer sales and service, systems protection and controls, substation maintenance and generation plant management.



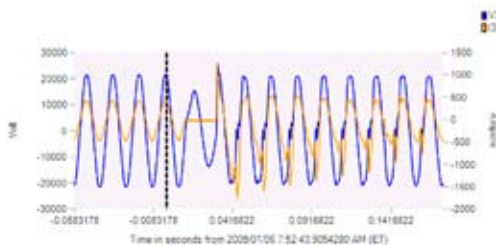
### In action

“The system has been very useful in identifying a number of power quality issues, both internally and at customer sites,” says Tom Ventresca of the System Analysis Group. In one instance, the system reported a C-phase zero current value of less than half a cycle, happening a few times each day. Over a four week period this duration increased to just over one cycle. Investigation pointed to a load tap changer in a substation transformer. Once taken off line during a maintenance outage, a broken pin was found on C-phase of the tap changer transfer switch. It was estimated that the transformer would have survived only two weeks before the jaw would have completely melted and a catastrophic failure occurred.

A similar fault led to the discovery of deterioration in a connector ring and diverter switch. Another instance required the replacement of 49 contacts, moving fingers, collector hubs and neutral. JEA has now programmed the power quality system to trigger an alarm for this specific waveform signature, which is helping them identify these types of issues even faster.

“These kinds of issues are ticking time bombs,” says Ventresca. “In the past, an LTC failure has usually meant that we lose the transformer. The meters and software have already potentially saved three transformers at \$1 million apiece. And the value to customer service is immeasurable in avoiding unplanned outages to thousands of customers.”

Meters located at customer sites have also been programmed to send immediate alerts to JEA personnel and to the affected customers in the event of outages, restorations, faults, unbalances, sags or swells. “The system has definitely improved our response to problems or perceived issues. Having the real-time and PQ data to correlate with events on trouble tickets and sequence-of-events logs makes my job easier in responding to customers and JEA account executives.”



### Future plans

JEA has made the power quality meters standard equipment to be installed on all new substations and generating facilities, as well as any time a major overhaul is done on an existing transformer or when a transformer is added to an existing substation. This could include as many as 15 retrofits a year until all 26 kV transformers are monitored.

In making customer satisfaction and cost management top priorities, JEA will continue to leverage leading-edge energy analysis technology to assure reliability across its entire network.

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