

# Inspections of Distribution Network Help Company Deliver Uninterrupted Power

## RESULTS

- Reduced number of customer power outages due to damaged transmission equipment
- Enhanced circuit reliability
- Improved deployment efficiencies of line maintenance crews
- Lower distribution system maintenance costs

## APPLICATION

A power distribution system comprising more than 500 electric substations and some 21,000 miles of transmission lines must be well maintained to eliminate weaknesses that could cause unexpected power outages, especially in bad weather.

## CUSTOMER

Nearly two million customers depend on this electric power and natural gas utility in the northeastern United States for uninterrupted electrical service. The company has an excellent safety record and has been recognized as the state's safest utility.

## CHALLENGE

Identifying potential problems in the power distribution network is essential to ensure the effective deployment of line crews. Yet, assigning crew personnel to time-consuming inspection duties is costly and detracts from their primary mission. Still, planners need to know about overheated transformers, blown capacitor fuses, broken lightning arrestors, and even damaged poles so maintenance schedules can be established according to need. In addition, crews need to be aware of what to expect upon arrival at work sites, so they can be equipped and prepared to do each job.



*“The thermal and visual inspections saved the company enough money in avoided costs to more than pay for the program.”*

Inspection team leader

### SOLUTION

Emerson's Asset Optimization Services group has helped this utility by providing both thermographic and visual inspections of the entire 21,000-mile distribution system every year. All power lines, including transformers, capacitor banks, disconnects, etc. were checked for extreme internal temperatures using state-of-the-art infrared (IR) imaging. Any temperature above 75°C is considered an emergency condition to be reported immediately. Other abnormal conditions identified by thermographic or visual inspections were reported weekly. Each report included the circuit name or number, street address, pole number, and township as well as a digital image of the visual defect. Thermal images accompanied each IR report.

As many as 11 Emerson experts provided this service, which usually occurred during the first seven months of the year. The inspectors were provided with circuit prints of the distribution grid that consists of more than 1200 circuits. Frequently, the prints were inaccurate because the documents were not updated following maintenance performed during the preceding year. Errors of this kind were reported to the utility for correction.

Each year, the Emerson inspectors found a wide variety of problems. For example, visual inspections in 2008 uncovered a total of 985 defects, including broken poles, crossarms, and braces; blown lightning arrestors; broken CCMS spreaders and secondary spreaders; blown capacitor fuses; and more. At the same time, the IR inspections revealed 382 thermal defects, 37 of which were serious enough to require immediate repair.

In many cases, early identification and repair of existing defects helped the company avoid costly local area outages. When customers lose power, the company loses revenue, especially when commercial and industrial customers are affected. Often, emergency crews must be deployed to restore service. However, the thermal inspection and circuit control program provided predictive intelligence that enabled the company to avoid such reactive maintenance.

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