

## Engineering Services

### Power Systems Engineering

#### On-site power system assessment



#### Why Choose an On-Site Power System Assessment?

Evaluates the condition of the electric system

Improves system reliability and availability

Enhances electrical safety

Provides documentation of system configuration, condition and maintenance

Ensures proper operation of new or modified loads

Prioritizes system improvements

Contact your Square D sales representative, call Square D at 1-888-778-2733 or visit [www.SquareD.com](http://www.SquareD.com).

Emergency Services Available  
24 Hours/Day-7 Days/Week



Square D offers on-site services performed by registered, professional engineers to determine the condition of your electrical system.

#### An On-Site Power System Assessment Addresses

- Electrical system reliability and condition
- Single-line documentation of power system
- Basic codes and standards compliance
- Protective coordination assessment
- Short-circuit withstand overview
- Maintenance program review
- Recommendations for power system optimization
- Power monitoring recommendations
- Power quality analysis, loading measurements and energy management assessment (*as needed*)

#### Considerations for an On-Site Power System Assessment

- Electric power system has been under-utilized, damaged or neglected
- Recent changes to the electrical distribution system, or the potential exists for load additions or process modifications
- Lack of single-lines, as-builts, maintenance records or other vital documentation
- Concerns about power system reliability
- Need for improved maintenance practices or it has been over five years since protective coordination or short-circuit studies have been performed

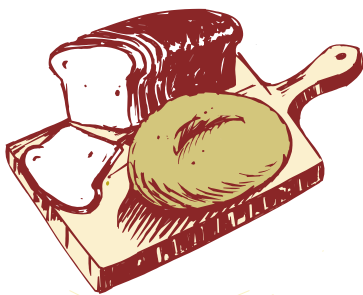
Square D's professional engineers--safety-trained and equipped--will listen to your needs, define the problem, then engineer the solution. Whether it is refurbishment, replacement or recommendations to optimize existing equipment, we can provide your complete service solution. Your most attractive economic return is our primary objective.

**Industry Leading Expertise. Customized Solutions.**



**SQUARE D**  
Schneider Electric

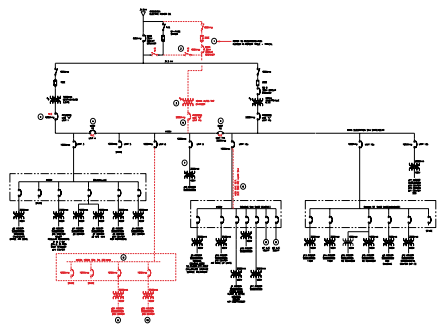
## Case Study: On-Site Power System Assessment



An automated bakery plant had focused its resources on production equipment at the expense of its electric power system. The medium- and low-voltage system had been allowed to deteriorate. In addition, failed or damaged equipment was patched, bypassed, and/or circumvented.

For example, one low-voltage transformer in a main-tie-main substation failed. It was removed from service but never replaced. One transformer fed the load formerly served by two. At another location, a 4160-V switch was damaged due to a loose connection. It, too, was bypassed, but the resulting configuration further eroded the power system reliability. Kirk-key interlocks at three locations malfunctioned. One lock contained the stem of a key broken off in its cylinder. Circuit breakers would not trip as designed.

All in all, the power system was suffering from years of neglect. When the single transformer serving two loads failed, the plant hired Square D to replace it and to perform a power system audit throughout the facility. While the plant was in a better financial position, and had allocated resources to upgrade the system, it could not, of course, replace the entire medium- and low-voltage systems.



Square D's challenge, therefore, was to perform power system triage by auditing the power system, identifying the problem areas and components, and submitting a prioritized plan to alleviate safety hazards, improve reliability, and reduce power quality problems. A summary of findings is shown in the table below.

### The Solution

The audit was performed by a professional engineer who led the activities shown below. The findings were outlined in a detailed report which identified problem areas and the urgency of these areas.

- 1) Power equipment assessment and maintenance review
- 2) Circuit loading measurements with portable test equipment
- 3) Thermographic survey
- 4) Protective coordination and short-circuit study
- 5) Single-line documentation of existing system and proposed changes

| PARAMETER               | Area 1 | Area 2 | Area 3 | Area 4 | Area 5 | Area 6 | Area 7 |
|-------------------------|--------|--------|--------|--------|--------|--------|--------|
| Loading                 | Yellow | Green  | Green  | Green  | Yellow | Green  | Green  |
| Voltage Quality         | Green  | Green  | Green  | Green  | Green  | Green  | Green  |
| Power Factor            | Green  | Green  | Green  | Green  | Green  | Green  | Green  |
| Metering                | Yellow | Green  | Green  | Green  | Green  | Green  | Green  |
| Codes & Safety          | Orange | Yellow | Green  | Orange | Orange | Orange | Orange |
| Reliability             | Green  | Green  | Green  | Green  | Green  | Green  | Green  |
| Equipment Condition     | Yellow | Orange | Orange | Orange | Orange | Orange | Orange |
| Maintenance             | Yellow | Green  | Green  | Green  | Green  | Green  | Green  |
| Short Circuit Withstand | Green  | Green  | Green  | Green  | Green  | Green  | Green  |
| Protective Coordination | Yellow | Orange | Green  | Green  | Green  | Green  | Green  |
| Thermographic Scan      | Orange | Green  | Yellow | Green  | Green  | Green  | Green  |

- Immediate corrective action required
- Corrective action recommended soon
- Within normal limits