CASE STUDY
IMPROVING RELIABILITY

S&C ELECTRIC COMPANY
Excellence Through Innovation

Averting a Potentially Calamitous Situation for a Municipal Utility

S&C Featured Solution: S&C's Power Systems Solutions

Location: Midwest United States

Customer Challenge

Customers of a Midwestern municipal utility were experiencing a large number of outages due to the operation of cutouts on the distribution system. Concerned that the cutouts were operating improperly, the utility contacted the cutout manufacturer, who theorized the utility's protective devices might not be coordinated correctly. S&C's Power Systems Solutions was contacted to determine the extent of the problem and recommend solutions.

The utility purchases power at 138 kV. Power is distributed through a 138/34.5/12.47-kV three-winding transformer substation and 2.4-kV satellite substations. The utility also owns eight generators, which can be brought on line during peak-load periods.

S&C Solution

S&C engineers visited the utility to gather the information necessary to prepare short-circuit and coordination studies on a portion of the distribution system. During the two-day visit, they verified the accuracy of the utility's electrical distribution map and the interconnection to the upstream 138-kV substation.

The data acquired was entered into CYME International's "Power System Analysis Framework—Fault," a commercially available computer program distributed by S&C Electric Company. The program calculates fault currents in accordance with ANSI standards and models "worst-case" fault scenarios.

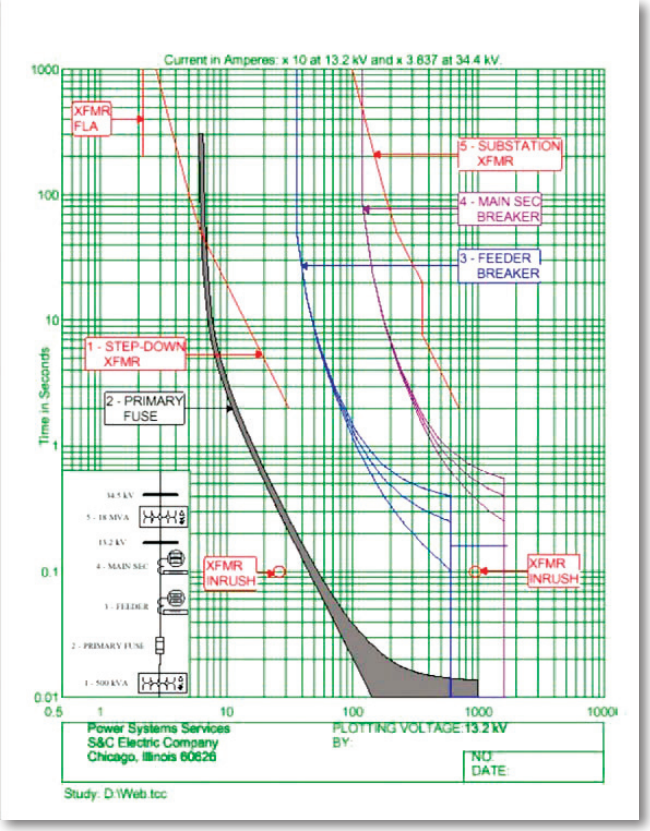
The results of the analyses indicated that, during normal operation of the substation—without the generators, fault currents are within the interrupting capability of down-stream circuit breakers and fuses. However, when the generators are brought on line, the increased power can potentially produce fault currents substantially higher than the interrupting ratings of the down-stream protective devices. Under these circumstances, a fault close to the substation could lead to substantial equipment damage and system-wide outages.

Results

On the heels of this finding, S&C engineers recommended a systemwide plan for the standardization of power fuses, which would yield a fully coordinated protection scheme from the substation to the downstream service transformers.

Since the implementation of these recommendations, the utility again called upon S&C to evaluate its other distribution circuits. S&C's engineers performed short-circuit and coordination studies for these other circuits and made similar recommendations.

Through S&C's involvement, a potentially calamitous situation was averted. A recent follow-up conversation with the utility verified that they are indeed experiencing fewer outages and have substantially increased service reliability to its customers.



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