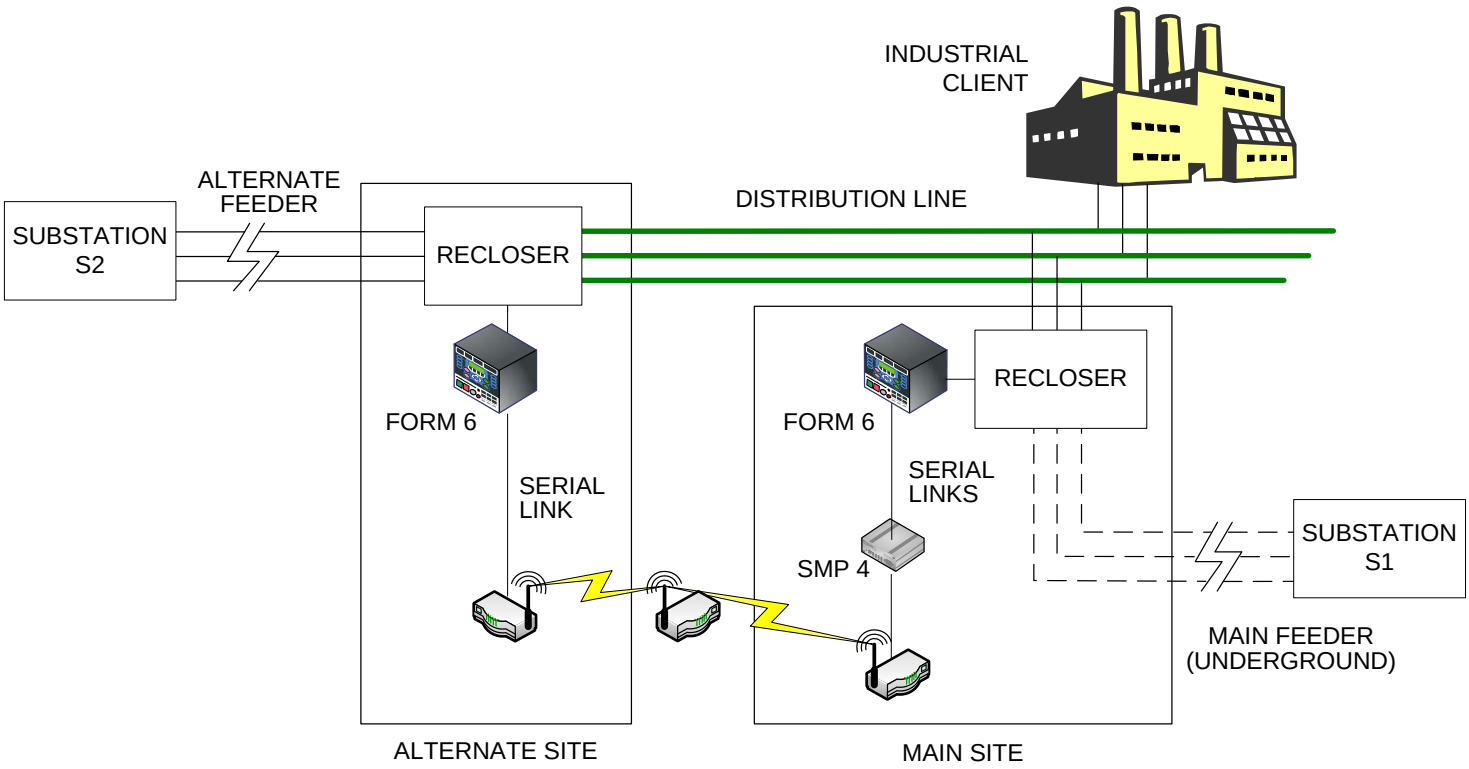
Smart Grid Solution for Automatic Source Transfer Using the SMP Gateway



Scope

This case study explores how a utility improved the reliability of its distribution network, and reduced its SAIDI and CAIDI indexes, by implementing an automatic source transfer solution using the Form 6 recloser control and the Cybectec SMP 4 data concentrator from Cooper Power Systems.

In service: Summer of 2008

Client

United REMC
http://www.unitedremc.com/

The Challenge

In Fort Wayne, Indiana (USA), a United REMC-owned distribution line serving several industrial clients is fed partly underground from a main substation. For several reasons, this underground part of the line is prone to interruptions. Outages lasting longer than 10 minutes affect those clients' industrial processes, resulting in significant economic losses.

These problems put pressure on the utility to implement a solution to improve the reliability of its distribution network and reduce its System Average Interruption Duration Index (SAIDI) and Customer Average Interruption Duration Index (CAIDI).

An alternate substation can feed the affected part of the distribution line, but only for short periods of time.

The Solution

Cooper Power Systems proposed an automatic source transfer solution involving two reclosers (one for each feeder), Form 6 recloser controls, and a Cybectec SMP 4 data concentrator.

The first recloser was installed at the end of the underground part of the main feeder, while the second one was installed on the alternate feeder. The data concentrator was installed at the main site, with source transfer logic implemented on it. Gathering information from the Form 6 recloser controls, the data concentrator will operate the reclosers based on the absence of source voltage on the main feeder line. Unlicensed 900 MHz radios are used to link the data concentrator to the Form 6 control located on the alternate site.

A site survey was held before finalizing the communications infrastructure, revealing these obstacles: there was no direct line-of-sight between the two sites, and the main site was 40-feet lower than the alternate site.

To solve these issues, a radio repeater was installed between the main and alternate sites, at a location called the "repeater site". The repeater would have direct lines-of-sight with both locations. In addition, a 60-foot pole was installed at the main site, raising that antenna to the same level as the antennas on the repeater and alternate sites.

Automatic restoration of the main feeder by additional logic in the data concentrator was proposed by Cooper, but declined by the utility.

Form 6 recloser control front panel pushbuttons and indicators are used for manual operations, such as the restoration of the main feeder and the deactivation of the automatic source transfer function.

The complete system was successfully installed and commissioned during the summer of 2008.

About United REMC

United REMC, a Touchstone Energy® cooperative, is a not-for-profit electric company founded in 1965. It owns and operates nearly1400 miles of electric lines, and over 25,000 poles. Historically, United REMC has ranked in the top of all electric utilities in Indiana in terms of low rates.

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COOPER Power Systems