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CASE STUDY / **DISTRIBUTION ASSET RENEWAL PLANNING**

Optimizing regional systems for improved reliability

Wisconsin Public Service needed to manage the risks of aging infrastructure and prepare for an electrified future. A holistic planning methodology led the way to the most beneficial and cost-effective projects for reliability.

We developed a variety of reliability improvement projects for more than 200 circuits using Synergi Electric distribution models.

Project stats

Client
Wisconsin Public Service

Location
Green Bay, Wisconsin

Project duration
January 2018-present

480K
electric customers served

220+
circuits analyzed holistically

$200M
of projects considered

Challenge

Electric utilities are under pressure to deliver greater reliability. Facing a future characterized by distributed energy resources, broad electrification and increased customer choice, Wisconsin Public Service (WPS) is no exception.

The utility serves more than 480,000 electric customers in northeast and central Wisconsin. It has a long-standing and industry-leading focus on reliability. However, its rural location means WPS faces many of the cost-benefit and feasibility challenges of a smaller rural electric cooperative (REC). WPS often must deal with long circuits and difficult interconnectivity while trying to achieve its reliability improvement objectives.

Accordingly, WPS solicited vendors to help develop a comprehensive and fiscally efficient five-year Distribution Asset Renewal Plan (DARP). This plan was to simultaneously address aging infrastructure and strategic investment to improve reliability.

Solution

WPS enlisted 1898 & Co. to optimize the utility's regional systems by leading a holistic distribution planning process. Instead of developing projects programmatically by asset type or budget category, as is typical in the industry, we applied a comprehensive set of criteria and analysis. Doing so across a geographic group of circuits and customers efficiently identifies beneficial and cost-effective projects.

For WPS, we added a granular reliability model to the company's traditional load flow plus short circuit planning models. This approach blended the historical outage propensity of circuit subsections and devices with the typical performance of system components. DNV GL Noble Denton USA LLC, the maker of Synergi Electric, was an integral part of the project team, working closely with us to amplify the value and capabilities of the modeling software.

In this way, we were able to consider geographic compactness and efficiency of the circuit layouts, load transfer and automated restoration schemes, phase balancing, optimal capacitor placement, protection coordination, aged cable and small copper wire, and small/aged pole replacements.

Results

Projects were developed on more than 200 circuits using Synergi Electric distribution planning models and CYMTCC protection coordination analysis. Other analyses included model cleanup, preparation and load allocation, substation modeling and model enhancements, weather-normalized load forecasting, circuit reconfigurations, and overcurrent protection analysis.

For each project, we created scope documents throughout the planning analysis. Working within the WPS design tools, we then created requests to facilitate the procurement and construction execution.

While renewing these assets, WPS is now also able to apply more consistent standards for design and construction, convert overhead facilities to underground and upgrade equipment to enable distribution automation.

About 1898 & Co.

1898 & Co. is a business, technology and security solutions consultancy where experience and foresight come together to unlock lasting advancements. We innovate today to fuel your future growth, catalyzing insights that drive smarter decisions, improve performance and maximize value. As part of Burns & McDonnell, we draw on more than 120 years of deep and broad experience in complex industries as we envision and enable the future for our clients.

Services

- Construction planning
- Distribution engineering
- Distribution planning
- Process engineering
- Program management

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