Smart sensors, smarter investments

PPL Electric Utilities successfully integrates dynamic line rating technology into operations providing real-time data for business decisions

PPL is piloting a new technology called Dynamic Line Rating (DLR) that employs sensors that give real-time information on conditions – like wind speed and line temperature – affecting transmission line performance. This information is used to increase the amount of electricity delivered over existing lines when needed, therefore decreasing congestion.

To understand congestion, think of it like a highway: when traffic jams become a regular problem, you need to find a way to keep the cars moving. Roads need to be expanded or added. Similarly, transmission owners like PPL must upgrade or build new electrical lines.

Traditionally, to manage congestion, static line ratings are taken when the lines are initially built. So, even though the environmental factors are continually changing, the rating assumes the most conservative factors are at play. When the grid becomes congested, a transmission operator may be unable to increase the amount of electricity because the initial static line rating assumes the line is at capacity. This means PPL must invest in upgrading or adding transmission lines.

PPL, in partnership with the regional transmission operator PJM, piloted DLR sensors on two transmission lines this past winter. The goal was to determine if the devices could better manage congestion. The pilot also aimed to provide PJM with real-time information from the sensors installed on PPL's transmission lines to optimize the performance and make infrastructure investment decisions.

The pilot was successful, and because of information from the DLR sensors, PJM determined that PPL did not need a new or rebuilt line to manage congestion. This saves millions of dollars in line rebuilds helping to keep customer rates low.

PPL is one of the first companies to successfully use DLR sensors to make operational decisions.

"The information we are collecting is helping us better balance strong resiliency while holding down costs," said Dave Quier, vice president of Transmission and Substations. "Not having to make upgrades to the transmission line that was part of the DLR pilot gives our team more flexibility to invest money where customers will see bigger reliability results."

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