NREL + EPRI

NREL is collaborating with the Electric Power Research Institute (EPRI) to validate the performance of a Spirae-developed advanced microgrid controller capable of managing 1–10 megawatts of aggregated generation capacity. The aim is to develop a commercially viable and flexible microgrid controller, easily adapted to different end-user applications and to a range of electric grid characteristics. EPRI is leading a team that includes Spirae, NREL, a microgrid system analytics consultant, 15 utilities, and target communities. This project is sponsored by the U.S. Department of Energy’s Office of Electricity Delivery & Energy Reliability.

R&D STRATEGY

NREL is validating and testing the functions of the controller by installing it in the ESIF and connecting it to a virtual model of a microgrid, embodied within a real-time digital simulator (RTDS). The controller is also being connected to a utility-scale battery inverter, which interacts with the virtual model through an AC power amplifier, adjusting its output to the simulated electric grid demand. For one targeted community, the controller is undergoing detailed testing to verify that it meets the technical functional requirements for that community.

IMPACT

Microgrids can create a more resilient electric grid by disconnecting from the main grid during disturbances, such as outages, and continuing to operate independently. They may also need to operate with high penetrations of renewable generation in addition to traditional distributed energy resources. NREL’s work can confirm the performance of a microgrid and microgrid controller before they are actually deployed.