



Customer Highlight



AES OHIO

Wireless protection communications improve distribution reliability

DEPLOYING THE INNOVATIVE SEL WIRELESS PROTECTION SYSTEM allowed AES Ohio to coordinate close-proximity recloser controls and improve distribution system reliability.

Customer problem

To achieve an ambitious reliability improvement goal, AES Ohio added hundreds of recloser controls to its distribution system, which includes more than 13,000 miles of power lines and encompasses both metropolitan and rural areas.

Because recloser miscoordinations would cut power to longer line segments than necessary, the company needed to implement a trip-blocking scheme for its numerous close-proximity recloser controls. High-speed protection communications would be necessary—but the utility's distribution circuits had no fiber-optic infrastructure. A different method was needed.

Solution

SEL proposed an innovative, economical communications solution: the SEL Wireless Protection System. This system consists of three interlocking components: the SEL-FT50 Fault Transmitter, SEL-RP50 Fault Repeater, and SEL-FR12 Fault Receiver.

The compact SEL-FR12 Fault Receiver is installed in a cabinet alongside a protective relay or recloser control and plugged into a communications port on the protective device—for AES Ohio, an SEL-651R Advanced Recloser Control. The SEL-FT50 Fault Transmitter is mounted directly on an overhead power cable; when it detects fault current, it broadcasts the fault status via 900 MHz wireless signals to an SEL-FR12 either directly or via line-mounted SEL-RP50 repeaters. In typical conditions, it takes 6 milliseconds to send fault data to the protective device, with each repeater in the communications chain adding just 1.5 milliseconds of delay to the overall latency.

Results

AES Ohio and SEL worked together to set up a pilot installation on a single distribution circuit. After it proved to be a viable solution, the company began deploying it at scale. For each circuit where close-proximity coordination is needed, an AES Ohio protection engineer specifies the recloser settings, the locations of the fault transmitters and repeaters, and the Wireless Protection System settings. Then a line crew installs the equipment. Radio reception in the field is hard to predict, so flexibility and ease of installation are key; if unexpected signal attenuation occurs, linemen can quickly adjust the settings of an additional SEL-RP50 repeater on the spot and hang it on the line with a hot stick. Four years into its reliability improvement and distribution automation program, AES Ohio has added more than 200 recloser controls to its system, and approximately 40 percent of them use coordination schemes enabled by the SEL Wireless Protection System. The next phase of the program calls for hundreds more.

About SEL

SEL is a 100 percent employee-owned company that specializes in creating digital products and systems that protect, control, and automate power systems around the world. This technology mitigates blackouts and improves power system reliability and safety at a reduced cost. Headquartered in Pullman, Washington, SEL has manufactured products in the United States since 1984 and serves customers worldwide.

Cybersecurity philosophy

We build layers of defense and maintain the integrity of each layer's purpose—in other words, we apply the right technology at the right layer. We believe simpler products are easier to defend and that the safety of the power system and availability of the protection and control devices come first.

Reliability

SEL products are designed and manufactured for the world's most challenging environments, exceeding all industry standards for temperature, shock, and electric stress.

Our products have a mean time between returns for repair (MTBR) of more than 250 years, based on observed field performance. This means that if you have 250 SEL products installed in your systems, you can expect to have less than one unscheduled removal from service per year for any reason, whether it's a defect or an external factor such as overvoltage, overcurrent, wildlife damage, or environmental exposure.

Warranty

SEL backs our products and commitments with a ten-year warranty, no-charge diagnostic and repair services, local support, and a variety of test procedures and certifications.

Support

SEL support teams are stationed in regional offices around the globe and staffed with application engineers who are experts in our products and in power system applications. We offer 24/7 technical support at no cost for the life of your SEL products.

Contact us

To learn more about partnering with SEL Engineering Services, contact esinfo@selinc.com or visit selinc.com/engineering-services.