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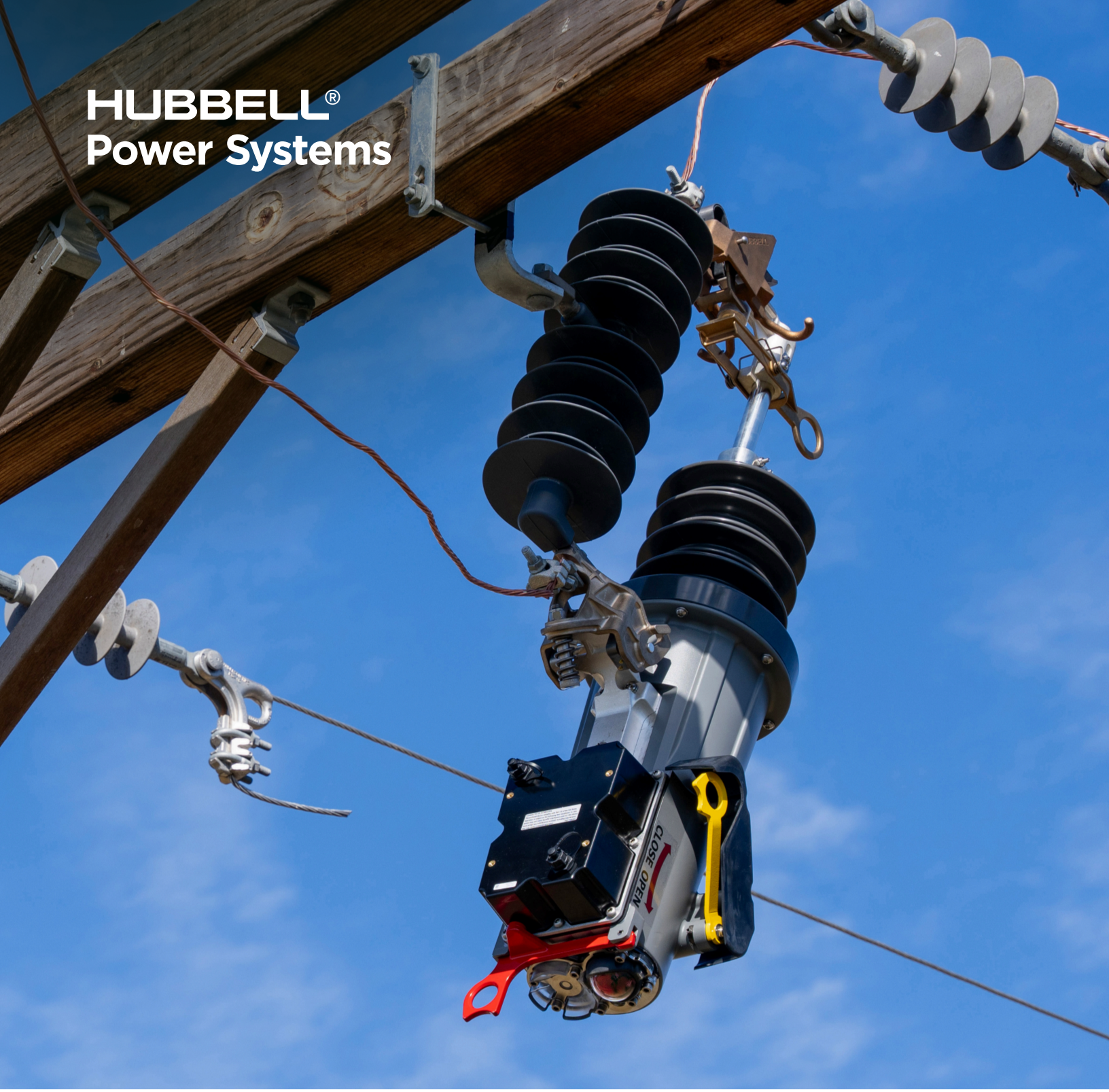

WHITE PAPER

Utility insights deliver industry-wide benefits

Inside the pilot program behind the LineDefender recloser

Hubbell Power Systems' largest pilot program to date began with a simple question: What do utilities need most from a single-phase recloser? In 2021, Hubbell surveyed line workers, engineers, and technicians to uncover pain points and gaps in existing solutions. Safety, ease of installation, intuitive operation, and reliability emerged as top priorities. These insights shaped the design of the new LineDefender™ recloser—a product built from the ground up to meet evolving utility needs.

By early 2025, after years of development and multiple prototypes, Hubbell launched a landmark pilot program with 36 utilities across North America. More than 60 LineDefender units were installed and tested in real-world conditions. Feedback from these pilot participants drove refinements that enhanced safety, simplified installation, and improved durability. This approach set a new benchmark for utility-focused product development and reinforced Hubbell's commitment to lineworker safety and operational excellence.

Customer Insights Improve Design

Hubbell's journey began with an initial survey of lineworkers, engineers, and technicians that led to a better understanding of the pain points and satisfaction gaps with existing single phase recloser offerings in the market.

The survey results showed that utility professionals were primarily concerned with safely and reliably closing and reenergizing devices. Visual status indicators, ease of use, and robust operation were also important, with survey participants also indicating only moderate satisfaction with features offered by current products.

Taking their lead from the initial survey results, the Hubbell product team also met with professionals from 20 additional utilities to gain other meaningful insights. These discovery sessions explored protection philosophies, device pain points, and unmet needs in the field.

The product team carefully analyzed the survey and interview feedback received from the utilities and identified safety, ease of installation, intuitive operation, and reliability as the key focus areas for the new recloser. The team then reviewed potential solutions to the problems the utilities identified. Some of the solutions explored included improving manual operation, enhancing visual indicators, and ensuring robust and reliable fault protection.

Fast forward two years and a few prototypes later, and the LineDefender recloser was ready for deployment in a pilot program. Hubbell began seeking utilities to participate as pilot users to assess the new recloser's performance through bench testing and installation on lateral lines.

"The LineDefender recloser has worked flawlessly on our distribution system with no false operations. Its ease of use and functionality make it a great addition to our overhead distribution system."

Todd Shaffer, Vice President of Operations
Mountain View Electric Association

Hubbell Launches Pilot Program

By December 2024, the first of 36 participating utilities across the U.S. and Canada deployed the LineDefender recloser. By the end of the pilot, 68 reclosers had been shipped, with 56 units field-installed and energized, and the remainder being reserved for extensive laboratory testing and future deployment. The pilot study, including the scale and selection of test sites, was designed to provide a robust validation of the reliability and potential impact of the LineDefender recloser in different regions as well as under a variety of climatic conditions.

Reflecting on his decision to participate in the pilot, Douglas Conrady, an engineering technician at Alfalfa Electric Cooperative, said, "When we were asked to be a test site for the LineDefender™ reclosers, I had no reservations." He explained, "In my dealings with Hubbell, I've never had a bad experience. The product experts are indeed experts. When some of

my feedback elicited a call from the actual engineers, I was surprised. That was impressive. They wanted to listen to a guy at the end of the line."

Fig. 1 – Safe and easy operation from the ground

Pilot Delivers Exceptional Results

During the pilot, the devices detected more than 75 faulting events and performed 65 protective operations, confirming the device performed as expected. Utilities participating in the pilot reported no incorrect operations, false trips, or protection issues.

The LineDefender recloser operated over a wide range of fault currents, exercising numerous time-current curves and advanced protection features during the pilot program. These advanced features—such as high-current trip, inrush restraint, cold-load pickup, sequence coordination, and adaptive reclosing intervals—ensured proper fault discrimination and device coordination.

"The LineDefender recloser allows for versatile implementation," commented pilot participant Trey Davis, a system engineer at Wiregrass Electric Cooperative. He explained, "It can replace sectionalizers, feeding underground risers in areas that require too much current for fuses and yet allows for proper coordination with upstream devices."

Davis said the recloser has additional helpful features for Wiregrass, explaining, "The LineDefender recloser also captures and records events and operations to allow for troubleshooting reoccurring or strange events. Communications with the device will further integrate our system with SCADA, creating more visibility for our system operators."

Throughout the pilot study, utilities expressed appreciation for the LineDefender recloser's enhanced safety features and ease of installation. "Our linemen value a design that allows them to close the recloser into the cutout with the bottle open, ensuring load is picked up without arcing," said Davis. He continued, "The feature that sets the LineDefender recloser apart is the ability to independently operate the bottle, allowing for safe installation or removal of the device. Installation and operation of the LineDefender reclosers has been smooth and, most importantly, safe."

Several other utilities also commented on the recloser's appeal to lineworkers, including James Ray, director of line operations at Holy Cross Energy in Colorado, who said, "LineDefender is the most lineman-friendly device that I have seen on the market."

"The LineDefender recloser provides a cost-friendly solution for the distribution industry."

Sam Miller, System Engineering Associate
Tri-County Electric

Feedback Drives Product Innovation

The LineDefender recloser delivered on the most crucial unmet needs identified in the initial user survey. Safety, versatility, intuitive design, and reliability were all enhanced based on utility input early in the process.

"Hubbell has repeatedly stressed how important our feedback is to them and have considered and used that feedback," explained Davis. He added, "Hubbell has made the commitment on several occasions to visit us to better understand exactly how we plan to use the LineDefender recloser and what characteristics were most important to us."

With valuable feedback from utilities, Hubbell was able to make several modifications and enhancements to the initial design, including:

• **Non-Reclose and Hot-Line Trip Mode Improvements:** Utility feedback led to a sturdier, easier-to-use one-shot mode handle (non-ratcheting or hot-line trip), with a redesigned channel and improved placement for ease of operation from the ground.

• **Weight Workaround:** It was clear that utilities wanted a robust, utility-hardened product with no compromises in safety or protection. Any concerns around device weight were cleverly addressed by incorporating a shock-absorbing spring and counterbalancing the recloser weight in the cutout-style mount.

• **Mounting System:** A custom cutout-style mount with a top-locking latch ensures secure installation and easy resetting. The latch eliminates any risk of the device inadvertently dropping out of the mount due to storms or high winds. It also ensures a wider angle of approach, significantly reducing the risk of arcing, while improving overall usability.

• **Visible Break and Safety:** Features like a visible break and manual operation from the ground increased safety for lineworkers, allowing quick visual confirmation and reducing accidental re-energization.

• **Durability Enhancements:** The use of aluminum cast bodies, stainless steel hardware, and marine-grade materials ensure long-term reliability.

The device's high basic impulse insultation level (BIL) rating and fault-current rating without the mount, along with its up to a 200-amp continuous rating, also set new standards for performance, meeting full recloser operational specifications as defined by IEEE C37.60. Features like easy installation and operation, visible status indicators, robust design, and technology integration received strong satisfaction ratings from pilot participants.

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Trey Davis, System Engineeri
Wiregrass Electric Cooperative

Versatility that Exceeds Expectations

In terms of technology, utilities noted that the coordinating GridHUBB™ software platform was accessible via laptop, tablet, or phone, which made device programming and data analysis easy. Participants said they also benefited from the LineDefender™ recloser's ease of local communications via Wi-Fi and Bluetooth, embedded GPS for timestamping, multiple options for SCADA integration, and advanced cybersecurity features. Data highlights for participants included the unlimited TCC curve library, the large capacity of internal memory to capture event logs with waveforms, as well as demand, event sequence, and audit logs.

"The LineDefender recloser has met and exceeded all of our expectations," summarized Davis from Wiregrass. "The criteria the LineDefender had to meet for us included being versatile—useable in many scenarios and programable to coordinate with any scheme—as well as capable of safe operation, meaning a design that did not require physically closing the device while simultaneously picking up load."

He added, "It would also need to be reliable and have an intuitive design, featuring handles and indicators that linemen are accustomed to and include a mechanical connection to the bottle to ensure operation despite a charge on the battery."

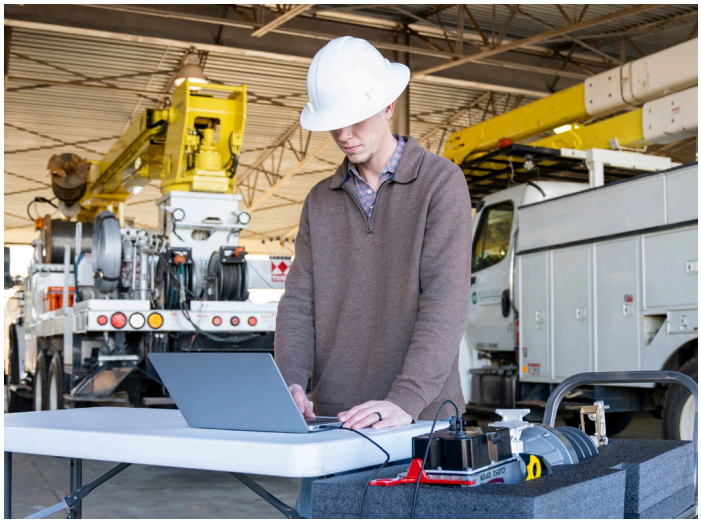

Fig. 2 – User-friendly programming via USB-C port or built-in WiFi and Bluetooth Low Energy

Other pilot participants also commented on the way the new recloser would positively impact their operations. "The LineDefender recloser provides a cost-friendly solution for the distribution industry in terms of reliability over our 6,000-mile distribution area that we did not have before," said Sam Miller, P.E., system engineering associate at Tri-County Electric. "This device gives us a chance to use it in locations where we only had fuses. We can now use the LineDefender™ recloser to provide less truck rolls and more reliability for our members. Hubbell has provided a great product for co-ops for big distribution areas to improve their reliability metrics."

Being able to reduce trips and truck rolls allows utilities to save valuable resources. “Having our service area converted to LineDefender reclosers will enable us to see when and where the faults are more accurately, which will allow us to get the lights on quicker,” commented Douglas Conrady from Alfalfa Electric Cooperative. “Our linemen won’t have to drive as many miles looking for problems when conditions are less than ideal. Towards the ends of the lines, placing a LineDefender recloser where we might have a fuse or no protection keeps truck rolls lower.”

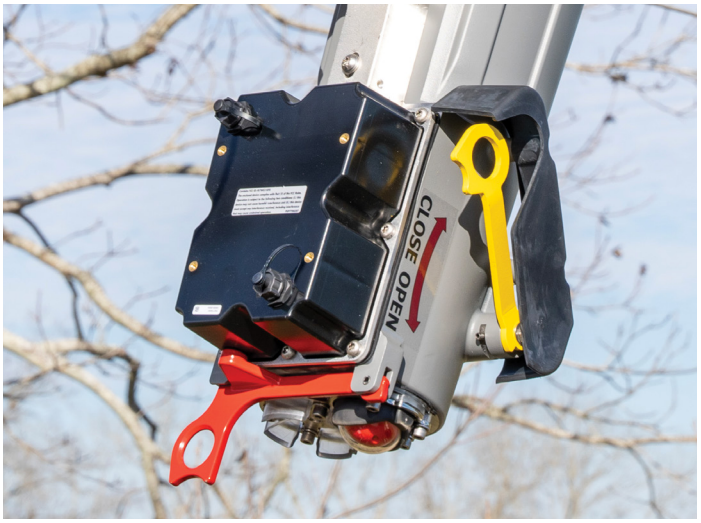

Fig. 3 – Manual open/close operation via yellow handle and visual open/closed status via mechanically-linked semaphore

In terms of his overall experience with the pilot, Conrady added, “Going into testing, I had an idea of what the LineDefender was. When they arrived and I started working with them, I had to revise that thinking. To me, it’s not a direct competitor for other devices, but a better class of device.”

Hubbell remains committed to ongoing innovation, driven by utility input and real-world experience. Based on feedback from utility engineers, technicians and linemen, the product team compiled a LineDefender product roadmap for features and enhancements to be implemented over time, with set timelines and expectations for future software and firmware releases.

“LineDefender is the most lineman-friendly device that I have seen on the market.”

James Ray, Director of Line Operations
Holy Cross Energy

Conclusion

The pilot program for the LineDefender recloser stands as a model for collaborative product development in the utility industry. By engaging numerous utilities across North America, Hubbell validated the reliability, safety, and usability of the new LineDefender single-phase recloser, making real-time improvements based on field feedback.

The result is a recloser that meets the evolving needs of utilities and sets a new benchmark for lineworker safety and operational excellence. “The LineDefender recloser has worked flawlessly on our distribution system with no false operations. Its ease of use and functionality make it a great addition to our overhead distribution system,” explained Todd Shaffer, vice president of operations at Mountain View Electric Association. He then added, “We look forward to working with Hubbell and adding additional units in the future.”

Learn more about the LineDefender recloser here or contact us for additional information.

HUBBELL®
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Hubbell Power Systems, Inc. (HPS) manufactures a wide variety of transmission, distribution, substation, OEM and telecommunications products used by utilities.

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HUS-MULTI-CH-EN-04047 | 01/2026

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