





UTILITIES UNDERSTAND  
THE IMPORTANCE OF  
THE RELIABILITY AND  
RESILIENCY OF THEIR  
SYSTEM, BUT THEY  
NEED HELP.

Electric utilities around the world are facing a new wave of challenges to the way they operate and maintain their networks. Our reliance on electricity to power our daily lives, along with increasingly severe major weather events and natural disasters, are putting pressure on utilities to do more to reduce outage frequency and duration, but with less resources.

Indeed, seemingly everything today is “powered.” Households can have 24 or more devices<sup>①</sup> that rely on electricity to operate; commercial and manufacturing plants can have multitudes more. No one wants to experience the frustration that results when the power goes off.

The financial losses alone from both temporary and sustained outages are staggering. **Outages cost the U.S. economy approximately \$79 billion a year.**<sup>②</sup> The impact is felt the world over, with a single hour of downtime in the United Kingdom, for example, **costing each affected small-business utility customer on average £800 (US\$1,042)**<sup>③</sup>. In Canada, the **estimated nationwide cost annually of sustained power outages is CAD \$4.1 billion (US\$3.1 billion)**. For temporary outages, the **cost doubles to CAD \$8.1 billion (US\$6.3 billion)**.<sup>④</sup>

When an outage inevitably occurs, either during severe weather or on a blue-sky day, utilities rely on highly skilled line crews to safely assess, repair, and re-energize electrical systems. Every utility’s priority is to keep these crews safe, but the reality is the more time crews spend on the road and working on energized lines, the greater their chances of serious injury.

On top of this, each day utilities must rely on a legacy electrical network that is more susceptible to major weather events and is aging faster than it’s being replaced. This adds up to mounting operation and maintenance costs through unnecessary truck rolls, damaged-equipment replacement, and nuisance operations that eat into utilities’ resources and ability to build the grid their customers demand.

New revenue to invest in necessary grid improvements is scarce because utilities have seen consistently flat or declining customer load growth. The situation isn’t expected to get better.

**By 2050, the average U.S. household will use less than half the electricity for lighting it did in 2017.** Other nations face flattening growth in power demand for similar reasons.<sup>⑤</sup>

The organizations that regulate these utilities hear customers’ demands for more reliability but are hesitant to approve more money until utilities meet customers’ reliability expectations. This often results in a cycle that leads utilities to look inward to maximize reliability while reducing overall costs of grid operation.

Tight budgets, problems securing capital to invest in infrastructure, and stakeholder calls for greater power reliability—all the while needing to ensure line crews stay safe are the realities utilities face around the world.

- ① Forbes, “24 Electronic Products Per Household—Got Recycling?” Jan. 2, 2013.
- ② Berkeley National Laboratory, “Cost of Power Interruptions to Electricity Consumers in the United States (U.S.),” February 2006.
- ③ Daily Business, “How Much Does a Power Cut Cost Your Business,” October 20, 2017.
- ④ S&C GridTalk, “The True Cost of Outages in Canada: \$12 Billion,” December 12, 2018.
- ⑤ U.S. Energy Information Administration, “Annual Energy Outlook 2018,” February 6, 2018.

**S&C UNDERSTANDS  
THESE CHALLENGES  
AND HAS FOCUSED ITS  
MISSION ON HELPING UTILITIES  
KEEP THE LIGHTS ON WHILE  
REDUCING  
OPERATIONAL COSTS.**

## For more than a century,

S&C has helped utilities reduce their operations and maintenance costs while driving significant improvement in grid reliability, safety, and resilience. Founded by the creation of the world's first liquid power fuse, S&C maintains its customer-driven focus and emphasis on innovation, resulting in measurable results for our customers:



S&C's power switching, protection, and control solutions each year help utilities worldwide avoid more than 2.7 billion customer-outage minutes (1.7 million minutes along feeders; 1 million minutes along laterals) and save customers more than 13 million power interruptions.



S&C's patented PulseClosing® Technology tests for faults using 95% less energy than traditional reclosers, reducing fire-causing sparks and saving utilities millions by protecting valuable (and expensive) aging assets from the strain of repeated testing at full fault current.



In rural areas with long lateral lines, S&C's lateral-protection products can save utilities \$45,000 per year (a 90% rate of return).



S&C's automation solutions have helped avoid 170,000 truck rolls, helping utilities save \$85 million in operations costs.



More than 174,000 customers are benefiting from S&C's more than 30 operational microgrid projects that keep the lights on if the grid goes down.

S&C accomplishes these massive improvements in reliability and customer operations costs by empowering people to transform the grid. What sets S&C apart from others is how we accomplish this transformation in unique ways.



## BLAZING PACE OF INNOVATION

Recognizing utilities incur significant costs each day they continue to use outdated technology, S&C innovates at a pace unparalleled in the industry. S&C invests heavily in research and development, with at least 6% of company revenues being applied to R&D initiatives—above the average of our publicly traded competitors. The result of this investment is more than 90 patents, about two dozen of which involve major industry innovations.

One unique way S&C has positioned itself to be innovation-driven is through its investment in the Nicholas J. Conrad Laboratory, the largest manufacturer-owned short-circuit testing laboratory in North and South America. Based at S&C's world headquarters in Chicago, two 850-megawatt electrical short-circuit test generators can test up to 100 kA and up to 230 kV. The laboratory enables S&C to accelerate development and delivery of innovative electrical solutions worldwide by being able to thoroughly test new inventions in our own back yard. This means faster innovations that address today's rising reliability problems as well as new features to continually improve the equipment that keeps the grid running today.



**S&C EMPHASIZES ADDRESSING THE LONG-TERM NEEDS OF CUSTOMERS, NOT ON MEETING QUARTERLY GOALS FOR OUTSIDE INVESTORS.**

## EMPLOYEE OWNERSHIP

S&C would not have been able to accomplish all that it has over the years without its diverse workforce. As a 100% employee-owned company, S&C leadership focuses on addressing both immediate and long-term goals without the distraction of trying to satisfy financial goals for outside investors and stockholders.

The stockholders that company leadership are accountable to are the same team members that make S&C so successful. This unique relationship enables S&C to think and act differently from publicly traded and privately held companies, providing the ability to think in the span of decades rather than quarters. This includes expanding our ability to invest in innovation and the team-member development needed to remain at the top of our industry. This focus on putting the viability of the company first has made S&C an extremely bankable business and an ally our customers can rely on to remain in full support of our solutions for the next 100 years.

S&C's own return on this investment comes from team member loyalty and unparalleled experience. The average S&C full-time team member spends more than a decade with the company, and more than 330 active team members have remained longer than 25 years.



## COMMITMENT TO QUALITY AND EFFICIENCY

S&C's Lean Production System (LPS) emphasizes doing more with less—less time, less space, less human effort, less machinery, less materials—while still maintaining high-quality products that help keep customers' long-term costs down. S&C is a world leader in the application of Lean practices, including problem solving, value-stream analysis, workplace organizational training, and Kaizen events, in all aspects of the business—from the offices to the product assembly lines.

In addition to our LPS initiatives, modern technology, such as robotics, automation, and advanced machining, coupled with S&C ingenuity, are helping S&C maintain quality by preventing mistakes and catching them quicker and closer to the source.

S&C's commitment to quality and efficiency has earned all our global operations certification under the International Standards Organization's ISO-9001:2015 standard, representing critical approval of our ability to "consistently provide products and services that meet customer and applicable statutory and regulatory requirements."



**WE COMPLEMENT OUR EMPHASIS ON  
THE CUSTOMER WITH AN  
UNDERSTANDING OF OUR RESPONSIBILITY**

## UNMATCHED LIFETIME SUPPORT

As a leading provider of essential utility electrical equipment, S&C is known for its unmatched commitment to support its solutions throughout their lifespan. This includes industry-leading warranties to ensure equipment is free of defects to comprehensive training and deployment support through our team of application professionals. Before, during, and after major weather events, S&C stands together with our utility customers to quickly provide replacement equipment and field support so utilities can restore power as fast as possible.

Once S&C solutions are installed, S&C's Global Support & Monitoring Center (GSMC) quickly responds to customer inquiries 24/7/365. Through proactive monitoring of nearly 200 field locations throughout the world, the GSMC immediately responds to any irregularities to prevent small problems from turning into big problems.

When in-the-field support is needed, S&C's regional service centers around the world help customers quickly address their toughest challenges. Stocked with local inventory and staffed with service technicians with decades of utility experience, the regional service centers enable a technician with the right parts and the right skills to arrive on-site quickly.





HUNGER TASK FORCE  
**THE FARM**

**S&C** understands its leadership position on a global scale comes with significant local responsibilities. S&C strives to be a good neighbor through support of its surrounding communities. Each year, S&C's foundation spends more than \$1 million to support dozens of charitable organizations around the world.

S&C's team members also chip in with their own continual community support, with many volunteering their own time to local not-for-profits. Moreover, through combined team-member and company contributions, S&C's annual Giving Campaign donates more than \$450,000 a year, providing essential financial support to such important organizations as Misericordia Heart of Mercy, United Way, and Community Health Charities.

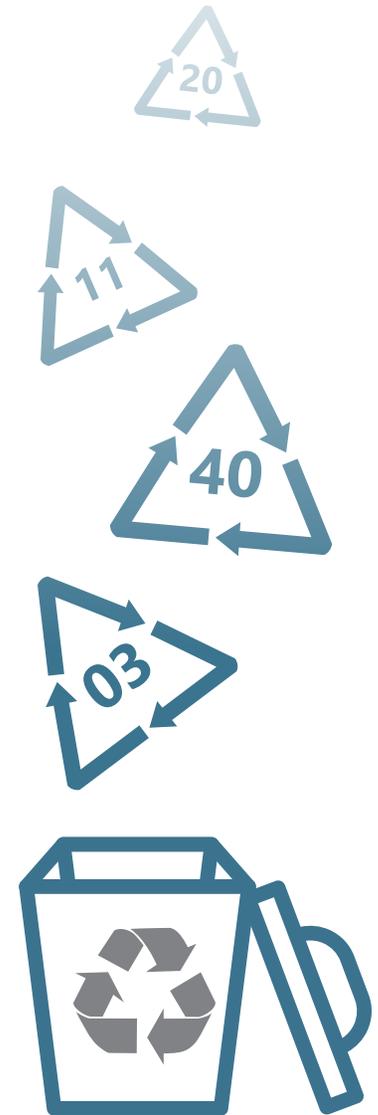
S&C's commitment to the local community also includes minimizing the company's environmental impact. With an ultimate goal of becoming a landfill-free company, our world headquarters in Chicago each year avoids sending more than 94% of its waste

to landfills. To accomplish such a feat, S&C annually recycles unused materials, including:

- 8.6 million pounds of scrap metal
- 32,000 pounds of red fiber board
- 4,000 pounds of zinc phosphate
- 30,000 pounds of boric acid and aluminum oxide

Among the other S&C sustainability efforts include continued reductions in water, electricity, and natural gas use—all while production and output has been growing. In addition, S&C minimizes its production of hazardous air pollutants, with a goal of soon eliminating HAP emissions altogether.

S&C also designs its buildings to be environmentally friendly. Each of S&C's six manufacturing facilities globally is certified as compliant with the latest ISO 14001:2015 standard, which specifies requirements for an effective environmental management system. These plants are strategically located in Chicago; Toronto; West Palm Beach, Florida; Alameda, California; Aguascalientes, Mexico; and Suzhou, China.



## GIVING BACK TO THE COMMUNITIES IN WHICH S&C WORKS



## SOLUTIONS THAT IMPROVE RELIABILITY

S&C's longstanding presence in the electrical industry provides us with a unique understanding of customers' systems and problems. S&C has used this experience to design and offer utilities an array of medium- and high-voltage switching, protection, and control solutions—some of which stay deployed and operational for decades—plus various specially designed products to support their efforts to bolster the reliability their customers have come to expect. These solutions cover such important areas as:

**AUTOMATION.** S&C's state-of-the-art automation products, including the TripSaver® II Cutout-Mounted Recloser and the IntelliRupter® PulseCloser® Fault Interrupter (with PulseClosing® Technology), are designed to take split-second corrective action in the event of a fault, thus enabling utilities to limit exposure to temporary faults and dramatically reduce permanent outages. The distributed intelligence supported by our electrical network control and automation systems further enables S&C's automation devices to operate independently when system problems arise and restore power in seconds—or prevent the power from going out altogether.

**SWITCHING AND PROTECTION.** S&C has introduced many innovative products over the years to significantly improve power delivery and reliability: The liquid power fuse, circuit-switchers, pad-mounted gear, the Fault-Tamer® Fuse Limiter, and VacuFuse™ Self-Resetting Interrupter to name a few. Today, S&C offers the most comprehensive selection of medium-voltage underground and overhead switchgear from any manufacturer, plus our high-voltage switches have proven reliability in substation applications. There's a version to suit almost every application and economic requirement, and S&C's switching and protection products are renowned for their long-term reliability and exceptional value. They're carefully designed and proven through rigorous testing and have performed dependably over decades of service in the most demanding environments—reducing users' operating costs.

**SERVICES.** With technology, distributed generation, and automation systems adding complexity to grid operations, S&C's Power Systems Solutions team of planning and engineering experts is well-suited to perform the analysis and design needed to deliver a complete grid solution. This includes consulting and analytical services; engineering, procurement, and construction; post-installation support; and integration leadership for such applications as substations, smart grids, and microgrids.



**COMBINED, THESE ATTRIBUTES  
MAKE S&C UNIQUE AND THE BEST SUITED TO HELP  
CUSTOMERS TRANSFORM THE GRID.**



**SOFTWARE.** S&C's wide range of software products support the company's automation equipment by making them easier to use and leveraging the massive amounts of data they collect. This includes the IntelliTeam® SG Automatic Restoration System, which directs the rapid self-healing of customer devices, thereby restoring unfaulted line segments and minimizing the number of customers experiencing extended power interruptions. Helping utilities fully realize the benefits of a smart grid, S&C's IntelliTeam® FMS Feeder Management System manages devices and provides insightful data analytics from an entire fleet of S&C automated smart grid products. Whether a utility is designing a system in the office or performing work in the field, S&C offers software utilities need to simplify these tasks.

**COMMUNICATIONS.** Reliable communication networks are a critical component of SCADA and grid-automation systems. That's why the best networks emphasize resiliency, speed,

and security as their top priorities. S&C's SpeedNet™ Radios supporting mesh technology excel in those areas and support high-volume, two-way data transmission. This enables devices in automation and control applications to quickly and reliably communicate with one another during outages.

**CONTROLS.** S&C offers a variety of controls to match a utility's automation objectives. For remote supervisory control applications, 6800 Automatic Switch Controls provide remote reporting of switch status points, current, voltage, watts, and vars via the DNP3 protocol. For critical loads such as hospitals, airports, pumping stations, and commercial office buildings, S&C's 6800 Automatic Switch Controls and microprocessor-based Micro-AT® Source-Transfer Controls improve service continuity. For microgrid applications, S&C's IPERC GridMaster® Microgrid Control System ensures all electrical demand is satisfied while maximizing efficiency and eliminating single points of failure.

Electric utilities face mounting pressure to improve performance in an increasingly complex business environment. They need help from a company that focuses on helping build the reliable and secure power grid their customers expect. They look for a company that makes their safety, reliability, and operational efficiency goals their primary focus.

**THAT COMPANY IS S&C.** Our proven performance is reflected not only in loyalty among our customers but internally within our own walls and in the communities in which we serve.



**S&C ELECTRIC COMPANY**  
Excellence Through Innovation

To learn more, visit [sandc.com](http://sandc.com)    

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