LONG'S DRILLING SERVICE & BAY SHORE SYSTEMS FIXING THE ELECTRICAL GRID

FOUNDATION DRILLING

NOVEMBER/DECEMBER 2020

KELLER
SAVING THE SLOPE

SPERRYCO/NYPA
ROCK SOCKET MICROPILES

BRAYMAN CONSTRUCTION
LARGE DIAMETER DRILLED SHAFTS

GORDIE HOWE INT'L BRIDGE PROJECT, PART II
DRILLING DOWN IN MOTOWN

ADSC
The International Association of Foundation Drilling

COVER STORY

FIXING
—the—
FAILING
ELECTRICAL GRID
—for—
FUTURE
GENERATIONS

In 2019, PG&E pled guilty to 84 counts of involuntary manslaughter after regulators found that the 2018 California Camp Fire (the most destructive and dangerous fire in California's history at the time) was sparked by poorly maintained power line equipment. The fire cost $16.5 billion, burned over 153,000 acres and forced the evacuation of over 52,000 people. However, this is not the first (or the last) wake-up call for global infrastructure improvements. With the increased demand for stronger and more durable bulk-power systems In the United States, distribution systems (including power line infrastructure and substations) will need to keep up. The foundation drilling industry is expected to be more in demand than ever, driving the need for qualified drillers.

In July 2020, 1.28 million new houses were completed in the United States, with 364,000 units in buildings of five units or more. With those new buildings come today's greater need for reliable internet and power. Our way of life is creating ever-increasing demands on power distribution and electrical grids. The annual increases in residential and commercial developments make evident that our present electrical grid is not fitting the bill. The oldest power lines in the United States date back to the 1880s, and most of today's grid was built in the 1950s and 60s with a life expectancy of 50 years.

Improvements have been less than acceptable because they are not inexpensive. Increased safety standards and irregularity in the cost of doing business mean that private and public utility providers have been slow to maintain and improve electrical infrastructure. However, these same utility providers have several incentives to push for powerline maintenance, repair, replacement and improved safety. The finding of PG&E's guilt has inspired changes and highlighted the need for improved quality and safety across the industry aimed at keeping catastrophic damage, like the campfire, from reoccurring.

Fire suppression is not the only thing pushing the industry. National security has played a role in advocating for more work on the national bulk-power systems, as well. On May 1, 2020, President Trump declared a national emergency concerning the nation's power grid (Executive Order (EO) 13920, "Securing the United States Bulk-Power System"). According to the order, the unrestricted use of bulk-power system equipment designed, manufactured or supplied by foreign adversaries may allow them to exploit vulnerabilities in bulk-power systems with catastrophic effects. Therefore, unrestricted foreign supply of these materials constitutes an extraordinary threat to the national security, foreign policy and economy of the United States. While no one knows exactly what this will mean for distribution systems, and in-turn foundation drillers, the declaration of a national emergency concerning United States' bulk-power systems is expected to have an effect on the amount of work approved for power grid maintenance, repair, replacement and improvement. It is time to use American-made materials with the help of American-owned contractors and drillers to preserve our way of life.

Severe weather and storms have also been highlighting the wear-and-tear on the nation's current electrical grid. From 2003-2012, weather-related power outages doubled in the United States, and have only increased from there. The technology to improve power distribution and grounding methods has progressed in that time, but it has not been implemented where it is needed.

All these needs are coming to a head at the same time, creating urgency and demand for upgrades to our dangerously aging equipment, protection against foreign adversaries exploiting our grid vulnerabilities and increasing protection against natural disaster. Drillers should prepare for the opportunity. However, not all foundation drillers are created equal.

For example, in the summer of 2019, Arkansas Electric Cooperative and Chain Electric of Mississippi were setting up a new, complete powerline right-of-way in the Clinton, Arkansas area, which has mountainous terrains with steep grades and multiple bluff lines. The existing powerline system had been hit multiple times by tornadoes, ice storms and more, causing dangerous outages for residential neighborhoods. Most substations in the area were small, unreliable (69 kV) and in desperate need of improvement. This part of the project included work on two substations, one expansion and another brand new, improving them to 131 kV substations. To start this project, they were looking for a driller to complete the first 18 miles of a 45-mile transmission line job.

Arkansas receives about 50 inches of precipitation per year, and in 2019-2020 the state received approximately 66 inches. The rain was constant. Chain Electric knew that they needed a foundation driller with a stable, durable drill rig offering strong traction and a stable footprint. Coupling the weather and traction demands with the hilly terrain, they needed a foundation driller with versatile equipment: equipment that could access the remote drill sites and reliably drill anywhere, traversing over slopes up to 35-40 degrees. It was necessary to remove portions of the mountain to get to the drill sites in some area. The access roads and trails in the remote hills also led to weight restrictions for equipment transport. No rigs over 100,000 lbs. (45 MT) could travel out to the site, but the sandstone they needed to drill in meant they needed something with high torque, which usually requires a large, heavy drill rig. Some structures were as far as three miles in, restricting access to one foundation.

Wasting time on failed efforts can be expensive for contractors and drillers. Anyone trying to meet the needs of a remote site like this one can easily lose money. Some drillers walked away from this job, knowing that it would be next to impossible to get it done, and they would lose more money than they could make. Many of those who walked away just did not have the right equipment. They needed to be able to improve the safety of the current

substations and powerlines, preventing catastrophic outages from happening again. They knew they would lose too much money trying to force the equipment they had to

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work, breaking machinery and increasing their downtime. The unfortunate reality is that the dated utility line work is in remote and dangerous areas, not close to the beaten path. Remote areas drive the need for drillers to use technical equipment built with versatility. Being unable to meet these challenges will make or break drilling companies in the years ahead because, as Brian Long, Vice President of Long's Drilling Service, puts it "if you don't continue to stay on top of technology, you are losing to your competition."

Chain Electric chose a local American, certified woman-owned small business, Long's Drilling Service (LDS) to help with this endeavor. LDS knew they could meet the technical drill rig demands required for hilly terrain, access weight restrictions and hard sandstone. They also knew that, due to the remote nature of the project as a connect-

ing point, they had very little access, so the rigs they chose had to be reliable, with minimal downtime and backed by a solid service team. They decided to utilize American-made to ensure support, parts and coverage. Two Bay Shore Systems' TR80's – previously coined "Rock Hawg" and "Bore Hawg" – were chosen for the job. These rigs can get to any drill site. One is mounted on a CAT 330 and has a transport weight less than 95,000 lbs. (43 MT) and the other is mounted on a Komatsu PC360 with a transport weight of 100,000. They also have 80,000 ft-lb (108 kN-m) of torque, and with round-locking bar sets, can drill up to 60 feet in just about any material. "Rock Hawg" and "Bore Hawg" also have a Sigalarm power line detection system that warns the operator if they come too close to high-voltage power. These rigs were made for jobs like this one. Keeping outage times to a minimum meant working with live power overhead at times, and the safety system on the rig protecting the drillers was invaluable.

The job cut through the right-of-way and caused crews to mobilize several times throughout the project. Long's Drilling Service stayed versatile while they were under the gun, building 345 shafts in this one-year project. Due to the solid rock from beginning to end, very little dirt, layered sandstone and cobbles (15 ksi – 20 ksi) and 15 ft – 25 ft deep vertical holes (4.5 m – 7.5 m), they began working with several types of auger teeth to come up with the best drilling solution. They were able to achieve the needed 42" – 84" (1650 mm – 2100 mm) hole diameters, knowing the 24/7 support of the Bay Shore System's service department was right there to back them up if they needed it.

While they were drilling their way through the Ozarks, Long's Drilling Service was working alongside a major gas pipeline. At the closest point, it was 25 ft (7.5 m) to the pipeline, and the pipeline company had their own safety staff out there when Long's crew was drilling that close to the pipeline. It was crisscrossing through 50% of the project, which caused a major safety hazard, scaring some drillers away from the job. They had to be precise. Long's Drilling Service was able to access every site they needed to, and they got the job completed on schedule with zero injuries and zero incidents. They built wood-mat bridges to cross the pipeline with their Bay Shore Systems TR80's assistance. In fact, they were able to do it all with their TR80s: direct imbed structures, anchor bolts, guy wire anchors – all facets of the job. They assisted with the installation of ConduFlow, the pourable earthing back-fill, which contributed to not just replacing old equipment, but improving the long-term stability of the utility pole and transformer grounding for future electrical stability. This two-part mixture is poured around a pole, around the grounding grid and around the anchors to prevent electrolysis and increase conductivity of the grid. Long's Drilling never could have completed what they did in the amount of time they had with another heavy, rigid, drill rig that had no safety features. They kept outage times low, knowing that people were relying on that power, and scheduled power outages can cost up to $800,000 a day to the power company. And now, thanks to the whole team, the residents in the area will have more reliable power.

Foundation drillers need to be prepared. Most utility line work is in remote and dangerous areas. Inaccessible areas require drillers to have versatility and improved technology to get the job done. Being able to meet these challenges will be vital for drilling companies in the years ahead.

project **TEAM**

CHAIN ELECTRIC
LONG'S DRILLING SERVICE
BAY SHORE SYSTEMS: DRILL MANUFACTURER