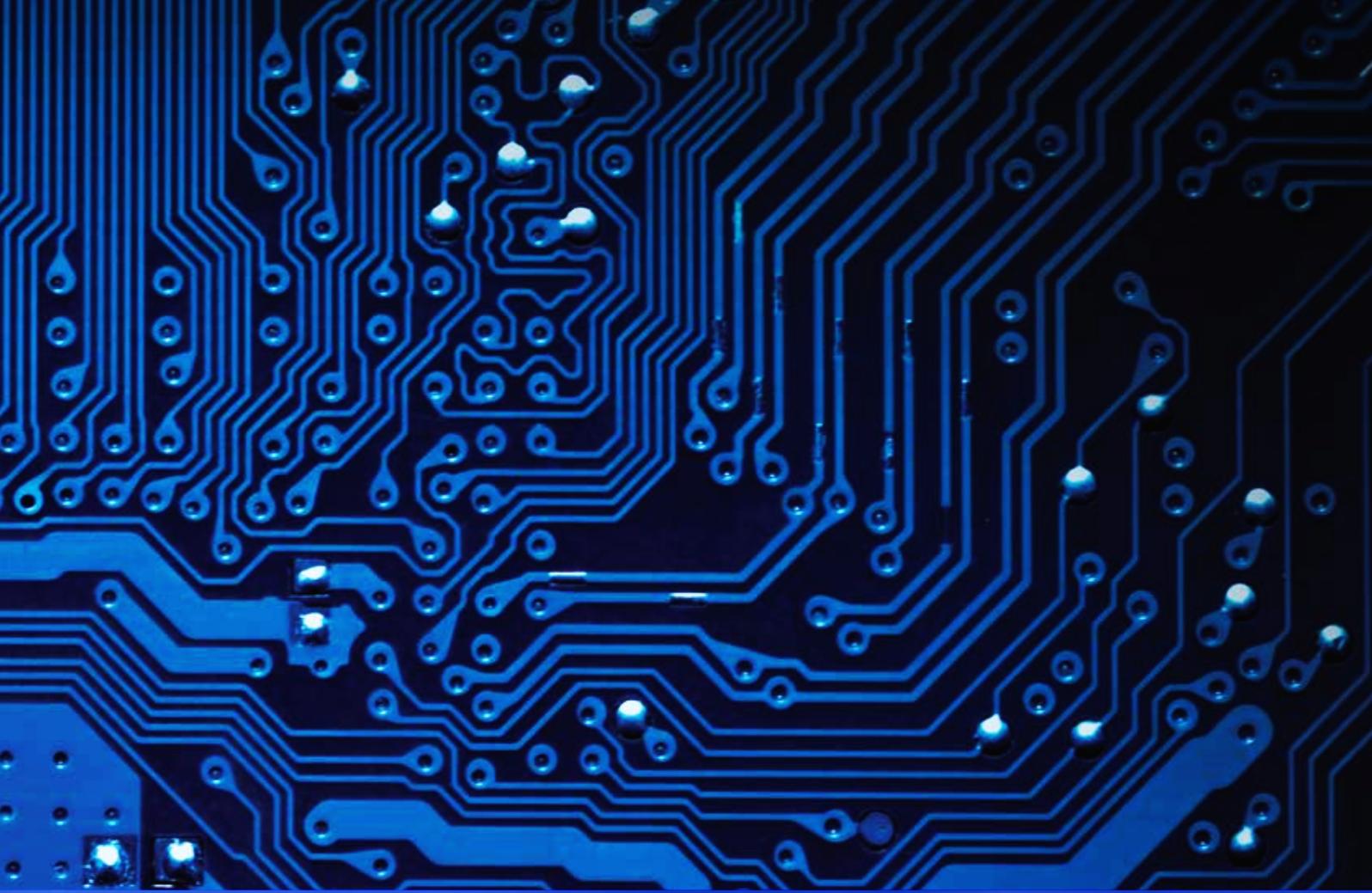




FROM THE LAB



TO THE



FIELD: ENGINEERING FIRMS PUT TECHNOLOGY TO WORK FOR CO-OPS

BY GAYLE M. IRWIN

Technological advances affect all industry sectors. From the invention of the telephone to today's smart phone communication, from printed, hand-held maps to computerized Google Earth software, each innovation has made business more precise and prompt. Such advances often developed because of engineers. Their work, and the technology they employ,

benefits numerous enterprises, including electric cooperatives.

Assisting Co-ops, Meeting Member Needs

Engineering innovations help electric cooperatives and the engineering firm.

"Many of our electric cooperative clients have a small staff, limited budgets, and are far from our offices,"

said Tom Ghidossi, president of Exponential Engineering Company. "Using new information sources like Google Earth, for example, enables us to provide a preliminary line design prior to our field work; we start out with better information for our field trip and can use that time more effectively to solve the difficult engineering issues."

"Remote access in the systems, both for monitoring and for support, is



THEN AND NOW

An electrical engineer's work has changed dramatically during the past 50 years, according to Tom Ghidossi, president of Exponential Engineering Company.



"Fifty years ago, engineers performed calculations by hand with slide rules and used conservative guidelines based on experience to ensure that systems would be designed to last," he said. "Drawings were created by hand using ink on Mylar or vellum; specifications and contracts were typed on carbon sheets to be passed out to contractors for construction. Communications were by mail and far more limited. If you wanted to visit a client, you would have to plan ahead to stop at a pay phone to update them on your planned arrival.

"Today, we can communicate quickly and far too easily with emails and texts; we have to remind ourselves to stop, listen, and spend that personal time with our clients to understand what is really important."



Kevin Hartig, president of ESC Engineering

Photo courtesy of ESC Engineering

one the biggest gains we've seen," said Kevin Hartig, president of ESC Engineering. "It can eliminate a lot of travel and it can also allow us to respond in a much shorter time frame."

Relays that estimate how far away a fault occurred from the main substation are another innovation, improving communication and saving time, said Eli ImMasche, electrical engineer with ESC Engineering.

"In the case of Wyoming where there are 50 or more miles of line, you don't have to patrol all 50 of those miles anymore—you can get within a half-mile or a mile of where the fault occurred—that's a big benefit for co-ops," he said.

Innovations in civil engineering and surveying also provide benefits.

"New innovations are enabling us to do our work faster and more accurately," said Don Davis, president of WLC Engineering, Surveying & Planning. "We design projects based on what exists in the physical environment of

the proposed project site, and survey enables us to gather this information. Therefore, improvements in surveying technology give us more precise data to accurately design, which in turn minimizes errors between collected data and the existing condition.

"Additionally, new innovations give us more ability to customize deliverables for our clients' specific requirements," he continued. "We understand there is no one-size-fits-all in this industry, and having the ability to give electric cooperatives the customized support they need is critical."

Technologies Advance Quickly

Electrical engineering advances occur at nearly warp speed.

"Innovations are appearing faster than they used to," said ImMasche.

"It's not much of a surprise," Hartig said. However, he offered a caution.

"Just because it's appearing faster doesn't mean every new piece of technology that comes up is the right fit. It requires we slow things down a little bit to do

Don Davis, president of WLC Engineering, Surveying & Planning

Photo courtesy of WLC Engineering



due diligence—we want to make sure we do proper vetting...to make sure it's a relevant fit and has some type of value for the client," he said.

"Electric power engineering is still a field with a large body of knowledge and practice developed over the past 100-plus years," said Ghidossi. "The industry has been notoriously slow to accept change, but deservedly so when the equipment and installations are intended to last 40-60 years or more.

"Computational power for calculations, mapping, and protective equipment settings are probably where the greatest improvements in engineering have occurred in our field. We are now able to model far more possibilities in terms of equipment and system performance than ever before. However, this capability leads to more complexity in applications without corresponding benefit; sometimes the simplest of the old methods provides better results."

Many changes have come to the civil engineering field as well.

“The sciences of engineering and surveying are advancing quicker now than at any time in history,” Davis said. “New technology and equipment now allows one man to do the work of the traditional two- or three-man survey crew.”

Weighing the Benefits and Risks

Before adopting new technology, companies weigh the pros and cons.

“We need to be sure that our clients can utilize the results we produce from the use of the technology without a great deal of difficulty or expense,” Ghidossi said. “We also have to take into account the costs for training, verification, upgrades, and long-term maintenance over the life of a project. Some new technologies have great potential, but without proper implementation are not successful.

“The utility industry is very conservative and there is an expectation that equipment and installations will last at least five decades,” he added. “Many of the newer technologies have much shorter lifespans and thus the expected benefits can be outweighed by the ongoing requirement to update and upgrade the equipment. There is also a tendency to complicate the analysis just because we can; however, that complexity may result in a more expensive design than is warranted based on long-term experience.”

There are three characteristics by which Hartig and his staff assess new technology before implementing it.

“Reliability, repeatability, and applicability,” Hartig said.

Those traits build on one another.

“If we’re going to look at implementing products or technologies, they have to have a long-projected lifespan

because I don’t want to be changing things every year when something new comes out. And they have to perform without failure. If you’re expecting it to perform a certain way, it needs to keep those operations consistently, not be erratic in its performance. Just because something is new and shiny...doesn’t make it relevant or beneficial to the utility.

“Is the technology following an industry best practice? Or is it just something we want to try because it’s new?” he added.

Engineering companies help electric cooperatives find that balance between technologically helping or hindering operations while meeting the needs of co-op members. ■

Gayle Irwin is a Casper-based freelance writer.

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