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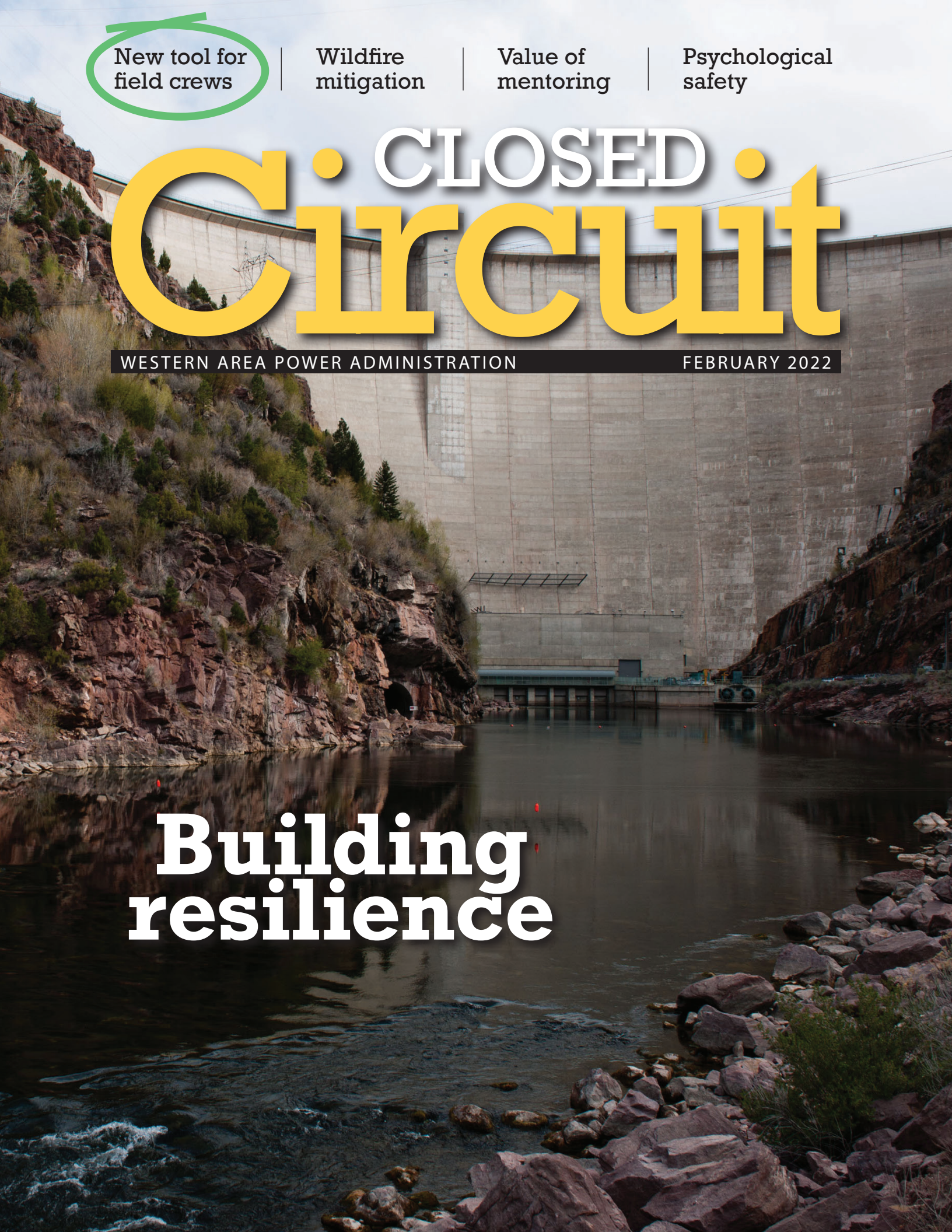

Building resilience

New tool saves time, improves inspections

Lineman *Dave Horton* inspects a structure along a portion of the Carr-to-Keswick line in Shasta County, California, using a new application that more easily and efficiently captures structure condition information. (Photo by Dave Horton)

By Leah Shapiro

Last month, WAPA launched a new tool that, according to Executive Vice President and Chief Operating Officer **Kevin Howard**, will "enable us to more effectively monitor the health of our transmission system and efficiently react to condition issues while continuing to maintain the high level of reliability we have always achieved."

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The tool, IQGeo, is geospatial productivity and collaboration software that field employees use to record transmission line condition and any vegetation or right-of-way concerns as they conduct annual ground and aerial patrols of WAPA's 17,000+ miles of line.

As they look at each structure, they log any deficiencies they see, such as a cracked crossarm or a chipped bell. They assign the structure a rating, from A to E, depending on its condition. They also log each structure they've inspected to ensure they capture the entire system during the year.

ABCs of structure rating

Structure ratings help crews plan and prioritize their work throughout the year.

- A: Good or like new. No action required.
- B: Minor defect. Monitor degradation.
- C: Moderate defect. Rehabilitation or replacement recommended as scheduled maintenance.
- D: Serious defect. Repair, reinforce or replace as soon as possible.
- E: Risk to public safety or system reliability.

IQGeo allows crews to capture this information more quickly and easily. It replaces a tool that WAPA had been using since the early 2010s and offers increased functionality.

"It automatically pulls up the structure as you get close to it and shows all the information we have about that particular structure," said Lineman **Drew Tierney**. "We used to have to enter that type of information manually."

The base functionality of IQGeo gives crews a large amount of data that they didn't have before.

"It shows the previous rating and deficiency details, so they know to look for certain things," said Information Technology Project Manager **Christine Hale**. "With a simple query, they can pull up Maintenance information on a particular line, structure or area. This alone is going to save crews lots of time, and there are additional benefits as well. IQGeo uses technology similar to geofencing. It detects where the lineman is, and when they are in proximity of a structure it automatically opens the structure form with pre-populated fields."

The program will aid field employees performing both ground and aerial patrols.

"As they fly down the line, the application will show them the structure number and rating, and can mark each structure as inspected," Hale explained.

"I'm excited to see what it does with aerial, the way it will log us as we go," said Supervisory Maintenance Specialist **Russ Barnett**. "It's going to save us so much time."

Regarding benefits for ground crews, Hale provided the example that a lineman who is driving in North Dakota from Bismarck to Fargo could see if there was anything that needed to be inspected or addressed along the way.

The program ties together all the data for any particular structure, "so crews can see a holistic view of structure health," said Hale.

Cloud improves availability

Beyond its capabilities in the field, IQGeo is notable behind the scenes as well.

"This was the only software vendor we talked to that had experience deploying their software in the cloud," said Supervisory IT Specialist **Tonya Spencer**. "Not only is it hosted in the cloud; it's the first application to be deployed and hosted in WAPA's Amazon Web Services cloud."

One benefit of this is that it gives crews access to the program — and all of the incorporated data — through an internet connection. They don't have to be connected to WAPA's VPN.

"As soon as they have service, data will securely travel over any network that's available," said Enterprise Architect **David Tucker**. "This is one of WAPA's firsts steps in moving applications to the cloud for better performance, reliability and availability."

There are technical benefits as well.

"Because it's hosted in the cloud, we didn't have to buy new hardware," Tucker explained. "All its storage, compute power and application functionality is in the cloud, not in WAPA's data center."

"WAPA is embracing the cloud where it makes the most sense," said Senior Vice President and Chief Information Officer **Mike Montoya**. "We're doing it strategically and methodically to ensure that we leverage the most benefit. We don't want to wait until we are forced to move; we're doing it on our terms."

Performance matters

The tool being replaced by IQGeo was implemented in the early 2010s and was the first transmission-line inspection tool to be used WAPA-wide.

"It wasn't the perfect tool, but it was a big step at the time," said Barnett. "Before it, crews and regions were doing things differently, some with paper and pencil and some on various computer programs. There was no consistency."

As WAPA stood up its Asset Management program and started looking to make data-driven decisions, this became more of an issue.

"That tool provided a consistent approach for transmission line component inspection," said Vice President of Transmission Asset Management **Chris Lyles**. "Everybody could use the same inspection criteria and rating system, which produces consistent health and risk scoring. And with that comes a way for WAPA to better prioritize transmission line projects across regions."

Over time however, support for the application began to wane.

"Around 2019, multiple issues popped up, and that's what started us looking for a possible replacement," Spencer said. "Data was being lost. Users had to reinspect some lines."

There were latency issues as well. When crews would push a button, there was a delay with every click.

"This is what I'm most excited about," offered Tierney, explaining that

As part of the market research to identify an improved transmission line inspection tool, staff from WAPA's Maintenance, Information Technology and Asset Management programs watch a live demonstration in Las Vegas. (Photo by *Tonya Spencer*)

in addition to IQGeo being faster, it requires fewer clicks all around when conducting an inspection.

"It was a big deal," said Hale. "We're exponentially reducing the time it takes to do each inspection and, when talking about more than 100,000 structures, it adds up."

The system was also taking an inordinate amount of time to upload and download data for inspections. Sometimes it was hours.

"When you're planning your 10-hour day to get your crew out in the field, if it takes three hours to download the information you need, that cuts into work time," Barnett said.

"There is a very real cost to that loss of time," said Hale.

In November 2019, IT personnel met with craft employees from all regions to discuss the idea of moving to a more state-of-the art tool. They conducted market research, which included attending a conference where they received in-depth demonstrations of several products.

"Getting involved at that level, that kicked it off for me," said Barnett. "From that point, I felt comfortable and invested. I knew I could have a voice in what they were putting together."

Partnership provides path forward

In May 2020, the team decided to replace the previous tool. "We kicked off the project with the goal of implementing a new tool in early January 2022," Spencer said.

"It had to be January," Barnett added. "The inspection year kicks off in January and there was no way we could switch to a new tool in the middle of a year."

The core project team included people from five IT functions, Asset Management and Maintenance. Though it was an IT-led project, the end users are field employees. It was essential that whatever product was chosen would meet their needs.

"Our goal was always to deliver a product—on time—that would make inspections easier and faster," Hale emphasized, "and we didn't want to lose any functionality."

Maintenance representatives were involved in the design calls and testing, reviewed form templates and had opportunities to speak directly with the vendor about their needs.

"Linemen aren't computer experts, so I sat back a bit, but Christine often pulled me in, asking for my opinion," Barnett said. "The best value I think I offered was around the helicopter work, explaining how those patrols are conducted and what we could do safely."

"This type of partnership is what we expect with all our IT projects," said Vice President of IT – Enterprise Applications **Joe Fast**. "We are strategic partners and consultants in delivering solutions that improve a process, work better for the users and make the most sense for WAPA."

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The procurement process began in January 2021 and was awarded in May, not allowing much time before the go-live date of January 2022.

That wasn't the only challenge. "Resource loss and attrition on the vendor's development team also affected our timeline," Hale said.

Additionally, work had to be done with the Department of Energy to navigate their processes for implementing the software in WAPA's cloud tenant.

Late in the project, the vendor "wanted a specific deployment and it simply wasn't working," said Hale. "People on the WAPA side, our cloud people, changed the environmental architecture, pulling it off in two business weeks over Thanksgiving."

She asserted that had they not gotten that done, there was no way the project would have gone live on time.

"With all the challenges, testing didn't begin in earnest until December," Hale added.

Once the application was up and running, meeting all requirements, it was time to train field employees to use it. There was only one week for training before the project deadline. Hale conducted the training via Teams for about 150 people in five four-hour sessions between Jan. 3-7.

"We walked through every aspect of the program," said Hale. "Then we pushed them to go out to the field, inspect some structures and let us know about its performance so we could identify any bugs that need to be worked out."

"We held follow-up sessions to hear how it went and address any issues," Spencer added.

Using this new tool is a significant change.

"It will take some time to learn the program and get comfortable with it, but I know it will become second nature," said Barnett. "We had influence in choosing the tool, so ultimately we have buy in."

Innovate, improve, repeat

Both Hale and Spencer admitted that there were many times in the last few months of the project that they weren't sure they would be able to meet the deadline.

"This was a complex project with a short timeline, and it took everyone to make it happen," said Hale. "Ultimately, we were able to release a product that works and works well at our original planned date."

Though the tool is live, the project will continue.

"We'll be spending time reviewing any defects and continuing to improve," said Hale. There are also plans for a second release over the next few months, which will introduce further improvements.

"We now have a more reliable tool that will save us time and make some parts of the patrol easier," said Tierney. "It will help us be more efficient with planning, too."

At the end of the day, it all comes back to the mission.

"The backbone of WAPA's system is its 17,000 miles of transmission lines," said Howard. "Without reliable transmission, we would not be able to meet our mission. This effort will help us manage our rates and continue to provide affordable, reliable service to our customers." □

Note: The author is a management and program analyst.

Core project team

- IT Specialist **Brian Avis**
- Supervisory Maintenance Specialist **Russ Barnett**
- Program Analyst **Valerie Berk**
- IT Specialist **Steven DeRidder**
- IT Project Manager **Christine Hale**
- Lead Information Technology Specialist **Jane Harrell**
- IT Specialist **Satpal Kalsi**
- IT Specialist **Max Pitard**
- IT Specialist **John Posten**
- IT Specialist **Jason Sporer**
- Quality Assurance Services **Jennifer Tardif**
- Geographer **Eric Weisbender**