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ITC holdings in Novi is critical to part of nation's electric grid



Jamie L. LaReau

Detroit Free Press

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On the edge of Novi sits a facility so critical to part of the nation's electric grid that just to get inside requires a methodical clearance process, passing through several security points and swiping your employee or guest pass at each doorway.

Security wants to keep track of everyone's movements at ITC Holdings.

It's because from this Novi location, ITC operates the high-voltage electrical transmission infrastructure across seven states. At any given time, 34,500 to 345,000 volts of electricity are traveling across thousands of miles of ITC-owned and -operated power lines. Put simply: The lights stay on in much of lower Michigan, parts of Iowa, Minnesota, Illinois, Missouri, Kansas and Oklahoma because of a crack team of engineers controlling the grid from this highly secured building.

It's so secure that if you make it past the general offices, you end up in a nondescript area facing a single-file revolving door. Here, you will go no further if you do not have authorized fingerprint access to enter. For behind that rotating door, down a short hallway, is a conference room. In it, a large shade covers a room-length window that, when the shade is drawn, allows a full view of the top-secret control room below.

The 54 operators who are certified to be in that control room help to keep the electric grid running as part of the Eastern Interconnection, which are all the states east of the Rocky Mountains. The room itself is dark, located on ground level and built to withstand tornadoes. The entire area from the conference room above to the control room below is so restricted that even ITC Michigan President Simon Whitelocke does not have fingerprint access.

"There are bad people out there who want to take down the grid," Whitelocke said of the extreme security measures. "That's where we monitor the heartbeat of our systems, and that's the heart and soul of our operations so that has to be under tight security to make sure that only those who need to get in there can access that facility."

But the few who do go inside will see all of the electric superhighways across the seven states and how they connect to the adjacent transmission systems in the United States. It is lit up in multiple color-coded data points all sprawled across an 11.5-foot tall screen that spans nearly half the length of half a football field.

This map board dwarfs everything else in the room, including a dozen or so desks with multiple computer monitors that face the gigantic board. About seven to nine engineers work 12-hour shifts here. They sit at those desks, moving electricity to where it's needed most and keeping the central part of the nation from a blackout.

How electricity works

ITC gave the Detroit Free Press access to its control room on the condition that no photographs be taken due to the high-level of security. ITC does have a backup control center in the event this one is compromised or ITC needs to make repairs or upgrades to it. The backup is also in Michigan, but ITC asked that its exact location not be disclosed for security reasons.

To understand the importance of ITC, one must understand the three-step electric power-flow process.

The first step is generation. Electricity is made when energy is generated from sources including nuclear, wind, solar, water, natural gas or coal power, and then sent to a substation for the second step, which is transmission.

The electricity is transmitted or moved through the high-voltage power lines that sit atop the tall metal towers usually seen along highways, stretching for hundreds or thousands of miles. It is sent to substations where up to 345,000 volts of electricity are lowered to 13,800 to 40,000 volts and handed off to the low-voltage power lines, such as those on the wooden poles seen in neighborhoods. These lines are owned and operated by utilities such as DTE, Consumers Energy or others.

The last step is distribution. The electric companies then lower the voltage even more to say, 10,000 volts, to distribute it to your home where you flip on your lights, turn up the AC, turn on the television and nuke your dinner.

ITC controls the transmission services for its area. It has no role in the generation or distribution of electricity. ITC gets paid by the utilities for bringing that electricity to them. According to ITC's 2023 earnings report, its revenue from transmission and "other services" for the full year was \$1.6 billion, up from \$1.5 billion in 2022. Its full-year net income was \$463 million compared with \$442 million in 2022.

If ITC is not running, nothing is running

Engineers monitor ITC's transmission 24/7, constantly shifting and changing to put electricity where it's needed most or turn it off if necessary. So if Michigan has excess electricity that it's not using, that power is moved to Illinois if more is needed there, Whitelocke said. Or, if there's a storm that knocks out the low-voltage power lines, ITC may have to shut down a part of its system for DTE or Consumers Energy to repair the lines.

"I use roads as an analogy a lot. If all of a sudden I-275 is shut down, are there other ways that people can get home from work?" Whitelocke said. "That is kind of what we do on the transmission system. We make sure the other highways are up and running and energy can get to where it needs to go."

ITC's high-voltage transmission lines once belonged to DTE. But in 2000, DTE formed a new subsidiary called International Transmission Co., according to www.encyclopedia.com.

On Feb. 28, 2003, following the approval of the transaction by the Federal Energy Regulatory Commission, ITC Holdings Corp. acquired the outstanding ownership interests of International Transmission Co. from DTE Energy, ITC spokesman Andrew Johnson said. In 2016, ITC became a subsidiary of Fortis Inc.

ITC has grown from some 38 employees in 2003 to more than 750 today, most of whom are located in Novi. It serves 90,000 square miles of territory, with 16,000 circuit miles of transmission lines. It owns or co-owns 676 stations and substations for electric transmission and its lines can carry a peak load of 26,000 megawatts of electricity, the company's website www.itc-holdings.com states.

ITC is big, but there are bigger electric transmission companies. One is American Electric Power based in Columbus, Ohio. It serves small portions of lower southwest Michigan. According energy industry consultant Certrec, American Electric owns 39,000 miles of line that include 765-kilovolt ultrahigh voltage transmission lines, which Certrec said is more than all other U.S. transmission systems combined.

American Transmission Co. out of Waukesha, Wisconsin, serves Wisconsin and the Upper Peninsula of Michigan, according to the Michigan Public Service Commission.

In Michigan, ITC has invested \$7 billion to date since 2003 in the Lower Peninsula transmission system. So how important is ITC?

"We think it's really important," Whitelocke said. "Without transmission, there would be no electricity. It's the middle section of that three-part process. If we're not up and running, then nothing is up and running."

The great blackout, a wake-up call

ITC was a months-old company when the major power outage of Aug. 14, 2003, struck, taking out a large portion of the power in the northeastern United States and Canada. About 50 million people were without power and, according to Encyclopedia.com, it was the third-largest blackout in North American history.

The outage began in Ohio around 2 p.m. when a FirstEnergy generating plant shut down, resulting in transmission line failures that lead to a domino-like series of events. As voltage dipped in Ohio and utility companies in Pennsylvania disconnected to save their systems, about 2,500 megawatts of power was drawn out of Michigan through the International Transmission system with no warning.

Whitelocke said that blackout is the best illustration of the interconnected nature of the grid, the complexity and the need to collaborate with the other electric utility companies.

"We have hundreds of utilities from the East Coast to the Rockies that are connected to each other, rely on each other, that work together in real time to deal with issues, but also have to plan for the long term together because it's a team sport," Whitelocke said.

The blackout was a wake-up call for the industry, he said.

"Until that point in time, a lot of what we did was based on good utility practice. There were no mandatory standards on how you should do things," Whitelocke said. "Whether it's how you maintain your lines to how you secure your facilities to cybersecurity. All that really changed after the blackout."

Simulating ransomware attacks

Since then, a lot of work has gone into physical security and cybersecurity. For example, a section within the Novi facility is dedicated to cybersecurity, said Vinit Gupta, ITC's vice president of operations.

Gupta said ITC studies other security breaches for lessons. For example, a cyberattack on Chicago-based auto dealership software provider CDK Global that began June 19 forced CDK to shut down most of its systems across the country until July 5. It left about half of the nation's car dealerships struggling to operate. According to Bloomberg, the group that orchestrated the attack demanded tens of millions of dollars in ransom to end it. East Lansing-based Anderson Economic Group estimated that total direct losses to car dealers in the three calendar weeks of the cyberattack reached \$1.02 billion.

"We looked at CDK and said, 'Is this something that could happen to us?' " Gupta said. "We simulate ransomware drills three to five times a year."

ITC also does random drug screening and background checks every few years on the engineers staffing the control room, Gupta said.

"There are a lot things we do to make sure ... but if someone doesn't seem right, we want people to say something," Gupta said.

A secured bunker with important people

To work several 12-hour shifts in ITC's control room requires the right stuff mentally, said Brenda Houtz, ITC's director of Real Time Operations. For one thing, the control room is built to withstand an EF-4 tornado, which is described as a devastating tornado with winds from 207 and 260 mph, according to the National Weather Service.

"It's not conducive to someone who likes sunlight given it's ... dark," Houtz added.

On the morning of June 25, a thunderstorm brought heavy rains, high winds and lightning to the state. By 10:30 a.m., more than 160,000 homes and businesses were without power

across the state, according to USA Today.

Yet inside the Novi headquarters, leadership was calm and all was operating smoothly. The color-coded lights on the gigantic map board in the control room signaled which utility companies were out and where. Indicators flashed showing how much electrical current was traveling through the lines at any time, making for a kaleidoscope of red, yellow, white and blue colors sporadically glinting across various parts of the board. The data told the operators which breakers were open and which were closed.

"I think the most interesting thing about this room is the people," Houtz said of the team of engineers. "They're always on their toes. You, as a customer, never see those blackouts because of these people."

In fact, the people are so important that during COVID, ITC had them quarantine in a hotel away from their families and the outside world for several weeks. The company and the seven states it serves could not afford for this team of people to get sick.

Low-flying chopper over wires is routine maintenance

On the early morning hours of May 28, a helicopter carrying the pilot, an ITC forrester and ITC planner lifted off from the Oakland County International Airport. On that day, a Detroit Free Press photographer joined the team.

The mission was a biannual aerial inspection of all of ITC's 8,700 miles of high-voltage transmission lines in Michigan, its structures supporting the lines and other equipment throughout the state. It is an inspection that takes place throughout June. They do it again in October. The patrols are a North American Electrical Reliability Corp. requirement for ITC's vegetation management program, and it helps the company take proactive maintenance steps to keep operations running smoothly.

The inspection flight is done at low enough altitudes that the crew can visually check for damaged or worn equipment and vegetation hazards, said Rachel Woodbridge, ITC's Vegetation and Transmission Line Maintenance Manager.

"As they fly over the lines, our crews will call out any points so they can be ground-inspected afterward," Woodbridge said. "If we need to address anything or trim any branches, that can be done. It's to make sure the lines in our corridor remain safe. The crews that go up, they

like to be conservative, so if something looks like they're not sure, they'll call it a point. Then, we'll go put a foot patrol on it and check it out."

Despite the company's efforts, sometimes, during a big storm, a tree does fall onto a line or makes contact with the wires and pulls them down causing an outage, she said. The good news is that homeowners may not notice.

"Depending on where that occurs, it will vary on who it will affect because our system is very robust and redundant, so having a tree fall on a line in one area, it might be redundant, where it wouldn't effect that many people," Woodbridge said. "But we're doing these visual inspections and trimming to make sure we're mitigating any of these issues from happening, keeping it safe for the public and keeping it reliable."

A future of renewable energy

Back at ITC's Novi headquarters on June 25, there's an area tucked away amid a sea of cubicles. That's where five engineers known as ITC's Michigan Interconnection Group work. These people are the future. They spend their days studying new ways to more efficiently connect the generation of power to the rest of the electric grid.

"We study any overloads on the transmission system and propose any improvements to it," said Erron Raifsnider, supervisor of Michigan Interconnection.

For Raifsnider, who has a bachelor's degree in electrical engineering from the University of Michigan and a master's in that subject from Michigan Technological University, it's a dream job.

"I was about 10 years old and we'd drive by a substation and I'd think that looks really intriguing," Raifsnider said. "I was always intrigued with the grid. I like that it's ever-changing. New technologies are coming with wind and solar and a resurgence of nuclear."

ITC will play a key part in Michigan's Healthy Climate plan, which includes clean energy legislation to put the state on track to achieve 100% clean energy by 2040. Whitelocke said clean energy includes nuclear, solar and wind generation, and natural gas with carbon sequestration, a process that removes most of the carbon for cleaner emissions.

"To get there, a lot of generation has to be retired and a lot of generation has to come online," Whitelocke said, adding, "DTE and Consumers and other utilities have plans to retire

existing facilities and bring on new facilities. To do that, they have to connect those new facilities to the grid. We're part of that process."

More: DTE, Consumers Energy customers targeted by scams that trick them into calling crooks

More: Lawmakers hope to continue fight against political spending by DTE, Consumers in Michigan

Raifsnider's team specifically is a part of the task. The team was studying new solar fields planned for the state that day, looking at how those will impact the grid and what will need to change to allow for a new connection to happen seamlessly so that it's unnoticed and the lights never go out. While the control room is crucial for keeping the lights on in the present, his team's work is key to the future.

"It's critical," Raifsnider said. "All the objectives we have as a country and a state to go renewable, it goes through this team at ITC."

Contact Jamie L. LaReau: jlareau@freepress.com. Follow her on Twitter @jlareauan. Read more on General Motors and sign up for our autos newsletter. Become a subscriber.