

COMPANY

Duke Energy

INDUSTRY

Energy



CASE STUDY

Powering digital transformation to enhance the employee experience

Duke Energy is reimagining training, recruitment, and more with virtual reality and Oculus for Business.

AFTER GOING THROUGH THE
FIRST VR TRAINING APPLICATION,

94% OF
TRAINEES

SAID IT WOULD HELP THEM DO
THEIR JOBS BETTER

AFTER COMPLETING THE FIRST NATURAL
GAS INDUSTRY VR QUALIFICATION FOR
PATROLLING A GAS LINE

78% OF
TECHNICIANS

WOULD RECOMMEND THE VR
QUALIFICATION TO THEIR PEERS



How Duke Energy is advancing digital transformation with help from Oculus for Business.

One of the largest electric power holding companies in the U.S., Duke Energy provides electric and gas to millions of customers across seven states. The company is modernizing its energy grid, generating clean energy, and speeding up its effort to reduce the effects of climate change with a [new goal](#) to cut carbon emissions from electricity generation to net-zero by 2050. It's also pursuing a digital transformation to deliver better experiences for customers and employees. The strategy includes leveraging cutting-edge technologies like virtual reality for training, workforce development, and more.

When the team at Duke Energy's XR Lab started their VR journey, they knew what was required for success. "Tethered VR hardware wasn't going to be palatable or scalable enterprise-wide, so we needed a mobile solution," says John McGuire, Senior IT Architect. "We needed to reduce the cost of entry and improve the user experience — without spending several thousand dollars on high-power graphics servers. We needed programmatic support with APIs, drivers, and other development tools to help us build our platform. And we needed to be able to engage with hardware experts for support."

The team found what they were looking for in the Oculus for Business offering, and they started building VR apps for Oculus Quest headsets.

“

VR will empower us to train the workforce of the future. With VR, we can improve training effectiveness and enable teammates to train any time and as many times as needed at no additional cost.”

Elizabeth Escobar-Fernandes
IT Software Engineering Manager
Duke Energy

Improving employee safety with VR training

“Many of our field employees work in nuclear and natural gas power plants, as well as solar and wind farms. We have a lot of procedures in place to keep employees safe and reinforcing those procedures is really important to us — safety is ingrained in our culture.”

The XR Lab first developed a VR training simulation to better prepare natural gas technicians for hazardous environments. In this application, users don proper personal protective equipment (PPE), ensure there aren't sources that could ignite the natural gas, and practice purging a gas line using compressed air as well as natural gas. Following the initial app's success, the XR Lab developed both a wind power and gas technician application. The former allows practice shutting down a substation, while the latter features opportunities to inspect for leaks, encroachments, and other hazardous conditions around gas pipes.

“VR gives trainees a safe place to make mistakes, correct them, and learn,” McGuire says. “They can feel the effects of messing up without actually getting hurt.”

Elizabeth Escobar-Fernandes is a software engineering manager who helped bring the apps to life. “Trainees are building muscle memory in VR,” she says. “It's so immersive — the Oculus Quest hardware and our VR software make everything look and feel so real. The first time trainees go out in the field, they feel they've done it before. They have more confidence, and they know which mistakes to avoid.”

Superpowers of VR

VR delivers unique capabilities that give enterprises a competitive edge.

Top 3 VR superpowers for Duke Energy:



Spatial Memory



High Stakes, Less Risk



Possible Impossible Scenarios



“

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John McGuire
Senior IT Architect
Duke Energy

Despite initial concerns that the pandemic could hinder VR adoption, the opposite happened. In collaboration with the enterprise Environmental, Health and Safety (EHS) experts, Duke Energy developed safety guidelines to properly sanitize VR hardware — and created a safe and effective medium for teammates to come together and collaborate. Gas pipe inspection training was previously done in the field, with instructor and trainee riding for miles in an ATV where they couldn’t sit six feet apart. Now, instructors can offer the same training in VR from the company’s Operations Center. “There’s more value in VR use cases now because they allow everyone to socially distance,” says Escobar-Fernandes.

Boosting training and operational effectiveness

VR with Oculus for Business is also helping Duke Energy reduce costs. Instructors no longer have to travel to different sites to deliver in-person training, and Escobar-Fernandes anticipates that the company can eventually reduce the costs of maintaining ATVs and other training equipment.

Training quality has improved as well. “In a real-life scenario, a trainee might walk down a pipeline with an instructor and not see any issues,” says Escobar-Fernandes. “With VR, we can offer a much better test, and we can randomize the content so everyone experiences different conditions. We can test trainees on a wide variety of scenarios they might not encounter in the field, and we can really test on knowledge, not memorization.”

Amber Lineback, Director of Training, Natural Gas, says, “For our business, giving time and capacity back to the folks who are interfacing directly with our customers is important to us because it really impacts the bottom line. VR helps support that effort — it allows us to deploy training efficiently and effectively, with a lot of good repetition, and reduces the need for travel. We can expose technicians to simulations of dangerous events, like gas leaks, that they would otherwise not get to experience in training. And VR gets other business units and employees thinking about new ways transformative technologies can be used to generate cost savings.”

Employees think the VR training content is effective, too. “We have a lot of employees who aren’t gamers and who’d never experienced VR before, so we expected about a 50% acceptance rate,” says McGuire. “But when we had 70 people try our first VR application, almost all said it would help them and their teammates do their jobs better.” In fact, he says that one of the team’s most skeptical professionals is now the biggest champion of the VR solution.

Ray Blackwell, a Natural Gas Senior Performance Evaluation Specialist, was skeptical of VR at first, but over the past few months of seeing employees gain comfort and trust with it, he has done the same. For Ray, “I’m most excited

about how we’re keeping employees out of dangerous environments. My team can end up at a right-of-way in a remote area, which could potentially have dangerous terrain, animals, and gas leaks. Working in this VR simulation has helped prepare me for those same conditions and still be successful. I’ve become a huge believer in this process and the benefit of this technology for the business.”

Attracting and empowering top talent

As different business units within Duke Energy witness the tangible value of VR, many have sought to propose new use cases that will benefit their organizations. Duke Energy’s internal security organization has asked the team to build a training app for responding to a workplace emergency situation, such as an incident involving an active shooter. Another team requested a virtual 3D scale model of a nuclear power plant to make it safer and easier to plan for future facility maintenance and modifications. And the company is even using VR to attract for top talent.

“New talent is coming into the pipeline, and they use different tools,” says Escobar-Fernandes. “They’re accustomed to mobile technology and immersive experiences.” To help continue attracting the best people, the XR Lab created a workforce development VR game that teaches future engineers about how Duke Energy generates and delivers power. The app won a [Nuclear Energy Institute Top Innovative Practice award in 2020](#).

“We started thinking about better ways to engage our audiences, middle school and high school students who are trying to figure out their course path in high school and secondary school,” said Sydney Echevarria, the workforce development consultant leading the VR game. “As we talk to them and encourage STEM fields that would work with the utility industry, we found that old-school paper brochures were not very effective. Our VR solutions helps us stand out from other utilities at career fairs and connect with kids by meeting them with technology that they’re interested in, like VR.”

Transforming for the future

The XR Lab is also investigating multiplayer functionality that will allow employees in different locations to put on Oculus Quest headsets and collaborate using whiteboards and other virtual tools. “We’re building a better way to stay connected and engaged, which is even more important now with teammates working remotely during the pandemic,” says Escobar-Fernandes. Given the success Duke Energy has had so far, she thinks VR can unlock even more opportunities to improve safety, training, and collaboration across the company.

