Unexpected Direction Change

DOE internship leads to Pacific Northwest National Laboratory career in cybersecurity

By Kelly Day

Two DOE internships while in community college inspired Penny McKenzie to a career in industrial control system cybersecurity. (Photo by Andrea Starr | Pacific Northwest National Laboratory)

Penny McKenzie was working in customer service when an unexpected layoff led her to retrain in computer science.

McKenzie studied cybersecurity at Columbia Basin College in Pasco, Wash. One day, representatives from Pacific Northwest National Laboratory (PNNL) in the neighboring city of Richland gave a presentation at the college, describing the Community College Internships (CCI) program offered by the Department of Energy Office of Workforce Development for Teachers and Scientists.

McKenzie decided to apply and was selected by Idaho National Laboratory (INL) for a summer internship. That experience was so positive that she returned the following summer for another internship at INL. After the two INL CCI Internships, she applied to the Science Undergraduate Laboratory Internships (SULI) program and participated as an intern at Pacific Northwest National Laboratory (PNNL).

These experiences set her on a path of learning about wireless security and ultimately developing a passion for industrial control system cybersecurity. Those systems control how utilities are distributed. Cybersecurity specialists take steps to protect the systems.

McKenzie said the SULI internship was vital to her career development.

“The mentor that I worked with was fantastic,” she said. “She put me on a project on forensic analysis of Industrial control systems, and It really shaped the way my research is today.”

McKenzie now works as a cybersecurity engineer at PNNL, focusing on protecting critical infrastructure for electrical distribution and grid operations in the U.S. and abroad. She also researches how to protect those

operations from smart technology.

At PNNL, she established the Internet of Things (IoT) Common Operating Environment research laboratory. In this lab, the team studies security implications and energy efficiency of network-connected devices in a realistic testing environment.

Penny also recently published papers through DOE related to how to safely use IoT technology within a nuclear facility. One paper—" My Phone Says it's Time to Replace the Fuel Rods: The Impact and Application of Internet of Things (IoT) in Nuclear Environments"— was presented at the International Atomic Energy Agency 2023 computer security conference in Austria.

"To think, I started as a customer service representative and now I'm a cybersecurity engineer protecting our interests here and overseas," McKenzie said. "If it wasn't for my DOE internships, I don't think I would be where I am today."