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MCHD's Dr. Lee B. Smith travels to Chernobyl to augment radiation training

MORGANTOWN, WV (Oct. 11, 2021) — Dr. Lee B. Smith spent five days in late June, dosimeter in hand, measuring radiation levels both inside the former Chernobyl Nuclear Power Plant in Ukraine and the surrounding area, known as the Exclusion Zone.

Dressed in assigned white personal protective gear (PPE) when inside the domed-off plant, which experienced a catastrophic explosion, meltdown and fire in 1986 that rained radiation at least as far away as Sweden, and in blue PPE outside in and around the ghost city of Pripyat, Dr. Smith continued his ongoing training in radiation detection and preparation that he utilizes for his job as Monongalia County Health Department's executive director and county health officer.

"It's still highly radioactive," said Dr. Smith of Chernobyl. "Radioactivity will go on for thousands of years."

Working in conjunction with MCHD's Threat Preparedness program, Dr. Smith uses these skills locally, such as by helping to monitor mass gatherings for individuals or groups that might attempt to set off a "dirty" bomb that contains radiological material.

"We were part of a 10-person team to train in taking measurements and performing drills while seeing effects of the explosion 35 years later," he said.

Dr. Smith was accompanied by his wife, Dr. Vicki Everly, an emergency physician at Mon Health Medical Center who prepared for the trip by undergoing training by the U.S. Department of Energy.

“My husband asked, ‘Do you want to go to Chernobyl?’” Dr. Everly said. “It’s not one of the top places I want to go, but I said, ‘Yeah, I can do that.’”

In the end, she was glad she did. “I loved it. It was one of those things that you can put a checkmark by,” she said. “I don’t know if I would do it again, but to stand in those places where all of this took place was amazing.”

And stand in amazing places they did. Drs. Smith and Everly visited locations that included a control room identical to one where an ill-advised test was conducted at 1:23:45 a.m. April 26, 1986 and the sarcophagus that now covers the remaining structures to keep radiation from escaping.

The test triggered a chain reaction nuclear explosion and fire in Chernobyl’s No. 4 reactor.

When the accident took place, responding firefighters had no idea how to effectively extinguish radioactive flames from the more than 200 tons of uranium that melted down the reactor. They also were not properly outfitted to do so. Many died within three months and others died later from radiation.

“Many of those guys had lethal doses of gamma radiation,” Dr. Smith said. “It was reported to us that many of the helicopter pilots who dropped sand and boron on the site also received lethal doses of gamma radiation just from flying helicopters over the open reactor.”

Residents were not immediately alerted to the dangers of the nuclear accident and were not evacuated for three days.

The area will not be inhabitable for 30,000 years, and reaching the site required a daily train ride from Slavutych, about 60 miles away, and built for those involved in the clean up, Dr. Smith noted.

Dr. Smith was invited to participate on this trip by Technical Resources Group, based in Idaho Falls, Idaho, which has been conducting this exercise for about 10 years.

“Because of the work Monongalia County Health Department does with radiation training and preparation, we’ve been involved in a lot of education and drills,” he noted.

Also, in 2015, the state Department of Health and Human Resources designated MCHD as the Northern West Virginia Radiation Response Team, which includes maintaining a cache of equipment and trained personnel who can respond to radiation events.

“Since then, we’ve put a lot of time and effort into getting our Threat Preparedness staff up to speed,” he added.

That has meant sending staff members to Oak Ridge Institute for Science and Education (ORISE) in Oak Ridge, Tennessee. Also, Dr. Smith just completed Radiation Emergency Preparedness, a yearlong training at the Naval Postgraduate School in Monterey, California.

“That’s been an involved course,” Dr. Smith said. “We got to meet in person for the class, and there were subject matter experts from the federal government and from state governments, and someone from Oak Ridge was there. There were people from all over the country that were accepted into this program, and they were equally interested in what I had learned at Chernobyl.”

That included insight into what prompted the accident. “Reactor No. 4 had about 200 tons of uranium in it and it was a twin to reactor No. 3,” Dr. Smith. There were also twin reactors Nos. 1 and 2. “So there were huge amounts of radioactive materials there.”

At the time, Ukraine was part of the United Soviet Socialist Republic (USSR) and the Cold War that was about to end was still ongoing.

“The Soviets thought that the Americans were going to come and bomb them, and they wanted to know if they could switch the electrical generator from nuclear power, generating steam to turn the turbines, to a diesel-fired generator. That’s why this whole thing happened.”

A series of errors occurred, including postponement of the test until the middle of the night when a less experienced shift would be working, and then by going ahead with the test even as indicators continued to emerge that should have stopped them from proceeding.

“Long story short, they ended up trying to shut down a lot of energy created from radiation and start it back up again. But the reactor power went so low. In order to make it heat up, they drained water from the cooling system, which was another error that sealed their fate.”

Then, control rods filled with boron to absorb neutrons were withdrawn to allow more radiation and heat. When radiation reached critical levels, the safety control rods started to lower back down into the reactor. However, the rods’ tips were made of graphite, which absorbs radiation. The rods were burned and ruined, jamming the safety rods from being further lowered. “It was a fait accompli. It went critical within seconds.”

Although it's been more than 35 years since the Chernobyl nuclear disaster occurred, it reentered public awareness and was introduced to a new generation in 2019 through both an acclaimed HBO miniseries, "Chernobyl," and a bestselling book, "Midnight in Chernobyl: The Untold Story of the World's Greatest Nuclear Disaster," by Adam Higginbotham.

As depicted in the series, in the minutes following the explosion, area residents gathered on a nearby bridge to watch the flames, having no idea of the radioactive fallout that was swirling around the sky.

"Some of them ended up with thyroid cancer, which can be treatable," Dr. Smith said. "Not everybody died quickly of acute radiation sickness."

Unauthorized individuals are not supposed to visit Pripyat and the surrounding areas, but natives known as stalkers steal into town.

"Some of the people who were evacuated came back, thinking, 'It's my homestead and I can live off the land,'" he said. "But can you take the radiation? If you take a meter and hold it up to a tree, it's giving off large amounts of radiation in counts per second. Heavy metals follow gravity and wash into the soil, where it is absorbed by plants."

There are also adventure tourists who want to see the area for the coolness factor of visiting a forbidden place.

Dr. Smith recalled seeing a busload of sightseers disembark a bus. "And they have on T-shirts and flip-flops like they are on a picnic, and the leader of the group lets them turn on their meters, which make a big noise," he said. "But they didn't have a clue what they were doing."

On the other hand, Dr. Smith felt very safe as his team was led by experienced professionals who have been conducting the tour twice a year for about a decade.

"It gives you a sense of reality that your meter is singing," he said. "To you, it's a real-world situation. But you are conscious of limiting your amount of exposure."

They were in "harm's way" for five days and were measured for radioactivity before and after. "At the end, we had like 45 microsieverts, which isn't exceptional. It's a really small cumulative dose, like getting dental X-rays."

Pripyat offered its own fascination as a city stopped in time. The group saw abandoned amusement rides such as a merry-go-round and Ferris wheel; circa-1986 televisions, furniture and pianos on display at deserted shops; and a café with beautiful stained glass that served as a reminder of the city's former status as a cultural center.

Also remaining in the area are dogs who survived in spite of a mass effort to eliminate all pets that might have been contaminated with radiation. One of the group's guides runs a site called "Dogs of Chernobyl" that raises funds for communities affected by industrial accidents.

"He also sets up funds for people with various cancers to get them treatments that for them are not financially attainable," Dr. Smith said.

As seasoned world travelers, Drs. Smith and Everly were able to compare their experience to previous trips.

"It was one of the most rigorous things we've ever done, maybe other than Machu Picchu," Dr. Smith said. "It was 95 degrees a day, and when we were outside in Pripyat, we wore wool polyester-blend pants, big work boots and jackets while we walked about 10 miles each day. It wasn't like you could sit down and put your backpack down because everything is contaminated."

But it's an experience that Dr. Everly will never forget. "It touches you to see this area, that it is now kind of beautiful and all grown over and green and lush, but it's going to be radioactive for the next 30,000 years. Nothing is going to be able to inhabit it safely."

For up-to-date information on health and wellness in Monongalia County, check out monchd.org and follow the health department on Facebook and Twitter @WVMCHD and on Instagram at #wvmchd.