

Preparing for Nuclear Accidents

By Margaret Regan

During April and May last year, Ukraine's Zaporizhka nuclear power plant--the largest in Europe--shut down six times due to electrical and mechanical failures. In June, an atomic weapons researcher became Russia's first nuclear accident victim killed since the 1986 Chernobyl explosion. And currently more than 20 of the two types of nuclear reactors considered to be most unsafe by Western standards operate in Russia, Ukraine, Armenia, Lithuania, Bulgaria and the Slovak Republic.

These incidents, the specter of the Chernobyl accident and growing concerns about dependence on nuclear power in the NIS and CEE, drew 29 health care professionals from across the region to a two-week course that focused on the health effects of radiation exposure and how to prepare for and assist during radiation incidents. The course, which was held in October, was developed by the Radiation Emergency Assistance Center/Training Site (REAC/TS) in Oak Ridge, Tennessee under a program created by Boston University and funded by AIHA and the International Atomic Energy Agency (IAEA).

In addition to its specialized training courses, REAC/TS provides 24-hour assistance with radiation accidents for local, national and international radiation accidents and maintains a radiation accident registry system. The Oak Ridge National Laboratory manufactured enriched uranium for nuclear weapons from 1942 until 1989.

"It became apparent to us that, during the Chernobyl accident, the population and the majority of medical personnel were poorly prepared for that catastrophe," said Nikogos Hovhannesian, MD, PhD, director of the Research Center for Radiation Medicine and Burns in Yerevan, Armenia. "Therefore, a course like this--which prepares medical personnel for such accidents--is very important to increase our knowledge and preparedness for similar accidents."

The course explored topics from the biological effects of radiation to contamination control for ambulance personnel to the physics of nuclear reactions. During a disaster drill, participants prepared a radiation emergency area in a hospital emergency department within 30 minutes of a call with news of a nearby nuclear accident. Participants collected samples from three patients, examining them for external radioactive nuclides and internal contamination, from ingestion, inhalation or through open wounds using the Geiger-Mueller counter. They also worked together to control access to and exit from the contaminated area of the emergency room. The drill was videotaped, and the participants watched the tape and critiqued themselves later that day.

"Bearing in mind the extensive nuclear activities in Eastern Europe and the former Soviet countries, this training is absolutely essential," said Massoud Samiei, head of the Europe Section of the IAEA's Department of Technical Cooperation. He noted that in-kind contributions by partners and collaboration among AIHA and the EMS training centers have helped ensure that "IAEA's small input goes a long way."

To illustrate the importance of coordinated disaster response, REAC/TS Director Robert Ricks, PhD, told participants about a 1985 accident in Goiania, Brazil, one of the world's most serious radiological incidents. When a private radiotherapy institute moved to a new location, a radiation therapy unit was left behind, and scavengers sold pieces of it to a junkyard owner and distributed other components to people attracted by the glow-in-the-dark radioactive caesium chloride salt the equipment used. More than 200 people were contaminated either externally or internally, and four died within four weeks of the accident. Although the incident began with the contamination of just two people, after several days it had resulted in widespread human contamination and severe environmental contamination, Ricks said.

Boston University School of Medicine and the University of Massachusetts designed the course program, which taught participants how to train their colleagues on nuclear disaster response. Less than a month after the Oak Ridge course, Armenian, Bulgarian, Hungarian, Lithuanian, Moldovan and

Slovak participants held a training session at the EMS training center in Yerevan to share what they had learned. A similar course is planned for Moscow in January and will be taught by instructors from Belarus, Czech Republic, Estonia, Georgia, Poland, Russia and Ukraine who were trained in Oak Ridge. Both courses are monitored by faculty from Boston University, REAC/TS and the University of Massachusetts Medical Center.

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