



Steve Taylor was part of the TMI-2 accident investigation team from INL. The team's expertise, along with other related materials like this three-dimensional Plexiglas model of the damaged Three-Mile Island nuclear plant core area, will serve as a training program for Fukushima and can provide valuable insight into the damage expected at the reactors.

Safety is the legacy of Three Mile Island

By [Cathy Koon](#) for *INL Nuclear Science and Technology Communications*

Steve C. Taylor and Doug Akers haven't been to the Fukushima nuclear plant in Japan since the earthquake and tsunami damaged three of its reactors, but they understand the process under way to figure out what happened and why.

Both men were involved in the investigation and cleanup after a partial meltdown of the core in the No. 2 reactor at the Three Mile Island (TMI-2) nuclear plant in Harrisburg, Pa., on March 28, 1979. Taylor and Akers still work at Idaho National Laboratory in Idaho Falls and though neither man has traveled to Japan to assist in the effort there, they are involved in the assistance being provided by the U.S. Department of Energy lab.

Taylor said three of the six cameras that were sent to Japan from INL were systems that he built for work at INL. Akers said he has been consulted by government officials from Japan and provided radiation detectors for the robotic system that went to Japan. They both see similarities between Three Mile Island and the Fukushima Daiichi nuclear plant, and both speak confidently about the role the TMI-2 accident will play in helping the Japanese cope with the damaged reactors there.

"We (the international community) were able to take existing reactors and retrofit them to be safer and more reliable," Taylor said about the lessons learned from TMI-2. "Our kids and our grandkids will be safer."

Akers echoes the sentiment that safety is the legacy from TMI-2.

In Pennsylvania, "all of the safety measures worked very well, releases (of radioactive materials) were limited, no one was injured," Akers said. Those same safety measures can define the recovery effort in Japan. TMI-2 provided a "solid basis for anything that has happened in Japan," he said.



Doug Akers was a member of the initial Three-Mile Island accident response team that assessed radioactive material releases from the auxiliary building shortly after the accident.

Did You Know?

INL scientists, engineers, technicians and craftsmen were deeply involved following the Three Mile Island accident in 1979. At its peak of activity, 49 INL employees staffed the TMI Technical Integration Office in Pennsylvania, providing technical advice, assisting in various activities including entry into the containment building for inspections, visual inspections inside the reactor vessel, sample retrieval from the damaged reactor vessel core and support of many of the projects associated with eventual removal of the damaged spent fuel and core debris to INL. Scores more worked at DOE's Idaho site in support of

Taylor started work at INL in May 1978 so was relatively new at the lab when the TMI-2 accident occurred. He built equipment for TMI-2 and was part of the accident investigation, and worked in Pennsylvania for weeks and months at a time. He recalls being involved in the first video taken of the damaged core. The water surrounding the core was too muddy to see anything, and INL employees developed an ultrasonic probe that allowed them to build a model of the core.

"I helped with several projects including the design, fabrication, system integration, testing, training and operation of the TMI-2 Core Topography System. An operator on the TMI-2 Core Stratification Sampling System, and a camera operator," Taylor said of his role during the initial investigation.

After one 30-day stay in Harrisburg, he had his family flown in so they could see firsthand where he was working. His two oldest daughters were even allowed to tour the TMI-2 control room. He said his children's reaction to the news from Japan was, "when are you going back, Dad?" His wife's reaction was quite the opposite: "You're not going."

A model of the damaged TMI-2 reactor core still resides at INL in Taylor's department. A duplicate of the probe, a three-dimensional Plexiglas model of the damaged core area and related materials from INL's support effort, were displayed at The Smithsonian Institute's American History Museum in Washington, D.C., for the 25th anniversary of the TMI-2 accident.

the work. Akers' involvement at TMI-2 was quite different. At TMI-2 in 1979, he was part of one of the initial accident response teams that assessed radioactive material releases from the auxiliary building shortly after the accident. Later, he was involved extensively with the characterization of damage to the reactor core, and the location and releases of radioactive materials from the reactor to the environment. In addition, he was involved in the assessment of damage to the lower head of the reactor vessel and later, the drying and storage of the core debris. He worked for the TMI-2 Accident Evaluation Program for seven years full time.

Akers worked with many people involved in the TMI-2 accident. A number of those people still work at INL and can contribute knowledge of the TMI-2 accident to the Japanese reactors. Some of the INL staff with TMI-2 accident experience include Mike Tyacke, Kevin Croft, Brian Schuetz, David Petti, Eric Carlson, Joy Remppe, Kevin Streeper and Jim Wolf.

Looking back at TMI-2, Akers said it was a training program for Japan and provides insight into the damage expected at the reactors, and the hardware and systems needed to safely recover from the accident. The same equipment used at TMI-2 can't be used in Japan as it has been scrapped, but the research and technology developed by INL can give Japan a long head start in developing systems suitable for safely removing the reactor cores from the Japanese reactors and cleaning up the site.

Akers was quoted recently by the Wall Street Journal regarding the cleanup in Japan. The big difference between the two incidents is the number of reactors involved. TMI had one reactor; Fukushima had multiple reactors and spent fuel storage pools and was the result of a natural disaster because of a huge earthquake followed by the tsunami.

Akers told the Journal that the situation in Japan will become more complicated if workers find fuel melted in the reactor core as would be expected based on the initial information from Japan. That would require what he termed a "mining operation" to remove the debris. Tons of rubble were removed from the reactor core at Three Mile Island. That and the transfer of radioactive casks weren't completed until 1990, a decade after the accident.

Taylor was positive about the cleanup in Japan. He said it will be "just a matter of time and money. It's nothing to be feared."

For additional information about the TMI accident, the Smithsonian exhibit and INL's involvement in the TMI cleanup, go to: http://newsdesk.inl.gov/press_releases/2004/03-10Three_Mile_Island.htm



Members of the INL accident investigation team built a model of the upper part of the TMI-2 reactor core using an ultrasonic measurement system.

[Feature Archive](#)