Features

Engineers question meaning of nuclear power in wake of Fukushima crisis

University of Tokyo's Yasuda Auditorium, made famous by the student activism of the 1960s and 70s. (Mainichi)

Half a century since the Department of Nuclear Engineering at the University of Tokyo's Faculty of Engineering was founded, it continues to live on as the university's Department of Systems Innovation, Environment and Energy Systems. But since the ongoing nuclear crisis at the Fukushima No. 1 Nuclear Power Plant first emerged, what has been going through the minds of members of the first class to enter the department in 1962?

On the evening of April 15, seven men with graying hair sat at a table at a Japanese-style pub in the Shinbashi district of Tokyo for a reunion of the first class to enroll at the University of Tokyo's Department of Nuclear Engineering. Conversation naturally turned to the nuclear accident at the stricken Fukushima power plant.

"I should have been more vocal about the importance of anti-tsunami measures," Michio Yamawaki, now a professor emeritus at University of Tokyo, said with regret. Some of his classmates were abstaining from alcohol in solidarity with those in the Tohoku region, who were hit hardest by the March 11 earthquake, tsunami, and ensuing nuclear disaster, and have been forced to make many sacrifices. Still others were going out of their way to enjoy sake from the Tohoku region to support local businesses.

Most of the 15 members of the University of Tokyo's first class of nuclear engineering students -- including Hiroto Ishida, a former administrative vice minister at the Science and Technology Agency, and Shinzo Saito, a former president of the Atomic Energy Society of Japan (AESJ) -- have, since graduation, been involved in the field of nuclear energy. Of them, two have already passed away.

Yamawaki, now 70, was born in Hiroshima, where he experienced the atomic bombing of the city when he was four years old. His home was located some six kilometers from the hypocenter of the blast, and he remembers clearly what he experienced that day. In a book published by the Japan Atomic Industrial Forum (JAIF) last year, Yamawaki wrote: "A flash of light suddenly enveloped the room, and after a moment we were overcome by a huge explosive sound and strong blast of air. I felt a huge impact, and the sliding paper screens and doors, and the wooden planks of the verandah were blown away..."

Nuclear power left a strong impression on the young boy: that it was both a demonic weapon that had taken the lives of many people, and an amazing neo-futuristic tool. While in high school, Yamawaki went to a small exhibit on the peaceful use of nuclear power, and saw displays showing the use of nuclear power to generate electricity. He came to feel that he wanted to improve people's lives through the use of nuclear power, and "to show the U.S." what Japan could do.

Yamawaki enrolled at the University of Tokyo in 1960. The school began recruiting students for its new nuclear engineering department during his second year. Feeling that it was fate, he enrolled without a second thought. He went from being an assistant, to assistant professor, to professor at his alma mater, and has been conducting research on materials and fuels used for nuclear power, as well as nuclear fusion.

"The very thing that I thought would make lives better has made lives worse. I've gone from being disappointed to feeling hollowed out," Yamawaki said about the ongoing disaster in Fukushima. "But still, we, along with science and technology, must overcome the accident and bring nuclear power under control."

Former International Atomic Energy Agency (IAEA) staff member Toshio Konishi, 70, explains that his entry into the field of nuclear power originated from his experiences of the postwar era. "Having experienced hunger as well as snow blowing into our shoddy home in Toyama Prefecture with little electricity during Japan's impoverished postwar years, I came to feel that energy was important. I thought it was interesting creating new energy from somewhere or something in which you didn't know energy existed."

Looking back on radioactive materials, Konishi said: "In theory, I thought that we could control it."

After finishing his graduate studies at the University of Tokyo, Konishi got a job at Hitachi Co, and was involved in the design and construction of the prototype fast breeder reactor Monju for nearly 30 years. Monju, which uses plutonium produced in reactors for fuel and produces more fuel than it uses, has been called a "dream nuclear reactor," and efforts are being made to develop a commercial version by 2050.

"But," Konishi said with a forced smile, "in my estimation, the commercial reactor should have been ready around 1990..."

Hired by the IAEA at the age of 55, Konishi spent seven years in the Austrian capital of Vienna. It was during his tenure there that the 1999 JCO nuclear accident took place in the Ibaraki Prefecture village of Tokai. Later, he wrote about the accident in an essay he contributed to a magazine.

"There is no such thing as 'absolute safety.' I think what we need is 'reliable technology...' Of about the 10 experts with whom I came into contact all spoke of their attitude that 'accidents happen, and when they happen, we tell the people about it, and then we make improvements. By building up through those steps, we earn trust.'"

Konishi speculates that experts' attitudes changed over the years. "As they promoted the use of nuclear power, the attitude, "we don't think there will be any accidents" somehow turned into "there won't be any accidents." Still, Konishi doesn't think the country should head in the direction of complete abandonment of nuclear power.

"I'm not saying that we'll need to keep using nuclear energy for eternity, but we'll need it for a while. Solar- and wind-powered energy, both easily affected by nature, are not a stable source of electricity. We need to get out all the information and accurately evaluate what happened (at the Fukushima plant). That's the important thing."

The only member of the nuclear engineering class to have long maintained an anti-nuclear stance is 71-year-old Ikuro Anzai, a professor emeritus at Ritsumeikan University.

Speaking to this reporter at an apartment building close to JR Kyoto Station, he spread out several photos from his university days on a table. In the photos were Anzai, wearing his black-rimmed glasses, and his classmates.

It wasn't that he was opposed to nuclear power from the very beginning. "It was a new department, and appeared to be cutting-edge." Anzai's specialty is in the protection of human beings from the effects of radiation. He spoke about an experiment he conducted as a student.

"We exposed rats to massive amounts of radiation and observed them. Over several hours, the rats went into spasms and eventually died. They didn't look any different in appearance, but when we dissected them, we found that their organs had become enlarged...It was shocking," Anzai said. "I thought to myself, can humankind tame something as dangerous as this?"

Anzai published paper after paper on radiation protection and became an assistant at the University of Tokyo's medical school in 1969.

He eventually became wary of the government's nuclear policy, citing its lack of safety guarantees while continuing to promote nuclear power. When he publicly criticized the national government, his colleagues at the lab began to give him the cold shoulder. Later, a sympathetic colleague informed Anzai that they had been given instructions to bring him down. A doctor from a power company who came for training at the lab and sat next to Anzai for several years later revealed that he had been "spying" on him. A pro-nuclear energy advocate offered Anzai an opportunity to do research abroad, which he took to be Japanese academia's attempt to be rid of him without looking bad.

One episode from his years in radiation research stands out. It was September 1973, and a public hearing was being held by the city of Fukushima on the installation of the No. 1 reactor at the Fukushima No. 2 Nuclear Power Plant. A local woman with a pro-nuclear power stance pointed to a high school baseball team from Hiroshima that had done well at a national tournament as a testament to the harmlessness of radiation exposure. "If children from Hiroshima (who should have been contaminated by radiation) are growing up healthy, there's no need to fear radiation."

Ultimately, Anzai stepped down from his 17-year-long position as an assistant at the University of Tokyo, and became a professor at Ritsumeikan University.

Anzai's parents are originally from Fukushima, and it is where the professor evacuated to as a young boy during World War II. In April, he visited the prefectural town of Namie, to find the place deserted.

"It's an area with beautiful rape blossoms, but no one was there. It looked to me as though the invisible sediment of fear was settling into the land," Anzai said. "I just don't think that nuclear power and humankind can coexist."

This reporter had the chance to speak to several other members of the class. Every one of them seemed to be struggling with a sense of emptiness, asking themselves the meaning of nuclear energy, to which they had dedicated most of their lives. (By Mamoru Shishido, Tokyo Evening Edition Group)

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