



Technical college students engaged in a cloud chamber training, and elementary school students touring the information and communication building

## Learning about radiation through cloud chambers and measurement training

### Becoming a base in Fukushima for radiation education, risk communication, and development of human resources

Since fiscal 2011, full-fledged descriptions on radiation have appeared in junior high science textbooks used throughout Japan. This was due to revision of government curriculum guidelines in 2008, and the volume of descriptions has been increased further since the accident at the Fukushima Daiichi Nuclear Power Station. At elementary and junior high schools in Fukushima Prefecture, there is a high level of concern about radiation, and radiation education is being carried out using a variety of textbooks.

In cooperation with Fukushima Prefecture, colleges of technology ("Kosen"), universities, etc., the Japan Atomic Energy Agency (JAEA) provides lectures and practical training involving real experiences relating to radiation every year. A facility for hands-on learning has been set up in the information and communication building of the Fukushima Prefectural Center for Environmental Creation in Miharu Town, where the JAEA's Fukushima Environmental Safety Center is located. In this facility, visitors can learn about the environment and radiation. This facility has become a base for learning.

### Human resource development by a cross-sectional organizations

On August 11, 2016, thirteen students from nine colleges of technology throughout Japan, from Aomori Prefecture to Kagoshima Prefecture, gathered at the Fukushima Prefectural Center for Environmental Creation. This event is a part of the project to develop human resources for nuclear power, which the National Institute of Technology (NIT) has been implementing since fiscal 2011. This fiscal year, it aims to achieve human resource development by a cross-sectional organizations.

On the day, the JAEA staff first lectured on the fundamentals of radiation and internal exposure. Then, the technical college students underwent training regarding: measurement of environmental radiation using Ge analyzers, measurement of air dose rate using a monitoring vehicle, and internal exposure measurement using a WBC (Whole



**Radiation measurement training  
in the temporary storage place**

Body Counter) truck. At the information and communication building, a cloud chamber to visualize trajectory of radiation was fabricated using comparatively familiar materials such as plastic containers, alcohol (ethanol), airtight tape with sponge attached, and dry ice. The participants then observed the paths of radioactive rays. In the information and communication building, the cloud chamber fabrication and training to observe the paths of radioactive rays are also carried out for elementary school students in Fukushima Prefecture. A large cloud chamber is permanently exhibited in the information and communication

building, and visitors can view the paths of natural radiation.

In the afternoon, participants went to a temporary storage place for removed soil in Miharu. As a part of their practical training, they measured the radiation dose while walking using a gamma plotter H, a stick-type radiation measurement device with a global positions system (GPS), capable of detecting radiation at heights of 5 cm and 100 cm from the ground surface. Then they learned how to indicate the results on a map. Through this training, the students learned that the air dose rate in the temporary storage place can be reduced through the self-shielding effect due to piling of flexible container bags filled with contaminated soil, and by surrounding the container bags with sandbags for shielding.

### **Intensive lecture on the fundamentals of radiation**

For two days starting September 7, the National Institute of Technology, Fukushima College (Fukushima KOSEN) held intensive lectures on the fundamentals of radiation at Fukushima KOSEN and the Fukushima Prefectural Center for Environmental Creation. These lectures were part of a newly initiated radiation education program, and 63 students participated. On the first day, at Fukushima KOSEN, there was a lecture on radiation utilization, effects, and protection, and students also received training in radiation measurement on the school grounds, using Geiger Müller (GM) survey meters and NaI scintillation survey meters. They learned about the types of measurement devices, how they are operated, the existence of radioactive materials, and other topics. On the following day, they made cloud chambers to visualize the paths of radiation at the Fukushima Prefectural Center for Environmental Creation in Miharu Town.



**Making cloud chambers in the information and  
communication building**

### **Measurement of internal exposure using WBC at a university festival**

As a collaborative risk communication project with universities organized by Fukushima Prefecture, the JAEA has carried out internal exposure evaluation using WBC, cloud chamber demonstrations, and other initiatives since fiscal 2014 in cooperation with students belonging to the "Natural Lifestyle Club" (NLS Club), an environmental group at Koriyama Women's University. As part of this collaborative agreement with universities, during the university festival



**Students themselves conduct reception and explanation tasks in WBC training at Koriyama Women's University**

of the Nagaoka University of Technology, a WBC truck is parked on campus and students carry out tasks ranging from reception for internal exposure measurement to explanation of results.

The students received a lecture by JAEA staff in advance regarding topics such as radiation, radioactive materials present in the body, and the effects of radiation on health. Then they actually carried out internal exposure measurement for the general public visitors using the WBC truck. Many of these visitors said they understood the measurement results better thanks to the easy-to-understand language of the students' explanations.

Going forward, the JAEA plans to conduct radiation education and risk communication activities through student training, events, and other programs in collaboration with Fukushima Prefecture, colleges of technology, universities, and other organizations. JAEA expects that these activities will lead to the development of the human resources to bear the future of Fukushima.

### **TOPICS Fukushima No.77**

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