

Course on Handling of Radiation at Iwaki Meisei University

How to Face Radiation

The Japan Atomic Energy Agency (JAEA) conducted a practical course on how to handle radiation for students and instructors at Iwaki Meisei University on February 20 and 21.

The accident at the Tokyo Electric Power Company (TEPCO)'s Fukushima Daiichi Nuclear Power Station forced a lot of people, who had paid little attention to the subjects of radiation and radioactive materials, to become aware of them inevitably.

Knowledge and understanding of radiation are now required at places of education. Classes concerning radiation were restarted in FY2012 as part of the science program at junior high schools for the first time in 30 years. How to face radiation and how to convey information about the subject have become new initiatives for the JAEA, which has dealt with radiation since prior to the accident.

Aimed at providing an understanding of radioactive materials and handling of radiation for young instructors and students interested in becoming instructors, the course was initiated in FY2011 with the financial support of the Ministry of Education, Culture, Sports, Science and Technology. This was the first time that the course is held in Fukushima Prefecture. About forty students and teachers from the university participated in the course.

Fundamental practice with radiation was conducted in the laboratory of Iwaki Meisei University on the first day. The participants in the course observed the path of natural radiation in a cloud chamber. In the hydrogen detonating gas test, they learned the mechanism by which hydrogen explosions occurred in the accident at the Fukushima Daiichi Nuclear Power Station.

After that they learned how to use radiation meters on familiar substances containing radioactive materials such as chemical fertilizer and mantle used as the filament for camping lanterns. They also learned the difference between Becquerel (Bq) and Sievert (Sv) as well as precautions when measuring.

On the second day, the lecture was conducted at the Oarai Research and Development Center of the JAEA in Oarai Town, Ibaraki Prefecture. The participants experienced manipulation using a glove box, simulated decontamination work using fluorescent paint, and putting on and taking off protective clothing such as tyvek suits that are worn during the work. The participants also experienced remote manipulation of radioactive materials using a manipulator at facilities equipped with a hot cell. The course instructors also briefly talked about the features of research and development facilities where radioactive materials are handled, safety management, necessary equipment and need for experienced researchers and engineers.



The picture above shows the participants observing radiation using a cloud chamber. The chamber is full of alcohol vapor and cooled. When the radiation passes through, the vapor collects along the path forming a white "cloud" on the path. The picture below shows the cloud chamber fabricated by the participants using familiar



Amount of radioactivity (Bq) of a mantle is checked with a GM survey meter. You can see that the dose rate goes down as you move away from the radiation source (left).

How to Convey Knowledge of Radiation

One of the features of the course is that it includes practical follow-up training. In the follow-up training, participants discussed how to convey what they learned in the course to people who don't know much about radiation in easy to understand terms, and conducted a mock class by having some of them play the role of students and the others the role of teachers. A cloud chamber and survey meters were used as props for the class.

Some of the participants commented that until then they did not have an opportunity to learn about radiation in detail, and the experiments and training conducted in the course provided them with a valuable opportunity to study about radiation and radioactive materials.

The course has been held 4 times so far (twice in FY2011 and twice in FY2012). It is scheduled in the next fiscal year as well in collaboration with educational

institutions in Fukushima Prefecture.



Anorak suits and masks are worn. It takes about 20 minutes to put on or take off the gear. If an anorak suit is worn over a tyvek suit, the person will break out in perspiration in just a few minutes even during the winter. The mask must adhere closely to the face, and the participants felt it was unexpectedly hard to breathe.