



Improving remote-control technology such as robots towards the decommissioning of the Fukushima Daiichi Nuclear Power Station

International conference was held at the Naraha Center for Remote Control Technology Development.

In the decommissioning of the Fukushima Daiichi Nuclear Power Station (1F), Tokyo Electric Power Company Holdings, Ltd., there still remains many works that are dangerous for workers due to high radiation. In order to conduct such dangerous works, remote control instruments such as robots are being used in many places. However, when robots are applied to the real decommissioning work in 1F, there are many technological subjects in addition to the function of the robots. The other subjects are; 1) how to operate robots including robot transportation and preparation of surrounding instruments, 2) safety measures against the risk caused by the robot during the work, and 3) education of robot operators.

Under these circumstances, the Naraha Center for Remote Control Technology Development, Japan Atomic Energy Agency (JAEA), held an international conference named “The third Fukushima Research Conference (FRC) in FY2018” in the Center from October 30 to 31, 2018, in order to discuss the remote control technology such as robots in nuclear facilities including 1F. About fifty people, including researchers from USA, Australia, Korea, Philippines and Japan, participated in the conference.

■ Experiences and subjects in 1F

At the beginning of the conference, Dr. Masahiro Ishikawa, Director of the Naraha Center for Remote Control Technology Development explained the purpose the conference. He presented that the practical technology for robots working at the 1F decommissioning such as remote-control

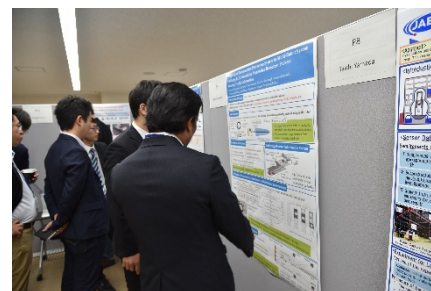
technology and the methods for test and training is discussed in the conference. Also, he stressed that the conference would be a place where positive opinions and information are exchanged. Then, the keynote speech was presented by Professor Hajime Asama of the University of Tokyo (right photograph), who has served as a member of many committees on technology for his continuous work on the development of investigation robots since the 1F accident. Professor Asama presented the tasks required for remote-control technology such as removal of rubbles, investigation of decontamination and measurement, and sampling of contaminated water, based on the examples of the 1F decommissioning. Also, Professor Asama explained that the research and development on communication technology and methods for operation training will be necessary as future subjects. After the keynote speech, the discussion was held with participants on the details and how to cooperate among researchers.



■ Opinion exchange by the domestic and oversea researchers through invited lectures and poster presentations

As invited talks, Dr. Kenji Kaneko of the National Institute of Advanced Industrial Science and Technology firstly gave a lecture at the request of the Committee on Safety Recovery System, System Integration Division, the Society of Instrument and Control Engineers. This Committee has knowledge on the removal and decommissioning of dangerous materials such as contaminated structural materials. Dr. Kaneko explained his efforts to develop humanoid robot that works not only in daily life but also in dangerous places. As a next invited talk, Professor Robin Murphy of Texas A&M University, USA, who has developed robots that are actively working in disaster sites including the Great East Japan Earthquake. Professor Murphy stressed the importance of the human robot interaction[※] in the 1F decommissioning with reference to the examples of rescue robots. Participants asked questions about the possibility of automation and application of AI (artificial intelligence), and active discussion was held.

In the poster session, thirteen posters were presented mainly by the domestic and oversea young researchers (right photograph). The hot discussion was held in various fields such as technology on communication, control and environmental recognition, nuclear disaster response robot, application of virtual reality technology to operation training, and application of simulation technology. Eager exchanges of opinions were held.



※function for people and robots to work together

■ Opinion exchange through the technical demonstration



A technical tour to the Naraha Center for Remote Control Technology Development was held after the conference. In the tour, the technical demonstration of the small unmanned aerial vehicle (UAV) was held. The UAV made by the Perspective Robotics Co. has been developed by JAEA in collaboration with Professor Robin Murphy. The participants discussed in detail and exchanged their opinions in front of the real flying UAV (left photograph).

Many of the participants told their impression about the conference as follows; “The invited talks and poster presentations were good stimulus for me. I would like to take this opportunity to closely exchange information.” From now on, JAEA will set up such an exchange place where researchers can exchange their opinion on the latest knowledge towards the 1F decommissioning.

<Terminology>

FRC : Fukushima Research Conference

UAV : Unmanned Aerial Vehicle

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