

# Radiation Countermeasures and Decontamination Efforts

Ever since the earthquake disaster, Fukushima University has been enacting a variety of measures and countermeasures to address radiation and decontamination. Amid a shortage of specialized equipment for measuring radiation, the university was able to overcome this obstacle by forming a team comprising participants from industry, academia and the government.

## Publicizing data on radiation dose measurements on the university and affiliated school campuses

Immediately after the TEPCO Fukushima Daiichi Nuclear Power Plant accident, we recognized the importance of providing objective investigations and accurate information as the local national university.



The Radiation Dosage Measurement Team, comprising mainly volunteers from among the teaching staff of the Faculty of Symbiotic Systems Sciences, began by measuring Northern Fukushima and the campuses of Fukushima University and its affiliated schools. Measuring instruments were in short supply initially, which made periodic measurements impossible, but with more equipment subsequently being borrowed from other universities, periodic measurement became possible from the latter part of March 2011. The measurements taken at the university and affiliated school campuses are posted on our website.

## Radiation dose measurements within the Fukushima University and affiliated school campuses

<http://www.fukushima-u.ac.jp/guidance/top/fukudai-housyasen.html>

## The Radiation Information Desk and lending program for dosimeters and survey meters

Responding to doubts and anxieties among students regarding the effects of radiation from the nuclear accident, the university opened the Radiation Information Desk in June to answer their questions. From July, the Information Desk also began lending out *electronic pocket dosimeters (cumulative dosimeters)* that students carry on their person to measure individual radiation exposure.

In November, the Information Desk also started lending out *pocket survey meters* that can measure environmental gamma radiation, enabling students to measure radiation dose in their immediate environment. Advice is given on operating these devices and interpreting the readings when the equipment is lent out.



## Creating a Radiation Guidebook

When the university was reopened in May, a *Radiation Manual* was given to new and returning students. This summarized radiation dose conditions within the university and actions taken regarding radiation, information about radiation exposure and minimizing exposure, topics to be aware of and reference materials. Since then, the university has remained attentive to any changes in nuclear accident and radiation dose trends, while demonstrating its stance to prioritize student safety. To this end, a *Radiation Guidebook* was drafted and distributed to the student body in July to help students really engage with the radiation issue as well. The guidebook contained basic information on radiation and exposure, as well as things students should consider on campus and in their daily lives.





### Removing earth from and cleaning U-shaped gutters – removing hotspots –

The Radiation Measurement Team together with cooperating teaching staff from each faculty and office staff measured radiation doses on the university campus and confirmed that hotspots (areas with exceptionally high radiation doses) existed in grassy areas, areas below drain-pipes and gutters where rainwater was accumulating. Prompted by their findings, from July to August, earth, sand, and fallen leaves that had gathered in hotspots and U-shaped gutters were removed and cleansed in order to lower radiation doses in the Kanayagawa Campus. The removed earth and sand were buried in trenches lined with waterproof sheets, and then the top surface was covered with asphalt to safely store contaminants.



Cleansed gutters



Decontamination measures (trenches drilling)

### Work to replace topsoil on the campus grounds

The university decided on the course of a mid- to long-term decontamination plan in October. The decontamination plan identified steps to lower radiation dose ratios in high-usage areas outdoors on campus to ensure a safe living environment on campus. Under this plan, 5cm of topsoil was removed from the soccer and rugby field, handball courts, baseball field, Japanese archery grounds and equestrian grounds in December. New

topsoil was brought in and compacted, and the removed topsoil is now permanently stored in an underground trench located under the sports field. Decontamination works began in February for the athletic field (grassed area), tennis courts, and the central square.



### Decontamination verification tests for interlocking paving published

On January 28th 2012, in cooperation with the Japan Atomic Energy Agency, Fukushima University published the results of decontamination verification tests after using *J Removers* on interlocking paving within the Fukushima University Campus. This equipment cleans contaminated paving using an ultra-high pressure (up to 280 MPa) water-jet surface treatment method to pressure-wash contaminated paving, and draws water back in as it decontaminates, to remove cesium. Only sand remains as a waste product, and the water can be reused after treatment. Normal high-pressure water jet cleaners (water pressure 5 MPa) have had little effect on interlocking paving, but the *J Remover* achieved impressive results, reducing contamination levels to less than half. We expect that this technology will be used widely in future decontamination activities.

