

March 11, 2011: Fukushima radiation spread to residential areas hours before venting

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Radioactive material from the damaged Fukushima No. 1 Nuclear Power Plant spread to residential areas hours before workers vented the containment vessel of the plant's No. 1 reactor on March 12, 2011, to release pressure, it has emerged.

In one area, the level of radiation had surged to more than 700 times the normal level, indicating that many local residents were exposed to high levels of radiation before they evacuated.

The Fukushima Prefectural Government operated 25 monitoring posts around the nuclear power plant before it was crippled by the March 11, 2011 Great East Japan Earthquake and tsunami. Five monitoring posts were swept away by the tsunami, and 20 couldn't send data because the quake caused power cuts. Accordingly, officials were unable to put the data to use when evacuating residents.

Over the period up until September last year, the prefectural government collected and analyzed data from the 20 monitoring posts that survived the disaster. Results of its analysis were published on the prefectural government's website and the prefecture notified local bodies. However, it was not revealed that radiation had spread before the plant's operator, Tokyo Electric Power Co. (TEPCO), commenced venting operations — and neither the Diet nor the government's nuclear accident investigation committees were aware of the fact.

Workers are believed to have first tried opening a vent at the plant at 10:17 a.m. on March 12, 2011. TEPCO reported success after a fourth venting operation at about 2:30 p.m. the same day.

However, data at four monitoring posts in the Koriyama, Yamada, Kamihatori and Shinzan districts in the Fukushima Prefecture town of Futaba indicated that radiation levels had risen hours before TEPCO starting opening the vents.

Radiation dosages in the four areas before the disaster ranged between 0.04 and 0.05 microsieverts per hour, but as of 5 a.m. the level in the Koriyama district, located about 2.5 kilometers north of the plant, had swelled to 0.48 microsieverts per hour and at 6 a.m. it stood at 2.94 microsieverts per hour. By 9 a.m., roughly one hour before officials started opening the vent, the hourly radiation level had surged to 7.8 microsieverts. In the Yamada district 5.5 kilometers west of the power plant, the radiation level at 10 a.m. had increased to 32.47 microsieverts per hour — roughly 720 times the normal figure.

The average radiation dosage permitted by the government under normal conditions works out at 0.23 microsieverts per hour. The data obtained from the monitoring posts shows that radiation levels shot up rapidly over a short period of time. Officials believe that the radiation levels were affected by changes in the wind direction.

A final report by the Diet's independent commission to investigate the Fukushima disaster concluded that the core of the No. 1 reactor at the Fukushima plant melted down between the evening of

March 11, 2011 and the predawn hours of March 12 due to a total loss of power. Officials believe that the reactor's pressure container and other equipment were damaged, leading to a leak of radioactive material.

The Fukushima Prefectural Government ordered residents within a two-kilometer radius of the plant to evacuate at 8:50 p.m. on March 11. At 9:23 p.m. the central government expanded the scope of the evacuation zone to three kilometers around the plant. The following morning at 5:44 a.m. the central government ordered residents within a 10 kilometer radius to evacuate on the presumption that reactor vents would be opened. However, it was not until 8 a.m. on March 12 that many of the roughly 50,000 residents within the zone started evacuating. It is believed that radiation spread over a wide area after the fourth venting operation, as well as after a hydrogen explosion at 3:36 p.m. Thirty minutes after the fourth venting operation, the radiation level in the Kamihatori district stood at 1,591 microsieverts.

Kunikazu Noguchi, an expert on radiological protection at Nihon University, commented that the levels of radiation before venting were not high enough to immediately affect people's health, with the dosage from one hour of exposure being less than that received during a chest X-ray. However, he added, "We have to investigate how the radioactive materials spread and how much radiation residents were exposed to."

Mitsuhiko Tanaka, who served as a member of the National Diet of Japan Fukushima Accident Independent Investigation Committee, expressed surprise at the quick proliferation of radiation. He said it is assumed that radioactive substances leaked from the reactor judging from pressure changed inside the reactor, and it has been confirmed that radiation levels rose on the premises of the nuclear plant. However, he added there were issues that had yet to be solved.

"We haven't yet been able to identify the location within the reactor containment vessel from which radioactive materials leaked," he said. "There's a mountain of issues that should be examined before we start talking about restarting nuclear reactors."

The prefectural government did not finish analyzing data from the monitoring posts until after the government and Diet compiled their final reports on the Fukushima disaster, and the data is not reflected in health checks currently performed on Fukushima Prefectural residents.

"If the prefectural government was thinking firstly about the health of its residents, then it would have considered the data vital information that needed to be analyzed quickly," said Reiko Hachisuka, who represented Fukushima Prefecture at the Diet's Fukushima accident investigation committee. "As a prefectural resident, I find the Fukushima Prefectural Government's response shameful."

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Nationwide nuclear plant monitoring system stops working for over an hour

The Nuclear Regulation Authority announced that on Feb. 21, the Emergency Response Support System (ERSS) that monitors the status of nuclear plants around the country stopped sending

temperature, pressure and other readings for over an hour.

The Japan Nuclear Energy Safety Organization (JNES), which manages the ERSS, noticed around 8:25 a.m. that it was not displaying data from the nuclear plants. They rebooted the system, and at around 9:40 a.m. it recovered. JNES is investigating the cause of the trouble.

The ERSS is designed to predict events in the progress of nuclear disasters, such as the time of a meltdown, using information sent from the plants. If a nuclear accident had occurred during the downtime, JNES would have had to receive data from the relevant energy companies via phone or e-mail and enter the data in manually, which could delay responding to the disaster.

The ERSS experienced the same problem at the end of 2011.

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