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Fukushima workers exposed to high radiation levels

Six workers at stricken nuclear plant assigned to new tasks, while food supply problems grow

Justin McCurry in Osaka and **Tania Branigan**
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Empty streets in

Tamura in the Fukushima prefecture where residents are staying indoors due to the radiation risk caused by the failure of the Fukushima nuclear plant. Photograph: Joe Chan/Reuters

Six workers at the Fukushima nuclear power plant have been exposed to radiation levels beyond the usual legal limit while carrying out emergency operations to make the complex safe.

The news came amid reports that radiation from the stricken plant had found its way into the food supply, raising anxiety in a country already struggling to deal with the aftermath of the worst crisis in its postwar history.

Meanwhile Switzerland has announced it will move its embassy in Japan to Osaka because of fears radiation levels in Tokyo could increase.

The operator of the Fukushima plant, Tokyo Electric Power (Tepco), said it would have to vent radioactive gas from reactor 3, but later called off the risky procedure after pressure inside stabilised, albeit at a relatively high level.

The Kyodo news agency reported that Tepco said six staff members had been exposed to more than 100 milliSieverts of radiation, but had been assigned to other tasks and were continuing to work because they had not shown any abnormal signs since being exposed.

The government earlier increased to 250 mSv the limit for those working in the emergency operation.

Japan's fire and disaster management agency said readings of up to 27 mSv were detected on 50 firefighters. They were decontaminated after a 13-hour operation to spray water into the spent fuel pool at reactor 3 ended in the early hours of the morning.

On Sunday morning, workers doused a pool at reactor 4, also a cause of concern, for the first time.

"I think the situation is improving step by step," the deputy chief cabinet secretary, Tetsuro Fukuyama, told a news conference.

Yukiya Amano, head of the International Atomic Energy Agency (IAEA), heralded a "strengthening" of work.

But Hidehiko Nishiyama, deputy-general at Japan's Nuclear Safety Agency, cautioned: "We are making progress ... [but] we shouldn't be too optimistic."

Technicians have already restored power lines to reactors 1 and 2. They hope they can restore cooling systems, although the pumps may well have been damaged by the earthquake, tsunami and subsequent explosions at the plant.

David Lochbaum of the Union of Concerned Scientists in the US told Reuters: "The workers need to go through the plant, figure out what survived and what didn't, what can be readily repaired and get the cooling systems back up and running to deal with the cores and the spent fuel pools."

Tepco's president has made a public apology for "causing such great concern and nuisance".

The firm has been widely criticised for not being open enough about the problems at the facility and its attempts to remedy them.

The government's chief spokesman, Yukio Edano, confirmed the plant would not be used again.

The nuclear safety agency said the facility could be buried in sand and concrete, as happened at Chernobyl following the nuclear disaster in 1986, but has said that trying to cool the reactors remains the priority for now.

Japan is considering a temporary ban on sales of food products from the Fukushima region after levels of radiation exceeding government limits were found in milk and spinach.

The contaminated food and water pose no threat to human health, Edano said, adding that the tainted milk and spinach had not found its way on to the market.

"These levels do not pose an immediate threat to your health. Please stay calm."

Iodine-131 was present in milk at a farm 20 miles away from the crippled nuclear plant and in spinach grown at farms more than 60 miles away in neighbouring Ibaraki.

Tiny amounts of radioactive iodine have been found in tap water in and around Tokyo, about 150 miles away from the atomic plant, and five prefectures near Fukushima.

The education and science ministry said traces of another radioactive material, caesium-137, had been identified in tap water in nearby Tochigi and Gunma prefectures, but posed no danger to people even if ingested.

The government is to provide daily counts of radioactive materials in tap water from all of the affected areas, as well as levels in atmospheric fallout such as rain and dust.

Radiation was also detected on fava beans exported to Taiwan.

An official from Taiwan's department of health said a shipment of beans from Japan's south-western Kyushu island had shown slightly higher radiation than naturally occurring trace levels.

The department said the radiation, detected only on the surface of the beans, was well below Taiwan's legal limit and not harmful to human health.

Radioactive dust and particles were recorded in the greater Tokyo area but posed no risk to health, the government said on Sunday.

Edano said someone who drank the tainted milk for a year would receive the same amount of radiation as in a single CT health scan; eating the spinach would be the equivalent of one-fifth.

He said the contaminated water, milk and spinach would have to be consumed in enormous quantities over a long period to pose a threat to health.

"If you eat it once, or twice or even for several days, it's not just that it's not an immediate threat to health, it's that even in the future it is not a risk," he said. "Experts say there is no threat to human health."

Graham Andrew, a senior IAEA official, told reporters in Geneva that Japan was considering halting food sales from the affected region.

The spread of radioactivity to the food supply is already affecting Japanese food exports. South Korea, Indonesia, Thailand, Taiwan and Singapore have started screening food arriving from the country.

Local farmers said they were worried that the discoveries would affect other, so far unaffected, produce from the region, which is known for its rice and several varieties of fruit and vegetable.

"There will be damaging rumours," said Shizuko Kohata, a farmer who was evacuated from her home near the Fukushima plant. "I grow things for a living, and I'm worried that I won't be able to carry on after this."

The government said radioactive iodine-131 present in spinach tested on Wednesday was three to seven times above acceptable government standards.

Levels in drinking water from Fukushima were slightly over the limit on Thursday but had decreased significantly by the weekend, the health ministry said.

Drinking one litre (1.76 pints) of water with the iodine at Thursday's levels is the equivalent of receiving one 88th of the radiation from a chest x-ray, said Kazuma Yokota, a spokesman for the prefecture's disaster response headquarters.

Iodine-131 decays within a matter of weeks, but can pose a short-term risk to health, the IAEA said.

"There is a short-term risk to human health if radioactive iodine food is absorbed into the human body," the agency said. "If ingested, it can accumulate in and cause damage to the thyroid. Children and young people are particularly at risk."

A potentially greater concern is caesium-137, which caused widespread damage to the food supply in the wake of the Chernobyl disaster. The substance affects cells in the entire body and can increase the chances of developing cancer.

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