

# **Fukushima: Residents, workers vulnerable to radiation due do Tepco's policy**

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## **Radiation screening in high demand in Fukushima**

FUKUSHIMA—Being screened for radiation has become a routine exercise for many residents in Fukushima Prefecture as work continues to stabilize the disaster-stricken Fukushima No. 1 nuclear power plant.

An official in charge of radiation screening in Fukushima city said those who often come for measurements are parents who have spent a long time outdoors with their children, company employees about to return to their prefectures after a business trip to Fukushima and residents who do a lot of gardening work.

"Some people have brought in their pet dogs or rocks in the yard," the official said.

On June 13, a 38-year-old homemaker brought in her two children, aged 5 and 7, for full-body sweeps using radiation survey meters.

"I want to evacuate, but I have nowhere to go. So at least I want to periodically check on the radiation levels," the woman said.

A taxi driver in Iwaki goes for radiation screening on an almost daily basis.

"I have never had radiation levels above the standard, but passengers from outside Fukushima feel more relieved if I show them a certificate," the driver said.

So far, 200,000 tests have been conducted since March 13, including those on repeat visitors like the taxi driver. The prefecture's population is about 2 million.

Nine screening centers have been set up in Fukushima Prefecture, and even in June, some centers have had between 300 and 500 people come in for tests each day.

March 29 was the last time someone has been found with radiation levels above the standard requiring decontamination.

"There has been a shift from confirming whether someone has been exposed to radiation to

eliminating concerns about radiation and negative publicity,” said a prefectural government official in charge of disaster management.

Testing of public spaces has also spread.

In June, the Fukushima prefectural government began radiation testing at all kindergartens, elementary, junior and senior high schools in the prefecture as well as other public facilities frequented by children.

The prefectural government will establish a telemeter system at about 500 schools to monitor radiation levels around the clock.

The Fukushima city government plans to distribute small dosimeters to about 34,000 children attending day-care centers, kindergartens as well as elementary and junior high schools in the city, except those run by the central government. Accumulated radiation levels will be measured for a three-month period from September.

The total cost of the program will be about 160 million yen (\$2 million). Date and Kawamata will also distribute dosimeters to all children in elementary and junior high schools.

The spread of radiation measurement testing has also led to some confusion.

The Iitate village government had displayed the results of radiation measurements in front of the government building but had to temporarily stop the announcements because the results were different from tests conducted by the prefectural government.

According to officials of K.K. Alpha Tsushin, the Tokyo-based company that provided the radiation testing equipment to Iitate, radiation levels on May 30 were about 8.9 microsieverts per hour. The results released by the prefectural government for that area had levels of 2.8 microsieverts.

Company officials reduced the number of radiation types tested and raised the height of the counter to the 1-meter level used in testing by the prefectural government. That produced a result of 3.8 microsieverts per hour.

But the more detailed radiation screening may not ease the concerns of Fukushima residents unless the effects on human health are clarified.

Nozomu Asukai, a deputy head of the Tokyo Metropolitan Institute of Medical Science, said Fukushima residents had two major concerns: the effects of radiation on their children’s health, and whether the government and Tokyo Electric Power Co. were releasing all relevant information.

Because the results of radiation testing can vary widely depending on the type and quality of equipment used as well as the locations, experts said it is more important to focus on the accumulated amount of radiation exposure than the daily changes in radiation levels.

The government has set an annual radiation exposure level of 20 millisieverts as one guideline in deciding whether residents should evacuate from an area.

“Measuring radiation levels will likely lead to peace of mind as an objective standard,” said Shunichi Yamashita, a professor of radiation medicine at Nagasaki University and adviser to Fukushima Prefecture on radiation health risk control.

“But what is most important is not to be exposed to more than 20 millisieverts,” he said. “It will be

almost impossible to exceed that standard in the present lifestyle environment so I hope people will not be easily influenced by daily measurement figures.”

*Asahi Shimbun*, June 17, 2011

<http://www.asahi.com/english/TKY201106160184.html>

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## **1,400 Fukushima plant workers waiting for radiation exposure results**

TOKYO (Kyodo) — While authorities slammed Tokyo Electric Power Co. for exposing workers at its crippled nuclear power plant to radiation levels exceeding the allowable limit, particularly for internal exposure, around 1,400 of the company’s workers are still waiting for detailed checkup results.

About 3,700 people worked at the Fukushima Daiichi nuclear power plant in the period from the March 11 earthquake and tsunami to the end of that month, but the utility had finished detailed checks for internal radiation exposure on only around 2,300 by late May.

Hidehiko Nishiyama, a spokesman for the government’s Nuclear and Industrial Safety Agency, said one of the reasons for TEPCO’s inability to provide swift checkups for its workers is that the utility does not have enough whole body counters — dosimeters designed specifically to measure radioactivity levels within the human body.

The situation poses a serious problem as the nuclear crisis, triggered by the earthquake and tsunami, is still unfolding and a large number of people are desperately working to bring the plant under control. Internal radiation exposure could increase the incidence of cancer and leukemia.

On June 3, two TEPCO employees working at the Fukushima Daiichi plant were confirmed as having received radiation doses of 678 millisieverts and 643 millisieverts, more than twice the legal limit of 250 millisieverts for people working dealing with the crisis.

The Health, Labor and Welfare Ministry said earlier this week that another six workers may have been exposed to excessive radiation.

Each worker at the Fukushima plant wears a dosimeter to gauge external exposure and keeps a record everyday. As for internal exposure, caused by the absorption of radioactive materials through the nose and mouth, workers normally undergo detailed tests every three months using a whole body counter.

TEPCO had four such counters at the Fukushima Daiichi power plant, according to company officials. But they were rendered useless once the crisis broke out because radiation levels at the plant became too high to accurately gauge whole body exposure, they said.

TEPCO is currently conducting detailed checkups for people working at the plant using four whole body counters at a different facility, and it will take several months before the utility can increase the number of counters to over 14.

Given the situation, the utility reportedly placed priority on examining the internal exposure of 21 workers whose external exposure had exceeded 100 millisieverts, and 19 women, for whom a lower

limit has been set, engaged in non-nuclear duties at the plant.

The two men who were confirmed on June 3 as having been exposed to high levels of radiation were not in the priority group, indicating a substantial difference in the levels of external and internal exposure, experts said.

The external exposure of one of the men was 88 millisieverts but his internal exposure was 590 millisieverts, while the external exposure of the other was 103 millisieverts but his internal exposure was 540 millisieverts, they said.

The experts fear that the current legal limit for workers at the Fukushima plant could be raised because the crisis is unlikely to end anytime soon and there is likely to be a shortage of workers possessing the requisite skills and knowledge.

People working for TEPCO's subcontractors said radiation levels at the plant have fallen overall but there are areas with high levels where dosimeters can count 1 to 2 millisieverts within a couple of hours.

Some residents of Fukushima Prefecture have said they would also like to undergo whole body counter checks, but Goshi Hosono, special adviser to Prime Minister Naoto Kan, has said such checkups for residents may not take place for some time as the government only possesses a limited number of whole body counters.

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<http://mdn.mainichi.jp/mdnnews/news/20110615p2g00m0dm010000c.html>

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## **Gov't calls TEPCO radiation exposure standards 'overly optimistic'**

As the number of workers exposed to high levels of radiation at the crippled Fukushima No. 1 Nuclear Power Plant increases, the government is accusing plant operator Tokyo Electric Power Co. (TEPCO) of slack radiation dose calculations.

"From the start, the way TEPCO calculates internal radiation exposure has been overly optimistic," a senior Ministry of Health, Labor and Welfare official stated.

On June 14, Health, Labor and Welfare Minister Ritsuo Hosokawa directed TEPCO to withdraw any worker exposed to more than 100 millisieverts of internal radiation at the disaster-stricken plant, sparking a dispute between the company and the government over radiation dose calculation standards, and delaying the implementation of worker safety-first policies at the plant.

Meanwhile, with work at the Fukushima plant — where three reactors have melted down — projected to go on for some time, uncertainty over exactly how high a dose workers there are subjected to may impact TEPCO's public timetable for resolving the nuclear crisis.

On May 30, TEPCO revealed that two of its Fukushima No. 1 plant workers had been exposed to a higher radiation dose than the 250 millisievert emergency upper limit, though the firm did not state how much of that exposure had been from radioactive materials taken into the body.

The labor ministry had demanded that TEPCO calculate workers' cumulative radiation exposure starting from March 12, when a hydrogen explosion destroyed the plant's No. 1 reactor building. However, TEPCO rejected the government demand, stating, "It's impossible to say when any internal radiation exposure occurred. If workers were on the job until the end of March, then cumulative radiation calculations should be made starting March 21, about half way between the day of the earthquake and the end of the month."

Internal radiation doses are measured with a device called a "whole body counter," which measures not only current exposure but sums up a person's total dose over time. As such, TEPCO's insistence on calculating total radiation doses starting from March 21 has resulted in significantly lower exposure figures than those the government is using.

"We tried to persuade TEPCO to use a rigorous calculation method but the company wouldn't give in. In fact we're still at odds over the issue," the labor ministry's standards bureau told the Mainichi.

However, TEPCO's exposure estimates are only "provisional," and the utility leaves precise calculations to a radiology research laboratory that uses the government's dosage calculation standard. According to the lab, the two workers revealed on May 30 were exposed to 540-590 millisieverts of radiation internally, and 643-678 millisieverts in total.

TEPCO accepted the lab's conclusion, and submitted a revised report of worker radiation exposure totals on June 13. In that report, six more workers were revealed to have exceeded the emergency maximum exposure limit.

However, while the utility may have accepted the lab's, and thereby the government's, dosage standards, Hosokawa's 100 millisievert internal exposure limit has little scientific foundation and was a purely political decision.

Just after the revelation of the first two cases of workers exposed to radiation doses higher than the emergency limit, the labor ministry directed TEPCO to take internal radiation exposure measurements of the some 130 workers doing similar jobs. The results, reported on June 3, showed none of the 130 tested had exceeded the emergency upper limit, but there were three people who almost certainly had internal doses over 100 millisieverts. The ministry directed TEPCO to pull the three from the Fukushima plant.

The ministry furthermore stated that TEPCO's revised radiation dose calculations from June 13 "closely reflected actual conditions." In addition to the six workers who exceeded the maximum allowable exposure level revealed by the new figures, six more workers were shown to have doses over 200 millisieverts. Just to be on the safe side, labor ministry administrators also directed these six to be withdrawn from operations at the plant.

However Hosokawa, apparently fixated on his first June 3 directive ordering workers with internal doses exceeding 100 millisieverts be pulled from plant work, changed the administrative decision on the six workers. The change could be seen as a sign of worry that Hosokawa was pulling back set maximum dosage standards. However, a senior labor standards bureau official told the Mainichi it was "a political decision, based at least in part on TEPCO's tendency to be slow to take action."

Meanwhile, an attorney for former nuclear plant workers suing TEPCO has called Hosokawa's 100 millisievert internal radiation exposure limit "too high."

"That there hasn't been an internal radiation exposure limit before is also a major problem," said attorney Atsushi Suzuki, adding, "There are cases of multiple myeloma (a cancer of plasma cells, a type of white blood cell) from exposure to 70 millisieverts of annual external radiation, and cases of

leukemia caused by just 5 millisieverts. The internal radiation doses Fukushima plant workers have been exposed to just leave me at a loss for words.”

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<http://mdn.mainichi.jp/mdnnews/news/20110615p2a00m0na014000c.html>

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## **Poor decisions leave TEPCO workers vulnerable to radiation**

Six more employees of Tokyo Electric Power Co. working at the Fukushima No. 1 nuclear power plant were exposed to more radiation than allowed even under the relaxed limits put in place to deal with the critical accident.

In addition, 102 workers have been exposed to more radiation than allowed for nuclear power plant workers. Such workers are subsequently prohibited from working at nuclear power plants for up to five years under normal circumstances.

If more workers are discovered to have exceeded radiation exposure levels, TEPCO may face a serious shortage of workers even while the situation at the Fukushima plant is far from under control.

The government raised the upper limit for workers dealing with the Fukushima accident to 250 millisieverts. However, TEPCO announced June 13 that six additional employees had been exposed to more than that level of radiation. The company had previously announced that two employees had been exposed to more than 250 millisieverts.

What makes the situation serious for those six is that all have been exposed to more than 250 millisieverts through internal contamination by which they have inhaled the radiation.

The normal upper limit for workers at nuclear power plants is 100 millisieverts. TEPCO announced that a total of 102 employees had been exposed to more than that level.

TEPCO submitted a report to the Ministry of Health, Labor and Welfare on June 13 of a study into the 3,726 workers at the Fukushima No. 1 plant who worked between March 11, when the Great East Japan Earthquake struck, until March 31.

Of those workers, radiation exposure levels for 2,367 workers who were tested were reported to the labor ministry. The results of the study for the remaining workers will be submitted by June 20.

The eight workers found to have been exposed to more than 250 millisieverts were all male TEPCO employees.

The six employees who were added to the list in the latest report worked to restore equipment at the Fukushima plant as well as measure radiation levels.

The worker found to have the highest radiation exposure level was found to have been exposed to 497.6 millisieverts.

The labor ministry instructed TEPCO to remove a total of 12 workers exposed to more than 200

millisieverts from all emergency work at the Fukushima plant.

Of workers who were not exposed to more than 250 millisieverts, 23 were exposed to more than 100 millisieverts through internal contamination alone. A total of 94 workers were exposed to more than 100 millisieverts when internal and external contamination levels were combined.

Including the workers covered in the latest study, a total of about 7,800 individuals have been working at the Fukushima No. 1 plant through late May to restore operations.

The labor ministry has asked TEPCO to submit a report on total radiation exposure levels, including internal contamination, for all those workers by the end of June.

However, a problem for TEPCO is that the March 11 quake and tsunami devastated the systems to measure external and internal contamination levels.

Dosimeters at the Fukushima plant were damaged by the disasters so TEPCO had to borrow dosimeters from other nuclear plants. While that was completed in April, the company still has not installed enough equipment to test for internal contamination.

The local labor bureau has instructed TEPCO to improve its practices, and the Nuclear and Industrial Safety Agency has also issued a warning.

TEPCO officials and workers admit that internal contamination may have spread because all workers were not given clear instructions to wear face masks when working at the plant.

Another problem is that the emergency work station on the grounds of the Fukushima plant was damaged by hydrogen explosions at two reactors. That created cracks that allowed radioactive materials to leak into the work station, even though it is designed to prevent such leakage.

Because workers believed that radiation would not leak into the work station, they removed face masks when in the station, leading to the internal contamination.

Moreover, the whole body counters at the Fukushima plant used to measure internal contamination were exposed to radiation during the nuclear accident so there was no way of differentiating if measurements reflected contamination of workers or contamination of the equipment.

Workers had to be measured for internal contamination using two whole body counters at a facility in Iwaki, Fukushima Prefecture, away from the nuclear plant.

Labor ministry officials are caught in a bind because even with the relaxed upper limit for radiation exposure at the Fukushima No. 1 plant there could emerge a situation in which TEPCO does not have enough workers.

The labor ministry may be asked to further relax the radiation exposure levels if the work at the Fukushima plant becomes prolonged.

The labor ministry has also asked the Ministry of Economy, Trade and Industry, which oversees TEPCO, to compile a new structure to foster individuals capable of working at nuclear plants.

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<http://www.asahi.com/english/TKY201106140177.html>

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## **Tokyo ups radiation checks to 100 sites**

The Tokyo Metropolitan Government kicked off a weeklong program Wednesday to measure radiation levels in the air at 100 locations to address fears over the nuclear crisis at the Fukushima No. 1 power plant, instead of just relying on one central monitoring site since the emergency erupted in March.

Officials have designated one to three checkpoints per 4 sq. km across Tokyo, excluding mountainous areas. Two groups of metropolitan government employees will take measurements at six to seven locations a day during the week, with the results published almost every day on its website after each measurement.

At a park in Toshima Ward, the first location under the program, three employees measured 0.06 microsievert of radiation 1 meter above the ground and 0.07 microsievert at 5 cm above ground, against the legal limit of 1 millisievert per year for the general public.

**Kyodo**, June 16, 2011

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