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Japanese Nuclear Cleanup Workers Detail Lax Safety Practices at Plant

By PHRED DVORAK



Tepco

Using rest areas around the plant can require workers to discard their outerwear, then suit up again to leave.

OGAKI, Japan—When Masayuki Sakamoto stepped onto the grounds of the world's most dangerous nuclear power plant in March, he had little preparation other than a half-hour briefing on protective gear.

The 56-year-old owner of a 30-person construction firm from central Japan had been hired to clear debris and shovel

dirt at the Fukushima Daiichi plant at a time when its reactors were belching smoke and oozing gamma rays. He had never worn a hazmat suit or used a dosimeter. He still doesn't have the proper paperwork that, in normal times, would be needed to work in a radioactive environment.

Mr. Sakamoto's rare and detailed description of daily conditions at the plant reveals the extent of worker-safety concerns there. On Monday, plant operator Tokyo Electric Power Co., or Tepco, said six more workers—bringing the total to eight—have likely received larger doses of radiation than allowed, even under Japan's loosened exposure limits.

Mr. Sakamoto, a junior-high graduate, says he feels a "mission" to help tame the national crisis, but at the same time jokes that he's too dumb to be scared. "Smart people know about sieverts and becquerels, so they've really got this sense of self-



Reuters

preservation, fear, suspicion," he says. "When you think about it, it's a real plus to be uneducated and ignorant."

To clean up the plant, Tepco is leaning heavily on people like Mr. Sakamoto: an underclass of subcontractors and laborers who often have little education, training or understanding of the hazards they face.

The issues he described were compounded by the chaos inside the plant during the first few months of the crisis. After the quake and tsunami, normal systems for monitoring radiation and overseeing workers broke down, and Tepco was slow in implementing alternatives, interviews with Mr. Sakamoto and half-dozen other workers indicate.

Tepco acknowledges the issue. "Our top priority was cooling the reactors, so people might say that our response is slow," said

Tepco spokesman Takeo Iwamoto, discussing radiation management. "We are working on it as quickly as possible."

Some workers weren't properly registered for working in radioactive environments, Tepco said in a May report. Many didn't get dosimeters to monitor radiation exposure when equipment was short in the early weeks.

A few workers employed by a major construction company, who asked not to be named, say they weren't told when they were recruited that they would be going to the plant, where radiation levels can still be many thousands of times higher than normal.

Spokesmen for Tepco said they believe workers are trained properly. They also said Tepco isn't responsible for the employees and subcontractors of other firms working inside Daiichi.

In a response to Tepco's May report, the Nuclear and Industrial Safety Agency, Japan's nuclear regulator, said Tepco had violated laws by failing to register five female workers properly and failing to require workers in a contaminated building wear masks—violations that rated a warning. Japan has a hodgepodge of laws governing radiation exposure and worker safety, with few provisions for punishment of violations.

NISA also took Tepco to task for its dosimeter shortage and other lesser worker-safety issues. NISA said some of the stopgap measures Tepco had taken to train workers and track their exposure were appropriate, given the emergency. But it ordered Tepco to get proper radiation-management and worker-safety controls back on track as soon as possible.

A Tepco probe a month or so ago into puzzlingly high levels of radiation exposure recorded by people in Daiichi's command center revealed that the center was likely contaminated, and potentially thousands of workers ingested radioactive particles.

Tepco says it has tested more than 2,300 workers for exposure to inhaled radioactive particles and has found elevated levels in hundreds of people. On June 7, Japan's labor ministry said it was sending investigators into the plant to look into worker-safety measures itself.

"I was extremely surprised and I want to express my deep regret" at hearing about the high exposures, health minister Ritsuo Hosokawa told reporters on May 31. His ministry reprimanded Tepco and affiliate Kandenko Co. for safety violations and ordered Tepco this month to finish checks on internal exposure for people who have worked at Fukushima Daiichi since the accident.

250,000 MICROSIEVERTS

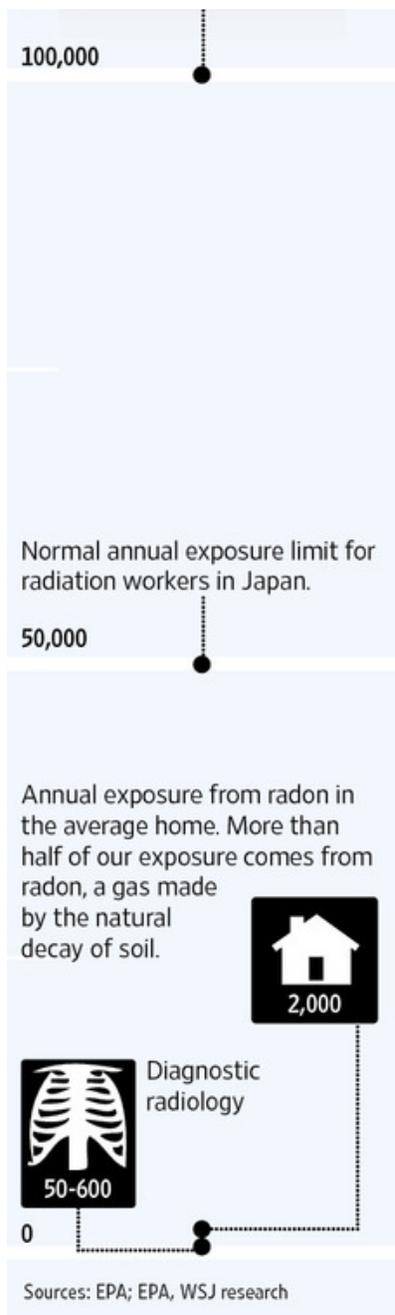


The new limit for Japanese workers dealing with a nuclear crisis like Fukushima Daiichi.

Exposed

Workers at the Fukushima Daiichi plant are being exposed to far more radiation than is normal even in the nuclear industry. Plant operator Tepco says two workers may have logged exposure of 650,000 microsieveverts.

Above this level, the chances of getting cancer rise slightly. Normally, exposure for Japanese radiation workers can't go above this level during a five-year period.



The health ministry estimates 7,800 people have worked there. Tepco is first testing 3,726 who worked at the plant at the height of the crisis in March.

A Tepco spokesman said the company is introducing vests packed with cooling gels and others made of tungsten to help with problems of heat and radiation. It is building more shelters where workers can rest, and making sure there are doctors present at all hours.

Meanwhile, Mr. Sakamoto is dealing with a problem from a management lapse of his own: In March, he gave a hiring center the wrong location for a truck-driving job. The driver later complained that he was improperly sent to Daiichi, a violation of a Japanese law requiring employers to give accurate job descriptions.

"I thought I was handling everything normally," Mr. Sakamoto says. "When I think about the mistake I made, I realize I must not have been in a normal state of mind."

Mr. Sakamoto, a talkative man with close-cropped hair, runs his company, Hokuriku Koki, out of a cramped house in the city of Ogaki. Normally, Mr. Sakamoto and his employees lay drains for highways and dams. Soon after the March 11 quake, he began receiving calls asking if his company could help with recovery work.

On March 15, explosions rocked two reactors at Fukushima Daiichi. The next day, Mr. Sakamoto and his initial team of 10 workers headed to J-Village, a soccer complex 16 miles south of the plant used as a staging area. There they got a medical exam and a 30-minute training session from Tepco on radiation and protective gear.

Mr. Sakamoto claims he forgot most of what he was told that day. But one lesson stuck in his mind: Be careful when turning over rocks, because radioactive material can be hidden there.

"It's like when you turn over rocks at the ocean, there may be crabs underneath," says Mr. Sakamoto. "They could be little crayfish or big king crabs. When you get hit by radiation, you

hope it's a crayfish but sometimes a big king crab crawls out."

Mr. Sakamoto's days started at 6:30 a.m. when the men would suit up: undergarments, hooded Tyvek suits, three layers of gloves and covers for their shoes. They would tape at sleeves and pants cuffs to seal gaps. They put on masks, helping each other tape shut the space between mask and hood.

Next it was off to the command center, the only place in the compound with power and walls thick enough to screen radiation. They would take off and shred their outer gear, measure their radiation exposure, get their orders for the day, then suit up to go out again. Mr. Sakamoto would repeat the procedure at least three times a day—for any meals, breaks or bathroom stops.

Mr. Sakamoto found the complete separation from the outside jarring. "When you wear gloves, then rubber gloves, then leather gloves, and you wrap tape around the sleeves, you cut yourself off from the world, you shut yourself up in a pack," he says. "That's what people do who go off on a space ship to the moon."

In the field, the crew would keep track of their accumulated exposure with cellphone-size radiation dosimeters carried in a breast pocket. Dosimeters sound an alarm if radiation levels jump.

The problem was, there weren't enough dosimeters for everyone. Mr. Sakamoto says in his typical team of four, only one person carried one. Veteran plant workers, however, knew that each worker was supposed to have his own. They complained, leading NISA to reprimand Tepco and demand it procure more.

There were scares. Around March 20 Mr. Sakamoto recalls seeing black smoke rise from the building housing Reactor No. 3 and hearing someone yell, "Mr. Sakamoto, run!"

Mr. Sakamoto jumped out of the vehicle he was driving—and right into a puddle. This can be extremely dangerous if the water is radioactive. Luckily, tests found him negative for elevated radiation. Soon after, however, two workers from Kandenko, the Tepco affiliate, weren't so lucky: They suffered exposure of more than 100,000 microsieverts (more than what Japan's nuclear workers are normally allowed in five years) after wading in radioactive water.

As time went on and dangers seemed to recede, Mr. Sakamoto says he and others at the plant cut some corners. Some of his employees didn't don waterproof ponchos when it rained, allowing their suits to get wet with contaminated rainwater. Mr. Sakamoto says he scolded them.

And, for a time, radiation readings in places they worked fell to near-normal levels, Mr. Sakamoto says. So he and others stopped taping their masks to their hoods. Privately, he says, he questioned whether some precautions were truly necessary. "Sometimes we wondered what it was all about."

Mr. Sakamoto stopped working in the plant on April 23, though he says he would go back. His small firm still has about a dozen workers in the plant. He recalls his cumulative exposure for five weeks at Daiichi being just over 25,000 microsieverts—a bit more than half the maximum a worker at a nuclear plant in Japan would be allowed in a normal year.

In early June, Mr. Sakamoto went to Fukushima again to meet with the construction firms that hired Hokuriku Koki to discuss current issues. Worker health was a big topic, Mr. Sakamoto says.

They also talked about pay. For the first few months, Mr. Sakamoto's employees had received 2.5 times their normal pay of between 20,000-to-25,000 yen per day, or about \$250-\$310 per day. Now, Mr. Sakamoto says he was told, Tepco had declared the emergency inside the plant over. The new rate for the nuclear cleanup: just 50% more than usual.

—Daisuke Wakabayashi contributed to this article.

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