

Japan's Leaked Radiation May Soon Become Harmless

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Scientists examining the types of radioactive substances that have spewed from Japan's Fukushima Dai-ichi nuclear power plant conclude that it's overwhelmingly material that will turn harmless in the next few months.

Along with officials in Japan, independent experts in the United States and Europe are investigating the source and nature of the radiation released. But it looks like most of the material likely came from the reactors themselves, not from the pools of used fuel that have caused such concern.

Measurements of radioactivity in the region show three spikes — major releases — from the plant on Tuesday and Wednesday of last week. Now scientists are looking at what specific radioactive substances were released. It turns out most of it is an isotope called iodine-131.



Early Radiation Data From Near Plant Ease Health Fears

Readings from within a 37-mile radius of Japanese plant don't reveal any immediate health threat.

Per Peterson, chairman of the nuclear engineering department at the University of California, Berkeley, says this tells him a lot about the nature of the accident that led to those releases.

"Because there's iodine, this certainly was material that had come out of the reactors, not the spent fuel pools, because in those cases the iodine-131 is pretty much completely gone," he says.

Iodine-131 decays quickly — it has a half-life of just eight days. That means that over the course of two or three months, virtually all of it will be gone. Because the used fuel has been sitting in its pools for months or even years, it clearly can't be the source of this material. That's reassuring news for engineers concerned about the condition of those pools.

Peterson says closer study of the isotopes will also help engineers figure out exactly what went wrong inside the reactors — for example, the temperature there at the time of the releases.

"Of course we can't go in and look at it inside the reactors, and so we need to gather as much evidence as possible because this will aid in the subsequent cleanup effort as we move into that phase of this accident," he says.

It's also good news for people who live within a hundred miles of the plant. They have been exposed to higher doses of radiation since the accident. The amounts vary a lot depending on

location, but Gerhard Proehl at the International Atomic Energy Agency says a wide area is now experiencing radiation that is many times higher than natural background levels.

"You may worry about that, and these levels are really high. However, they will not remain such high," Proehl says.

That's because most of the radiation is coming from iodine-131, he says, which will be gone in a matter of months. In fact, radiation readings in the area are already declining noticeably and — barring more releases — for most of the region, it appears it won't be long before the levels are equivalent to those in Denver.

Denver has unusually high levels of background radiation because of natural uranium in the rocks around it, and because the thin atmosphere of Colorado's mile-high city lets in more radiation from space. Studies of Denver residents find no ill effects from those high background levels.

But when the iodine-131 is gone altogether, that's not the end of the story. The reactors also emitted another radioactive isotope — cesium-137. The amount of that material, even right at the nuclear plant, is low enough that it's below safety standards for the workers there. But cesium-137 has a half-life of 30 years, so it will remain radioactive for a long time to come.

Berkeley's Peterson says fortunately that's contributing just a small fraction of the radioactivity in the region.

"We still need to see how things might change going forward, but as long as things continue on the current trajectory, we should see these radiation levels dropping off steadily over time because they're still being dominated by the shorter-lived radioactive species," he says.

Iodine-131 does pose a health hazard for the short term because it concentrates in the thyroid gland and increases the risk of thyroid cancer. However, that cancer can be prevented through the use of potassium iodide — which Japanese health authorities have been distributing to people who live near the plant.