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Q&A

Long-life cesium top threat to seafood

By JUN HONGO

Staff writer

The damaged Fukushima No. 1 nuclear power plant is contaminating seawater with heavy amounts of iodine-131 and other radioactive materials.

Here are questions and answers regarding the latest threat from the ongoing radiation leaks.

Where is the leak into the ocean coming from?

Tokyo Electric Power Co. said it hasn't tracked down how radioactive materials leaked into the sea. Tepco officials speculated Saturday that it was somehow flowing directly from the plant, because no radioactivity spikes were observed on site. There was also no rain that could have caused atmospheric concentrations of iodine and other radioactive substances to fall to the sea.

Are the leaks substantial?

The Nuclear and Industrial Safety Agency said Monday it detected radioactive iodine-131 about 30 meters from reactors No. 5 and 6, or about 1,150 times the government safety limit. This followed revelations Sunday that iodine-131 measured about 300 meters away from reactor No. 1 hit 1,850 times the limit, suggesting the leak is spreading.

How long will the leaks continue to effect the environment?

That depends on the half-life of the materials, which is the time it takes the radioactivity of a specific substance to decrease by half. Iodine-131's half-life is about eight days but the half-life of cesium-137 is about 30 years.

The massive iodine-131 leak will not only be diluted by the sea, but also by the time it takes to reach fish and other marine products, pundits say. This is because both materials are water-soluble.

But this all depends on how fast Tepco can determine the cause of the leak and stop the radioactive water from discharging. So far the utility appear to be clueless.

Is the level of the leaks safe?

NISA said people within 20 km of the nuclear plant have already evacuated, hence the seawater contamination does not pose any immediate threat to their health. Nuclear Safety Commission of Japan Chairman Haruki Madarame also said Saturday that radioactive particles "are diluted and spread out" in seawater, adding there is no harm in eating fish from the coast because the levels of contamination would be negligible.

So far the agencies' claims appear to be true.

According to a survey conducted 30 km off the Fukushima plant by the Education, Culture, Sports, Science and Technology Ministry, the level of iodine-131 has seen a substantial drop.

Where is the radioactive water likely to flow?

The Okhotsk current and Kuroshio current meet off the Pacific coast. Seawater off Fukushima Prefecture is pushed southbound by the Okhotsk current toward Chiba Prefecture. There it will meet the northward Kuroshio (Black) current, and the two will push whatever radioactive water they contain away from Honshu into the Pacific.

Which marine products are vulnerable?

A survey by Tokyo-based Marine Ecology Research Institute shows that cesium-137 tends to accumulate in larger fish near the top of the food chain.

While the radioactivity of iodine-131 will be halved every 8 days, that will not be the case for cesium-137 — which is raising concerns.

Have there been any signs of fish contamination similar to that of the vegetables around the area?

At this point, no. For example, Chiba Prefecture on Friday studied anchovies, mackerel, spear squid and flounder caught off its shores. None was found to have contamination over state standards.

Is the situation under control?

As of now it appears things are not out of hand, but circumstances may change considering the tons of water that have been sprayed on the reactors to cool them down, as well as the leaks that may be coming from the reactor cores, or the spent-fuel pools above them, and the dangerous radioactive materials involved.

“The radioactive particles will be diluted, and iodine-131 has a half-life of 8 days,” Kanazawa University professor Seiya Nagao told The Japan Times, hinting it is not a major concern.

But the expert on environmental monitoring and radionuclides warned that cesium has a much longer half-life and often accumulates in fish meat. While iodine-131 concentrates in the thyroid gland and increases the risk of thyroid cancer, cesium-137, once ingested, is accumulated by muscle tissues in the human body.

Experts say this may increase the risk of cancer.

“Its hard to tell if everything is under control at this point.”

Reference URL: <http://search.japantimes.co.jp/cgi-bin/nn20110329f1.html%20=EF=BB=BF>