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## Hong Kong Radiation Exceeds Tokyo Even After Nuclear Crisis

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By Stuart Biggs and Yuriy Humber

(Updates with radiation in Brazil nuts in 11th paragraph. See EXT2 <GO> for a special report on Japan's nuclear crisis.)

April 1 (Bloomberg) -- Typical amounts of radiation in Hong Kong exceed those in Tokyo even as workers struggle to contain a crippled nuclear plant in northern Japan, indicating concerns about spreading contamination may be overblown.

The radiation level in central Tokyo reached a high of 0.109 microsieverts per hour in Shinjuku Ward yesterday, data from the Tokyo Metropolitan Institute of Public Health show. That compares with 0.14 microsieverts in the Kowloon district of Hong Kong, the Hong Kong Observatory said on its website. A person is exposed to 50 microsieverts from a typical x-ray.

Many countries have naturally occurring radiation levels that exceed Tokyo's, said Bob Bury, former clinical lead for the U.K.'s Royal College of Radiologists. A 30-fold surge in such contamination in Tokyo prompted thousands of expatriates to leave Japan after the March 11 tsunami knocked out power at Tokyo Electric Power Co.'s Fukushima Dai-ichi nuclear plant, triggering the crisis. Radiation in Tokyo is barely above levels in London and New York even now, analysts said.

"The situation in Japan looks set to follow the pattern of Chernobyl, where fear of radiation did far more damage than the radiation itself," Bury said in an e-mail referring to the 1986 accident in the former Soviet Union, the world's worst nuclear disaster. "Whatever the radiation in Tokyo at the moment, you can be fairly sure it is lower than natural background levels in many parts of the world."

### Exceeds New York

Tokyo's radiation level is only slightly higher than New York, where an average of 0.095 microsieverts an hour was recorded in the seven days to yesterday, according to a real-time Geiger counter reading set up as part of the Background Radiation Survey, a project where owners of the equipment feed their readings into a central database. The level in Tokyo the day before the accident averaged 0.0338 microsieverts an hour.

Radiation levels in Hiroshima prefecture, where the U.S. dropped an atomic bomb in 1945 killing an estimated 140,000 people, averaged 0.051 microsieverts an hour yesterday, according to data from Japan's Ministry of Education, Culture, Sports, Science and Technology.

In Singapore, the radiation level was 0.09 microsieverts an hour at 4 p.m. local time yesterday, according to the city state's National Environment Agency. Radiation levels in London yesterday were about 0.08 microsieverts an hour, according to figures from RIMNET, the U.K. national radiation monitoring network and emergency response system.

### Underground Uranium

The U.K. Health Protection Agency estimates the typical Briton receives about 2,200 microsieverts of radiation per year from background radiation, or about 0.251 microsieverts per hour -- more than double the levels registered in Tokyo.

"Half of the average annual radiation to people in the U.K. comes from radon -- an invisible, colorless, radioactive gas present in all soils," John Harrison, deputy director of the agency's radiation center, said in an e-mail. "It's a byproduct of the decay of uranium which is found in all soils around the world, and the amount that seeps out is dependent on the local geology."

Cornwall, a popular tourist destination in southwest England, has four times the level of radon as other parts of the country, he said.

### Natural Radiation

Natural radiation makes up about 85 percent of the global total, according to the World Nuclear Association. Manmade contributors include medicine and buildings, as well as the nuclear industry, which accounts for 1 percent of the total, the association says. Foodstuffs also contain radiation, and a 135-gram (4.8-ounce) bag of Brazil nuts has a dose of about 10 microsieverts, according to the U.K. agency.

Other activities that enhance naturally occurring radiation levels include mining, milling and processing of uranium ores and mineral sands, manufacturing and use of fertilizers and the burning of fossil fuels, according to a 2008 report by the International Atomic Energy Agency.

The highest level of background radiation is in the state of Kerala and city of Chennai in southern India, where people receive average doses above 30 millisieverts per year, or 3.42 microsieverts an hour, according to the World Nuclear Association. India has vast amounts of thorium in its soil. A millisievert is 1,000 microsieverts.

In Brazil and Sudan, exposure can reach 40 millisieverts a year or 4.57 microsieverts an hour, the Association says.

### Partial Meltdown

Tokyo Electric's nuclear plant entered a partial meltdown after a magnitude-9 earthquake, the largest recorded in Japan, triggered a tsunami over 15 meters that knocked out power, including the backup generators, at the facility 220 kilometers (135 miles) north of Tokyo. Radioactive material has leaked into the air and sea ever since as workers, firefighters and the military battle to restore power and cool the reactors.

The highest level of radiation recorded at the plant has so far been 1 sievert, or 1 million microsieverts, found in water that flooded a turbine hall. While direct exposure at that level can cause hemorrhaging, the level drops to about 1 microsievert an hour at a distance of one kilometer and to 0.01 microsieverts at 10 kilometers, according to Tetsuo Iguchi, a professor specializing in isotope analysis and radiation detection at Nagoya University in central Japan.

#### No Fishing

Radioactive iodine rose to 4,385 times the regulated safety limit earlier this week off the coast of Fukushima, Hidehiko Nishiyama, a spokesman for Japan's Nuclear and Industrial Safety Agency, told reporters in Tokyo yesterday. No fishing is occurring nearby and the sea is dispersing the iodine, he said.

A sample of Tokyo tap water, measured at the Kanamachi purification plant northeast of Tokyo, on March 22 found levels of radiation at 210 becquerels per liter, more than double Japan's recommended limit for infants. The level dropped to within safe levels the next day. The news triggered bulk buying of bottled water at supermarkets and convenience stores even as the government said the health risks are minimal.

Dismantling the plant and decontaminating the site may take 30 years and cost Tokyo Electric more than 1 trillion yen (\$12 billion), engineers and analysts said.

Japan's government has set up a mandatory evacuation zone extending 20 kilometers around the plant in Fukushima and advised residents within 30 kilometers to stay indoors. The U.S. government recommends its citizens to avoid going within 80 kilometers of the stricken facility.

#### 'Tokyo Is Safe'

Tokyo is safe for habitation and the French school in the Japanese city will re-open next week, French President Nicolas Sarkozy said in a speech at the French embassy in Tokyo yesterday. The crisis surrounding the crippled nuclear plant is "critical, unstable and durable," he said.

Foreign embassies in Japan have been overly cautious and alarmist in advising their nationals to leave, Shunichi Yamashita, professor at the Graduate School of Biomedical Sciences at Nagasaki University, southwestern Japan, said in a briefing last week in Tokyo.

"It's wrong to say that even a trace of exposure would be dangerous," said Yamashita, who studied the effect of radiation on children after Chernobyl and is an adviser on radiation levels to the local government of Fukushima. "A person who gets radioactive material on their skin can easily wash it off."

Asked if someone living 31 kilometers, or just outside the government's evacuation zone, from the Fukushima Dai-Ichi plant was as safe as someone in London, he said, "Yes, absolutely."

--With assistance from Alex Morales in London. Editors: Brian Fowler, Randall Hackley

To contact the reporters on this story: Stuart Biggs in Tokyo at [sbiggs3@bloomberg.net](mailto:sbiggs3@bloomberg.net); Yuriy Humber in Tokyo at [yhumber@bloomberg.net](mailto:yhumber@bloomberg.net)

To contact the editor responsible for this story: Reed Landberg at [landberg@bloomberg.net](mailto:landberg@bloomberg.net)



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