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FROM THE
DIRECTOR OF
THE JOY LUCK CLUB

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Japan Orders Nuclear Plant Operators to Obtain More Emergency Generators

By **ANDREW POLLACK** and **MATTHEW L. WALD**

TOKYO — Radiation readings spiked sharply in one reactor at the stricken Fukushima Daiichi nuclear plant after a powerful aftershock late Thursday, according to data released by the government, a development that might indicate new damage to the already compromised reactor.

But the plant owner, the Tokyo Electric Power Company, said the gauge used to measure radiation was most likely broken.

The high radiation was measured in the drywell of Reactor No. 1, directly below the reactor pressure vessel and part of the primary containment that is a crucial barrier preventing the escape of radioactive materials. The drywell reading raised the worrisome possibility that highly radioactive water had escaped, and perhaps even material from the nuclear core, although this was far less likely.

Experts said, however, that keeping water in the drywell could limit the damage from any leak.

On Tuesday the United States [Nuclear Regulatory Commission](#) set off alarms when it said that such a leak might have happened in the No. 2 reactor at the plant, based on a high radiation reading in its drywell. But the agency has since appeared to step back slightly from that theory, emphasizing that its judgment was based on speculation because no one can get close enough to the reactor to judge what is really happening.

And on Saturday, Eliot Brenner, a spokesman for the commission, agreed with the power company's assessment that the high reading in the No. 1 reactor was most likely in error because there had not been a sharp increase in pressure or temperature in the drywell.

The radiation readings, while still quite high, were down Friday from the highest level, which was recorded a half-hour after the 7.1- magnitude aftershock.

The Nuclear Regulatory Commission had expressed concern in a recent report that the damaged nuclear power plant could prove unusually vulnerable to aftershocks.

Peter Yanev, a longtime consultant specializing in the earthquake resistance of nuclear power plants, said that the aftershock late Thursday had not been strong enough to cause new damage to previously undamaged equipment. But the Japanese authorities have not released detailed information on the extent of damage from the initial earthquake nearly a month ago, he cautioned. "If you have something severely damaged, teetering, it can fall over" in a later shock, Mr. Yanev said.

The Japanese government, meanwhile, ordered reactor operators on Saturday to bring in additional emergency diesel generators, as the aftershock again demonstrated the potential for such events to shut down portions of the power grid.

The new government order came after problems were reported at two other nuclear power plants, both run by the Tohoku Electric Power Company. The plants suffered temporary losses of cooling to spent fuel pools, electricity cutoffs and problems with backup diesel generators after Thursday's aftershock.

The Higashidori plant lost all outside power. Although it had three backup diesel generators, two were out of service for periodic maintenance. The remaining one worked for a while, but later, after some outside power was restored, it stopped because some of its oil spilled out.

At the Onagawa plant, three out of four outside power lines went down, but the plant continued to operate on the fourth line. Although diesel backup was not needed, it was discovered that one of the plant's two diesel generators had been out of order since April 1.

"There was no problem this time," said Hidehiko Nishiyama, deputy director general of the Nuclear and Industrial Safety Agency, which regulates the atomic energy industry, at a news conference. However, he said, nuclear plant operators will now be required to have more backup diesel generators available and working.

Mr. Nishiyama said his agency was also trying to find the causes for the loss of cooling to spent fuel pools. The cause of one stoppage seemed to be essentially a blown fuse, Mr. Nishiyama said.

Loss of cooling can allow spent fuel to heat up, which can lead to the release of radioactive materials.

The government also moved to ban the planting of rice in soil containing too much radioactive material, which has been released from the Fukushima Daiichi plant in the weeks

since a catastrophic earthquake and tsunami. Sales of some milk, vegetables and fish have been prohibited because of contamination, but the new measures affect the nation's staple crop, a foundation of its culture as well as its diet.

The new policy on rice will ban planting of the crop in soil that has more than 5,000 becquerels of cesium-137 per kilogram of soil.

So far, radiation testers have found only two spots in northeastern Japan, both in the town of Iitate, 25 miles from the Fukushima Daiichi plant, that has had cesium levels that high. Cesium-137 can damage cells and lead to an increased risk of cancer.

The national and prefectural governments are now hurriedly performing broader soil surveys to identify which areas would be off limits to planting.

With planting about to begin, "we don't have so much time," said Sumito Yasuoka, an official in the Ministry of Agriculture, Forestry and Fisheries, who said farmers pressed the government to let them know if they could plant their crop. The government also wants to assure consumers that the rice they eat will be safe.

The level of 5,000 becquerels per kilogram was chosen because rice grown in such soil would be expected to end up with about 500 becquerels of cesium 137 in the rice. That is the existing limit for vegetables and some other foods, Mr. Yasuoka said.

Fukushima Prefecture is the nation's fourth-largest rice producer, and rice is its biggest crop, so any ban on planting would cause financial hardship.

"It hurts terribly," said Yoshinori Sato, an official of an agricultural cooperative in Fukushima Prefecture with 13,000 households as members. Mr. Sato said that about half the rice acres his co-op's members hoped to plant this year might be off limits, either because of radiation or because of tsunami damage.

Mindful of the sensitivities, Michihiko Kano, the minister of agriculture, visited Iitate on Saturday and promised that farmers who were not allowed to grow rice because of soil contamination would be compensated.

Andrew Pollack reported from Tokyo and Matthew L. Wald from Washington. William J. Broad contributed reporting from New York and Yasuko Kamiizumi, Ken Ijichi and Kantaro Suzuki from Tokyo.

