Japanese nuclear crisis escalates as emergency workers withdrawn

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Several nuclear reactors in Japan's stricken Fukushima nuclear facility remain at risk of total meltdown, following a series of explosions and fires. On Wednesday afternoon, the Japanese government suspended operations at the facility due to a surge in radiation. This temporarily halted the desperate attempts of workers to contain the disaster.

Japanese government spokesman Yukio Edano told a press conference today that radiation levels had spiked to 1,000 millisieverts—1,000 times the level to which people can safely be exposed in one year—but had decreased to 600-800. The number three reactor container at the facility is feared damaged and may be leaking significant quantities of radioactive steam. "So the workers cannot carry out even minimal work at the plant now," Edano said. "Because of the radiation risk, we are on standby."

Nuclear engineer Arnie Gundersen told the *Washington Post* that the stand-down of emergency workers "is a sign to me that they have given up trying to prevent a disaster and gone into the mode of trying to clean up afterward".

Enormous uncertainty has surrounded both the actual amount of radiation leaked so far and the likelihood of a catastrophic meltdown. The response of the nuclear facility's operator, TEPCO (Tokyo Electric Power Company), has all the hallmarks of a cover-up, consistent with the company's appalling safety record, and contradictory statements are being advanced by Japanese and international nuclear experts.

At the same time, Japanese emergency personnel are struggling to deal with the destruction caused by last Friday's 9.0 magnitude earthquake and subsequent tsunami. More than 10,000 people are confirmed dead or missing by Japan's police force, and the final toll is certain to be higher, with nearly 10,000 residents still unaccounted for in Minamisanriku, one of several north-east coastal towns obliterated by the tsunami.

Rescue teams are only just beginning to enter some of the worst affected areas, with a small number of people found who managed to survive while being trapped under rubble for more than four days.

About 400,000 people have been evacuated. Together with a reported 850,000 households in the north, many of the evacuees are facing near-freezing temperatures at night without electricity. Japan's NHK public broadcaster has reported that emergency shelters are running out of food and fuel, "leaving weakened survivors cold and hungry".

Many of the evacuees are residents near the Fukushima Daiichi nuclear plant. Prime Minister Naoto Kan has told people within a 20-kilometre exclusion zone to leave immediately. Another 140,000 residents within 30 kilometres of the facility have been advised to stay indoors, turn off their air-conditioning units, and leave any washing on clotheslines outside to avoid contact with radioactive contaminants.

There are six reactors in the Fukushima Daiichi facility. Their power supplies were knocked out when the tsunami breached nearby seawalls and flooded backup generators that were supposed to ensure the maintenance of the reactors' cooling facilities. Authorities have pumped in sea water in a desperate emergency measure, but the ensuing reaction has seen a build up of hydrogen gas that has triggered multiple explosions. The building encasing reactors number one and three exploded on Saturday and Monday, with the number three incident injuring 11 plant workers and Japanese soldiers assisting the emergency response.

More blasts struck reactors two and four yesterday. At reactor two, attempts to pump more sea water into the reactor failed on Monday, after vents releasing the radioactive hydrogen gases stopped working. This exposed the reactor core's fuel rods, increasing the chances of overheating and meltdown. Another fire blazed at reactor four this morning, reportedly after yesterday's explosion was not completely extinguished, but is now supposedly under control. Temperatures are reportedly rising in the water pools storing spent fuel rods in reactors five and six.

Before their withdrawal earlier today, about 50 power plant workers courageously risked their lives to try to bring the situation under control.

The French nuclear safety authority has declared the disaster to be at level six on the seven-point International Nuclear Event Scale—just below the classification issued for the 1986 Chernobyl catastrophe. According to a Reuters report, the French government has instructed its citizens in Tokyo to leave Japan or head to the south of the country, and has asked Air France to provide planes for the evacuation.

Radiation levels in parts of the capital, Tokyo, were about 20 times higher than normal, though still described as very low by experts. These measurements were taken before today's radiation spike at the plant however. A US navy carrier strike group led by the aircraft carrier USS Ronald Reagan had to make a detour after radiation was detected downwind of the nuclear plant.

Prime Minister Kan is now heading an emergency response command, comprised of government officials and senior TEPCO

executives. The Japanese media reported that after the explosion at reactor two, TEPCO did not inform the government for more than an hour. The government's chief spokesman, Yukio Edano, added that the information that was finally divulged "was not correct". Kan reportedly chastised TEPCO executives, asking "what the hell is going on?" and warned, "that'll be the end of TEPCO, period," if the executives withdrew all their personnel from the facility.

That the Japanese government was provided with incorrect information by the private operator of the nuclear plant underscores the fact that none of the official assurances that the situation is under control can be believed.

Fukushima prefecture governor Yuhei Sato has reportedly told the prime minister that "residents are angry and about to reach breaking point". The Associated Press spoke with people in the coastal town of Soma, about 50 kilometres away from the nuclear facility. "I don't think they are telling us the truth," 63-year-old Toshiaki Kiuchi said. "Maybe even they don't know." Shinako Tachiya added: "We are really afraid, as if we didn't already have enough to worry about. You can't see fallout so we are totally relying on them for our lives. I used to believe the nuclear power officials, but not now. I think they are not being open with us. They aren't telling us anything."

TEPCO and other nuclear power companies, in league with Japanese government authorities, have a long record of trying to cover up nuclear accidents. In 1995, the Japan Atomic Energy Agency concealed the impact of an accident at its Monju fast-breeder reactor. In 1999, three workers at the Tokaimura reactor suffered high doses of radiation after safety measures were breached. Three years later, TEPCO personnel were found to have falsified safety data on 200 occasions. And in 2007, after a 6.6 magnitude earthquake, the company admitted that another of its plants had not been designed to withstand such an event.

The *New York Times* cited an unnamed senior nuclear industry executive as saying the Japanese power industry managers are now "basically in a full-scale panic ... they're in total disarray, they don't know what to do".

Successive Japanese governments bear responsibility for allowing the privately-owned nuclear corporations free reign. A leaked US diplomatic cable, published via WikiLeaks in the *Guardian*, revealed that prominent Liberal Democratic Party parliamentarian Taro Kono told American officials in 2008 that the Japanese government department responsible for the nuclear sector had been "covering up nuclear accidents and obscuring the true costs and problems associated with the nuclear industry".

Information is emerging about the impact of TEPCO's drive to extract maximum profits from the Fukushima facility, at the expense of public safety.

All the affected reactors have an allegedly substandard, but considerably cheaper, type of primary containment vessel—the steel and concrete outer reactor shell that is supposed to prevent radiation from spewing into the atmosphere in the event that cooling systems fail. The *New York Times* has noted that the "Mark 1" containment vessels, designed in the 1960s by General Electric (GE), were condemned by nuclear safety experts from the early 1970s. Despite this, it appears that nothing was done—the Mark 1 vessels are still used in 23 American reactors as well as in Japan.

In 1972, a safety official with the US Atomic Energy Commission, Stephen Hanauer, advised that the GE vessels, marketed by the company as a cheaper alternative to other models, ought to be discontinued due to "unacceptable safety risks". In 1975, three GE engineers—Dale Bridenbaugh, Gregory Minor, and Richard Hubbard—resigned in protest after concluding that the Mark 1 vessel they were reviewing was so dangerous that it would cause a devastating accident.

In the mid-1980s, Harold Denton, an official with the US Nuclear Regulatory Commission, concluded that Mark 1 reactors had an extraordinary 90 percent probability of breaching if fuel rods overheated and melted. The *Times* added: "A follow-up report from a study group convened by the commission concluded that 'Mark 1 failure within the first few hours following core melt would appear rather likely'. In an extreme accident, that analysis held, the containment could fail in as little as 40 minutes."

Questions have also been raised about the Fukushima facility's storage of thousands of spent nuclear rods, which may pose an even greater danger than the reactor cores.

The spent fuel rods are stored in large pools of water above each reactor, without any protective casing vessel. At least two of these pools have lost their roofs due to the hydrogen explosions, and it is unclear whether all the rods remain covered in water. If they do not, they may overheat and combust within a fortnight, sending radiation high into the atmosphere that would then be widely spread. "It's worse than a meltdown," David Lochbaum, a nuclear engineer at the Union of Concerned Scientists who worked as an instructor on the kinds of GE reactors used in Japan, told the *New York Times*. "The reactor is inside thick walls, and the spent fuel of reactors 1 and 3 is out in the open."

Russian nuclear accident specialist Iouli Andreev, who was involved in the Chernobyl cleanup, told the *Guardian* that the storage of large numbers of spent fuel rods in large concentrations directly above the nuclear reactors, "looked like an example of putting profit before safety". He explained: "The Japanese were very greedy and they used every square inch of the space. But when you have a dense placing of spent fuel in the basin you have a high possibility of fire if the water is removed from the basin."