

# No end in sight for Japan nuclear crisis

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The Fukushima nuclear crisis has already run for three weeks with no end in sight. Nuclear experts warn that it may go on for years. Hironobu Unesaki, a nuclear engineering professor at Kyoto University said that the process of decommissioning Fukushima would take longer than at Three Mile Island.

Engineers are encountering entirely new problems. Some experts are suggesting it may take 30 years to make Fukushima safe.

“This is uncharted territory, a lot of new technology will be developed to deal with these reactors. The closest to this we have is Three Mile Island, where there was a partial core meltdown—I think about 40 percent. The clean-up process lasted from 1979 to 1993, so almost 15 years, and cost \$1bn. That was \$1bn in 1993 money, so obviously a lot more now”, Malcolm Grimston, an energy specialist at the UK think-tank Chatham House, told Channel 4 News.

“Also now we have got four reactors damaged, not just a single one like at Three Mile Island, and the complicating factor of what state the spent fuel is in the ponds. At the moment there are huge imponderables, but whatever happens, the answer is long and expensive”.

Three weeks into the crisis there is no sign that the reactors have been brought under control. Contamination levels point to a situation that is worsening from day to day. Water gathering in underground tunnels below reactor 2 is now said to be more than 10,000 times more radioactive than normal levels. Water samples taken from near reactor 1 were also found to have elevated levels of radioactivity.

Radiation in seawater near the plant was found to be 4,385 times the legal limit on Wednesday. On Tuesday it was 3,355 times that level and last weekend it rose from 1,250 to 1,850 times the legal limit. This rapid rise is attributed to the tons of water that have dropped on to the plant from helicopters and pumped in with

hoses. The runoff cannot be contained.

“There’s definitely a conflict now between trying to keep the reactors cool and managing the contaminated waste water being generated by the operation”, said Ed Lyman of the Union of Concerned Scientists.

Airborne contamination is spreading. The International Atomic Energy Agency has advised Tokyo to increase the evacuation zone after harmful levels of radiation were detected at the village of Iitate 40 km (25 miles) away from the plant.

Village Mayor Norio Kanno said that he was “very worried” when he heard about the contamination. “But the government immediately informed us that there is no immediate harm to human health, so I was relieved”. Such assurances are of dubious value.

The official evacuation zone is a radius of only 20 km (12 miles). So far the government shows no sign of increasing the zone. The US has advised its citizens to stay 80 km (50 miles) away from the plant.

An estimated 1,000 bodies of people killed by the tsunami remain within the evacuation zone. They cannot be removed because of the radiation hazard and pose an increasing health hazard.

Heavy rainfall in the area is likely to increase the problems. It prevented a robot being used to spray resin that it is hoped will reduce the spread of radioactive material. The rain will increase the amount of runoff into the sea immediately. Many of the tunnels and channels are said to be within inches of overflowing already. A secondary effect will be to increase the amount of fallout from airborne radioactive material, with the result that animals grazing, vegetables and water supplies in the vicinity of the plant will be further contaminated.

Conditions for workers at the plant are increasingly dangerous. The media has little or no access to them. But it has emerged from emails that some of them are sleeping in the plant itself. In some cases they have lead

sheets to sleep on. But not all the workers have them. They are camping in conference rooms and offices. Their meals are limited to two a day and consist of instant rice and crackers.

In a sign that the international ramifications of the nuclear crisis are spreading, President Nicholas Sarkozy arrived in Tokyo where he met with Prime Minister Naoto Kan. Sarkozy expressed France's solidarity with the Japan and said that he would raise the question of the Fukushima nuclear crisis at the G8 summit.

Sarkozy's concern is somewhat less than altruistic however. France is unique in relying on nuclear power for 80 percent of its electricity. Prime Minister Francois Fillon has ordered a safety audit at all 58 of France's nuclear power stations. Those in heavily populated areas such Dunkerque will be subjected to special scrutiny.

André-Claude Lacoste, head of France's Nuclear Safety Authority, startled French parliamentarians when he admitted, "Nobody can guarantee that there will never be a nuclear accident in France".

Lacoste admitted at a parliamentary hearing that the French nuclear authorities had never taken possible natural disasters into account before in their safety planning. Yet there have been 1,700 noticeable earthquakes in France in the last 1,000 years.

Climate change would have to be factored into any risk assessments, Lacoste said, since it would increase the risk of flooding. "Seismic, tsunami or flooding hazards.... We must go back (to the power stations) given what's happened in Japan".

Only four French nuclear plants are on the coast—the rest draw their cooling water from rivers. Lacoste tried to reassure the French deputies that the Nuclear Safety Agency was planning for the risks that are now perceived.

"We could envisage setting up areas with emergency diesel supplies at all nuclear plants in France (or that) at plants along the coast, the diesel be stocked at the top of a cliff rather than at the bottom. That might appear extremely rudimentary but that's typically the kind of question that must be asked".

The nuclear industry in France is run by three largely state owned companies, Areva, GDF Suez and Électricité de France. The fact that these major companies have not already taken such basic measures

when emergency cooling has been identified as a significant problem at nuclear power stations for over 30 years is astonishing. It reflects the fact that they are major export earners for France.

France accounts for 16 percent of global production of nuclear power. The USA accounts for 30 percent of the nuclear-generated electricity worldwide and generates 20 percent of its electricity from this source. Britain gets 20 percent of its electricity from nuclear power stations. Germany relies on nuclear power for 25 percent of its electricity. Japan gets 30 percent of its electricity from 50 nuclear power stations.

Underlying this network of nuclear power generation is a massive financial structure. The Fukushima crisis poses significant financial risks. Bank of America Merrill Lynch expects Tokyo Electric Power Company share holders to be wiped out by the mounting costs of Fukushima. Currently, the total cost is estimated at \$133 billion (11 trillion yen). The figure is likely to rise as the scale of the disaster grows. Even this current figure, which is more than 4 times the company's equity, is pushing the company to the point of bankruptcy. Tepco shares have fallen more than 70 percent, and 58 percent of the company's value has been lost. The company was valued at 3.5 trillion yen before 11 March; its value is now 800 billion yen. Merrill assumes that the Japanese government will step in with a bailout for Tepco if bankruptcy is imminent.



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