

Shaken to the Core: Japan's Nuclear Program Battered by Niigata Quake

David McNeill

Shaken to the Core: Japan's Nuclear Program Battered by Niigata Quake

David McNeill

One of the lesser-known casualties of the deadly July 16 quake that struck Niigata Prefecture was a headstone that toppled in a village a few miles from the epicenter off Kashiwazaki. The grave bore the name of legendary former Prime Minister Tanaka Kakuei, Japan's postwar master of pork-barrel politics and the man who helped bring the Kashiwazaki-Kariwa Nuclear Power Plant to this deprived area on the Sea of Japan coast.



Tombstones toppled in Niigata by the July 16 quake

Tanaka's pitch was energy self-sufficiency in a country famously dependent on fuel imports, nearly all of it from the volatile Middle-East. But as its hosts now know, Tanaka's dream required building the planet's largest nuclear power complex directly over an active earthquake fault. Today, the plant squats on

the outskirts of this town of 93,000, a seven-reactor, 8200-megawatt monster, surrounded by cracked and buckled roads and local people who wonder anew if they are safe living in its shadow.



Comprehensive view of the Kashiwazaki-Kariwa Nuclear Power Plant

Inside, in the seconds after the 6.8 quake (now officially known as Chuetsu-oki) struck just twelve miles away, pipes burst, drums of nuclear waste toppled and monitors stopped working. A fire in an electrical transformer burned unattended for over two hours and 1,200 liters of contaminated water sloshed into the sea. Ten days later, Tokyo Electric Co. (Tepco), the utility giant that runs the plant, admitted that the damage "extended to the interior of the reactor building" and, at the end of July, that a small amount of radioactive water had also escaped from the No.1 reactor.



Kashiwazaki-Kariwa Nuclear Power Plant entrance days after the earthquake

When Tepco President Katsumata Tsunehisa, who heads Japan's largest electric power company and the largest privately owned electric utility in the world, surveyed the site in the aftermath of the quake, he reportedly called it "a mess."

But the full dimensions of the problem would continue to leak to the public over the coming weeks. Not until July 30 did Tepco acknowledge that the July 16 quake had caused the Power Plant to sway a maximum 2,058 gals. A gal is a unit of acceleration equal to 1 centimeter per 1 second squared.

It was, the utility reported, not only the strongest sway recorded at a nuclear power plant in Japan, but might be the most powerful at any nuclear plant in the world.

In at least one area of the Kashiwazaki-Kariwa plant, the shaking was 6.8 times larger than the maximum level taken into account when the plant was designed. Following the quake, Tepco had announced that the maximum shaking recorded at the plant was 680 gals on the lowest basement floor of the No. 1 reactor.



Tepco Shinsaiwaibashi Building

The problems at the complex quickly overtook media coverage of the wider and tragic destruction caused by the quake: eleven dead, over a thousand injured and an estimated 1.5 trillion yen in damage. At a time when some governments are rethinking a freeze on nuclear power as an alternative to carbon-based energy, Japan was something of an anomaly: an advanced country that had continued building plants despite the twin nuclear disasters of Three Mile Island (1979) and Chernobyl (1986). The country was now "paying a price" for that commitment, according to the LA Times, one of many foreign news outlets that felt compelled to comment on the disaster.

Such coverage elicited a testy press release from Japan's Foreign Office on July 27, which blamed foreign news organizations for "inappropriate or inaccurate" reports on the quake. Like Tepco, the Foreign Office insists that the reactors worked as designed,

automatically shutting down as the quake struck and releasing an “insignificant” amount of radiation “substantially lower than the standards under law.” The world awaits confirmation of these claims, but they follow a history of dissembling and cover-ups concerning nuclear power that critics say continues in Niigata. On July 23, a delegation of Social Democratic Party members led by Hosaka Nobuhiko was refused entry to several key areas of the Kashiwazaki-Kariwa complex, including reactor buildings 5 and 7, by Tepco managers. A report written afterward by lawyer Ito Yoshinori called the extensive damage around the plant “alarming.”

Kashiwazaki-Kariwa’s seven reactors are now idle, threatening power shortages throughout the peak energy-demand summer months and forcing Trade Minister Amari Akira to request that business users cut electricity consumption. Kashiwazaki Mayor Aida Hiroshi invoked a little-used emergency order to shut down the reactors because he considered them “a threat to the safety of the public.” According to the Nikkei business newspaper, the plant, which generates enough power to supply 16 million households, is likely to be closed for up to a year.

Locals say that after he read the riot act to Tepco’s managers, Mayor Aida sent cars equipped with loudspeakers around the town to reassure his constituents he had been “tough” with the company. Some said he wasn’t tough enough. “I wish the plant wasn’t here,” lamented resident Yamada Koji. “But now that it is we have to live with it and hope the government keeps us safe.” That’s far from a unanimous view: Igarashi Mitsuo who lives in a hamlet right beside the stricken nuclear giant said: “I don’t like it but as long as it stays safe, I think it is better that we have it.”

Locals have argued about the plant’s merits since it was announced amid a blaze of publicity and national pride in 1969. Later, the

central government forcibly bought up the land and surrounding seas, according to local anti-nuclear activist Takemoto Kazuyuki. “The slogan was: ‘Nuclear power is a state policy, so you should be cooperative,’” he wrote in a 2002 petition to have the plant closed. Takemoto first petitioned to close the complex in 1974; demonstrations, petitions and court-cases were a regular feature of life here as the reactors went online between 1985 and 1997.

Since 2001, the site has been constantly monitored by police helicopters and coastguard ships permanently anchored offshore, the same year a public referendum narrowly (53 percent) voted to reject the use of MOX fuel, which combines plutonium and natural uranium oxides, in the reactors. Today, the most common local reaction to questions about the power station is *shikata-ga-nai*: It can’t be helped. “Most people who live here keep a wary eye on the plant the way they would a dangerous neighbor,” says Briton Paul Woodcock, who teaches in the town. “They just hope it stays calm.”

Over the years, a total of \$2 billion dollars (2,500 oku) in government subsidies has been pumped into Kashiwazaki, estimates Mayor Aida, and hundreds of local people now work at the complex; a quarter of households in Kariwa (a village of 5,000 people) are dependent on its salaries. “The plant contributes a lot to the area but we only want it here if Tepco can guarantee the safety of the people here,” says Aida in an office on the top of the city’s administration building visibly scared by the quake. “We must be assured of this before it is reopened.”

Privately, the mayor is said to be furious at Tepco. Japan’s biggest power company initially failed to report the leak, then admitted that it was 50 percent bigger than previously announced. According to the Asahi, journalists who visited the reactor building on July 25 found workers mopping up radioactive water with paper towels. Earlier this year Tepco

admitted falsifying inspection data 200 times at Kashiwazaki-Kariwa and other reactors going back decades. After the quake, it emerged that the International Atomic Energy Agency (IAEA) had warned the plant managers two years ago that their fire-prevention measures were inadequate.

Trade Minister Amari warned that such scandals “could make people lose their trust in nuclear power” and ordered the country’s top nuclear power companies to tighten up plant operations. His concern is understandable. Japan has 55 of the world’s 440-odd operating reactors, supplying about one-third of the country’s demand for electricity, and another 11 in construction or planned. The government’s national energy policy aims to bury the “Hiroshima Syndrome” and raise the proportion of nuclear-generated electricity to 40 percent. Japan aims, in the words of Gavan McCormack, author of *Client State: Japan in the American Embrace*, to become “a nuclear superstate.”

That puts the world’s second-largest economy out of step with much of the developed world. The contribution of nuclear power to global energy demand fell by one percent to 16 percent in the decade to 2003, and the scheduled closing of many older plants in Europe and the US is likely to reduce that level in coming years. While the US, Britain and much of Europe essentially froze their nuclear programs in recent years, resource-poor Japan continued building in the pursuit of energy self-sufficiency. One of the byproducts of this policy is an enormous and growing stock of plutonium – 45 tonnes, or enough to build thousands of the bombs that leveled Nagasaki in 1945. “It is astonishing that even after Chernobyl, Japan has built more than 20 new reactors,” says Murata Mitsuhei, former Japanese ambassador to Switzerland and now an antinuclear campaigner.

Murata says he and his network have collected

900,000 signatures demanding that all Japanese nuclear plants built on active faults be shut down.

Murata and leading seismologist Ishibashi Katsuhiko, who coined the phrase *genpaku shinsai* (roughly meaning a nuclear disaster triggered by an earthquake), warn that the nuclear technocrats are dangerously delusional about their ability to predict the impact of quakes on Japan’s 55 reactors. “The people in charge say the faults (under the Kashiwazaki-Kariwa plant) were unexpected, but they had actually been predicted,” says Ishibashi, who warns that the ability to forecast where quakes will hit is in any case limited. “Even in areas with no detected faults, M7-class destructive earthquakes can happen.”

Ishibashi recently resigned from a subcommittee of the Japan Nuclear Safety Commission, set up to revise Japanese nuclear plant seismic standards, because he “didn’t think the new standards were sufficient.”

Japan’s nuclear plants are designed to withstand M6.5-quakes, but the construction regulations are a quarter of a century old and new rules issued last year recommended an upgrade, widely and erroneously reported as 6.8, according to Ishibashi. “The new guidelines are vague...and should be reviewed again. If we don’t make fundamental improvements to nuclear plant earthquake design, Japan will suffer a catastrophic *genpaku shinsai*.” The most likely venue for such a disaster, he contends, is the aging, five-reactor Hamaoka plant in Shizuoka Prefecture, 190 km southwest of Tokyo. Seismologists suggest an 87-percent probability of a magnitude-8 quake striking under or near the Chubu Electric Power Co. plant in the next 30 years. Doomsday scenarios predict clouds of radioactive dust from the plant descending on the world’s most crowded metropolis within six hours of the quake. “Thirty million people would have to be evacuated from the city,” says

Ishibashi. “We could never live there again.”

Despite such chilling warnings, there is little evidence that the Niigata quake has shaken government confidence in its nuclear program and, as the Foreign Office statement suggests, may have even reinforced it. “We believe,” said the statement, that a joint IAEA investigation “will not only confirm the current safety of the Kashiwazaki-Kariwa Nuclear Power Plant...but also further contribute to the transparency in Japan’s Nuclear Energy, and help promote to share lessons learned from the earthquake internationally” (sic). Many wonder, however, whether the pursuit of transparency and safety will survive the enormous costs generated. “The logic of nuclear power is that the companies want to reduce the costs of earthquake-resistant design as much as possible,” says Kyoto University’s Imanaka Tetsuji. “That leaves a lot of room for underestimating the risks.” Ban Hideaki, co-director of the Citizens’ Nuclear Information Center, put this more bluntly. “The target is money rather than safety” he told the Asia Times.

The Nuclear and Industrial Safety Agency has already ordered an investigation into the Niigata disaster, citing “concern at the delayed reaction to the accident by the operators of the plant.” The result could be a demand that up to half of Japan’s nuclear complexes be refitted. Several plants, including the Onagawa facility in Miyagi Prefecture and the Shika plant in Ishikawa Prefecture have recently been rattled by much stronger quakes than they were built to withstand, and suggest that a quake resistance of at least 7.0 will have to be the new standard, a deceptively small change that could carry a price tag of hundreds of millions

of dollars. The new regulations may demand that geologists identify quake faults active up to 130,000 years ago, a reaction to the stunning revelation that the Kashiwazaki-Kariwa plant sat atop an active fault. In the meantime, Takemoto and his anti-nuclear colleagues wait for the results of a lawsuit (now in the Supreme Court) demanding that the government revoke Tepco’s operating license for the plant. “We predicted the earthquake and Tepco did not,” says Takemoto. “The company does not have the right to operate.”

Japan’s nuclear issues are not contained within its borders and indeed the reverberations of the July 16 quake are already being felt around the world: The Niigata plant shutdown is likely to undermine the country’s commitments to the 1997 Kyoto Protocol, which require a six-percent cut in greenhouse gases by 2012, based on an operational rate for its nuclear plants above 85 percent. Tokyo is planning to offer support and technological assistance to other fast-growing Asian nations that want to develop their own nuclear programs. Murata believes the Niigata quake should be the beginning of the end for Japan’s entire nuclear program. “To me it is a moral and ethical question. How can we keep building these plants when we don’t know how to dispose of the waste they generate or if they will survive an earthquake?”

David McNeill writes regularly from Tokyo for the Chronicle of Higher Education, the London Independent and other publications. He is a coordinator of Japan Focus.

He wrote this article for Japan Focus. Posted at Japan Focus August 1, 2007.