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# Crippled Fukushima Nuclear Power Plant at One Year: Back in the Disaster Zone

**David McNeill**

*David McNeill revisits Japan's northeast and the crippled Fukushima Daiichi nuclear power plant a year after it was battered by the triple disaster of March 11 and finds a region still struggling to emerge from its huge shadow.*

"The world is heavy on us," says Sakurai Katsunobu, recalling the day that its weight almost crushed the life out of his city. On the morning of March 11 last year, Minamisoma and its mayor were struggling with the same mundane problems as many other small rural cities across Japan: a declining, greying population, creaking public services and a faltering local economy. By nightfall, an existential disaster had engulfed Mayor Sakurai's office, one from which it has yet to reemerge.

It began with the huge quake that struck off the coast of the city of 71,000 at 2:46pm. Less than an hour later, Sakurai was on the roof of the city office, squinting toward the sea about six miles away. "We could see this huge cloud of dust rising into the air from the Pacific. I asked someone, 'is that a fire?' Then we realized it was the tsunami." Even as he spoke, the deluge was inundating hundreds of homes, drowning old people and children; sometimes whole families. By evening, corpses were being brought to a makeshift morgue in a local college.

The March 11 quake and tsunami took 630 lives in Minamisoma, including 100 children. For days, Sakurai wondered if his elderly parents were among the casualties. But instead of looking for them he was dealing with the crisis that would define his city. On March 12, an explosion blew apart the building housing reactor 1 at the Daiichi nuclear plant, 23km south of his office. Operator Tokyo Electric Power Co. (Tepco) and the central government were silent on what was happening. Public television said there was no need for panic. Minamisoma's citizens made up their own minds and began to flee from rumours of radiation.

**Flag on the wall inside Minamisoma City Office**

Within a few days, the town had almost emptied of people. Twenty-seven thousand – a third of the population – have yet to return a year later. "They're scattered all across Japan," says Mr. Sakurai. "We know of some families in America too. Who knows if they will ever come back?" About 150 of his city's 830 employees are expected to quit this year, what he calls a 'municipal meltdown' brought on by the stress of last year's calamity. "We had to work everything out for ourselves because there was no help from the central government. We're seeing the results of that now."

Today, the power plant is officially "in a state of cold shutdown" according to Tepco. The 20km exclusion zone that surrounds it runs into the southern border of Minamisoma and swallows up Mayor Sakurai's small farm. Police officers with dosimeters pinned to their chests prevent locals from going through a roadblock, even the Mayor who runs the city. Reporters and citizens who venture inside through back roads can be arrested.

**Checkpoint on the outskirts of Minamisoma into the 20km exclusion zone (photos David McNeill)**

Inside the zone, life has frozen in time. Homes have been abandoned and reclaimed by weeds along a route that emptied on a bitterly cold night 12 months ago. Thousands of farm animals and pets have been left to die. Cars wait outside supermarkets where their owners left them in Tomioka, Okuma and Futaba, once neat, bustling towns that now take their place alongside the Ukrainian nuclear ghost town of Pripyat. Even birds have deserted this area, if the latest research is to be believed. http://www.independent.co.uk/news/world/asia/bird-numbers-plummet-around-stricken-fukushima-plant-6348724.html Roughly 80,000 people who once lived here have not been told when, if ever, they can return.

The reason is signaled by a symphony of beeping noises from dosimeters aboard our bus on the way to the plant. A party of about 40 journalists, including five foreigners, has been granted a restricted tour. As we drive through a police checkpoint and into the

town of Tomioka, about 15 km away, the radioactivity climbs steadily, hitting 15 microsieverts per hour at the main gate to the nuclear complex. At the other end of the plant, where the gaping buildings of its three most damaged reactors face the Pacific Ocean, the radiation level is 100 times this high, making it still too dangerous to work there.

Inside the plant's emergency coordination building, the air is filled with the sound of humming filters laboring to keep the contamination out. Hundreds of people work here every day, many sleeping in the makeshift beds and cots scattered throughout the building. Workers in radiation suits and full-face masks wander in and out. Some are young, shaven-headed, tough-looking men who eye us warily. Several reporters have claimed (http://www.telegraph.co.uk/news/worldnews/asia/japan/japan-earthquake-and-tsunami-in/9084151/How-the-Yakuza-went-nuclear.html) that subcontractors at the plant employ Yakuza gangsters, an accusation not denied by Tepco. "There are so many subcontractors here that it's not impossible," said a Tepco spokesman. A large digital clock showing the current radiation reading inside the building dominates the wall of the central control room, where officials in utility suits huddle around computers.

"Our main challenge now is to remove the nuclear fuel from the reactors," explains Takahashi Takeshi in his first interview since he took over as plant manager two months ago. "It's a technically very difficult problem, but we cannot hurry and we want to take it step by step." His predecessor Yoshida Masao was forced to quit in December after being diagnosed with cancer – unrelated to his work, insists Tepco. Takahashi too looks drawn and exhausted. But he is satisfied with the progress being made in bringing the plant to a state of cold shutdown, meaning that radiation releases are under control and the temperature of its nuclear fuel is consistently below boiling point.

The term is considered controversial. Engineers have only a rough idea of where exactly the melted fuel lies inside the damaged reactors, or of its exact state. The fuel is being kept cool by thousands of gallons of water that Tepco pumps onto it every day and which it is struggling to decontaminate. Engineers are frantically working to build more water tanks, and create space to store them. On a ridge about 20 meters from the reactors is a huge field of gleaming 1000-ton water tanks – about 100. A building crew is leveling land next to the tanks to make way for more. "In April the existing tanks will be full so they are trying to make more space," admits a Tepco official.

We are told to wear our full-face masks for the climax of the visit – a tour of the six reactors. Every inch of our bodies is covered and even in the subzero temperatures of Fukushima in February, it is unbearably hot. Thousands of men worked through last year's summer heat of over 30 degrees Celsius in this protective gear, struggling to clear debris from the quake and tsunami and bring water to the reactors. "They were dropping like files in the heat," said one worker who spoke anonymously. "But they just had to keep going. They had no choice because no one else could do it."

**McNeill on the beat**

"The worst time was when the radiation was 250 Millisieverts (per year – the maximum, temporary government limit) and we couldn't find people to do the work," explains Sakamoto Kazuhiro, an onsite subcontractor. "We could only work in two-minute bursts, when we were extracting cesium from contaminated water."

Some of that work is clear onsite. The concrete building housing reactor 1, which was blown apart in the first explosion on March 12, is now completely covered with a tarpaulin designed to contain its radioactivity. As our bus drives slowly by the building, the beeping dosimeters climb to100 microsieverts an hour. But as the most badly damaged reactor 3 looms into sight, its mess of tangled metal and steel gives off a startling reading of 1,500 microsieverts. Its cargo of lethal fuel includes plutonium and the roof of the building housing the reactor was blown off the second explosion. "It's still too dangerous for workers to enter reactor No.3," admits engineer Hibi Yasuki.

**Fukushima Daiichi reactor 3 (left) and 4 (right)**

The state of reactor 2, meanwhile, sparked some panic recently after Tepco reported that the heat of the fuel inside was climbing and apparently resisting efforts to bring it down. The nightmare scenario of another out-of-control reactor was briefly conjured up by the media before Tepco banished it by claiming faulty equipment. "We've identified the problem as a broken thermometer," says plant manager Takahashi in response to repeated questions about the reactor. "I'm terribly sorry to everyone for causing so much concern."

Tepco officials constantly apologize, drawing on the most profound Japanese mea culpa in the dictionary, which literally translates as 'there is no excuse for what we have done." The apologies have become perfunctory and ritualized, failing to douse public anger over the scale of the disaster, or some of the company's sharp-elbowed tactics since it began. Compensation has dribbled into the pockets of evacuees who have lost everything and are stuck in legal limbo, without homes or clear futures. In one now infamous incident, the utility argued against a compensation claim by a golf course operator, saying that radioactive materials from the nuclear plant belong to individual landowners, and are not the company's responsibility. Lawyers for the Sunfield Nihonmatsu Golf

Club, 45 kilometers west of the plant, said they were "flabbergasted" by the argument.

Radiation from the Daiichi plant has blanketed eight percent of the entire country, according to the government.Nearly all of the 23 million tonnes of rubble from the tsunami and quake is still piled up around the coast because it is widely believed contaminated and the government can't persuade local authorities to dispose of it.

Much of the worst radiation damage was inflicted on March 14 and 15, when a plume from the plant was carried by winds northwest and over pristine farming land in Fukushima, one of Japan's key food baskets. "It rained on those nights and the rain brought the radiation down on top of us," says Ito Nobuyoshi, a farmer in the mountain village of Iitate, 40 km from the plant and a half hour scenic drive from Minamisoma. For reasons that remain murky, the government delayed releasing data that would have shown the radiation's path and saved many from heavy exposure. Hundreds of families unknowingly evacuated into the most irradiated areas. "It was a crime and the people in government who made that decision should go to jail," says Ito.

**Outside Minamisoma Village Office, Feb. 2012**

He is among a tiny number of farmers who have ignored a government directive to evacuate from this area. The directive has emptied once thriving towns around the plant whose population numbered 114,000 people, including over 6,000 from Iitate. An unknown additional number, anywhere from 50,0000 - 120,000, according to observers, has moved voluntarily because of radiation fears, ignoring official claims that life inside or around Fukushima Prefecture is safe.

Cleaning up the contamination and convincing people to return is a mammoth task. Across the region, workers in boiler suits and masks have descended on towns with power hoses, trying to scour the Daiichi plant's toxic payload from playgrounds, parks and other public areas. The workers have removed most of the most dangerous contaminant – cesium - from the grounds of Minamisoma Middle High School, says its principal Hamano Shinichi. Like other public buildings here, the school has planted a large dosimeter outside its front gates showing the current radiation in large digital letters in an attempt to reassure local parents – with limited success. Only half of its 360 students have returned since last year, Principal Hamano admits.

**Outside IItate Village Office, Feb. 2012**

A radiation readout outside the Minamisoma Middle High School, 2 km from the exclusion zone

"I don't know if we will ever recover to what we were before March 11 but we are certainly improving," he says, pointing to the flashing red dosimeter outside, which reads 0.2 microsieverts. Last March, radiation was ten times that high here, a level that exceeded central government guidelines of 1 millisievert of radiation a year. In response, the government controversially hiked the limit to 20 millisieverts, sparking bitter protests for placing children at risk. Many children have since reported low immunity and other health problems, though nobody has proved a link to the nuclear plant. Hamano says that his students are still limited to two hours play outside a day, and are told to stay on the main roads when walking home and avoid 'hot spots' around the city. By April, he expects the radiation to have fallen enough to allow unlimited outside play. "We will survive this horrible event, I believe."

Outside the zone, the government is decontaminating hundreds of thousands of acres of farmland and forest by scraping off a 5 cm-layer of topsoil, an operation it estimates will leave a pile of nuclear waste almost 29 million cubic meters high – enough to fill one of Tokyo's largest stadiums 80 times. Across the Fukushima countryside, trucks trundle to 'temporary' dumps with their cargo of poisoned clay past mask-wearing security guards, a plan Ito and others insist is doomed to failure. "They're just moving the radiation from one place to another," he says. "Who is going to take it when they're finished? Fukushima will stay poisoned for decades to come."

Cleaning up and compensating for the triple disaster will add to Japan's already groaning debt burden. Although its powerful economy is showing signs of life after contracting in 2011, the nation faces profound long-term structural problems, notably a looming demographic crisis. In January 2012, the health ministry forecast that the population of 128 million will fall by 30 per cent in the next half-century, while soaring life expectancy will further burden the state. The shrinking and ageing population means the government will struggle to cope with ballooning social welfare costs and the aftermath of March 11, while trying to pay off Japan's public debt – at $12 trillion, the worst in the industrialized world.

Mayor Sakurai and other observers fear that the central government may have backed off from the more radical changes needed to guide the country through what former Prime Minister Kan Naoto called Japan's worst crisis since World War II. Mr. Kan became a convert to alternative energy before being dumped by his party last year. His successor, Noda Yoshihiko, has signaled business as usual for nuclear power and little else in the way of new initiatives, except for a hike in sales taxes to pay for recovery. "I think we

**Workers' beds inside the Daiichi Plant**

can recover, but we need leadership and I see little of that," says Sakurai.

At the Daiichi complex, the task is clearer and less clouded by politics. Plant manager Takahashi must somehow cool the uranium fuel inside its reactors, locate and remove it and make the plant safe to dismantle. Work here is hard, unrelenting and in the long term possibly fatal. Takahashi says he is motivated above all by one thing: "We will try to allow people to return to their homes as early as possible."

It is a mammoth task. Japan's government has admitted that dismantling the reactors and its 260-ton payload of nuclear fuel will take up to 40 years. Many people believe the government and Tepco will eventually be forced to recognize that the people who fled from this plant a year ago may not return for decades. In the meantime, the work at Fukushima Daiichi goes on. And on. . .

*David McNeill is a Tokyo-based correspondent for* The Independent, The Irish Times and The Chronicle of Higher Education. *He is an Asia-Pacific Journal coordinator.*

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