

Fukushima Nuclear Crisis: How it happened - too little, too late, warnings ignored

Monday 13 June 2011, by [Yomiuri Shimbun](#) (Date first published: 12 June 2011).

NUCLEAR CRISIS: HOW IT HAPPENED / Government radiation data disclosure—too little, too late

Three months have passed since the Great East Japan Earthquake triggered a nuclear crisis that shows little sign of ending any time soon.

This is the third installment in a series that looks into what has given rise to the unprecedented crisis, dealing a fatal blow to myth of safety at nuclear power plants in this country.

On June 3, the Nuclear and Industrial Safety Agency released a shocking, but very belated, report about what happened around the Fukushima No. 1 nuclear plant immediately after the March 11 earthquake and tsunami.

At 8:39 a.m. on March 12, about 18 hours after the earthquake, radioactive tellurium-132 was detected in Namie-machi, Fukushima Prefecture, six kilometers from Tokyo Electric Power Co.'s damaged plant, according to the report from the agency.

The detection of Te-132 meant the temperature of nuclear fuel at the plant had shot up to more than 1,000 C. It also meant nuclear fuel pellets in the reactor cores had been damaged and nuclear material had leaked into the environment.

Seven hours later, a massive hydrogen explosion rocked the plant's No. 1 reactor.

Attempting to explain the delay in making the information public, agency spokesman Hidehiko Nishiyama said later, "We never meant to conceal the information, but it never occurred to us to make it public."

SPEEDI data unused

Throughout the ups and downs of the nuclear crisis, the government's transparency record has been consistently atrocious.

At 5:44 a.m. on March 12, the government expanded the evacuation area around the plant to 10 kilometers from three kilometers. Namie-machi authorities moved residents by bus to the Tsushima district in the western part of the town.

Meanwhile, the System for Prediction of Environmental Emergency Dose Information (SPEEDI) had been pumping out estimates of radiation doses once every hour since 4 p.m. on March 11.

SPEEDI—a system used to make forecasts of radiation diffusion patterns—had been showing that the Tsushima district was being hit with high radiation doses. This crucial information, however, was not passed on to town authorities.

Mayor Tamotsu Baba said later, "We weren't told anything important."

According to the government's basic nuclear disaster plan, SPEEDI should be used to help make evacuation recommendations. The system cost more than 11 billion yen in taxpayer money to install. When Prime Minister Naoto Kan directed a disaster response drill at Chubu Electric Power Co.'s Hamaoka nuclear power plant in Shizuoka Prefecture last year, SPEEDI simulations were used to set evacuation areas.

However, the March 11 calamity severed power at the Fukushima plant, meaning SPEEDI data could not be transmitted. The government said it did not make forecasts from the system public because "accurate predictions could not be made."

Despite the information blackout on radiation levels, SPEEDI continued to churn out useful data about radiation emissions immediately after the earthquake and tsunami by inputting provisional readings.

The system's estimates on radiation pollution for the afternoon of March 12 show high contamination in areas eerily similar to those the government eventually designated as "planned evacuation areas" in April.

"Although the system was supposed to be used to deal with a crisis, we weren't fully prepared to actually use it," said one senior education ministry official. "There were no ideas or discussions about if the [SPEEDI] data should be made public," he said, essentially admitting the ministry wasted the system.

On May 2, Goshi Hosono, special adviser to the prime minister on the Fukushima crisis, made public about 5,000 SPEEDI radiation-prediction images. Explaining why the disclosure had been so late, Hosono said the government had been "afraid of triggering a panic."

Commenting on the matter, Hirotada Hirose, professor emeritus of Tokyo Women's Christian University and specialist in risk psychology, said, "In a fast-changing crisis situation, delays in releasing information to try to ensure accuracy often aggravates people's suspicions and unease."

"Even if information is only about possible developments, data obtained through scientific methods should be disclosed," he said. "In the initial phase of the Fukushima crisis, scientifically valid forecasts should have been made public, with the understanding that the information would be modified immediately if the situation changed."

Numbers, but no analysis

In addition to the problems with transparency, the Fukushima nuclear crisis has also highlighted issues with the arrangements the government has made for measuring radiation from the nuclear power plant and how the data are evaluated.

The government's basic disaster response plan assumes the task of measuring radiation levels around a nuclear plant in the event of an accident would be done by the prefectural government involved. The education ministry's role is only "supplementary" to the duties of the prefectural government.

In this crisis, however, the Fukushima prefectural government was unable to handle the task of making radiation measurements on its own.

Therefore, on March 16, Chief Cabinet Secretary Yukio Edano instructed the education ministry to

cooperate with the prefectural government in analyzing and announcing radiation dosage data.

The ministry then brought observation vehicles and robots to construct 13 observation networks in April to measure air, sea and soil radiation levels. Findings were subsequently posted on the ministry's Web site.

Since the networks were only makeshift and there was no way to digitally transmit the data to the ministry, trips to the observation stations were a cumbersome necessity. The readings were sometimes even called in over public pay phones. The result was chaos—wrong data were sometimes made public, while information that had been gathered and reported sometimes was not released.

Looking back at the situation, senior vice minister of the education ministry Ryuzo Sasaki said, "Both personnel and equipment were sorely lacking, as there was no proper plan in place for the central government to take the initiative in addressing the situation."

Data, no matter how much effort was expended to collect it, does not serve people's needs unless it is combined with expert evaluation and analysis. Organs in charge of making evaluations, however, failed to do their jobs.

On March 16, Yasutaka Moriguchi, deputy minister of the education ministry, announced that radiation doses of 330 microsieverts had been measured about 20 kilometers from the crippled nuclear plant. When asked about possible health hazards, Moriguchi only said, "Our duty is confined to providing the public with data."

'No comment'

The observation point Moriguchi was reporting on was in an area where residents had not been evacuated but were currently being told to stay indoors.

The data alone would likely have fanned anxiety among residents near the nuclear facility, but Moriguchi, when pressed over why he was only reporting the data, told the press conference, "We have been instructed by the chief cabinet secretary not to make any comments on the data."

Around that time, Chief Cabinet Secretary Edano had issued an order that evaluations of radiation data could only be done by the Nuclear Safety Commission.

Chief of the commission Haruki Madarame, however, was tied up advising Kan and other government leaders. For a full week after Edano's order, no evaluation of the radiation data was announced by the commission, the nation's expert body on the matter.

Instead, Edano repeated in press conference after press conference that radiation levels would not cause any "immediate" health damage.

On March 23, Madarame finally held his first press conference. In it, he apologized. "We are very sorry, but we cannot make any [radiation evaluations] because we are very understaffed."

The Yomiuri Shimbun , June 11, 2011

<http://www.yomiuri.co.jp/dy/national/T110610005496.htm>

Government, TEPCO brushed off warnings from all sides

Three months have passed since the Great East Japan Earthquake triggered a nuclear crisis that shows little sign of ending anytime soon.

This is the fourth installment in a series that examines what caused the unprecedented crisis, which has dealt a fatal blow to the myth of the safety of nuclear power plants in this country.

“The lands of Mutsunokuni were severely jolted. The sea covered dozens, hundreds of blocks of land. About 1,000 people drowned.”

This is a description of the massive Jogan Earthquake and tsunami that hit the Tohoku region about 1,150 years ago. It is contained in “Nihon Sandai Jitsuroku” (The official history of three reigns of Japan), which was compiled during the early Heian Period (794-1192).

Mutsunokuni is the name of the region that covered most of the present-day prefectures in the Tohoku region.

It is now clear the government and Tokyo Electric Power Co. did not learn from history.

Since 1990, Tohoku Electric Power Co., Tohoku University and the National Institute of Advanced Industrial Science and Technology have researched the traces left by the Jogan Earthquake. Their studies have shown that the ancient tsunami was on the same scale as that caused by the March 11 earthquake.

According to a report submitted by the national institute to the government in the spring of last year, the Jogan Earthquake occurred off Miyagi and Fukushima prefectures and is estimated to have had a magnitude of about 8.3 or 8.4.

The Jogan Earthquake tsunami penetrated more than four kilometers inland in the Sendai plain in Miyagi Prefecture, and about 1.5 kilometers inland in an area where Minami-Soma, Fukushima Prefecture, is currently located, the report said.

According to a recent study conducted by Tohoku University, two tsunami equivalent to the size of the Jogan Earthquake tsunami have hit the Sendai plain in the past 3,000 years.

Before March 11, scholars had repeatedly warned at academic conferences and other occasions that a massive tsunami could hit the Tohoku region in the future.

However, the government’s Central Disaster Management Council and TEPCO never factored such studies into their estimates of the damage that earthquakes and tsunami could cause to nuclear power plants.

TEPCO said there was not much evidence of the damage caused by the Jogan Earthquake. It was more appropriate, the utility said, to reference the Shioyazaki-oki Earthquake—a magnitude-7.9 temblor that hit Fukushima Prefecture in 1938 and caused much smaller tsunami than the March 11 earthquake—when estimating the damage earthquakes and tsunami could cause at the Fukushima No. 1 power plant.

Robert Geller, a professor at the University of Tokyo and an expert in seismology, said that if TEPCO and the government had referred to the study of the National Institute of Advanced Industrial Science and Technology, they might have increased the size of tsunami they thought the Fukushima plant might encounter. The government and TEPCO should have taken the risk of tsunami more

seriously, he added.

“This crisis at the power plant is not a natural disaster. It is a man-made disaster,” Geller said.

According to Geller, four earthquakes measuring magnitude-9 or stronger occurred in the 60 years to 2009.

“In 2004, there was the Indian Ocean earthquake. [The government and TEPCO] should have been aware that similar earthquakes could occur anywhere,” Geller said.

The government plays an enormous role in the safety of nuclear power plants, checking reports submitted by power companies regarding the quake-resistance measures implemented at each of their nuclear plants.

However, it takes time for the government to factor new studies into its evaluation of the reports. In addition, both the government and power companies have focused more on measures against earthquakes than tsunami.

According to sources, people who tried to raise the alarm about the risks of tsunami were in the minority at TEPCO. Many thought it was enough to arm against earthquakes equivalent to the size of the Shioyazaki-oki Earthquake, they said.

A former TEPCO executive once said: “Tsunami are a threat to ria coasts, such as the Sanriku coast. However, they’re not a threat to straight coasts, such as the one where the Fukushima No. 1 power plant is located.”

There are other examples of risks regarding earthquakes and tsunami being ignored.

In its annual reports, which have been made public since 2008, the Japan Nuclear Energy Safety Organization (JNES) has predicted possible damage tsunami could cause to Mark-1 nuclear reactors that are about the same size as the Nos. 2 and 3 reactors at the Fukushima plant.

One report said if a breakwater that extended up to 13 meters above sea level was hit by a 15-meter-high tsunami, all power sources would be knocked out—including outside electricity and emergency power generators. In such a situation, the report said, cooling functions would be lost and the reactor’s core would be 100 percent damaged—a meltdown, in other words.

The breakwater at the Fukushima No. 1 plant was about 5.5 meters high, less than half the assumed height in the JNES report.

TEPCO assumed the tsunami hitting the plant would be 5.4 meters to 5.7 meters high. But the wave that struck on March 11 was 14 meters to 15 meters high.

Another report by the organization released last year predicted that if all power sources were lost due to an earthquake, fuel rods will begin melting after only 100 minutes. This report said a reactor’s containment vessel would be damaged after about seven hours and a large amount of radioactive material would be released into the air.

According to an analysis by the government’s Nuclear and Industrial Safety Agency, damage to the core of the Fukushima plant’s No. 1 reactor started about two hours after the tsunami and its pressure vessel was damaged in about four hours—very close to what JNES had predicted.

Both entities are under the Economy, Trade and Industry Ministry and are in charge of safety

regulations at the nation's nuclear power plants. Findings by JNES are often reflected in safety measures adopted by plant operators. But one TEPCO official said, "We prioritized preparing for high-probability incidents, so we couldn't respond to everything."

Wataru Sugiyama, a lecturer on nuclear power safety at Kinki University's Atomic Energy Research Institute, said, "From a cost-performance perspective, it's difficult to prepare for low-probability disasters and prevent all accidents." But by thinking about things after an accident, it's possible to prevent worse situations," he said.

His words were proved true by Japan Atomic Power Co.'s Tokai No. 2 nuclear plant in Tokaimura, Ibaraki Prefecture, which was also hit by the disaster but managed to avoid a serious accident.

After the Kashiwazaki-Kariwa nuclear plant was hit by the Niigata Prefecture Chuetsu Offshore Earthquake in July 2007, Japan Atomic Power decided to build anti-tsunami walls at the Tokai No. 2 plant. The walls were built to withstand a tsunami 5.7-meters high, up from about four meters.

Construction had not been completed by the time the March 11 tsunami struck, but a finished section on the south side of the Tokai plant protected a seawater-intake pump needed to cool an emergency diesel power generator, which prevented a complete loss of power at the plant.

Economic factors are not the only reason why power utilities were reluctant to take action on safety measures. The firms also wanted to avoid losing the trust of local residents.

Many cases of cover-ups or altered data have been unveiled since 2002, including some at the Fukushima No. 1 plant. TEPCO believed that launching repairs to solve these problems would make their explanations about the safety of nuclear power to local residents ring false.

Another issue was that the voices of workers at the plant did not reach the higher-ups.

"Workers at the plant thought from before the quake that there was a risk all power could be lost if a tsunami flooded the emergency power generators," according to one TEPCO employee who has worked as an operator at the Fukushima No. 1 plant.

But a former TEPCO executive who is now an adviser to the firm said, "If there was a risk of losing all power, why didn't workers present their views at board meetings? It's really too bad."

When asked why the government failed to act on tsunami warnings, industry minister Banri Kaieda said his ministry had blindly believed Japan's nuclear plants "were the safest in the world."

The Yomiuri Shimbun , June 12, 2011

<http://www.yomiuri.co.jp/dy/national/T110611002697.htm>
