Communicating Disaster

How Did Government, Scientists, and the Media Perform in the Crisis?

By David Pacchioli

Fukushima Central Television

For most of Japan and the rest of the world, the first clear sign of trouble at the Fukushima Dai-ichi nuclear power plant was a breaking news video aired the day after the tsunami in March 2011. Captured live by Fukushima Central Television (FCT) and broadcast four minutes later, the video showed a thick white cloud emerging over the plant—what turned out to be the explosion of the Unit 1 reactor (above). At the time, however, the only facts that were known came across in the newsreader's urgent voiceover. It looked like smoke, she said, but it might be water vapor. It appeared to be drifting north, over the ocean.

Yuji Terashima, the FCT managing director responsible for airing that footage, described those desperate days for attendees of the Fukushima and the Ocean conference in Tokyo in November 2012. Terashima was part of a panel of Japanese and American journalists who examined efforts to communicate during and after the disaster.

"As a local media outlet," he recalled, "it is our primary role to immediately report events occurring around us, especially in the event of a disaster. However, we didn't know the substance of what we had seen. We were forced to report events as we saw them."

Martin Fackler, Tokyo bureau chief for *The New York Times* and another panelist, was similarly in the dark. "That's how I would characterize the first ten days," Fackler said. "The government was telling us nothing. TEPCO [Tokyo Electric Power Co., operator of the plant] was telling us nothing. We had very little input from the scientific community in Japan. Here we are trying to figure this out, and we had first one, then two, then three explosions."

Fackler had to talk with scientists overseas to learn that what he had witnessed were likely hydrogen explosions, which probably meant partial meltdowns of the affected reactors. "But when we reported this, we had so much criticism from the Japanese side for using the word 'meltdown,' " he said. "There was this amazing denial."

Only FCT's camera survived a blackout and captured the explosions. And the footage was aired exclusively on that network in Japan. The Japanese government had declared a state of emergency, and confusion and fear were rampant.

"Some people commented that our decision to broadcast pictures of the explosion was brave," Terashima recounted. "My own belief is that it is irresponsible to hesitate to disclose critical information of this nature and to justify that by stating that it could cause panic." In the event, many Japanese citizens simply turned to YouTube, where clips of the explosions taken from foreign news broadcasts were abundant.

"As a result of this broadcast, the public realized the true seriousness of the crisis," Terashima said, "and many decided to evacuate." And a pervasive attitude of suspicion and mistrust of the authorities began to take hold.

Days of confusion

Geoff Brumfiel, who reported on the crisis for the journal *Nature*, offered conference attendees a somewhat different perspective. "In London, where I was," Brumfiel said, "I was surprised at how quickly the information was coming and how much there was. TEPCO was providing preliminary radiation numbers within 24 hours of the accident, and real-time updates on conditions at the reactor."

The real problem, Brumfiel suggested, was not a lack of information, but a lack of communication—a distinction that would grow clearer during the second phase of the crisis. After a week and a half with little official word, Fackler said, "there was an information dump. I guess the government had had enough criticism. They just threw crates and crates of numbers at us with no explanation."

At that point, Brumfiel said, with few reporters possessing any expertise in the radiation physics, "it became very hard for the media to understand what the risk actually was. And the government, meanwhile, was trying to wiggle out of the numbers they were reading. Even as the doses were going way above established safety levels, they were saying, 'Everything's fine, there's no risk.' "

To Terashima, the futile attempts by government officials to forestall panic were themselves a form of crippling fear. Indeed, this so-called "elite panic" likely contributed to a widely reported debacle

regarding the government's System for the Prediction of Environmental Emergency Dose Information, known as SPEEDI. This sophisticated computer forecasting system began generating predictions of the spread of airborne radioactivity almost immediately after the disaster, but the first public release of this information was delayed for almost two weeks. Lacking this or any other guidance, residents of at least one evacuating community, instead of moving away to safety, headed straight into the path of the fallout.

Fackler, reporting for the *Times*, wrote that "Japan's political leaders at first did not know about the [SPEEDI] system and later played down the data, apparently fearful of having to significantly enlarge the evacuation zone—and acknowledge the accident's severity." Whatever the motives, the withholding of data, critics say, put unsuspecting citizens into harm's way, and the result was a further erosion of public trust.

There were other, similarly fateful decisions. Brumfiel noted the rush by some affected prefectures, in the days following the disaster, to pronounce their local rice and fish safe to eat—and subsequent findings of contamination in those same foodstuffs. Even more damaging, he said, was the government's unexplained—and seemingly arbitrary—raising of safe radiation-exposure levels for schoolchildren, from 1 millisievert to 20 millisieverts per year (see Page 20).

Combined with nagging uncertainty about the effects of low-level radiation, these official missteps created frustration and anger in the Japanese public—emotions directed not only at the government, but also at Japanese scientists, many of whom were reluctant to speak publicly.

Any news is good news

Nor did the media come through unscathed. Panelist Masakatsu Ota, a senior editorial writer for the Tokyo-based *Kyodo News* agency, acknowledged early mistakes by many of his peers, including a lack of preparedness for covering large-scale disaster, an unwillingness to criticize the beleaguered government, and a tendency, when lacking necessary expertise, to parrot the official line.

In the vacuum that resulted, worried citizens turned to other sources for information. Many sought out foreign websites and news services. In other cases, citizen volunteers stepped into the breach.

Toshio Katsukawa is a fisheries management specialist at Mie University who has spent most of his time since March 2011 helping fishermen in some of the many villages destroyed by the tsunami. As a parent worried about what to feed his children, however, Katsukawa began educating himself about radiation health effects, and, after talking with other concerned parents, he decided to share food safety information via the Internet. His blog and Twitter feed became so popular that he was asked to speak to consumer groups, write for a women's magazine, and eventually to appear on television.

"Japanese scientists hesitated to release information that was uncertain," he told attendees of the conference in Tokyo. "But almost everything was uncertain after the accident." Given that most of the radioactive iodine that wound up in the atmosphere was released during the first two days, he said, "there was no time to wait for uncertainty to disappear."

What he found in his own efforts at communication, Katsukawa added, was that "most people did not demand perfect information. They were OK with uncertainty, as long as things were carefully explained. They just wanted to know."

Unfortunately, as Katsukawa and others reported, the tendency to withhold information and downplay radiation risk has had lasting consequences across post-disaster Japan. Miguel Quintana, a correspondent for *Nuclear Intelligence Weekly* who has reported extensively from Fukushima, told conference attendees, "There's a big disconnect be-

New Center for Marine and Environmental Radioactivity Launched

We live in a radioactive world. There are more than 1,500 radioactive isotopes (radionuclides) on Earth. Most originated from the Big Bang and are naturally occurring in rocks, water, and air. Some are human-made products of the nuclear era that were released into the environment by Cold War weapons testing and by accidents, such as Chernobyl and Fukushima.

Radionuclides have widely varying chemical and physical properties. Some have known impacts on human health; others pose risks that are misunderstood and/or overstated. Many have been used as tracers to study environmental processes and enabled revolutionary understanding of the natural world.

In the aftermath of Fukushima—after years of relative complacency—the public and policymakers have renewed concerns about radioactive contamination. There are more than 400 nuclear power plants worldwide, a number that is growing in many countries. In addition, radioactive wastes have piled up without safe storage, nuclear-fueled ships and submarines ply our oceans, and there are concerns about the spread of nuclear weapons and non-nuclear "dirty" bombs. Yet, at the same time, many nuclear scientists and radiochemists trained during the Cold War are retiring.

"There is a need for trained experts to respond when needed, and research from trusted, independent laboratories is essential for building public confidence," said Ken Buesseler, a marine chemist at Woods Hole Oceanographic Institution. That realization inspired him, immediately after he returned from Tokyo, to begin to establish a new Center for Marine and Environmental Radioactivity (CMER) in partnership with other institutions worldwide.

CMER will provide training for the next generation of radiochemists and support a critical mass of scientific capability. Its mission is to propel scientific breakthroughs and generate valuable knowledge that will inform the public and policymakers about the risks, benefits, and impacts of ionizing radiation in the environment.

CMER

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tween public perception and the scientific information that's out there. A lot of people I talk to totally mistrust the information they're getting."

The *Times*' Fackler concurred. "There are big, big issues that still haven't been resolved," he said. "There still is no social consensus. My friends who are Japanese don't buy seafood from the Pacific—they don't trust the monitoring, the reassurances. They see a bureaucratic system that favors producers over consumers and has consistently lied to consumers about safety levels."

Trust and disconnects

Given the level of mistrust, some international attendees said, it should not surprise Japanese scientists that their reassurances fall on deaf ears. Instead of trying to downplay risks, they advised, experts must first acknowledge the depth of public anger. Abel Gonzalez, an adviser of the Argentine Nuclear Regulatory Authority who conducted assessments of the Chernobyl accident for the International Atomic Energy Agency, said that in his experience, trying to minimize concerns is counterproductive. Instead, he argued, "We have to say, 'You are right to be upset. You are right to be angry.' "

Seconding this approach was John Stein, director of the U.S. National Oceanic and Atmospheric Administration's Northwest Fisheries Science Center, who led NOAA's seafood safety program in the Gulf of Mexico after the Deepwater Horizon oil spill.

"Down on the Gulf Coast, being a federal scientist, I was by definition untrustworthy," he said. "If there's one lesson we took from that experience, it's that communicating the science is an incredibly difficult issue. You very much have to acknowledge what happened. People are very hurt by an event like this. Rebuilding that trust, and rebuilding public and consumer confidence, takes a long time."

One thing that helped to establish NOAA's credibility in the Gulf, Stein said, was engaging outside experts to conduct independent tests. Katsukawa agreed. "Scientists from other countries can be a big help," he said. When the environmental organization Greenpeace measured airborne radiation around Fukushima and their results matched those of the government, he said, the government regained some of its credibility.

What is the role of scientists?

Katsukawa's volunteer work illustrates an important role for independent scientists within Japan. As Brumfiel noted, "In my reporting, I've heard of physicists coming out into the field with their germanium detectors, taking measurements of the soil, working with the local people—and I think there's a lot of that going on. I think what's missing is a formal voice for these individuals." The establishment of some truly independent nongovernmental organizations, or NGOs, in Japan, Katsukawa and Brumfiel both suggested, would be an important step forward.

Another piece of advice was repeated often throughout the symposium: To credibly share expertise on so sensitive a topic as radiation health, it's important that scientists don't try to persuade the public simply to take their word. "Hearing a scientist say, 'Your exposure has been low so you have nothing to worry about' doesn't work at all," is the way Miguel Quintana put it. Kazuo Sakai, a radiation biophysicist with Japan's National Institute of Radiological Sciences, agreed. "Science is not able to convince anybody," he said. "All we can do is say, 'Here is your exposure level, and based on past experience, here are the associated effects.' You must judge for yourself.' "

Last but not least, the panel stressed, scientists must find ways to work productively with the media, even when doing so involves overcoming an ingrained lack of confidence in journalists' ability—and desire—to "get it right." Buesseler, whose extensive media contacts date back to Chernobyl, suggested that the key is finding and engaging journalists who can be trusted not to distort a nuanced message.

For his part, Ota of the *Kyodo News* acknowledged this natural tension. But after Fukushima, he said, the relationship between scientists and the media is too important not to cultivate. "There are fundamental questions of governance of this country," he said. "This exchange, this dialogue between media people and specialists, is critical for our future."

The myth of absolute safety

A day after the Fukushima and the Ocean conference, participants held a meeting open to the general public. At that event, Brumfiel, speaking for the media, summarized his impressions from 18 months of reporting on Fukushima. "The conclusion I come away with," he said, "is that scientists and the government, faced with communicating this disaster, were very concerned with protecting the public. They didn't want to cause a panic, they didn't want to spread fear—but in trying to avoid doing so, they withheld information, and this spread more fear than anything else they probably could have done.

"In a funny sort of way," he added, the official tendency toward reassurance at all costs reflected a problem that existed well before the accident. "It's this idea of absolute safety. And I think it's not just in Japan but everywhere in the world. The nuclear industry wants people to believe that nuclear power is absolutely safe. They work very hard to make that case. I think Fukushima shows the risk of preaching absolute safety. Because when this accident happened, the government had no real policy in place for responding to it."

His words echoed those of Takashi Onishi, president of the Science Council of Japan, whose remarks had opened the conference. "The myth of absolute safety has dominated the policies of this country and prevented us from applying additional improvements to our nuclear power plants," he said. "This groundless myth shouldn't be revived."

Instead, he said, the science council must take a lead role in promoting a change in mindset, from one of absolute safety to one that recognizes the inevitability of future natural disasters and aims not at preventing or avoiding them, but at anticipating them and reducing their impact. Such a mindset, he said, must incorporate the lessons of past mistakes.

Onishi cited a nationwide opinion survey that showed public confidence in Japan's scientists dropping sharply after the Fukushima disaster, and rebounding only partially since then.

"We understand as an organization of scientists that we failed to live up to the people's expectation," he said. "Without this careful investigation and reflection we cannot fully recover their confidence."