

## Lessons in Leadership from the Fukushima Nuclear Disaster

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Three widely cited investigations of the Fukushima disaster — one by the Japanese government, one by an independent team of experts in Japan and a third by The Carnegie Endowment for International Peace — have now concluded that the nuclear disaster of March 2011 was not, as it first seemed, the inevitable result of events no one could have predicted.

“It was a profoundly man-made disaster that could and should have been foreseen and prevented,” said Kiyoshi Kurokawa, chairman of the Fukushima Nuclear Accident Independent Investigation Commission, established by the National Diet of Japan.

In an effort to understand what went wrong and what lessons in leadership the tragedy can offer, leaders directly and indirectly involved in the disaster spoke candidly at the Tokyo panel on Fukushima sponsored by Wharton’s Initiative for Global Environmental Leadership (IGEL). Based on their presentations in Tokyo and the analyses of others in Japan and elsewhere, three areas emerge as essential to leadership in a crisis: preparation for emergencies, leadership style and communications.

### **Lesson 1: To prepare for the worst, leaders have to face up to what might actually occur.**

Erwann Michel-Kerjan, managing director of the Risk Management and Decision Processes Center at Wharton, says that Japan spent the years following the 1995 Kobe earthquake, the nation’s last great crisis, diligently preparing for future disasters. Since many people died in train wrecks during the Kobe quake, the Japanese government re-engineered its entire railway system. As a result, just moments after the earthquake in 2011, and well before the tsunami hit, Japan’s high-speed bullet trains were successfully shut down, saving countless lives (no one died on trains on 3/11, says Michel-Kerjan).

But just as generals are sometimes faulted for “fighting the last war,” Japan’s mistake was preparing for a disaster like Kobe, which was far less severe and complex than Fukushima. The 3/11 earthquake was significantly more intense (9.0 vs. 7.2 on the logarithmic Richter Scale) and it not only badly damaged the Fukushima Daiichi nuclear plant but also crippled the area’s power grid, cutting off the nuclear facility’s access to any off-site electricity.

Back-up generators kicked in when the power grid went down, but they were obliterated when the tsunami hit. This loss of virtually all power meant that the nuclear fuel inside damaged reactors went without essential cooling. In Reactor 1, the exposed fuel soon reached 2,800 degrees Centigrade. Desperate workers tried to cool the fuel with water from fire trucks and relieve building pressure inside the reactors by venting gases and steam. The venting, subsequent explosions and leaks led to the release of radioactive material into both the atmosphere and the ground water.

This series of events — the destruction of the Fukushima Daiichi plant by a massive earthquake and tsunami — was entirely predictable. In “Why Power Companies Build Nuclear Reactors on Fault Lines: The Case of Japan,” J. Mark Ramseyer, a visiting professor of Japanese legal studies at Harvard, notes that earthquakes of comparable magnitude have struck the northeast coast of Japan, on average, every 100 years, each one generating a devastating tsunami. In fact, the previous tsunami in 1933 was almost precisely as high as the one that struck Japan on 3/11.

Robert Meyer, co-director of the Risk Management and Decision Processes Center, points out that this pattern has been well known since ancient times. A monument from the first century still sits on a hill, high above the area destroyed by the 2011 tsunami, he says. Its inscription reads, “Beware the great tsunami; do not build below this level.”

Despite these historical warnings, “Nobody was remotely prepared,” says Akihisa Shiozaki, an attorney who was instrumental in putting together the first independent, non-governmental investigation of the Fukushima nuclear disaster, titled, “The Independent Investigation Report on the Fukushima Nuclear Crisis.” Not only were leaders unprepared for a tsunami following a major earthquake, they also failed to anticipate both the damage inflicted on the nuclear plant and the total loss of power to the cooling systems of the plant.

The failure to adequately prepare was widespread. The leaders of Tokyo Electric Power Company (TEPCO) built the reactors on a known fault line and then colluded with government regulators to avoid preparing for the inevitable. And the office of then-Prime Minister Naoto Kan (the Kantei) was totally unprepared to manage the crisis that resulted. As the report commissioned by the National Diet of Japan concluded, “The government, the regulators, TEPCO management, and the Kantei lacked the preparation and the mindset to efficiently operate an emergency response to an accident of this scope. None, therefore, were effective in preventing or limiting the consequential damage.”

Several reasons have been offered to explain why so many in leadership positions ignored the warnings of history. All are valid and offer valuable lessons to leaders in future crises.

Shiozaki looks to history itself to explain the reluctance of those in power to consider worst-case scenarios. After World War II and the destruction of Nagasaki and Hiroshima by nuclear weapons, the Japanese population vehemently opposed all use of nuclear power in their country. So the government undertook a campaign to persuade people of “the absolute safeness” of nuclear power, says Shiozaki. “Absolute safeness meaning that there was no risk that something could go wrong, no risk that a meltdown could happen. Well, that myth of absolute safeness developed over the years into a culture where it almost became a taboo to even talk about this.... Discussing a worst-case scenario was feared because it might bring panic to the citizens. And therefore it was omitted from the regulatory discussions.”

Eric Feldman, a law professor at the University of Pennsylvania, emphasizes the political and economic forces behind this reluctance to confront worst-case scenarios. “There was, of course, a good deal of local opposition [to nuclear power] despite the government’s downplaying of the risks, which is why it took so long for the first plants to be built,” he notes. With significant political and economic forces backing nuclear power, “talking about worst-case scenarios was avoided not simply because it would

scare people, but because such fear would mean that local communities would oppose the building of reactors, and without local support the reactors would not be built.”

Ramseyer views the problem from a legal perspective, pointing to the “moral hazard” that arises when the potential losses of a catastrophe far exceed the value of a company. Like any private company, TEPCO’s liability was “capped by the value of its net assets.” Beyond that amount, the company would pay nothing, leaving them with “no incentive to limit damages beyond the value of those net assets. For risks beyond that point, they capture all the returns but bear none of the costs.” The result was that “Tokyo Electric wildly underplayed the risk of a large earthquake and tsunami, but it did not underplay it carelessly or negligently. It underplayed it rationally — wildly, but rationally.”

And then there is simple human nature – there is a “threshold of concern,” says Howard Kunreuther, Wharton professor of operations and information management and co-director of the Risk Management and Decision Processes Center. “You have a lot of things to worry about, and often when you talk about what the chances are of an accident like this occurring, the general feeling is that it’s not going to happen to me,” he said. “That’s not just true in Japan, it’s true around the world.”

Despite the historical inevitability of the earthquake and tsunami, says Kunreuther, the earlier events happened so long ago that “there was a tendency to ignore them. They come out of the woodwork after an event, when everyone looks back and says, ‘Oh, we should have known this.’ But it’s not easy for people to make these decisions when there are so many things on their agenda.”

One way to combat this natural tendency, suggests Kunreuther, is to “stretch time horizons, so you don’t just think about the likelihood of this occurring next year but over a period of years.” The probability of an event, or series of events, increases considerably “when you look at the situation over the next 20 years instead of over the next year.” The geologic time scale involved in the Fukushima disaster — and the decades of radioactive contamination left in its wake—make it seem prudent to extend the planning time horizon a good deal further in some cases.

The lesson is clear: To adequately prepare for worst-case situations, those in power need to look past cultural prejudices, shortsighted financial reasoning and their own limited experience. Whether the leaders of private companies worried about quarterly earnings or governments struggling to meet pressing needs can, or will take this lesson to heart, is an open question.

## **Lesson 2: In the midst of chaos, leaders should stop looking for control and start looking for answers.**

Asked what experience he found most challenging during 3/11, Kenichi Shimomura, former deputy director general for public relations and chief spokesman for the Japan’s prime minister during the crisis, replied, “Being a leader without information.” It is easy, he said, to make decisions when a leader has all the necessary facts, “but information about the nuclear crisis was a luxury we did not have in the prime minister’s office at the time.”

The National Diet’s report explains that “as the situation deteriorated and the planned government accident response systems failed to function, control of the emergency response was taken by the Kantei, with Prime Minister Kan at the center of an ad hoc group of politicians, advisors and the chairman of the Nuclear and Industrial Safety Agency (NISA).”

While the government report states that this group did not include any experts, Shimomura told those attending the IGEL panel that there were in fact three top-ranked nuclear experts on hand. However, these experts were incapable of contributing to the decision-making, because of what Shimomura called not just a blackout of energy, but a “blackout of experts,” who seemed incapable of providing any useful guidance.

“With each new report from the site, the prime minister would ask [the experts] what he should do ... and each time they averted their eyes.... Once the prime minister asked one of the scientific experts a question directly, but the expert was at a complete loss for words.” Even when asked to consult with his company, this expert was frozen in place until Shimomura literally walked up to him, and whispered into his ear that he should take out his cell phone and call his company for answers in the moment. “I was shocked,” said Shimomura. “He had lost his ability to make any decisions on his own.”

The prime minister also contributed to the confusion. Instead of helping to orchestrate the vast multitude of problems contributing to the disaster, Prime Minister Kan immersed himself in the minutiae of the nuclear plant. Shiozaki reports that Kan and his closest advisors brought a white board into his office and started “counting the number of trucks that were trying to arrive at the Fukushima nuclear plant, trying to check what types of electricity codes could be connected to the power plants.” In a vain attempt to gain direct knowledge of what was going on, Kan himself visited the Fukushima Daiichi plant, which “disrupted the chain of command and brought disorder to an already dire situation at the site,” according to the National Diet’s report.

The prime minister also refused to delegate decision-making. Kan “allowed the reporting line to stretch out in a very multi-layered hierarchy up to the final decision maker, which was him,” impeding what was already poor communications with TEPCO, noted Shiozaki. It was not until “five days after the crisis that he delegated the decision-making power to a lower-level joint team,” which included both his advisors and TEPCO management.

The problem was not just that Prime Minister Kan made these mistakes, but that no one in his inner circle questioned his decisions, offered other options or acted independently of the Kantei. In his introduction to the National Diet’s report, Kurokawa attributes this failing to Japanese culture. “What must be admitted, very painfully, is that this was a disaster ‘Made in Japan,’ ” Kurokawa writes. “ Its fundamental causes are to be found in the ingrained conventions of Japanese culture: Our reflexive obedience; our reluctance to question authority; our devotion to ‘sticking with the program’; our group-ism; and our insularity.” It was this “mindset of obedience to authority” that hindered the free flow of ideas and information, according to the parliamentary report.

Japanese culture and authoritarian leadership, which have endured for centuries, clearly offer important advantages. But those benefits are much more evident when information and time are plentiful. “Hierarchical culture works well when you have lots of time to make a decision; it helps you make a good decision,” notes Michel-Kerjan. “But by definition, crisis management is about making very quick decisions with very limited information.”

Feldman believes that “stereotypes such as ‘reflexive obedience’ and ‘reluctance to question authority’ are not terribly illuminating, and seem an odd juxtaposition with the public anti-nuclear demonstrations

post-Fukushima.” He agrees with those who suggest that Prime Minister Kan’s personal leadership style is just as likely as Japanese culture to have discouraged dissent.

It is never easy to distinguish the personal from the cultural. Was Kan’s failure to delegate the result of a personality trait or of Japanese culture? Did the nuclear experts in his office and at the site fail to speak up because of a cultural mindset or because, as some of them later told interviewers, they were intimidated by Kan, who berated them publicly?

Whatever the mix of culture and personal qualities were in the Fukushima case, the lesson for leaders struggling to manage a crisis is as simple to state as it is difficult to implement: Rise above the fog of details; encourage fresh thinking and frank communication; and delegate decision-making to those best able to make decisions on the ground.

### **Lesson 3: In a crisis, leaders have to prevent panic *and* maintain credibility. Rehearsals help.**

At each stage of the crisis, experts offered Kan varying estimates of the area that should be evacuated, and each time, Kan took the safest option. But the estimates kept changing, so Kan kept changing what he told the public. Paradoxically, this emphasis on safety and truthfulness led to growing fear and mistrust.

“When the safest option was 10 kilometers, the prime minister went with 10 kilometers. When it was 20 kilometers, he chose 20 kilometers,” Shimomura said. “But each time the radius of the evacuation zone increased, so did the people’s mistrust of the government. People accused the government of underestimating and playing down the gravity of the situation. It was far from the case. The public thought we were lying or hiding something.” Yet, “we didn’t have the luxury of any certain information to hide.”

“What would you do in a situation like that?” asked Shiozaki. “If you said on the first day, ‘Twenty kilometers should evacuate,’ you’re likely to cause a panic. Roads would be filled. Elderly people would be left behind in their homes. People in hospitals might lose their lives because of the confusion.” And in fact, when Kan first announced an evacuation zone of just three kilometers, he had been told that was the safest distance.

Shimomura, who was in charge of communication with the public, noted: “If your leader is a liar, you can solve the problem by kicking out your leader. But if the leader is honest, but still causes these problems, what should you do? This was my most challenging leadership experience.”

Shimomura told those at the IGEL panel that “for two years, I have asked myself the question, was there a better way to handle the crisis communication?” His answer: “Try to share information about the whole iceberg, not only the tip of the iceberg.”

In particular, Shimomura believes that while Kan was personally announcing the official evacuation zone, others in his office — but not the prime minister himself — should have provided the public with the information leading up to the decision, including other possibilities or scenarios that were considered during various meetings. This would allow Kan to maintain his position of authority but also make it clear that his announcement was not likely to be the last word, that what was being released

was provisional. “The PM could have shown the tip and his office could have shown the rest of the iceberg.”

A more direct version of this approach, reminiscent of the way Mayor Rudolph Giuliani communicated with the public during the 9/11 crisis in New York City, has proven effective in other crises. The prime minister, suggests Michel-Kerjan, could have told people that he would report to them on a regular basis, say twice a day, and share what he knew at that point. This approach would allow him to maintain a reassuring position of authority, but also admit the truth about what he did and did not know. And by telling people that ‘we are all in this together, all struggling to get the right information,’ he could also help build a sense of trust and community.

What many people don’t realize about Giuliani’s mastery of this approach was that he had rehearsed it numerous times. Michel-Kerjan points out that New York City had large-scale crisis management rehearsals on a quarterly basis before 9/11, and Giuliani participated in every one.

This last point is key. When Michel-Kerjan works with corporations on similar rehearsals, he always insists that the CEOs participate, because they are the ones who will be on the front lines. “When you look at companies that have handled crises well,” says Michel-Kerjan, “every one of them has had conventional and unconventional rehearsal exercises quite a few times, typically with the CEO present.”

The performance of the JX Nippon Oil and Energy Corporation offers compelling evidence of how useful rehearsals can be. For the past 20 years, ever since the Kobe earthquake, the company has conducted annual disaster drills that included the formation and training of teams charged with specific duties: employee safety, the gathering of information from within the company and from outside sources, identifying and securing emergency supplies, information technology and engineering and construction.

Hiroshi Hosoi, executive officer and senior vice president of the company, told the IGEL attendees that this preparation helped explain how JX Nippon was able to overcome the devastation of its Sendai refinery and the loss of all its trucks and railroad tankers, and find ways to deliver badly needed fuel for cars, home heating and emergency vehicles.

The company also worked with competitors and the government to “enable fuel supplies to flow smoothly to where they were most needed, like evacuation centers, hospitals, power plants, etc.,” said Hosoi. And throughout the crisis, JX Nippon communicated on a regular basis with the public, updating which service stations were open and discussing the supply situation on their website.

While Hosoi pointed out that “March 11 was different,” it is clear that the yearly disaster drills prepared the company to rise to the same challenges all leaders confront in a crisis — facing up to a worst-case situation, quickly gathering information, encouraging fresh thinking, delegating decision-making and communicating openly and regularly with a community desperate for answers.