The Triple Catastrophe: Japan’s 03/11/11 Earthquake, Tsunami, and Nuclear Crisis

Just after 2:45 p.m. on Friday, March 11, 2011, inhabitants of northeastern Honshu – Japan’s largest island and home to Tokyo, the country’s densely populated capital – felt the ground shake violently beneath them. Although the Japanese were accustomed to powerful tremors, this one (soon termed the Great East Japan Earthquake) struck with frightening intensity.¹ With a magnitude of 9.0, it was Japan’s largest earthquake in the modern era and the world’s fourth largest since 1900.²

Due in large part to mitigation and preparedness measures put in place after the 1995 Great Hanshin-Awaji Earthquake, which caused significant damage in and around the city of Kobe,³ initial casualties and physical damage were relatively low.⁴ But, having occurred along the ocean floor at the intersection of the Pacific and

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³ Causing the deaths of more than 6,400 people, the Hanshin-Awaji Earthquake triggered a set of reforms intended to improve Japan’s resilience against future seismic events. Post-Hanshin developments included the enactment and enforcement of stricter building codes, the emergence of a more robust network of nongovernmental organizations involved in disaster relief, and the initiation of a range of community preparedness efforts, such as evacuation planning and exercises. They also included the establishment of mechanisms within the prime minister’s office dedicated to crisis management issues, leading to a greater centralization of disaster management powers at the national level, the merits of which would be intensely debated in the aftermath of the March 11 disasters (Cabinet Office, Government of Japan, Disaster Management in Japan, February 2011; and Kingston, Natural Disaster and Nuclear Crisis in Japan).

North American tectonic plates, the tremor also unleashed a series of tsunami waves that began racing toward Japan’s Tohoku region\(^5\) (northern Honshu) at speeds of up to 500 miles per hour. Measuring as high as 38 meters at landfall,\(^6\) the tsunami inflicted catastrophic damage along approximately 500 kilometers of coastline, destroying whole communities, taking the lives of over 20,000 people,\(^7\) and displacing hundreds of thousands of survivors.\(^8\)

But the March 11 crisis did not end there. A series of events triggered by the earthquake and tsunami also compromised the cooling system at the Fukushima Daiichi nuclear power plant, located roughly 100 miles southwest of the epicenter, exposing Japan – the only country ever to have been attacked by atomic weapons – to the terrifying prospect of a nuclear meltdown. Attracting global concern and remaining volatile for months on end, the situation at Fukushima Daiichi had serious long-term implications for national energy policy and for the health and safety of area residents, who were forced to abandon their homes to avoid sustained radiological exposure.

At a televised news conference held on Sunday, March 13, Prime Minister Naoto Kan spoke to the severity of the situation. “In the 65 years after the end of World War II,” he declared, “this is the toughest and the most difficult crisis for Japan.”\(^9\) Indeed, as they sought to simultaneously deal with the severe aftereffects of the natural disaster and the worsening nuclear emergency, Japan’s political leaders and emergency response officials across all levels of government confronted a host of unprecedented challenges and a long list of difficult questions. With severely crippled communication and transportation systems, how would they obtain sufficient situational awareness about conditions and needs in the affected area? How would they balance the multiple and varied demands that were rapidly emerging across a broad landscape? Would preexisting response plans and mechanisms prove sufficient – or would officials have to adapt and improvise strategies on the fly? And to what extent – if any – could government hope to centrally coordinate the massive relief effort that would soon unfold?

See Exhibits 1 and 2, respectively, for maps indicating the location of the earthquake’s epicenter and of the Tohoku region in relation to the rest of Japan.

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\(^5\) The Tohoku region encompasses the six northernmost Honshu prefectures, including Aomori, Fukushima, Iwate, and Miyagi, which were the most heavily affected by the tsunami.

\(^6\) USGS, Magnitude 9.0 – Near the East Coast of Honshu, Japan.

\(^7\) This figure includes individuals officially categorized as “missing.”


A Mega Earthquake, a Catastrophic Tsunami

At 2:46 p.m. local time, the Great East Japan Earthquake struck off the northeastern coast of Honshu. Its violent shaking lasted more than five minutes—an unusually long time—and manifested itself in a variety of ways: solid ground cracked and liquefied; skyscrapers swayed back and forth with terrifying intensity; furniture, equipment, groceries, and supplies crashed to the floor in countless homes, offices, and stores; and transit systems screeched to a halt. Thanks in large part to Japan’s enforcement of strict seismic building codes, an impressive amount of infrastructure survived intact; but a number of buildings, bridges, and roadways still sustained serious damage. In a particularly striking illustration of the earthquake’s power, parts of the Tohoku shoreline dropped by as much as three feet.

Capturing the tremor’s severity, a local official in Sendai (the capital of Miyagi Prefecture and the closest major city to the epicenter) recalled, “I never experienced such a strong earthquake in my life. ... I thought it would stop, but it just kept shaking and shaking, and getting stronger.” In fact, severe trembling continued to occur throughout the remainder of the day—and beyond—further fraying the nerves of Honshu’s rattled inhabitants. Within just 45 minutes of the earthquake, three aftershocks with magnitudes greater than 7.0 rocked the island, and hundreds more followed over the next several days and weeks, including dozens with magnitudes measuring 6.0 and above.

Circumstances became especially dire in eastern Tohoku, where a tsunami sparked by the massive subsea earthquake began battering the coast within just 30 minutes. Depending on the height of the seabed and the local topography, the tsunami’s size and intensity at impact varied significantly—but in many places it took the form of a series of gigantic waves that wrought destruction across an area already suffering from years of economic decline and population loss.

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12 Japan’s buildings and infrastructure withstood the shock remarkably well, given that the Great East Japan Earthquake was estimated to be over 500 times more powerful than the tremor that had devastated Haiti just a year earlier, in January 2010 (Kingston, Natural Disaster and Nuclear Crisis in Japan; and NOVA, Japan’s Killer Quake).
13 NOVA, Japan’s Killer Quake.
15 Tokuyama, “Learning from Japan’s Ordeal.”
17 Samuels, 3.11: Disaster and Change in Japan.
Slamming into and cascading over large sea walls built to protect against this very type of event – but not sufficient to block waves of this size – the tsunami swept through ports, decimated fisheries (a backbone of the regional economy), swamped farmland and rice paddies, and tore apart low-lying neighborhoods. As its waves crashed into and destroyed vehicles, infrastructure, and utility lines, they absorbed and pushed along enormous amounts of debris, growing ever more destructive. In some places, the waves pushed into rivers, reversing currents and reaching several kilometers inland. Elsewhere, as the tsunami retreated back to sea, it formed massive whirlpools that churned in the open water. In its wake, fires ignited by ruptured gas lines and damaged oil refineries burned across the devastated landscape.  

Immediately following the earthquake, the Japan Meteorological Agency (JMA) announced that a magnitude 8.0 event had occurred. It also warned that a tsunami as high as 6 meters could be on its way. Some municipalities, having received JMA’s notifications either directly or from prefectural governments, were then able to sound sirens and broadcast evacuation instructions via outdoor loudspeakers. Others, however, scrambled to disseminate the warnings through alternate channels, since the earthquake had knocked out their public announcement systems.  

In the end, even though the vast majority of residents managed to safely relocate in advance of the tsunami, far too many experienced difficulty trying to do so: those fleeing by car found themselves mired in gridlock; others, who moved slowly or required assistance (such as the disabled and elderly), simply did not have enough time to reach safety. And while JMA’s initial warning had prompted some people to take shelter in locations secure enough to withstand a moderately sized tsunami, not all sites were capable of enduring one exceeding 10 meters, which the agency soon indicated was possible. For many of these evacuees, JMA’s revised alerts (the first issued at 3:14 PM and another at 3:31 PM) came too late; and as the tsunami crashed ashore, in some places approaching 40 meters in height, buildings that just minutes earlier had offered safe haven became deathtraps. Together, these factors contributed to a death toll exceeding 20,000 – an enormous number for a highly developed country like Japan, with its sophisticated levels of emergency preparedness.

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18 Ibid; and Interview with senior officials, Miyagi Prefecture, August 7, 2012
19 The earthquake’s magnitude was later revised to 9.0.
22 Tokyo Fire Department, “What Should be Improved at TFD (Lessons from the Earthquake).”
23 Interview with senior officials, Miyagi Prefecture.
24 FDMA, “How FDMA Responded to the 2011 Great East Japan Earthquake and Tsunami.”
25 Due to the demographics of the region and the special challenges of evacuating the elderly, more than half the casualties were older than 65 (Samuels, 3.11: Disaster and Change in Japan).
“Everything is Coming to an End”: Enduring the Tsunami’s Wrath in Rikuzentakata and Beyond

Communities up and down the Tohoku coast had long understood that their chances of soon experiencing a powerful, offshore earthquake were extremely high. The city of Rikuzentakata – located in Iwate Prefecture and home to about 24,000 people – was no exception, and like their counterparts in neighboring jurisdictions, its leaders had spent a considerable amount of time planning and preparing for a major seismic event. Among other things, they had conducted trainings for local officials, supported community disaster prevention organizations, and distributed hazard maps to residents.

When the Great East Japan Earthquake struck, Rikuzentakata’s public officials moved swiftly to prepare for the possible arrival of a tsunami. Among other things, they sounded the city’s outdoor warning sirens, which prompted many citizens to report to pre-identified evacuation centers. For their part, volunteer firefighters made a frantic effort to convince residents who hadn’t yet relocated to do so quickly. At the same time, they also attempted to manage the rapidly swelling evacuation traffic, the chaos of which was beginning to present its own dangers. When some of the city’s massive sea-gates failed to close automatically, yet others made a valiant but ultimately futile effort to shut them manually. Tragically, 51 of these firefighters lost their lives in Rikuzentakata, battling the tsunami up until the very last moment.

In fact, the city endured one horror after another on March 11 – including at evacuation sites located in its low-lying center. Based on hazard data and guidance provided by the Iwate Prefectural government, local officials had designated several places to which area residents and workers should evacuate in the event of a tsunami. Among them were a city concert hall, the Takata Hospital, and a public gymnasium; these buildings were located within the simulated tsunami inundation area, but believed to be tall and strong enough to shelter from the impact of tsunami. On the afternoon of March 11, many residents initially reported to these sites – but the height of that day’s tsunami far surpassed the estimates that had informed the city’s planning efforts, and these pre-identified evacuation centers no longer guaranteed safe haven to those gathered within their walls. In one last attempt to reach safety, some residents decided to relocate to higher ground. Matsumi Konno, who struggled to lead one group to what he hoped would be a more secure location at city hall, later described the terrifying conditions they encountered as they fled the tsunami’s wrath. “It was black, black water,” he remembered. “It was as if Godzilla had come and was trying to eat the people.”

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27 Like other rural communities in Japan, the city employed just a small force of professional firefighters and primarily relied on private volunteer fire brigades.

28 Personal Communication with Takashi Kubota, Deputy Mayor, Rikuzentakata, December 1, 2015.

Unfortunately, not even all who found their way to city hall escaped the brutal force of the tsunami; and anyone who failed to reach the top of the building met the same deadly fate as those stuck outside. In total, Rikuzentakata lost 1,757 of its 24,246 residents, including 111 local officials – or about one-fourth of the city’s civil service, including contracted and term employees. (See Exhibit 3 for images of the damaged gymnasium.)

Similar scenes played out in communities up and down the Tohoku coast, with residents fleeing to rooftops, elevated roadways, and steep hillsides – any place they thought high enough to escape the tsunami’s reach. Some were luckier than others. In a terrible echo of events in Rikuzentaka, local officials in Minami Sanriku, Miyagi Prefecture, took to the roof of their own town hall; but most were swept away by a powerful wave that swamped the building. Only ten officials managed to hold on and survive. Meanwhile, those who did make it to safety on higher ground in Minami Sanriku and other coastal communities were left to gaze in stunned horror as the tsunami slammed ashore and absorbed all that lay below them. Wrote the *New York Times* of the reaction of residents who had evacuated to the second floor of a school in the fishing village of Yuriage (also in Miyagi):

> From the windows, they watched uprooted homes and cars flowing by on the wave. People did not speak .... They just cried and moaned, a collective “Ahhhh!” as they watched the destruction unfold.

In the village of Noda, Iwate Prefecture, an onlooker exclaimed in despair, “Everything is coming to an end!”

*In the Tsunami’s Wake: The Scene in Rikuzentakata*

By 5:30 the next morning, the tsunami had receded from Rikuzentakata and other parts of the coast. The quiet that followed was a welcome relief, but survivors – including local leaders who now faced the difficult task of guiding their community out of the crisis – were left stranded, completely cut off from the outside world, and unsure how to proceed. “We didn’t have electricity, and cell phones didn’t connect either. We had no way to communicate what was happening,” recollected Rikuzentakata Mayor Futoshi Toba, who had taken office just a month earlier. “I didn’t know what was going on .... [And] I didn’t know what to do.”

As dawn broke, helicopters appeared in the sky above, briefly giving Toba and others reason to hope that outside help had arrived. However, despite some frantic waving from the ground, they soon realized the pilots were not yet prepared to land and deliver aid. “There was no sign of them coming to rescue us,” the mayor

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31 Kiyoshi Murakami, Goodwill Ambassador, Rikuzentakata, and President, AidTAKATA, *Resilience in the Face of Catastrophe: Rikuzentakata’s Ongoing Recovery from Japan’s 3.11 Triple Disaster*, presentation made at Harvard Kennedy School, Cambridge, MA, September 12, 2013; and Samuels, *3.11: Disaster and Change in Japan*.

32 Gerald L. Curtis, “Tohoku Diary: Reportage on the Tohoku Disaster.”


35 Interview with Futoshi Toba, Mayor, Rikuzentakata, Iwate Prefecture, August 9, 2012. Unless noted, material in this section is drawn from this interview, as are subsequent quotations from and attributions to Mayor Toba.
recalled. He thus turned to a small group of city officials who had survived the tsunami alongside him to discuss how best to proceed. After reviewing their options, they decided to make their way to the city’s school lunch preparation facility and set up a local emergency response headquarters there.

The journey to the facility was arduous and heartbreaking. “There was a lot of debris; and we would climb up [onto piles of it] and see a lot of bodies,” Mayor Toba remembered. With strong seismic aftershocks continuing to rattle the area, one fear in particular hung over him and his colleagues. “We were also worried about the next tsunami,” he noted.36 Thus, instead of following the main route, which would have carried them through tsunami-vulnerable areas, they navigated a more difficult path, hiking up and down a mountain to reach their destination.

Arriving at the lunch preparation facility, the group came upon an emotionally wrenching scene of survivors searching for missing loved ones. But the city’s leaders also discovered that external assistance had, in fact, begun to materialize: about 100 members of Japan’s Self Defense Forces (the country’s military, commonly referred to by its acronym, SDF) had just reported to the facility. Taking the opportunity to establish basic priorities for the emerging response, Mayor Toba asked the SDF contingent to concentrate on saving anyone who had survived the tsunami but was now stranded or hurt. Recognizing that the disaster had completely immobilized his government and feeling that he, personally, was incapable of giving much more guidance at that point, Toba delegated responsibility for most operational tasks to the SDF. “Officially, I [should] have taken the lead, because I was at the top of the city,” he observed, “but in that reality, it was impossible for me to [do so].” Not only had the tsunami seriously damaged most of Rikuzentakata’s key public facilities, including city hall and the fire station, but many surviving local officials were already or would soon be mourning the loss of relatives and colleagues.

**Beyond the Coast: A Struggle for Situational Awareness**

The appearance of SDF troops in Rikuzentakata and other tsunami-ravaged communities represented the start of what was to become a massive relief operation across eastern Tohoku’s devasted landscape. In particular, the prefectural governments of Fukushima, Iwate, and Miyagi (based in the capital cities of Fukushima, Morioka, and Sendai, respectively) and the national government in Tokyo would play essential roles in coordinating and delivering aid to the region. But before this effort could fully take shape, officials at both levels of government first needed to get a sense of conditions within the disaster zone. This was by no means an easy task, given the extent of destruction wrought by the Great East Japan Earthquake and Tsunami.

*The Prefectures’ Perspective*

Prefectures – government subdivisions roughly equivalent to provinces or states in other countries – play an integral role in Japan’s disaster response system, serving as a bridge between affected localities and the national government. Accordingly, in reaction to the powerful force of the March 11 earthquake, officials in Fukushima, Iwate, and Miyagi immediately moved to maximize their situational awareness of conditions in the disaster zone. Only with this information, they realized, could they adequately support survivors and represent their needs to the national government.

36 Toba and others were concerned that one of the earthquake’s many aftershocks might trigger yet another tsunami.
In the minutes following the massive tremor, prefectural officials aimed to collect as much information as they could, through whatever means possible. Among other things, they tuned into live television broadcast and monitored computer notifications from the Japan Meteorological Agency (JMA). They also reached out to affected localities via telephone, which in the immediate aftermath of the earthquake still functioned, for initial assessments of conditions on the ground. In Iwate, this first meant calling municipal officials in Rikuzentakata and Ofunato, as these two cities were expected to bear the brunt of the long-predicted Miyagi Offshore Earthquake, which seismologists believed had a 90% probability of occurring within 30 years. Fortunately, initial reports from both Rikuzentakta and Ofunato were fairly positive, with local leaders indicating that they were unaware of any major structural damage. All the same, prefectural officials remained worried about the possibility of a tsunami striking the coast, and they began reaching out to vulnerable municipalities to reiterate JMA’s tsunami warnings.37

The three prefectures also proceeded to activate disaster response headquarters in their capital cities.38 Headed by the prefectural governors, the headquarters were intended to coordinate the many response organizations that soon began converging on the region. (Among those eventually represented at these headquarters were SDF liaison officers, senior members of fire departments and police forces, and medical personnel.) But prefectural officials noted that since many front-line response activities, especially in the immediate aftermath of the disaster, were actually coordinated on-scene, the headquarters largely focused on collecting information and forwarding requests for support to national agencies, such as the Ministry of Defense and the Fire and Disaster Management Agency (FDMA).39

Although the prefectures managed to establish their headquarters quite rapidly, doing so was not without its challenges. In Fukushima, for instance, officials worried that the pre-designated location – the prefectural government office building – was not sufficiently resistant to an earthquake as powerful as the one that had just occurred. They thus scrambled to find an alternate venue from which they could operate. Although they soon found a more secure site, they then discovered that they would have to make do without the equipment and technologies that had been available in the former location. To maintain contact with coastal communities, officials set about collecting satellite phones, which helped address the problem – but they still had to contend with the space’s severely limited wireless system (the original location had been equipped with 47 wireless lines; the new location had only two.) Despite these challenges, Fukushima officials reported that all 10 of the prefecture’s coastal municipalities received tsunami warnings in advance of the first wave’s arrival.40

37 Interview with senior officials, Iwate Prefecture, August 8, 2012.
38 Separate hubs for liaisons representing national ministries -- Local Disaster Response Headquarters -- were established in close proximity to the prefectural headquarters (Interview with senior officials, Fukushima Prefecture, August 6, 2012; and interview with senior officials, Miyagi Prefecture, August 7, 2012).
39 Interview with senior officials, Iwate Prefecture, August 8, 2012.
40 Interview with senior officials, Fukushima Prefecture, August 6, 2012.
When the tsunami’s powerful waves crashed ashore, however, they wiped out almost all forms of communication, which seriously compromised the prefectures’ efforts to help facilitate the emerging response.\(^{41}\) As one prefectural official observed, “Communication lines were shut down. In addition, specific information as to what kind of responses was required – what kind of help was needed, what supply was needed, and where evacuees were – did not come to us [from localities]. All we could gather was that it was catastrophic damage.” The lack of information resulted from several different factors: landlines and cellular systems had failed, a number of local government buildings had been destroyed or badly damaged (and officials based in them had been stranded or killed), and communication systems lacked essential power supplies. And even though almost every municipality owned one or two satellite phones, this was simply not enough for supporting communication with the prefectural governments. As one official in Miyagi explained, “Usage exceeded capacity.”\(^{42}\)

All the same, a sense of the scale and nature of destruction eventually began to emerge in the prefectural capitals Fukushima City, Morioka, and Sendai – even if very slowly and only in bits and pieces. “On the day of [the earthquake and tsunami], we had no idea about the number of deaths and injuries,” one prefectural official recalled. “Information was very fragmentary, such as ‘all the houses along the coast up to Route 6 were gone, etc.’” While reports like this characterized much of the information available to prefectural leaders throughout the remainder of March 11,\(^{43}\) communication started to improve the next day, once SDF advance teams managed to find their way to coastal communities and began serving as the main conduit of information from the scene of the disaster to the prefectures’ disaster response headquarters.\(^{44}\)

To further improve communication, the prefectures also worked to provide isolated communities with equipment. In Miyagi, for example, prefectural workers collected satellite phone units from private telecommunication companies, which SDF troops then delivered to municipalities affected by the tsunami (by March 13, the SDF had distributed 200 satellite phones across the prefecture). This, Miyagi officials observed, went a long way in improving their understanding of conditions on the ground.\(^{45}\)

Tokyo Gets its Bearings

Back in Tokyo, some 230 miles from the earthquake’s epicenter, national officials had also sprung into action as soon as the initial shaking had subsided. Among them were members of the Cabinet Secretariat’s Crisis Management Staff, most of whom had made it to the government’s Crisis Management Center – located beneath the Kantei, the prime minister’s official residence and offices – within ten minutes of the tremor.\(^{46}\) To get a sense

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\(^{41}\) Interview with senior officials, Miyagi Prefecture, August 7, 2012; and interview with senior officials, Iwate Prefecture, August 8, 2012.

\(^{42}\) Interview with senior officials, Iwate Prefecture, August 8, 2012.

\(^{43}\) Interview with senior officials, Fukushima Prefecture, August 6, 2012.

\(^{44}\) Interview with senior officials, Iwate Prefecture, August 8, 2012.

\(^{45}\) Interview with senior officials, Iwate Prefecture, August 8, 2012.

\(^{46}\) Japan does not have a national-level general purpose emergency response agency (such as FEMA in the United States), but the Secretariat’s Crisis Management Staff—headed by the Deputy Chief Cabinet Secretary for Crisis Management — is tasked
of the extent of the damage, staff members (mirroring their prefectural counterparts) concentrated on assessing
the information that was available through television broadcasts, as well as transmissions from the SDF, the Coast
Guard, and national police forces, all of which had quickly initiated sea and aerial surveillance in the Tohoku
region.

According to officials present in the center, the surveillance proved helpful in providing a “big picture”
perspective—but it also had serious limits. Details of conditions on the ground were spotty, especially after
communication systems collapsed in the aftermath of the tsunami. “At a central level, it is true that we couldn’t
figure out the extent of the damage,” one member of the Crisis Management Staff acknowledged. “We were
feeling anxious about [this] lack of information.” 47 It was abundantly clear, however, that the earthquake and the
subsequent tsunami were extraordinarily powerful and would require a substantial response. “We knew,” the
official continued, “this was not a usual [disaster], it was a gigantic one.”

Organizing the Kantei’s Response

Under Japanese law, localities are responsible for managing their own response and relief efforts, including
establishing and maintaining shelters and providing residents with essential goods and supplies. But when a major
disaster renders them incapable of performing their emergency management duties, the national government may
become more directly involved. 48 The events of March 11, as illustrated by the scale of destruction in
Rikuzentakata and scores of other coastal communities, would require such an intervention—and to a degree far
greater than what most had ever imagined.

Even though it would take some time for the actual extent of devastation to become clear to those in Tokyo,
the severity of the Great East Japan Earthquake prompted the Crisis Management Staff to swiftly set up several
groups designed to lead national-level response efforts. 49 One such entity was the Emergency Assembly Team,
which convened at the Crisis Management Center within thirty minutes of the earthquake. 50 Consisting of

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47 Interview with the Crisis Management Staff of the Cabinet Secretariat, Japanese Government, August 1, 2012.
48 Cabinet Office, Disaster Management in Japan; and interview with a former counselor, Team in Charge of Assisting the Lives of Disaster Victims, July 19, 2012.
49 Japanese law prevents the prime minister from directing other ministers and their subordinates; by bringing together senior officials during major emergencies, these bodies were thus designed to facilitate collective leadership and whole-of-government action.
50 The national government’s response plan groups emergency scenarios into various categories (e.g., natural disasters, terrorist attacks) and identifies the ministries and agencies that would constitute the Emergency Meeting/Assembly Team for
directors-general from ministries and agencies responsible for various aspects of the response, the team was tasked with analyzing the disaster and providing information and advice to the prime minister. At roughly the same time, the Crisis Management Staff also supported the activation of the Emergency Headquarters for Disaster Response, which was headed by the prime minister and included members of the cabinet. Responsible for coordinating the ministries’ responses to an emergency, it, too, was based out of the Kantei. 51

Over the next several hours, additional bodies would be created within the context, especially once the national government learned of the severity of the situation at the Fukushima Daiichi Nuclear Power Plant.

National Agencies Mobilize

Meanwhile, various ministries and other public agencies had activated their own response plans immediately after the earthquake had struck, and they rapidly began taking steps to mobilize personnel and marshal resources. Although many of these organizations would be represented by senior leadership within the coordination units at the Kantei, their early efforts were largely self-initiated and decentralized due to the scale of the devastation, disruption to communication systems, and the pressing need for immediate relief. Among those taking early action were the Self Defense Forces (SDF), the Coast Guard, the National Police Agency, firefighting units, and the Ministry of Land, Infrastructure, Transport and Tourism (MLIT).

The Self Defense Forces: An Unprecedented Mobilization

At 2:50 p.m. – just four minutes after the earthquake – SDF leaders set up a Disaster Response Headquarters at the Ministry of Defense’s Tokyo campus in Ichigaya. From there, they began organizing what would become the largest operation in SDF history, ultimately involving 107,000 personnel (close to half of its manpower), 52 about 550 aircraft, and almost 60 ships. 53 Given the scope and scale of the task that lay before it, the SDF would experience many firsts throughout the course of the ensuing relief effort, including the establishment of Japan’s first-ever Joint Task Force (JTF-Tohoku), which encompassed all three of its services – the Ground, Maritime, and Air Self Defense Forces; 54 the activation of Reserve and Ready Reserve personnel (consisting largely of interpreters,
emergency medical personnel, and other specialists); and the implementation of a cooperative effort with the American and Australian militaries, termed Operation Tomodachi (“friends” in Japanese).  

As had their counterparts at the Kantei and the prefectures’ disaster response headquarters, leaders of the SDF’s Disaster Response Headquarters initially prioritized maximizing their situational awareness. Accordingly, they proceeded to launch many of the aircraft that conducted much of the critical early surveillance. The SDF also scrambled to reestablish communication between headquarters and units already stationed in the disaster zone.

At the same time, SDF officers began taking steps to deploy massive amounts of personnel to affected communities. Two factors, in particular, helped expedite the mobilization of troops. In a significant shift from procedures that had been in place during the Hanshin-Awaji Earthquake, which had required them to wait for prefectural governors to formally request support before responding, commanders of locally-based SDF units now had the authority to automatically mobilize in the wake of large-scale disasters. In addition, local governments no longer had to agree to pay the costs of SDF forces conducting rescue and relief within their jurisdictions. As a result, in comparison to the Hanshin-Awaji response, when just 9,500 SDF members had deployed after three days, 8,000 personnel were deployed by the close of March 11; 20,000 the following day; and 66,000 by day three.

Among the SDF personnel who began fanning out across Tohoku were liaisons charged with expediting aid requests from the affected communities. Joint Staff officers expressed considerable pride in the liaisons’ work, which, they said, helped fill the void left by the incapacitated local governments. But they also voiced concerns. Despite past efforts to build relationships, there was still confusion as to how, exactly, the SDF should operate in respect to the authority of local governments. Going forward, members of the Joint Staff argued, SDF’s relationship with localities in post-disaster scenarios needed clarification.

Meanwhile, despite the efforts of the units that had formed within the Kantei, SDF leaders quickly concluded that coordination across the national government was “not very good.” Consequently, they began developing

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57 Interview with senior officer, Joint Staff, Japan Self Defense Force, July 20, 2012.
58 According to a senior officer of SDF’s Joint Staff, annual exercises with localities helped reinforce relationships – including one held in 2008 that simulated a scenario similar to the events of March 11.
60 “SDF Operations in Response to the Great East Japan Earthquake.”
61 Interview with senior officer, Joint Staff, Japan Self Defense Force, July 20, 2012.
62 “SDF Operations in Response to the Great East Japan Earthquake.”
various coordination mechanisms of their own.\footnote{Interview with senior officer, Joint Staff, Japan Self Defense Force, July 20, 2012.} In Tohoku, for instance, the Sendai Airport would emerge as a major hub of the response, with SDF units, local authorities, private companies, and US military forces converging at the tsunami-damaged complex.\footnote{National Geographic, \textit{Witness: Disaster in Japan}, available at \url{http://www.dailymotion.com/video/xk1ri0_national-geographic-witness-disaster-in-japan_shortfilms} [accessed November 12, 2013]; and Mikio Ishiwatari, “Institution and Governance Related Learning from the East Japan Earthquake and Tsunami,” in \textit{Disaster Recovery: Used or Misused Development Opportunity}, Rajib Shaw, ed., Springer Japan, 2014.} Many of these organizations at first operated independently of one another, however; and to bring some order to relief efforts, the SDF began convening multi-agency coordination meetings at the airport. While voluntary, the meetings eventually featured the participation of most entities operating on-site, and according to members of SDF’s Joint Staff, they generally served their purpose of bringing greater cohesion to relief efforts.\footnote{Interview with senior officer, Joint Staff, Japan Self Defense Force, July 20, 2012.}

\textbf{Operation Tomodachi}

Another collaborative effort spearheaded by SDF was \textit{Operation Tomodachi}. A close partnership with the U.S. military (and, to a lesser extent, Australian forces), \textit{Tomodachi} ultimately involved more than 16,000 U.S. military personnel, 15 ships, and 140 aircraft. Through \textit{Tomodachi}, which was directed out of three coordination centers – the Ministry of Defense in Ichigaya (central Tokyo), the US Forces Japan headquarters in Yokota (western Tokyo), and the headquarters of JTF-Tohoku in Sendai (Miyagi Prefecture) – the U.S. and Australian forces provided critical support by transporting SDF units from Hokkaido and Okinawa islands to the Tohoku region, along with supplies and equipment that Japan had stockpiled in anticipation of a major disaster.\footnote{“SDF Operations in Response to the Great East Japan Earthquake.”}

Notwithstanding some political tensions between Washington and Tokyo at the time of the March 11 events,\footnote{Interview with senior officer, Joint Staff, Japan Self Defense Force, July 31, 2012.} senior SDF officers characterized \textit{Tomodachi} as “tremendously important.”\footnote{Ministry of Defense, \textit{Japan Defense Focus}, March 2012; and telephone interview with U.S. Marine Corps captain, October 8, 2014.} Tomodachi’s success, they said, was built on years of bilateral exercises and consultation among the long-time allies. Reflecting back on the March 11 experience, one officer underscored this point. “We had a lot of experience coordinating with the U.S. through many exercises,” he said. “So the channels of coordination were there.”\footnote{“SDF Operations in Response to the Great East Japan Earthquake.”}
U.S. military officers who participated in Tomodachi agreed that the many years of collaboration proved enormously beneficial as they set about organizing and implementing the operation. Tomodachi, they observed, was built on long-standing relationships, which contributed to a solid awareness of each side’s capabilities and of the region’s geographic and political landscape. All the same, it was not a seamless effort. According to one U.S. Marine Corps captain involved in Tomodachi, moving U.S. aircraft and personnel from South Korea, where the Marines had been taking part in a major military exercise at the time of the earthquake and tsunami, was a difficult and time-consuming process. Moreover, he noted, because US Forces-Japan did not have a plan for responding to such a large-scale disaster, they had to rely on existing defense plans. Because these plans were built around an invasion scenario, they did not address many of the needs and challenges of the March 11 disasters and, consequently, caused some confusion as the militaries worked to adapt it.  

Meanwhile, once they had arrived in Japan, Marine Corps units received conflicting reports from the SDF about their role in the relief effort. Although they were prepared to begin providing aid across Tohoku, the SDF initially instructed them to “step down” and operate in a limited support role. Only on March 13, two days after the earthquake and tsunami, did the SDF ask them to become more directly involved. According to the Marine Corps captain, the change coincided with improvements in the overall coordination by the units that had formed within the Kantei, which had by then developed a more detailed understanding of conditions and needs in the affected areas.

For their part, SDF leaders expressed considerable pride in what their forces and key partners managed to accomplish amidst significant novelty and a host of operational challenges. Indeed, in addition to conducting critical early surveillance and coordinating with other organizations on multiple fronts, the SDF performed a number of the most crucial response and relief tasks. Among other things, they conducted the bulk of search and rescue efforts (in total, the SDF saved about 70% of the 27,000 people rescued); supported the clearance of debris from roadways; delivered water, food, and medical supplies; and provided temporary bathing facilities (important not only for comfort, but also culturally) to survivors who had congregated in evacuation centers and other temporary shelters.

According to a senior member of the Joint Staff, although preexisting response plans helped guide much of this work, the SDF frequently had to adapt its approach due to the dramatic scale of the disaster and to meet local needs, which varied considerably from one community to another. SDF leaders also acknowledged that they had never thought through a deployment on this scale – and, they admitted, as days turned into weeks and weeks into months, coordinating so many people and resources for an extended duration proved enormously taxing.

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71 Telephone interview with U.S. Marine Corps Captain, October 8, 2014.
72 Ministry of Defense, Japan Defense Focus, March 2012; and “SDF Operations in Response to the Great East Japan Earthquake.”
73 Interview with senior officer, Joint Staff, Japan Self Defense Force, July 20, 2012.
74 Interview with senior officer, Joint Staff, Japan Self Defense Force, July 31, 2012.
would be made even more difficult once the SDF took on important elements of the effort to bring the nuclear crisis at Fukushima Daiichi under control.75

The Tohoku Regional Bureau of MLIT: Improvisation and Adaptation

Along with the SDF, several other national entities also played key roles in providing early relief. Among the most prominent was Japan’s Ministry of Land, Infrastructure, Transport, and Tourism (MLIT) – and in particular its Tohoku Regional Bureau (TRB). When the earthquake struck on March 11, the bureau’s offices, located near the center of Sendai, were directly affected. Lockers fell to the floor and cracks spread across walls, making it unsafe for staff to remain in the damaged parts of the bureau’s complex. Fortunately, TRB’s disaster operations center was located in a building that had withstood the earthquake. Structurally sound, powered by emergency generators, and supplied with three days’ worth of food and water, the space thus served as a gathering place for TRB personnel in the immediate aftermath of the earthquake. From there, they began to consider how best to proceed.76

TRB Director General Hideo Tokuyama, who had assumed his role just a month earlier,77 decided that above all, he needed to provide his team with general guidance and reassurance. Speaking into a microphone approximately 30 minutes after the earthquake,78 he asked TRB staff members to remain calm and to proceed as they had been trained to do during emergencies. He emphasized three key objectives. First, he stressed that they should concentrate on collecting as much information on the extent and nature of damage as was possible. This included determining the safety of all of the bureau’s workers and the status of its telecommunications systems, as well as damage to transportation infrastructure. To this end, TRB liaisons deployed to the four affected prefectures of Aomori, Fukushima, Iwate, and Miyagi.79 Second, Tokuyama stressed the importance of good media outreach, knowing from past experience that the media was a critical partner in disseminating messages to the public– and that it often played a big part in determining public perceptions. Third, he emphasized the need to ensure that communication with MLIT’s central office in Tokyo was well coordinated.

At the same time, Tokuyama also had to make some urgent operational decisions. After his staff had gathered at the disaster operations center, the manager of TRB’s disaster management division asked for Tokuyama’s permission to deploy a helicopter in support of surveillance efforts. The catch, however, was that the aircraft would have to be flown by a contractor, without any TRB staff on board. Under normal circumstances, policy mandated that TRB officials accompany the helicopter crew, but, she observed, with only 2½ hours of sunlight left,  

75 For their part, prefectural officials noted that although they and individual municipalities had standing disaster prevention and response plans to coordinate actions with SDF, they, too, had never considered that “the scale of disaster would be this big” (Interview with senior officials, Iwate Prefecture, August 8, 2012).
76 Interview with Hideo Tokuyama, Director General, Tohoku Regional Bureau (TRB), Ministry for Land, Infrastructure, Transportation, and Tourism, August 8, 2012; and Tokuyama, “Learning from Japan’s Ordeal.”
77 Bungeishunju.
78 Tohoku Regional Bureau (TRB), Ministry for Land, Infrastructure, Transportation, and Tourism, Memo for Announcement to TRB Staff.
79 TRB, Memo for Announcement to TRB Staff; and TRB, Actions Taken after the East Japan Earthquake.
they simply couldn’t wait for a TRB delegation to make the hour-long journey to the airport. Eager to get a better sense of the extent of damage, Tokuyama approved her request, and at 3:23 pm – just 37 minutes after the earthquake had struck – a TRB helicopter took off from Sendai Airport. The speed with which the bureau launched the helicopter proved critical, as it was one of just two to fly out of Sendai that day. Soon thereafter the airport was overtaken by the tsunami.

TRB benefitted from having developed and installed disaster-resistant means of communication as well. Although landlines and cellular networks were not working, MLIT’s proprietary microwave telecommunications system allowed the bureau to maintain contact with most of its 100 locally-based branches. In addition, the high-tech media equipment in the operations center displayed images from approximately 1,800 fixed-point cameras situated throughout the Tohoku region. And with the center’s teleconferencing capabilities continuing to operate even after the tsunami, TRB officials were able to stay in contact with their MLIT counterparts back in Tokyo.

At 10:00 p.m. that evening, Tokuyama utilized this teleconferencing technology to talk through TRB’s strategy with MLIT Minister Akihiro Ohata. During the call, he proposed to the minister that the bureau pursue two main courses of action: (1) clearing and reopening roadways to enable the transport of aid and (2) providing general support to affected localities. The latter objective was highly unusual, given that it was well outside MLIT’s normal scope of operations and meant, potentially, bypassing prefectural governments. But Tokuyama stressed to the minister that because of the devastating effects of the tsunami, the disaster was unlike anything Japan had ever experienced, including the Hanshin-Awaji earthquake. Consequently, he argued, TRB and MLIT needed to organize as robust a response as was possible. He recollected, “I thought we would fail in the end unless we prepared for the worst and prepared big.”

Tokuyama expanded on his thinking:

In the midst of the disaster where telecommunications were shut down and some local government officials were missing from the tsunami, I knew it was only TRB that maintained a functional command and control system. I told the minister so, and proposed that we should bypass prefectural governments and provide help to municipalities directly. . . . I believe it was only TRB that was located within the area and could do initial response to this scale.

Given the conditions on the ground, he added that his staff should be empowered to take initiative and respond as they saw fit. “There was no other way than doing so,” he insisted.

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80 Although Tokuyama waited for the minister’s explicit permission before taking any action, he had already ordered his staff to take several preparatory measures that would enable TRB to move quickly once permission was granted. For instance, Tokuyama had already selected staff to dispatch to the affected municipalities and had ordered that disaster response equipment be collected and made ready for use. Indeed, once the minister gave the go-ahead, TRB was able to provide assistance on several fronts. Among other things, the bureau delivered telecommunications devices to 27 localities across three prefectures and dispatched liaisons to 31 communities.

81 TRB, Memo for Announcement to TRB Staff; and Bungeishunju.

82 Under normal conditions, TRB would work through the prefectural governments, instead of directly engaging with municipalities.
Minister Ohata replied that as long as Tokuyama adhered to the overarching objective of saving lives, he could decide what specific actions TRB should take, given that he and his staff knew the area best. Tokuyama later acknowledged that this delegation of authority was unusual—and that it may not have been entirely well received by all his colleagues in the ministry. But, he noted, “All director general level officials at MLIT—they would usually be my bosses—were present at the teleconference [with the minister] and heard Mr. Ohata’s direction. Staff members at TRB heard it here. And the teleconferences connecting to MLIT can be broadcasted to all regional bureaus in Japan, such as in Osaka, and all directors of regional bureaus heard it [as well].” Grateful for Minister Ohata’s support, Tokuyama observed that not every political leader would—or, in fact, did—grant such autonomy to his or her deputies.

Following the conference call, Tokuyama issued a memo laying out how his team would move forward—reemphasizing his two priorities of clearing transportation routes and supporting local governments. Although the bureau’s situational awareness was still limited, he recognized that the tsunami-devastated parts of eastern Tohoku were by far the worst off, and he thereby directed his staff to work overnight to organize an operation directed at the coastal areas as opposed to earthquake-damaged sections of the interior.

**Supporting localities**

Even though Tokuyama did not always formally delegate specific tasks to his subordinates in TRB’s Sendai office, officials who had taken part in the teleconference with the minister understood that they were empowered to take action as they saw fit, as long as it fell within the parameters set forth during the call. And to TRB branch staff members scattered across the disaster-stricken region, Tokuyama reiterated that they had the power to make decisions on site in order to save lives. “Since it was an extraordinary situation,” he explained, “I asked them to take appropriate measures, considering each situation.” Tokuyama believed that TRB personnel based at these branch offices were well positioned to provide aid because they interacted with local communities on a regular basis. “We always see and work with local people and have tight personal connections with the local areas,” he explained.

Working with localities, however, was not without its complications. For instance, many municipalities initially did not realize or understand that they could request extraordinary assistance from TRB, which stymied its liaisons’ attempts to collaborate with their local partners (96 liaisons were eventually dispatched to 4 prefectural and 31 local governments). Tokuyama first tried routine methods to address the problem, such as issuing a bulletin announcing that he had permission from the minister to provide all types of assistance. When that did not work, he then sent a letter to municipal leaders, written in a style unusual for a government bureaucrat, emphasizing that he had the authority to facilitate a wide-ranging response. He concluded the letter by asking officials not to think of him as director of TRB, primarily responsible for managing roads, ports, and riverways across the region.

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83 TRB, Memo for Announcement to TRB Staff.
84 Bungeishunju.
85 TRB, Actions Taken after the East Japan Earthquake.
86 Bungeishunju.
but instead as a “black market trader” who could help them in many different ways.\textsuperscript{87} Issuing this letter, Tokuyama believed, served as an important turning point. Once the TRB liaisons had delivered it to their municipal counterparts, many reported they were better able to do their job.

\textit{“Operation Comb”}

Meanwhile, despite the strength of the March 11 earthquake, TRB officials had quickly learned that many inland roads were, remarkably, still usable and that thousands of bridges had survived the earthquake intact, thanks in large part to reinforcement work conducted by MLIT after the Great Hanshin-Awaji Earthquake. Consequently, TRB did not have to spend time and resources building temporary bridges and could instead largely focus on debris clearance.\textsuperscript{88} To this end, Tokuyama and his team decided to concentrate on 16 roads running eastward from an inland highway, Route 4, to the Pacific, where the main coastal roadway, Route 45, had been seriously damaged. With the layout of this roadway network resembling a comb, the effort came to be known as “Operation Comb.”\textsuperscript{89}

In addition to TRB personnel, SDF forces and prefectural workers contributed significantly to road clearance efforts across Tohoku.\textsuperscript{90} The success of Comb, however, hinged on whether TRB could mobilize enough private construction companies with the right type of equipment, since MLIT did not have the heavy machinery required for the task at hand. Fortunately, even though local construction workers were themselves affected by the disaster, TRB was able to engage enough of them so that by the evening of March 11, 52 road-clearing teams had been formed. The first so-called “Keikai Team,” made up of TRB employees and contracted construction workers, began its work at 4:00 the very next morning, providing critical early access for SDF personnel and other rescue teams.\textsuperscript{91}

The speed with which TRB was able to launch Operation Comb was due to measures it had put in place well before the events of March 11. Recognizing that the major general contractors in Tokyo would likely have great difficulty reaching Tohoku in the immediate aftermath of a catastrophic event, TRB had established agreements with local small- and medium-sized construction companies for “emergency rehabilitation” services.\textsuperscript{92,93} About half of the companies that ultimately participated in Operation Comb had such preexisting emergency agreements with TRB. (The others responded to appeals by TRB staff members – some of whom personally rushed to companies’ offices to recruit them for the effort.)

\textsuperscript{87} TRB, \textit{“Man at the Black Market” Letter.}
\textsuperscript{89} Bungeishunju.
\textsuperscript{90} TRB, \textit{Actions Taken after the East Japan Earthquake.}
\textsuperscript{91} Bungeishunju.
\textsuperscript{92} Ishiwatari, “Institution and Governance Related Learning from the East Japan Earthquake and Tsunami.”
\textsuperscript{93} Although government contracts are normally awarded through an open bidding process in Japan, national law (e.g., Article 29-3-4 of the Public Accounting Act) allows TRB and other public agencies to contract with vendors directly during emergencies (Ishiwatari, “Institution and Governance Related Learning from the East Japan Earthquake and Tsunami”).
The ability to engage these contractors, Tokuyama emphasized, “was a major factor in making this mission successful.” Stressing that the scale of the disaster meant an altogether different way of operating, he elaborated:

In a normal-scale disaster, construction companies would not start working immediately for saving lives. They would start participating in normal reconstruction process and get some estimate [of TRB’s project budget] before starting the work. But this clearing mission was an anomaly. They were involved in the stage of saving people’s lives – no one would be considering such matters as budget issues. ... I think everyone was working out of a sense of mission. I don’t think anyone was thinking how much they could get out of the job.

But as they strove to bring Tohoku’s roadways back online, the contractors and their partners in the Keikai Teams first had to overcome a number of significant challenges. To start with, much of their work took place in a precarious environment that featured numerous aftershocks, tsunami warnings, and the continued evacuation of people fleeing from the worst-hit areas. In at least one instance, a team had to cast aside its power shovels and halt its activity after encountering a pile of rubble with bodies trapped inside of it, so that the careful work of rescuing possible survivors could proceed. In another temporary setback, the Keikai Team charged with clearing Route 4, the essential spine of Operation Comb, realized that part of the road had experienced serious damage and then had to spend valuable time identifying a detour.  

Despite these obstacles, TRB and its partners managed to secure road access to disaster-affected communities relatively quickly – especially when compared with the Hanshin-Awaji earthquake. On March 12, just a day after the massive earthquake and tsunami, the region’s two major north/south inland arteries – National Highway 4 and the Tohoku Expressway – had been reopened to traffic. Within four days, fifteen east/west roads that connected to coastal communities (the horizontal “teeth” of Operation Comb) had been cleared of debris. And on March 18, National Highway 45, which ran along the coast, was reopened.

**The Fire Services**

In addition to SDF and MLIT/TRB personnel, firefighters from across Japan also provided essential relief in the immediate aftermath of the earthquake and tsunami. Indeed, in the hours and days following the disaster, thousands of them converged on Tohoku to perform a wide range of critical emergency response tasks.

In Japan, municipal governments have primary authority over firefighting services. However, the earthquake and tsunami had not only overwhelmed local response capacities, but they had inflicted a devastating toll on the municipal fire departments themselves – decimating stations and taking the lives of scores of firefighters (the tragic deaths of the firefighters at Rikuzentakata’s floodgates being just one example of this sacrifice). Given the extent of damage, the support of fire departments from elsewhere in the country would thus be essential as communities struggled to respond to and recover from the disaster.

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94 Bungeishunju.

95 Ishiwatari, “Institution and Governance Related Learning from the East Japan Earthquake and Tsunami”; and TRB, *Actions Taken after the East Japan Earthquake*. 
Per the national Fire Service Organization Law, the Fire and Disaster Management Agency (FDMA) of the Ministry of Internal Affairs and Communications, plays an important coordination role during major disasters. In this capacity, the agency mobilized on March 11 to engage fire departments in the rapidly unfolding response. Based out of the agency’s emergency response center and communicating primarily through a satellite communications network, FDMA officials proceeded to collect information from the disaster response headquarters of the three worst-hit prefectures of Fukushima, Iwate, and Miyagi, as well as from fire departments in disaster-stricken communities. It then disseminated this information to other national agencies that could help resource identified needs. In doing so, FDMA officials noted that they communicated with government partners through the official coordination units established at the Kantei – but they worked via alternate channels as well, oftentimes communicating directly with the relevant ministries and agencies in order to expedite requests.

FDMA also began activating what it called “Emergency Firefighting Support Teams,” which were based in municipalities scattered across the country. These teams had been formed to provide support in the event of a major disaster, when the response capacity within a community’s own prefecture was insufficient for the task at hand. “Lead” municipal fire departments, generally from cities of 500,000 residents or more, were assigned in advance to specific prefectures. They were then charged with managing deployments of teams from other municipalities to individual communities within that prefecture. Commanders of each lead team were also pre-designated. According to an official from Miyagi Prefecture, even though the system was relatively new, the plans for activating it had been “meticulously” thought out in the years leading up to the Great East Japan Earthquake and Tsunami.

In response to the March 11 events, teams from 44 prefectures were ultimately dispatched to Iwate, Miyagi, and Fukushima; involving 30,684 personnel, this constituted the largest mobilization in the system’s history. The teams’ work was by no means easy. FDMA officials noted that the firefighters had to grapple with several major challenges, pointing out that many had to travel long distances to get to Tohoku, only to be confronted by fuel shortages, a lack of any formal base of operation, the cold weather, and having their mobility hampered by debris and extensive flooding. All the same, beginning as early as March 11 and into early June, the teams performed a range of critical emergency response and disaster relief tasks, including rescues (emergency fire response teams saved a total of 5,064 lives), firefighting, and providing ambulance services.

To enhance communication with the affected region, FDMA also sent liaisons to the disaster management headquarters in Fukushima, Iwate, and Miyagi prefectures.


These teams constitute a national rescue system, established as part of a set of reforms implemented after the Great Hanshin-Awaji Earthquake of 1995. A parallel reform empowers the commissioner of the national Fire and Disaster Management Agency [FDMA] to send these teams to disaster stricken areas without their request or approval. Almost all the costs incurred by the responding teams are covered by the national government if the teams are responding to a request by the FDMA commissioner (Tokyo Fire Department [TFD], “On the System of Emergency Firefighting Support Team”).

Interview with senior officials, Miyagi Prefecture, August 7, 2012.
Tokyo Fire Department

The Tokyo Fire Department (TFD) – the country’s largest – was one of the many firefighting agencies that deployed personnel and equipment to Tohoku through the FDMA-coordinated system. The Tokyo metropolitan area had experienced damage from the earthquake – including the collapse of an auditorium ceiling (which caused multiple casualties), severe structural damage to a parking garage, and a fire at an oil refinery in Ichihara City – and over the next several days, TFD responded to these and many other emergencies in and around the city. Fortunately, however, the damage was not as extensive as the devastation across large swaths of coastal Tohoku. As one TFD official observed, “We had anticipated damages far worse in case of a scale 5+ earthquake [on the Richter Scale], but it turned out building structures in Tokyo were relatively resistant. So the existing firefighters were enough to respond to these incidents.” TFD was thus free to dedicate a substantial amount of its highly sophisticated resources and well-trained and experienced personnel to the response taking shape to the northeast.

FDMA initially deployed TFD’s emergency firefighting teams to Miyagi Prefecture. There, TFD’s command support group based itself out of the prefectural disaster response headquarters in Sendai, from which it coordinated the teams’ work with other emergency response agencies active in Miyagi. TFD firefighters then proceeded to partner with their counterparts in several coastal communities, augmenting compromised local response capabilities by providing highly specialized equipment, such as “super pumper” to collect and deliver water for extinguishing fires, debris removers, and helicopters to assist with search, rescue, and emergency transportation. In total, TFD would provide 514 air and ground teams and 3,243 people (a significant portion of its 18,000 personnel) to the March 11 response efforts. (Separately, at the request of Prime Minister Kan, the TFD would also deploy elements of its response team to help combat the crisis at the Fukushima Daiichi nuclear power plant.)

TFD officials observed that the plans and procedures for communities to receive personnel and equipment from its emergency response team were generally useful for helping it take action upon arriving in Tohoku. All the same, like their counterparts at TRB and FDMA, they noted that unanticipated obstacles complicated their team’s delivery of aid to disaster-affected areas. Not only did TFD personnel have to navigate debris-clogged roadways, but transportation measures enforced by the police and the SDF also impeded their access to coastal communities. Going forward, they determined, TFD would need to find better ways to collaborate with its emergency response partners.

Fukushima Daiichi: A Nuclear Crisis Unfolds

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101 Interview with senior TFD officials, August 10, 2012.
104 What Should be Improved at TFD (Lessons from the Earthquake),” Chiko Gikai Jin.
The widespread destruction of homes, businesses, and roadways, along with the loss of thousands of lives and many more casualties, required a massive relief operation in its own right; and over the ensuing days and weeks, the SDF, TRB, firefighting agencies, and many other organizations poured enormous amounts of resources to help sustain it. But the March 11 disasters encompassed yet one more horrifying dimension. The Great East Japan Earthquake and Tsunami also triggered a terrifying crisis at the Fukushima Daiichi nuclear power plant, located about 165 miles north of Tokyo. With the plant’s owner and operator, the Tokyo Electric Power Company (TEPCO), unable to manage the intensifying crisis on its own, many of the agencies and groups involved in providing and coordinating disaster relief in tsunami-affected communities would simultaneously have to turn their attention and dedicate additional resources to the response at Fukushima Daiichi.

As soon as the earthquake struck on the afternoon of March 11, reactor units 1, 2, and 3 at Daiichi entered emergency shutdown mode (units 4, 5, and 6 were being inspected at the time of the disaster, and therefore were already off line). But the tremor also damaged the infrastructure of the electrical system connected to the plant, resulting in the loss of its entire external power supply. At the same time, several emergency systems kicked into gear: generators powered by diesel fuel began supplying electricity within the plant, while the earthquake also triggered emergency cooling systems that were designed to bring down the temperature of the active reactors.\footnote{National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission (NAIIC), \textit{The Official Report of the Fukushima Nuclear Accident Independent Investigation Commission: Executive Summary}, 2012; and The Sasakawa Peace Foundation, \textit{The Fukushima Nuclear Accident and Crisis Management: Lessons for Japan-U.S. Alliance Cooperation}, 2012.}

About 40 minutes after the earthquake, however, the tsunami struck the plant with horrific force. As was the case up and down the Tohoku coast, the tsunami’s powerful waves caused serious physical destruction throughout the complex, destroying vehicles, machinery, and equipment. But even worse, they also took out the emergency generators and AC power supply in units 1-5 and triggered the failure of the reactors’ cooling systems. Units 1, 2, and 4 (and, eventually, 3) lost their DC power supply as well. Together, this cascading series of events resulted in near total power failure at the plant and severely hampered efforts to continue cooling down the nuclear reactors.\footnote{NAIIC, \textit{The Official Report of the Fukushima Nuclear Accident Independent Investigation Commission}; and The Sasakawa Peace Foundation, \textit{The Fukushima Nuclear Accident and Crisis Management}.} This led to damage to the reactors’ cores, which began about three hours after the earthquake in Unit 1 and about 40 hours in Units 2 and 3. Soon, radioactive material began spreading across the surrounding area, contaminating air, soil, and water, leading to considerable concern regarding the safety of nearby residents.\footnote{NAIIC, \textit{The Official Report of the Fukushima Nuclear Accident Independent Investigation Commission}; and The Sasakawa Peace Foundation, \textit{The Fukushima Nuclear Accident and Crisis Management}.}

Compounding the situation, the tsunami also tore away manhole covers and scattered debris across the complex. Coupled with earthquake-related damage, this seriously hindered access to the site, which in turn slowed down and complicated response efforts. Meanwhile, with the loss of essential monitoring equipment, the ability for plant operators to manage the rapidly worsening situation was made all the more difficult.\footnote{Although TEPCO blamed the unprecedented scale and force of the tsunami for the crisis that unfolded at Daichi, an independent investigation formed by the Japanese Diet determined that years of insufficient attention to seismic risk by TEPCO

\begin{itemize}
  \item \textit{NAIIC, \textit{The Official Report of the Fukushima Nuclear Accident Independent Investigation Commission}.}
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wore on, observers would repeatedly compare the situation at Fukushima Daiichi to the crises at Three Mile Island and Chernobyl, considered the two worst nuclear power plant failures in world history.

**The Kantei Reorganizes its Response**

By the time the situation at Daiichi had developed into a full-blown crisis in the late afternoon of March 11, agencies at all levels of government were already in the midst of launching their responses to the earthquake and tsunami. The SDF had established its disaster response headquarters and was scrambling to deploy personnel and supplies. MLIT’s Tohoku Regional Bureau (TRB) was in the early stages of working out its plans to support tsunami-affected localities and clear key access routes. And in disaster-stricken municipalities, firefighters, locally-stationed SDF personnel, and residents were desperately trying to rescue and aid survivors, put out fires, and perform scores of other urgent relief tasks.

For their part, officials affiliated with the coordination units in the Kantei were focused on improving their situational awareness about conditions across Tohoku. Over the next several hours, however, they would begin receiving alarming reports about the worsening situation at Daiichi, prompting them to significantly expand the national government’s organizational response structure.

At 3:42 PM, adhering to procedures stipulated in the national Nuclear Emergency Preparedness Act, the director of the plant – via TEPCO headquarters – informed the Nuclear and Industrial Safety Agency (NISA) that Daiichi had lost its entire AC power supply. NISA then notified the Ministry of Economy Trade and Industry (METI) and the Kantei, where the deputy chief cabinet secretary for crisis management set up an Emergency Response Office to deal with this latest front in the March 11 disasters. Meanwhile the Emergency Assembly Team, made up of directors general from various ministries, added the nuclear crisis to its already full portfolio. Then, at 7:03 PM, after learning that TEPCO feared that the Daiichi’s emergency cooling system was now incapable of deescalating conditions at Units 1 and 2, the national government declared a nuclear emergency (the chief cabinet secretary publicly announced the declaration at 7:45 PM). At the same time, it formed a Nuclear Emergency Response Headquarters, also located within the Kantei and headed by Prime Minister Kan. It also established a Local Nuclear Emergency Response Headquarters, which was headed by the METI Minister and located at the “Off-Site Center” situated just kilometers from the plant.110

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110 Per response plans, the Off-Site Center was to serve as central point for the coordination of response activities concerning Fukushima Daiichi. However, in the aftermath of the March 11 earthquake and tsunami, the center, which was located about 5 kilometers from the plant, did not function as intended. This was due to a variety of reasons, including damage and disruption to transportation infrastructure, insufficient supplies, exposure to radioactive materials, and the failure of adequate numbers of government officials to assemble there (The Sasakawa Peace Foundation, *The Fukushima Nuclear Accident and Crisis Management*).
Confronted by the worsening conditions at Fukushima Daiichi, Kan and a small cadre of his close advisors decided to base themselves in the prime minister’s office, located on the fifth floor of the Kantei, instead of alongside the coordination bodies working out of the Crisis Management Center, which was located in the building’s basement. From Kan’s office, they would proceed to make many of the key decisions regarding the response to the situation at Fukushima Daiichi. This represented a significant departure from official emergency response plans, and to many, including others at the Kantei, the assembly of key national officials on the fifth floor severely complicated the overall coordination of the response. As one member of the Crisis Management Staff put it, the physical and organizational separation of the prime minister from the Crisis Management Center contributed to “great difficulty [communicating] with political leaders.”

As the emergency wore on, however, others saw benefits to Kan’s decision, arguing that it allowed the government to balance the response to the earthquake and tsunami, which largely fell to officials staffing the units based out of the Crisis Management Center, and the particularities of the response to the emerging nuclear crisis at Fukushima Daiichi, which would increasingly consume much of the prime minister’s attention. “We could also say,” a member of the Crisis Management Staff remarked, “that the reason he [Kan] could focus on the nuclear accident was because he could leave the response to the natural disasters [i.e., the tsunami and earthquake] to the bureaucrats.”

Still, having so many different coordination and decision-making hubs within the Kantei created considerable confusion for other organizations and levels of government involved in the response. As a senior member of SDF’s Joint Staff noted, “With this many entities, no one knew who had what decision-making responsibilities and authorities.” (See Exhibit 4 for a simplified organizational structure of various entities dedicated to coordinating the March 11 disaster response.)

**Searching for an Effective Response**

Amidst escalating concerns regarding conditions in Fukushima Daiichi’s Unit 1, public officials at both the prefectural and national levels issued a series of increasingly more expansive evacuation orders that evening and over the next several days. At 8:50 PM on March 11, roughly two hours after the national government had declared the situation at Daiichi a nuclear emergency, Fukushima’s governor called for an evacuation of people in the municipalities of Okuma and Futaba living within two miles of the power plant. Then, at 9:23 PM, Prime Minister Kan, acting in his capacity as head of the Nuclear Emergency Response Headquarters, ordered the evacuation of areas within a three kilometer radius of the plant. At the same time, he instructed individuals who were in a 10 kilometer radius of Fukushima Daiichi to remain indoors. At 5:44 AM the following day, Kan expanded his evacuation orders to include the entire 10 kilometer zone. Later on the 12th (at 6:25 PM), after hydrogen

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111 This dynamic reflected an already difficult relationship between Kan and the national civil service. As a member of the Democratic Party of Japan (DPJ), the prime minister represented a party that by and large had served in the opposition and that had taken power less than two years earlier from the long-time dominant party, the Liberal Democratic Party (LDP). Kan, himself, had served as prime minister for under a year when the earthquake struck on March 11. Kan’s political platform specifically emphasized that politicians take the lead in political and governmental affairs, rather than civil servants.

112 Interview with senior officer, Joint Staff, Japan Self Defense Force, July 31, 2012.
explosions occurred in Unit 1, the evacuation zone was extended to 20 kilometers. The zone would expand another 10 kilometers, to a radius of 30 kilometers, three days later, following a series of crises at additional reactors. Ultimately, more than 82,000 people were evacuated from 11 municipalities.  

Meanwhile, in the days following the earthquakes and tsunami, attempts were made to cool down Units 2 and 3 with water injections. These efforts, however, initially met with little success; and on March 14, another hydrogen explosion occurred, this time in Unit 3. Then, on the morning of March 15, the situation worsened dramatically. A little after 6:00 AM, explosions occurred within Units 2 and 4 (which was inactive but was housing spent fuel rods), damaging their containment vessels. These events significantly heightened fears that the plant was undergoing a nuclear meltdown, which seemingly prompted hundreds of TEPCO workers to desert Daiichi for the safety of Fukushima Daini, a nuclear power plant located 6 miles away. 

Although buses had been on standby at the Daiichi complex, in case a full retreat was necessary, power plant manager Masao Yoshida had, in fact, refrained from calling for an evacuation that morning, since measurements indicated that the reactors’ containment vessels had not ruptured. All the same, about 650 workers – including a number of plant managers – fled. Yoshida later speculated that their actions likely stemmed from confusion by his deputies over what, exactly, he had decided to do. “It was like the telephone game,” he recalled. “I said, ‘If [italics added for emphasis] we go, should it be to 2F [Fukushima Daini]?’ while the people who heard me gave the instruction to the drivers [of the buses] to go to Fukushima Daini.” Just 68 workers stayed behind to try and bring the crisis under control – something the plant manager thought was well worth it but had become near impossible. “Our image was a catastrophe for eastern Japan. ... I thought we were really dead,” Yoshida remembered. (This recollection contrasted with earlier reports – including TEPCO’s “official” findings – that Yoshida had ordered the evacuation and that it was an orderly process.)

Fortunately, through the dedicated efforts of Yoshida and the TEPCO workers who remained with him, along with firefighters (namely from the Tokyo Fire Department) and SDF personnel (with critical support from the

113 On April 21, the national government formally forbade reentry to areas located within 20 kilometers of the plant. This order was later adjusted to allow for temporary visits while the government and TEPCO undertook the difficult and costly process of decontaminating the area (The Sasakawa Peace Foundation, The Fukushima Nuclear Accident and Crisis Management; and Martin Fackler, “Japan’s Nuclear Refugees, Still Stuck in Limbo,” New York Times, October 1, 2013).

114 Residents of the town of Namie had a particularly horrific experience relocating. When they evacuated, they moved northward – directly into a radioactive plume – despite the fact that national officials were aware the route they had taken was potentially dangerous. Fearing that issuing a warning would create panic, officials chose to keep quiet and not share the information with evacuees (Martin Fackler, “Japan’s Nuclear Refugees, Still Stuck in Limbo,” New York Times, October 1, 2013.)


116 TEPCO took issue with part of Yoshida’s account, claiming that he had said that workers should retreat to “low radiation areas” – which Yoshida said meant other parts of Daiichi but which TEPCO argued could have also referred to a location even further away, such as Daini (Martin Fackler, “Panicked Workers Fled Fukushima Plant in 2011 Despite Orders, Record Shows,” New York Times, May 20, 2014).


U.S. military and government), attempts to cool down the reactors with injections of water eventually managed to deescalate the crisis at Daiichi. But the crisis still had a number of serious implications. Beyond harmful effects to the environment and risks to the physical health of area residents, TEPCO’s and the national government’s apparent reluctance to communicate the full extent of damage and its potential consequences created enormous mistrust and fear across Japanese society. This in turn complicated public communications efforts by other public authorities, who continued to deal with the aftereffects of the disaster. “In order to prevent harmful rumors, it is crucial to disseminate correct information, such as the level of radiation. But there was much confusion,” an official from Fukushima Prefecture observed. He added, “Harmful rumors have a tremendous energy. Once such rumors are spread, it takes 20-30 times more energy to extinguish them.”

With the Japanese became increasingly disenchanted with their national leaders, the nuclear crisis had devastating political consequences. In the months following the March 11 disasters, support for the political establishment as a whole, including both the Democratic Party of Japan and the main opposition party, the Liberal Democratic Party, took a serious hit. Prime Minister Kan’s reputation suffered in particular. Surveys indicated that less than 20 percent of respondents supported him in the wake of the earthquake and that over 70 percent disapproved of how he managed the response to the catastrophe. Kan, who insisted that shortcomings in the nuclear response were due to TEPCO officials and their nuclear regulatory counterparts having withheld information from him and his advisors, resigned in September 2011.

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119 Interview with senior officials, Fukushima Prefecture, August 6, 2012.
120 Gerald L. Curtis, “Tohoku Diary: Reportage on the Tohoku Disaster.”
Epilogue: Sustaining Relief, Beginning Recovery

The nuclear crisis notwithstanding, much of the most urgent response work was accomplished within about a week of the earthquake and tsunami: survivors had been rescued and moved to shelters, fires had been extinguished, and key roadways had been cleared and reopened to traffic. Many of the agencies that had sprung into immediate action had also begun reorganizing themselves to function more effectively over the ensuing weeks. On March 14, for instance, after several days of spearheading some of the most essential relief operations, the SDF restructured itself to better address the two major fronts that had emerged in the response to the disaster (see Exhibit 5 for a diagram depicting the SDF’s revised structure). To manage the ongoing relief operations in tsunami-devastated communities, it formed its first-ever joint task force, which it dubbed Joint Task Force Tohoku (JTF-TH). Comprised of all three of its forces (Ground, Maritime, and Air), JTF-TH operated under a single commander, who reported directly to the Defense Minister. According to Joint Staff officers, having a single commanding authority went a long way in helping the SDF better coordinate its (and its partners’) actions across the disaster-stricken region.\(^{122}\) Meanwhile, to deal with the particularities of the emergency at Fukushima Daiichi, SDF created another unit – the Central Readiness Force, headed by a separate “unified commander” who also reported directly to the Defense Minister.\(^{123}\)

In addition, the national government formed new bodies to focus on longer-term relief. This included the Team in Charge of Assisting the Lives of Disaster Victims, which Prime Minister Kan formally established on March 20.\(^{124}\) Kan charged the team with two main tasks: collecting data on the needs of the thousands of survivors who were now living in temporary shelters and coordinating ongoing relief efforts, including the delivery of food and other goods.

The prime minister and his advisors believed this new entity was necessary for several reasons. For one thing, even though more than a week had passed since the earthquake and tsunami, significant data gaps remained regarding the specific needs of survivors, especially at the level of individual shelters. Moreover, with the Kantei continuing to be largely consumed by the nuclear disaster, the team could focus exclusively on coordinating relief for tsunami survivors. This, Kantei officials hoped, would enable them to better balance the demands presented by the various elements of the crisis.\(^{125}\) (A separate unit – termed the Team in Charge of Assisting the Lives of Victims around the Nuclear Power Plant – was established to address the needs of those affected by the nuclear crisis).

\(^{122}\) Interview with senior officer, Joint Staff, Japan Self Defense Force, July 31, 2012; and interview with senior officer, Joint Staff, Japan Self Defense Force, July 20, 2012.

\(^{123}\) SDF, *C2 Structure of Operations*.

\(^{124}\) By early May, the national government had formed multiple units dedicated to the March 11 response. They included the Nuclear Emergency Response Headquarters, the Headquarters for Emergency Disaster Control, the Team in Charge of Assisting the Lives of Disaster Victims, the Team in Charge of Assisting the Lives of Nuclear Power-Related Disaster Victims, and the Nuclear Damage Compensation Facilitation Corporation (Special Headquarters for Assisting the Lives of Disaster Victims, *Government Response, Support for Affected Citizens*).

\(^{125}\) Interview with former counselor, Team in Charge of Assisting the Lives of Disaster Victims, July 19, 2012.
Based in Tokyo, the team deployed small groups of national officials to the affected prefectures, which bolstered the central government’s overall situational awareness and its communication with affected localities. The team also became involved in coordinating a number of core activities that formed the next phase of the relief process. For one thing, it issued guidelines that allowed localities to remove debris from private property without first obtaining permission from owners, many of whom were dead, missing, or relocated. The team also had responsibility for accepting donations from the international community, nongovernmental organizations, and the private sector.

Even a month after the disaster, the team continued to play a critical role in supporting the ongoing relief. Some disaster-stricken areas still lacked essential supplies; and in other places, demands for more than just the most basic goods began to emerge. The team worked to address these issues by deploying specialists to expedite distribution processes and by conducting interviews in shelters to get a better sense of specific, more nuanced needs. It also worked with prefectural governments to continue relocating displaced individuals from emergency shelters to temporary housing and supported local governments as they resumed some of their functions. This entailed a variety of tasks, including helping municipalities to relocate government offices, deploying national officials to enhance the capacity of localities, and setting up call centers and other consultation services.

Meanwhile, on April 21, about one and a half months after the earthquake and tsunami, prefectural governments formally assumed from Tokyo primary responsibility for managing relief efforts. Increasingly, tsunami-ravaged municipalities also began taking on more responsibilities, and they soon began to organize themselves for the massive recovery task that lay before them. (On May 1, for instance, the City of Rikuzentakata opened its reconstruction bureau.) And as spring turned into summer, the footprint of relief operations in Tohoku shrank substantially, with the SDF drawing down personnel and resources in consultation with municipalities and the prefectures. By July 30, it had withdrawn its forces from Fukushima, Iwate, and Miyagi.

As relief began evolving into early recovery, communities up and down the Tohoku coast sought to move on from the terrible tragedy of March 11. That fall, for example, Rikuzentakata finally held a seaside memorial service for victims of the tsunami. Even though many residents were reluctant to do so, given that hundreds of bodies had not yet been recovered, the city’s mayor, Futoshi Toba, felt it was important to hold the memorial then. “My personal feeling was that everyone should be recovered,” he said. “But the outside voice said it was going to be winter, and if you wait, it’s soon going to be one year from the earthquake. So I had to make the decision to conduct a memorial service.”

Public agencies also began turning their attention to preparing for the next major disaster. A little over a year after the Great East Japan Earthquake, for instance, the SDF organized a major 5-day exercise, termed JXT 2012, in which 8 local governments and 15 ministries simulated a response to a large-scale Tokyo-area earthquake.

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127 Interview with senior officer, Joint Staff, Japan Self Defense Force; and senior officer, Joint Staff, Japan Self Defense Force, July 31, 2012.

128 “SDF Operations in Response to the Great East Japan Earthquake.”
Exercising this scenario not only made good sense in the aftermath of the March 11 events – it also reflected a sobering reality: scientists predicted that a magnitude 7.3 tremor striking in or near Tokyo had a 70% probability of occurring in the next 30 years. Such an event could be similar to or even exceed the Great East Japan Earthquake and Tsunami, potentially affecting 22 million people, causing an estimated 30,000 deaths, resulting in 100 million tons of debris, and inflicting economic losses of some 200-300 trillion yen.  

Meanwhile, successive cabinets embraced differing policies regarding the fate of nuclear power in Japan. Despite the importance of the industry for the resource-scarce country’s energy supply, the Kan administration had temporarily shuttered all nuclear power plants in the immediate aftermath of the Fukushima crisis and had seriously considered phasing out nuclear power production altogether. But in April 2014, even as the zone around the power plant remained cordoned off, the cabinet of Prime Minister Shinzo Abe adopted an energy strategy that featured the resumption of nuclear power production -- as long as power plants met a set of safety requirements.

Government officials also debated whether – and, if so, how – to reorganize Japan’s emergency management system. A senior member of the SDF Joint Staff argued, “We believe that having a centralized system, especially inter-ministerial coordination, is ideal. That would certainly work best in times of emergency.” The Japanese Diet’s independent commission formed to review the events at Fukushima Daiichi concurred. In its recommendations, issued in 2012, the commission declared, “A fundamental reexamination of the crisis management system must be made. .... A structure must be established with a consolidated chain of command and the power to deal with emergency situations.”

But had Japan absorbed the right lessons from the March 11 triple catastrophe? As the country moved forward, with the bustle of reconstruction beginning to dominate Tohoku’s tsunami-ravaged landscape, some wondered whether Japan was on the right track as it prepared for another complex, large-scale disaster – and whether significant reforms, whatever their nature, could ever be realized. As Deputy Mayor Takashi Kubota of Rikuzentakata put it, “Japan is a disaster-prone country and everyone fears the possibility of the next earthquake. In reality [though], people start to forget about these things.”

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132 This was a striking decision for many reasons. Among them: senior politicians from Abe’s own party, including former Prime Minister Junichiro Koizumi, opposed the move, while opinion polls indicated that a majority of Japanese were against nuclear power (Editorial Board, “Fukushima Politics,” *New York Times*, October 14, 2013).
133 Interview with senior officer, Joint Staff, Japan Self Defense Force, July 31, 2012.

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Exhibit 1:
Maps of Japan and Northeast Asia


SOURCE: USGS, Earthquake Location: Magnitude 9.0 Near East Coast of Honshu, Japan, available at

NOTE: The red circle indicates epicenter of Great East Japan Earthquake, off of the Tohoku coast, Honshu Island.
Exhibit 2: Map of Japan, Indicating the Six Tohoku Prefectures


NOTE: The dark shaded area represents Japan’s Tohoku region, the area most directly affected by the Great East Japan Earthquake and Tsunami. From north to south, the three prefectures along Tohoku’s east coast are: Iwate, Miyagi, and Fukushima.
Exhibit 3:
Interior and Exterior Images of Damaged Tsunami Shelter (Municipal Gymnasium) in
Rikuzentakta, Iwate Prefecture

**Exhibit 4:**
Outline of Key National Government Headquarters for the Response to the Great East Japan Earthquake (Simplified)

NOTE: This diagram illustrates some of the main bodies that were organized to help coordinate the response to the various facets of the March 11 disasters. Other entities also played important roles, including national Local Disaster Response Headquarters, located in the affected prefectures; a Local Nuclear Emergency Response Headquarters, located in the prefectural government offices of Fukushima; and prefectural Disaster Response Headquarters.

Exhibit 5:
Organizational Structure for SDF’s Response to the March 11, 2011 Disasters

NOTE: Joint Task Force-Tohoku was primarily responsible for the response to the earthquake and tsunami, while the Central Readiness Force handled SDF’s response to the nuclear crisis.


SOURCE: Adapted from SDF, C2 Structure of Operations.