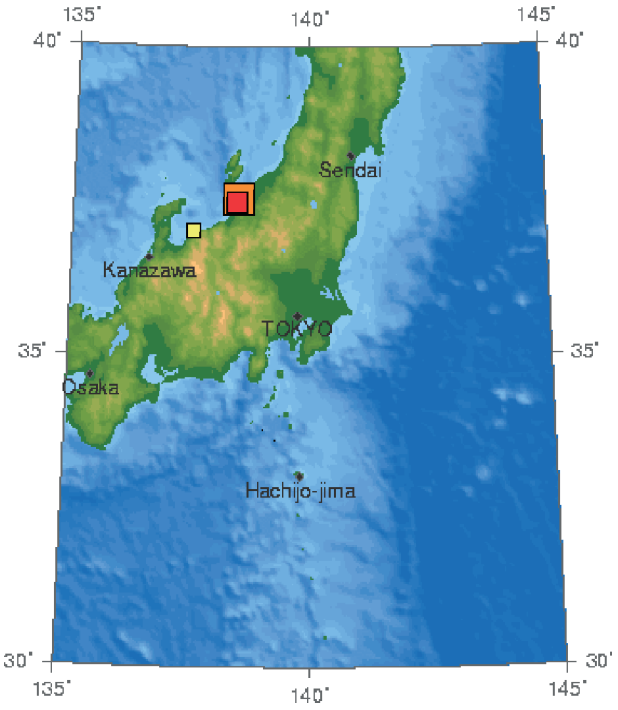
What Companies Have Learned from Experience

Japan VI

On 23 October 2004 the Chuetsu Niigata prefecture earthquake (M6.8, maximum seismic intensity of 7 on the Japanese scale) caused the death of 68 people, injured 4,805 people, and caused major damage including significant damage to a number of local companies.

On 16 July 2007 just after 10 a.m., another earthquake, the Chuetsu-oki Niigata prefecture earthquake (M6.8, maximum intensity seismic intensity of 6 on the Japanese scale) again caused the death of 15 people, and injuries to 2,345 people in the Chuetsu region of Niigata prefecture which includes the city of Kashiwazaki and others.

2004 Chuetsu Niigata prefecture earthquake



2007 Chuetsu-oki Niigata prefecture earthquake

Many companies have been working on lessons they learned from the bitter experience of Chuetsu Niigata prefecture earthquake in 2004, and they have set up numerous measures for disasters such as earthquakes.

In this regard, we have tried to verify whether those lessons learned from the 2007 earthquake in Niigata prefecture have been taken advantage of and whether these proactive measures have been effective.

Case study

(1) Company A: A manufacturer of housing appliances and furnishings

< 2004 Earthquake >

Due to telephone restrictions imposed immediately after the earthquake, the company headquarters and the factory were unable to communicate with each other. Under these circumstances, it was difficult to obtain information, and it took time to understand the effects of the situation.

The company staff members were going from the headquarters to the factory (about 60km) by car, but it took long time to get there due to road damage and major traffic jams.

<Countermeasure>

A Priority Action Plan was formulated for implementation in the initial stage of an emergency.

<2007 Earthquake>
Before the telephone restrictions were imposed after the earthquake, the headquarters staff communicated immediately with the factory by telephone during the seismic tremors. Headquarters also checked on the operation of the equipment in the factory simultaneously using “ping networks.”
The headquarters staff was able to get to the factory in two hours by motorcycle.
Being able to assess the damage in the factory quickly allowed them to change their settings at the data center in order to adjust customer orders.

(2) Bank B
<2004 Earthquake>
Bank B decided to set up an emergency task force on the fifth floor of their head office during emergencies, but it was unable to set up the task force higher than the third floor of the building after the earthquake because safety inspections were required on structures more than three stories tall. This caused a degree of confusion.
The telephone restrictions imposed after the earthquake caused an inability to connect with the other branches and the bank's data center, and thus stopped operations.
The ATMs shut down because of power outages; also, due to the shut off of the water supply in the area, the staff struggled to secure the water from storage tanks in order to maintain the degree of humidity necessary for the data serving room.

<Countermeasures>
An emergency task force was set up on the second floor.
Special cell phones were made available.
Electric power supplies for emergencies were ensured.
A manual for emergency water use was created.

<2007 Earthquake>
Because it had been decided that the emergency task force was to be set up on the second floor, there was no confusion.
Effective use was made of the special cell phones that had been provided for the data centers and headquarters.
An electric power generator was set up at each branch. These generators have been supplied with fuel and are checked once every three months.
The ATMs continued to operate at each branch after the earthquake, running on the power supplied by the generators.
By following the manual’s instructions on controlling the use of water, no water-related problems occurred.

(3) Company C: An Instrument Manufacturer
<2004 Earthquake>
Company C did not experience any fatal errors to their computer system. The server was not attached to anything but fortunately it was protected by a cable which prevented it from falling.

<Countermeasure>
The application of a seismic isolation system to the server

<2007 Earthquake>
The main server was moved to the data center with a seismic isolation system, and although the data center in Nagaoka City was hit by the tremors of seismic intensity 5 on the Japanese scale, there was no damage to information systems, and it did not shut down. The subsidiary company systems were also kept in the data center, thus reducing the damage to the subsidiary companies as well.

(4) Supermarket D
<2004 Earthquake>
At the physical distribution center of Supermarket D, sorting machines for the distribution of goods to each store suffered major damage. The sorting machines continued to operate while the earthquake was underway so the rollers were damaged.

<Countermeasure>
An automatic machine shutdown system with an earthquake detector has been introduced.

<2007 Earthquake>
A seismometer was set up and linked to the sorting machines. When the instrument detects tremors at level three or higher seismic activity, the sorting machines shut down. Since the introduction of this equipment there have been five cases of suspension including during the Chuetsu-oki Niigata prefecture earthquake, with the result that the earthquake did not affect the sorting machines.


Sorting machines

(5) Company E: **Semiconductor maker**
<2004 Earthquake>
There was no major damage, just panic and confusion.

<Countermeasure>
Introduction of an Earthquake Early Warning System

<2007 Earthquake>
Seismic intensity of 4 was observed in the area of Company E's plant which was about 80km away from the epicenter. The alarm from the Earthquake Early Warning System was received about 17 seconds before the start of the large tremors. The immediate broadcast and warning lights in the plant made it possible to avoid the panic and confusion this time.

Summary
These lessons have led to the employment of new technologies such as mobile phones, the internet, and seismic isolation systems, but we cannot rely completely on mobile phones and the internet because the lines may be disconnected or the relay base stations may be down in a blackout. Earthquake Early Warning Systems also may not deliver a warning quickly enough when an area is near the epicenter. In any case, further improvements are necessary.
However, the formulation of Priority Action Plan at the initial stage of emergency is very interesting; it is very important to formulate a Priority Action Plan for emergency cases such as earthquakes. Furthermore, it is essential to have regular drills for the company staff so they can take action according to the plan.

Earthquake Early Warning System:
When a large earthquake occurs, this system analyzes the seismic waves obtained at a point close to the epicenter, and as soon as possible, estimates the position of epicenter and the size of the earthquake (magnitude). As soon as possible, it provides information on the intensity of the ground motion in the region (seismic intensity) and the time it will take the S-wave (main tremor) to travel.
The Japan Meteorological Agency announces earthquake information gathered through the Earthquake Early Warning System in order to contribute to reduce the damage caused by earthquakes and to prevent human suffering in particular.

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