目　　次
CONTENTS

[The Hanshin - Awaji Earthquake]

1. Overview

At 05:46 on the morning of January 17,1995, Japan was struck by an earthquake with an epicenter on the northern end of Awaji Island. It was felt across a vast portion of the country from southern Tohoku to Kyushu. Damage was recorded in 17 different prefectures. The figures as of December 24, 1997 are frightening: 6,430 dead, 3 missing, 43,773 injured, 104,900 buildings totally destroyed, 144,256 partially destroyed, and over 310,000 evacuees at its peak.

Also, an estimated 285 fires were started by the earthquake and 7,071 buildings were either completely burned to the ground or partially damaged by fire.

The government at the time orally approved the name the "Hanshin - Awaji Earthquake" for the disaster (Table 7-1) at a Cabinet meeting.

(1) Casualties

Seismically unprotected against the powerful tremors, many old wooden buildings collapsed. Because most people were home when the quake struck, many died. Also, approximately 1% of all deaths were due to fire.

In terms of age bracket, 3,191 persons age 65 or older were killed which is about half of the overall death toll (6,430). In terms of sex, 1,228 men age 65 or older and 1,963 women of the same age bracket died, both which constitute roughly half of overall figures (2,723 men and 3,698 women).

(2) Major property damage

a. Damaged buildings

The damage to buildings concentrated in Hyogo Prefecture. As of December 24, 1997, 103,998 (99.1%) of the 104,900 totally destroyed buildings and 136,934 (94.9%) of the 144,256 partially destroyed buildings were in Hyogo Prefecture.

b. Fire

It is estimated that 285 fires (December 24, 1997) were started by the earthquake. New fires were even reported several days after the initial shock.

Table 7-1 Overview of earthquake (Reported by the Japan Meteorological Agency)

Time/Date occurred	05:46, January17,1995
Name	The Hyogo-ken Nanbu Earthquake
Epicenter	Awaji Island (34'36" north, 135'02" east)
Depth at epicenter	16 km
Magnitude	7.2
Tidal wave	None
Magnitude by area	
M7:	See Note
M6:	Kobe, Sumoto
M5:	Kyoto, Hikone, Toyooka
M4:	Gifu, Yokkaichi, Ueno, Fukui, Tsuruga, Tsu, Wakayama, Himeji, Maizuru, Osaka, Takamatsu, Okayama, Tokushima, Tsuyama, Tadotsu, Tottori, Fukuyama, Kochi, Sakai, Kure, Nara
M3:	Yamagushi, Hagi, Owase, Iroko, Toyama, Iida, Suwa, Kanazawa, Shionomisaki, Matsue, Yonago, Murotomisaki, Matsuyama, Hiroshima, Saigo, Wajima, Nagoya, Oita
M2:	Saga, Mishima, Hamamatsu, Takayama, Fushiki, Kawaguchiko, Uwajima, Sukumo, Matsumoto, Omaezaki, Shizuoka, Kofu, Nagano, Yokohama, Kumamoto, Hida, Miyakonojo, Karuizawa, Takada, Shimonoseki, Miyazaki, Hitoyoshi
M1:	Fukuoka, Kumagaya, Tokyo, Mito, Ajiro, Hamada, Niigata, Ashizuri, Utsunomiya, Maebashi, Onahama, Nobeoka, Hirado, Kagoshima, Iiyama, Chiba, Chichibu, Asosan, Kakioka
Note:	It was determined from site inspections by the Meteorological Agency that the earthquake was magnitude 7 in following areas. Kobe: Takatori (Suma-ku), Ohashi (Nagata-ku), Daikai (Hyogo-ku), Sannomiya (Chuo-ku), Rokkomichi (Nada-ku) and Sumiyoshi (Higashinada-ku); Ashiya: area around Ashiya station, Nishinomiya: Shukugawa; Takarazuka: some areas; Northern end of Awaji Island: Kitadancho, Ichimitacho and part of Tsunacho.

An important facet of this earthquake is that, in Kobe, many fires broke out simultaneously, which made fire-fighting activities difficult. In some places, the entire city district was lost to fire. As of December 24, 1997, 7,483 buildings with an overall extended floor space of 834,663 m^2 were completely destroyed by fire.

According to records of the Kobe Marine Observatory, weather conditions at 06:00 on January 17 were 1,014 hPa (air pressure), 3.4 (temperature) and 54% (relative humidity), with winds coming from the northeast at 4.6 m/s.

Table 7-2 Death toll and missing persons by prefecture

As of December 24, 1997 (Units: Persons)

Prefecture	Deaths	Deaths due to fire	Missing persons	Total
Hyogo	6,398	559	3	6,401
Osaka	31	—	—	31
Kyoto	1	—	—	1
Total	6,430	559	3	6,433

Note: The above death tolls include deaths due to illness if the said illness was brought on or worsened by the earthquake. This was determined by the cause and effect relationship.

The cause of the fire in many cases is unknown, but it was reported amongst the known cases, that 26 fires were caused by heaters, this itself owing to the fact that the earthquake occurred in winter.

c. Other damage

Fortunately, large scale fires, chemical spills and other hazards did not occur at facilities where hazardous substances were kept. Nevertheless, as of December 26, 1996, 1,350 cases of piping leaks, cracked oil fences, uneven settlement and other damage were reported at oil handling facilities, outdoor tank yards, etc.

Moreover, roads and railways were severed everywhere, bringing utter chaos to the transportation network. This had a very serious effect on daily life after the earthquake.

Furthermore, damage to lifelines seriously affected life after the earthquake. At the peak, approximately 2.6 million homes were without power, approximately 860,000 without gas, approximately 1.3 million without water and approximately 300,000 without telephone links.

2. Activities of Fire-Fighting Organizations and the Fire-Defense Agency

(1) Activities of fire departments in stricken areas

Immediately after the earthquake struck, fire stations in stricken areas were flooded with 119 calls. Communications, instructions and information reports were in total confusion in some areas.

Personnel on duty at the Kobe Municipal Fire Department and fire departments in stricken areas at the time of the earthquake became immediately engaged in fire-fighting, first-aid and emergency activities. As specified in plans, emergency personnel were roused up in an attempt to secure the required manpower.

Nonetheless, fire-fighters faced many unexpected difficulties such as multiple simultaneous fires, obstructed roads because of collapsed buildings and spewed rubble, and, as in the case of Kobe, dry hydrants because the earthquake had severed water mains. As a result, fire-fighters had to use water from fire prevention water tanks, swimming pools, rivers and the sea, which was accomplished with the cooperation of volunteer fire corps and others.

Also, reports of people buried alive or in other peril piled in. Search and rescue activities were carried out with the help of volunteer fire corps, local residents, police and self-defense forces, but it was extremely difficult.

Furthermore, many injured people sought help at fire stations immediately after the earthquake, so emergency first-aid centers were set up to treat them. However, the number of injured persons was overwhelming and personnel were pressed to provide first-aid, which left stations short-handed to transport victims to hospitals. With hospitals services impaired and roads congested with traffic, helicopters were kept on permanent standby from the day of the earthquake so as to transport victims across a wide area.

(2) Assistance from governmental organizations

In the Hanshin - Awaji Earthquake, approximately 32,400 firemen and 7,628 fire trucks from 7,602 fire-fighting squads and 451 fire stations in 41 prefectures were providing wide-area assistance until March 1995. Also, 2,471 persons and 379 helicopters from 15 organizations were deployed in fire-fighting and fire-prevention activities across a wide area. They transported 96 victims by airlift and were involved in diverse activities including information gathering, search and rescue, and supplies and personnel transport Their operations proved to be very important.

Furthermore, governmental organizations provided victims across the prefecture with daily essentials and supplies such as food, drinking water and blankets. Up until March 1995, approximately 74,000 prefectural servants (excluding police) and 122,000 municipal servants (excluding firemen) were active in and around the Kobe area.

(3) Activities of other organizations

a. Volunteer fire corps

Despite the fact that many of the persons in volunteer fire corps were themselves victims of the earthquake, they joined forces with local fire departments immediately after the quake and were engaged in putting out fires, searching and rescuing persons trapped under collapsed buildings, directing evacuations, examining the damage situation, transporting emergency supplies, supplying water and policing in stricken areas.

Being in close contact with local residents on a daily basis, volunteer fire corps were quick to sense when someone might be trapped under a collapsed building, which enabled them to rescue many persons.

More than 71,000 volunteer fire corps members, including those from outlying areas, were engaged in fire-fighting and rescue activities. They were a big inspiration for victims.

b. Other organizations

In the Hanshin - Awaji Earthquake, because of the widespread damage due to fire and cases of liquid propane leaks from designated disaster-prevention areas such as petrochemical complexes, 91 persons and 14 large chemical trucks from 17 private businesses with their own disaster-prevention organizations outside of the stricken area provided assistance across a wide area.

Also, in the initial moments after the earthquake, local residents took emergency action. In areas like Nagata-ku, Higashinada-ku and Nada-ku where fires broke out, fires were kept from spreading when people formed bucket brigades or put out fires with equipment which local businesses keep for their own fire-fighting squads.

Furthermore, many volunteers made their way to stricken areas immediately after the quake. They played an important role in sorting supplies, managing evacuation shelters, cooking, providing medical care, transport, interpretation and more.

In response to this kind of interest, regional offices of public organizations undertook various operations to effectively implement volunteer activities such as registering volunteers, communications and other related office work.

(4) Activities of the Fire-Defense Agency

The Fire-Defense Agency received word of the earthquake from the Meteorological Agency at 06:05. They immediately instructed the concerned prefectures to take the appropriate action and to report on damage situation, and started collecting information themselves. They were particularly interested in knowing whether Hyogo Prefecture needed assistance or not. They confirmed the availability of fire departments in other prefectures and made preparations to provide fire-prevention assistance across a wide area.

The Director-General of the Fire-Defense Agency received a request for assistance from the Governor of Hyogo Prefecture at 10:00. Going through prefectural channels, he immediately requested fire departments across Japan to mobilize and successively reinforced the fire-fighting capacity by requesting more assistance.

The Fire-Defense Agency also set up their own disaster prevention headquarters, which the Director-General acted as chief of. After that began activities to procure supplies for fire-fighting efforts and victims across a wide area, to provide manpower support and to move evacuees into public housing, etc.

At the request of the Director-General of the Fire-Defense Agency, the ???National Association for Promotion in Cities, Towns and Rural Communities??? donated a total of approximately 500 million yen to fire-fighting organizations and others involved in fire-fighting assistance outside their normal area of operation.

3. Amendments and Establishment of Disaster Prevention Laws

(1) Amendments to the Disaster Countermeasures Basic Law

Because traffic congestion impeded transit of emergency vehicles in the Hanshin - Awaji Earthquake, each Prefectural Public Safety Committee updated traffic regulations for times of disaster in the amendments of June 1995. In particular, it was made possible for fire prevention officials to order and enforce measures needed to ensure unobstructed transit of fire-fighting vehicles in emergency situations if emergency activities are hindered or potentially hindered by traffic conditions. However, this authority is allowed only in the absence of the police.

Also, in order to upgrade and strengthen countermeasures to disaster, the amendments of December 1995 made it possible, when an abnormal or severe disaster has occurred, even if a state of disaster has not be declared, for the Prime Minister to set up a national emergency response headquarters, for the chief of these headquarters to impart instructions to chiefs of certain governmental organizations and for field offices of the national emergency response headquarters to be set up in the local disaster prevention headquarters. It was also made mandatory for national and local governments to have a disaster prevention system, to create an environment that enables volunteer activities and to make special considerations for elderly persons, physically challenged persons and infants, as well as for local governments to make formal agreement to help one another in times of need.

(2) Amendments to the Fire Organization Law

In a large scale disaster such as that brought on by the Hanshin - Awaji Earthquake, it is necessary to swiftly mobilize a large number of rescue teams and to organize fire-fighting activities across a wide area. Therefore, to speed up the formalities for doing this, the amendments of October 1995 made it possible for the DirectorGeneral of the Fire-Defense Agency to directly request fire-fighting support of other prefectures without waiting for specific requests from the governor of the stricken area, if deemed unable to wait for such a request (in light of the scale of damage, etc.). It was also made possible for the Director-General to request assistance of cities, towns and rural communities outside of the stricken area at his/her own discretion.

Also, the Fire-Defense Agency has encouraged fire-fighting organizations across the country to set up emergency teams and to procure supplies needed for rescue activities and the sort, so as to ensure a swift response to a crisis situation.

(3) Enactment of the Earthquake Disaster Prevention Special Law

To protect the lives and property of people against earthquakecaused disasters, the Earthquake Disaster Prevention Special Law was enacted in June 1995. This law obliged prefectures to draw up a 5year emergency disaster prevention plan and enabled special fiscal measures for projects based on these plans. It also set up a system for promoting seismological research with the objective of reinforcing disaster prevention in earthquake-triggered disasters.

(4) Revisions to the Basic Plan for Disaster Prevention

The Basic Plan for Disaster Prevention was drawn up in 1963. It was partially revised in 1971, but because of a series of major disasters including the Hanshin - Awaji Earthquake as well as changes in the socio-economic state of Japan, the Central Disaster Prevention Council completely revised it in July 1995. The changes encouraged disaster prevention organizations to upgrade their initial response systems and to review the practicalness of their disaster prevention plans.

(5) Revisions to the Disaster Prevention Plans of the Ministry of Home Affairs and the Fire-Defense Agency

On the lessons of the Hanshin - Awaji Earthquake and following the 1995 amendments to Disaster Countermeasures Basic Law and revisions to Japan's Basic Plan for Disaster Prevention, both the Ministry of Home Affairs and the Fire-Defense Agency revised their disaster prevention plans in May 1996.

(6) Review of Local Disaster Prevention Plans

In February 1995, the Fire-Defense Agency requested local governments to urgently review their disaster prevention plans based on the presumption that a large scale disaster were to occur. They raised nine specific items to be reviewed including systems for gathering and disseminating information and systems for providing and accepting assistance.

The agency also pointed out ten basic precautionary items which local governments should observe in revising their disaster prevention plans so that plans would reflect the peculiarities of the local area.

4. Financial Support for Local Governments to Build Fire/Disaster Prevention Infrastructure

In order to restore fire and disaster prevention infrastructure which was damaged in the Hanshin - Awaji Earthquake as quickly as possible and to encourage governments across Japan to gear fire and disaster prevention systems for major disaster, the Fire-Defense Agency made special financial allotments in the second supplementary budget of 1994, the first and second supplementary budgets of 1995, and the supplementary budgets of 1996 and 1997.

In the second supplementary budget of 1994, 1.245 billion yen was allotted to restoration projects for fire and disaster prevention infrastructure which was damaged in the Hanshin - Awaji Earthquake. An additional 1.524 billion yen was allotted in the first supplementary budget of 1995 for the same reasons, while a total of 15.244 billion yen was allotted to ensure the availability of firefighting water in disaster situations and to set up a system of wide area support amongst fire-fighting organizations.

Also, from the viewpoint that it was necessary to build systems for gathering and disseminating information as well as to ensure diverse sources of water for fire-fighting activities, the second supplementary budget of 1995 also allotted a total of 9.234 billion yen to encourage local governments to build image transmission systems, networks for relaying seismic intensity information, systems for transmitting video footage from helicopters, fire water reservoirs and antiseismic water tanks. A total of 1.405 billion yen was also allotted in the supplementary budget of 1996 to encourage local governments to build antiseismic water tanks, etc.

Financial incentives for building fire and disaster prevention infrastructure were continued with the supplementary budget of 1997, with a total of 20.296 billion yen being allotted for this purpose.

Also, in 1995, an emergency disaster prevention fund was created with local bonds and taxes as a means of financial support. It aimed at helping local governments set up funds for disaster prevention projects such as local public works projects for making public facilities antiseismic.

[Recent Earthquakes and the Degree of Damage They Caused]

1. Earthquakes in Japan

From January to December of 2000, there were 17,678 earthquakes recorded with a magnitude of 1 or over. This marks a considerable increase in seismic activity over the 1,023 recorded the previous year. Of these, 357 earthquakes of were magnitude 4 or over, which is considerably more than the 23 recorded the previous year. This increase was largely attributable to earthquakes caused by the eruption of the Mount Usu Volcano in March (1,205 earthquakes with a magnitude of 1 or over and 45 with a magnitude of 4 or over), earthquakes caused by volcanic activity in the nearby seas off Miyakejima and Niijima-Kozushima from June to August (14,255 earthquakes with a magnitude of 1 or over and 253 with a magnitude of 4 or over), and earthquakes and aftershocks in Western Tottori Prefecture in October (1,064 earthquakes with a magnitude of 1 or over and 15 with a magnitude of 4 or over).

The following earthquakes with a magnitude of 4 or over occurred from January 2000 to September 2001:

a. Earthquakes with their epicenters in the nearby seas off Miyakejima and Niijima-Kozushima

On June 26, 2000, a volcanic earthquake phenomenon began in the western part of Miyakejima. It moved west to the seas between Miyakejima and Kozushima. On June 27, earthquakes with magnitudes of 4.0 and higher began to occur, on June 29 an earthquake with a magnitude of 5.2 occurred and an earthquake with a seismic intensity less than 5 was recorded in Kozu-mura.

After that, the series of earthquakes with their epicenter in the nearby seas off Miyakejima and Niijima-Kozushima continued. In all, 6 earthquakes with seismic intensities less than 6 were recorded and 7 earthquakes with intensities higher than 5 were recorded in the area of Kozushima-mura, Miyakejima-mura and Kozu-mura between July 1 and August 18. The earthquakes affected 6 towns and villages, resulting in one person being killed, 15 people injured, 15 buildings totally destroyed, 20 buildings half destroyed and 174 buildings partially damaged.

b. Seismic activity in western Tottori prefecture

On October 6, 2000, a magnitude 7.3 earthquake occurred, with its epicenter in western Tottori prefecture. Seismic intensity above 6 was recorded in Sakaiminato and Hino in Shimane prefecture and below 6 in Saihaku, Mizoguchi, and other places.

During this earthquake, 182 people were injured, 434 buildings were totally destroyed, 3,094 buildings were half destroyed and 18,199 buildings were partially damaged, in 10 prefectures centering on Tottori, Okayama and Shimane.

c. The Geiyo earthquake

On March 24, 2001, a magnitude 6.7 earthquake occurred with its epicenter in Akinada. Seismic intensity greater than 5 was recorded in Kure, Hiroshima prefecture and in Imabari, Ehime prefecture. During this earthquake, one person was killed in Hiroshima and another in Ehime prefecture, 287 people were injured, 69 buildings were totally destroyed, 749 buildings were half destroyed and 48,602 buildings were partially damaged.

d. An earthquake with its epicenter in the middle of Shizuoka prefecture

On April 3, 2001, a magnitude 5.1 earthquake occurred, with its epicenter in the middle of Shizuoka prefecture. Seismic intensity higher than 5 was recorded in Shizuoka City and lower than 5 in Shimada City, Okabe-cho and Kawane-cho. During this earthquake, 8 people were injured and 80 buildings were partially damaged.

2. Earthquakes Overseas

The table below (Table 7-3) shows major earthquakes overseas that occurred between January 2000 and September 2001.

Table 7-3

Date	Time (JST)	Region	M	Damage
2000				
January 15	8 37	Yunnnan, China	5.9	7 killed, 2,528 injured
February 3	7:58	Northern and Central Iran	5.3	1 killed; 15 or more injured
February 8	4:34	Swaziland, South Africa	4.5	1 killed
May 4	13:21	Sulawesy, Indonesia	7.5	46 or more killed; 264 or more injured
May 13	3:43	Jujuy Province, Argentina	6.2	1 killed
May 17	12:25	Taiwan	5.4	3 or more killed; 13 or more injured
June 5	1 28	Southern Sumatera, Indonesia	8 0	103 or more killed, 2,174 or more injured
June 6	11:41	Turkey	6.1	2 or more killed; 80 or more injured
June 8	8:45	Southern Sumatera, Indonesia	6.7	1 killed
June 11	3:23	Taiwan	6.2	2 killed; 36 or more injured
July 7	4:30	Nicaragua	5.1	7 killed; 42 injured
July 7	9:15	Turkey	4.2	1 killed; 34 injured
July 18	7 53	The Hindu Kush, Afghanistan	6 0	2 killed
August 21	22:25	Yunnnan, China	4 9	1 killed; 406 injured
September 20	17:37	Near the Coast of Ecuador	5.4	1 killed
November 11	5:10	Northern Algeria	5.8	2 killed, 12 injured
November 16	13:54	New Ireland Region	8.1	2 or more killed
November 26	3:10	Eastern Caucasus	6.3	26 or more killed; 300 or more injured
December 7	2:11	Turkmenistan	7.5	11 or more killed
December 16	1:44	Turkey	5.8	6 or more killed; 41 or more injured
2001				
January 14	2.33	El Salvador	7 8	835 or more killed; 4,520 or more injured
January 26	12:16	Western India	8 0	14,240 or more killed; 61,638 or more injured in India; 18 or more killed in Pakistan
February 13	23:22	El Salvador	6.5	283 or more killed; 2,937 or more injured
February 23	9:09	Sichuan, China	5.7	10 or more killed; 109 or more injured
March 1	3:54	Washington State, U S A.	6.4	1 killed; 407 or more injured
April 12	19:47	Yunnnan, China	5.4	2 killed; 159 or more injured
May 24	6:10	Yunnnan, China	5.3	2 killed; 605 or more injured
June 1	23 00	The Hindu Kush, Afghanistan	4.9	4 or more killed; 20 or more injured
June 24	5:33	Near the Coast of Peru	8.2	77 killed; 64 missing; 2,723 injured
July 7	18 38	Near the Coast of Peru	7.3	1 killed; 20 or more injured
July 18	0:06	Northern Italy	4 9	3 or more killed; 1 or more missing; 3 or more injured
July 24	14:00	Northern Chile	6.2	1 killed, 3 injured
August 9	11:06	Central Peru	5.5	4 or more killed, 15 or more missing; 15 or more injured