

DISASTER MANAGEMENT IN JAPAN

CABINET OFFICE GOVERNMENT OF JAPAN

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I The Nation and Its Disasters

1 A Disaster-prone Country

Japan is located in the circum-Pacific mobile zone where seismic and volcanic activities occur constantly. Although the country covers only 0.25% of the land area on the planet, the number of earthquakes and distribution of active volcanoes is quite high. Also, because of geographical, topographical and meteorological conditions, the country is subject to frequent disasters such as typhoons, torrential rains and heavy snow.

- (F) World Geographical Distribution of Hypocenters of 2000 and Plates
- (F) Volcanos of the World
- (F) Comparison of Natural Disasters in Japan and Other Parts of the World

2 The General Disaster Situation

In Japan there is much damage to lives and property due to natural disasters every year. Up until the 1950s, there were numerous large typhoons or large-scale earthquakes which claimed the lives of more than 1,000 people. However, due to the progress of countermeasures such as promotion of national land conservation projects, improvement in weather forecasting technologies, completion of disaster information communications systems and preparation of disaster management systems, the number of deaths and missing due to natural disasters shows a declining tendency.

- (F) The Number of Deaths and Missing in Natural Disasters in Japan
- (F) The Number of Deaths and Missing by Type of Disaster
- (F) Amount of Damage of Facilities due to Disasters

But in 1995 more than 6,400 lives were lost in the Great Hanshin-Awaji Earthquake, and there is concern that an enormous ocean trench earthquake will occur in the Tokai region. So the menacing threat of major natural disasters still lingers.

- (F) Major Disasters in Japan Since 1888

II Progress in Disaster Management

1 Progress in Disaster Management Laws and Systems

- (F) The Enactment of Laws
- (P) Great Kanto Earthquake, 1923
- (P) Fukui Earthquake, 1948
- (P) Typhoon Ise-wan, 1959
- (P) Torrential Rains in Nagasaki, 1982
- (P) Hokkaido-Nansei-oki Earthquake, 1993
- (P) Great Hanshin-Awaji Earthquake, 1995

2 The History of Disaster Management (Post-World War II)

The immense damage caused by the Typhoon Ise-wan in 1959 was a turning point for disaster management, giving rise to a movement to plan and prepare a comprehensive disaster management system, and in 1961, the Disaster Countermeasures Basic Act was enacted. Thereafter, the disaster management system has been improved and strengthened following the occurrence of large natural disasters and accidents.

- (F) The History of Disaster Management (Post-World War II)

III The Legal System and Structure of Disaster Management

1 Disaster Countermeasures Basic Act

The Disaster Counter-measures Basic Act is the basis for disaster management in Japan.

- The main contents of the act are as follows;
 1. Definition of jurisdictions and responsibilities for disaster management
 2. Disaster management system
 3. Disaster management plan
 4. Disaster preparedness
 5. Disaster emergency response

- 6. Disaster recovery
- 7. Financial measures
- 8. State of emergency

2 The Disaster Management System

(1) The Disaster Management System in Japan

For effective disaster management, the Government, the local government and designated public corporations are expected to work out disaster management plans and carry them out appropriately, according to the Disaster Countermeasures Basic Act.

(F) Disaster Management Organizations

Designated Administrative Organs

The Cabinet Office and 24 ministries and agencies are designated as "Designated Administrative Organs" which are national organizations for disaster management.

Designated Public Corporations

60 corporations in the fields of transportation, electric power, gas etc., including the Nippon Telegraph and Telephone and the Nippon Broadcasting Corporation are designated as "Designated Public Corporations" for disaster management.

(2) Enhancing the Disaster Management Administration Function

At the time of the reorganization of the Central Government in 2001, the Cabinet Office undertook the administrative duties for disaster management. The Director-General for Disaster Management is mandated to undertake basic policy making and planning, coordinate the activities of all ministries and agencies and respond to large-scale disasters. In addition, the position "Minister of State for Disaster Management" was newly established as the Minister State for Special Missions.

(F) Organization of Central Government and Cabinet Office (Disaster Management)

After the Great Hanshin-Awaji Earthquake, in order to improve and strengthen risk management functions in case of emergency situations such as large disasters, serious accidents and incidents, the governmental system was enhanced, including the establishment of Deputy Chief Cabinet Secretary for Crisis Management, the Cabinet Information Collection Center and others.

(3) Central Disaster Management Council

The Central Disaster Management Council was established for the purpose of promoting comprehensive countermeasures in which the Prime Minister takes the chair and other Ministers of State are members.

(F) Organization of Central Disaster Management Council

[Duties]

- Prepare and promote implementation of the Basic Disaster Management Plan and draft the Earthquake Disaster Management Plan.
- Prepare and promote implementation of the urgent measures plan for major disasters.
- Deliberate important matters pertinent to disaster management according to requests from the Prime Minister and/or Minister of State for Disaster Management (general coordination of basic disaster management policies and disaster management measures, declare emergency situations caused by disasters etc.)
- Offer opinions regarding important matters pertinent to disaster management to the Prime Minister and Minister of State for Disaster Management.

(P) Central Disaster Management Council

3 Disaster Management Planning

(1) The System for Disaster Management Planning

○ The Basic Disaster Management Plan :

This plan sets forth the basic activities for each type of disaster management plan, which is the foundation of the nation's disaster management measures. In the discipline of disaster management, it is the master plan prepared by the Central Disaster Management Council in accordance with Article 34 of the Disaster Countermeasures Basic Act.

○ The Disaster Management Operation Plan :

This is a plan made by the respective Designated Administrative Organizations and Designated Public Corporations according to the Basic Disaster Management Plan.

○ The Local Disaster Management Plan :

This is a plan made by respective prefectural and municipal disaster management councils according to local circumstances and the Basic Disaster Management Plan.

(2) The Basic Disaster Management Plan

The Basic Disaster Management Plan was revised entirely in 1995 based on the experiences incurred at the time of the Great Hanshin–Awaji Earthquake. The plan clarifies the duties assigned to the Government, public corporations and the local government in implementing measures. For easy reference to countermeasures, the plan also describes the sequence of disaster countermeasures such as preparation, emergency response, recovery and reconstruction according to the type of disaster.

(F) Structure of Basic Disaster Management Plan (varies by type of disaster)

(F) Circumstances for Drafting and Revising Basic Disaster Management Plan

IV Disaster Management Related Budget

The budget for disaster management provided by the Government was approximately 3.0 trillion yen in fiscal year 2001, accounting for approximately 5% of the total amount of the budget for general accounts.

The budgetary appropriation for disaster management is classified into four categories : ①Research and Development, ②Disaster Preparedness, ③National Land Conservation, and ④Disaster Recovery and Reconstruction. The change in budgetary appropriation for each category is shown in the figure below.

(F) Change in Disaster Management Related Budget

(F) Change in Disaster Management Budget by Category Classification

V The Present Situation of Disaster Management

1 Research and Development

The Basic Science and Technology Plan–Second–Term (decided at the Cabinet meeting held on March 30, 2001), which mentions the concept of Japan’s science and technology policy, emphasizes research and development related to national and societal interests, including the research and development of science and technologies for earthquake disaster management, communications technologies for times of emergency and disaster management etc. that reduce risks of the society. Priorities in the strategies for emphasizing the plan in regards to “promotion strategies,” which determine the basic matters to be targeted and promotion method for research and development (September 2001) in the area of social infrastructure, “creating safety ” and nine research and development disciplines are supported in the plan (see table).

(F) Constructing Safety – Important Areas of Research and Development

(1) Investigation of occurrence mechanism of Abnormal Natural Phenomena

Investigation of occurrence mechanism, and development of technology for forecasting the occurrence of large–scale earthquakes, large–scale volcano eruptions, abnormal localized torrential rain, abnormal water shortage etc.

(2) Disaster Quick Response System (disaster management IT, emergency medicine and life saving systems etc.)
Systems for minimizing damage by quick response when a disaster or an accident occurs.

(3) Countermeasures to Reduce Damage due to Massive Disaster in Highly Populated Urban Areas

Systems for supporting technologies to reduce damage (including measures for fire fighting), smooth and quick recovery and reconstruction countermeasures, self–help and mutual help in highly populated urban zones in case of the occurrence of abnormal natural phenomena.

(4) Systems for Protecting Pivotal Functions and Cultural Assets

Systems for disaster–proofing headquarter functions related to social and economic activities and protecting public property such as cultural assets, scientific technologies and research installations etc.

(5) Ultra–advanced Disaster Management Support System

Systems to support the next stage of disaster management such as high–level observation and communication systems utilizing space and low–orbit satellites, mobile equipment, transportation devices with high mobility, robots capable of rescue activities in disaster.

(6) Advanced Road Traffic System (Intelligent Transportation System, ITS)

Systems to support the transportation of people and physical distribution at the time of disaster as well as during the period of reconstruction, and also systems that reduce traffic accidents.

(7) Traffic Safety Countermeasures for Land, Sea and Air

Countermeasures that contribute to safety in response to changes and/or increases in ground, sea and aviation

traffic demand and/or characteristics.

(8) Countermeasures for a Deterioration of Infrastructure

Countermeasures for infrastructure facilities to prevent accidents and disasters caused by deterioration and to increase its durability.

(9) Safety Measures for Hazardous Materials, Crimes etc.

Countermeasures for solving problems due to the negative impact at the time of Industrialization, ensuring safety against hazardous materials or systems due to the development of new technologies and preventing crimes in public areas.

2 Disaster Preparedness

(1) Improvement of Disaster Prevention Facilities

The improvement of the following facilities and equipment are being promoted so that disaster management activities can be conducted quickly and smoothly: observation equipment such as meteorological satellites, weather observation radar and seismometers; materials and machinery required for emergency response such as firefighting equipment, water tanks and power generators; systems for liaising and communicating emergency information such as telecommunications or broadcasting facilities; transportation vehicles such as helicopters, ships and automobiles; facilities for evacuation and headquarters for disaster countermeasures.

In addition, projects such as fireproofing buildings, providing evacuation routes, areas and facilities for disaster preparation bases have been carried out.

Especially in urban areas, prevention measures such as creating green space for disaster prevention, spreading aseismic examination and reinforcement of existing buildings, improving and inspecting public facilities and seismic retrofit of lifeline facilities have been taken.

(F) Images of Setting up a Wide-Area Disaster Management Base

(2) National Land Conservation

A large investment extending over a long period of time is required for promoting national land conservation. Because of this, various plans such as the Five-Year Plan for Soil and Water Conservation, the Five-Year Plan for Coastline Projects, the Five-Year Plan for Steep Slope Collapse Countermeasures, the Five-Year Plan for Sewage System Improvements and the Long-Term Plan for Land Improvement have been formulated, and the following national land conservation projects set forward:

- Soil conservation project to prevent mountainous regions from collapsing and discharge of mountain soils and sediments
- River improvement
- Construction of dams for flood control
- Soil erosion control project to prevent sediment discharge and debris flow
- Landslide prevention project to prevent and decrease landslide disasters
- Steep slope countermeasures project to prevent earth-falls etc.
- Coastline conservation project
- Sewage system project
- Agricultural land and facilities disaster management project
- Land subsidence countermeasures project

(F) Various Plans and Projects of National Land Conservation Put into Practice

(F) National Land Conservation Projects Budget

(3) Increasing Disaster Management Consciousness and Disseminating Disaster Management Knowledge

In promoting disaster management activities, it is important that every citizen is cooperative and conscious of the importance of disaster management. Accordingly, knowledge of disaster management will be disseminated and increase of citizens will be requested to pay attention to disaster management through school education and regional disaster management activities.

By designating September 1st as "Disaster Management Day" and the period from August 30th to September 5th as "Disaster Management Week", a variety of events such as the Disaster Management Fair, Disaster Management Seminar and Disaster Management Poster Contest are held. Additionally, various events are held to promote volunteer activities and local disaster management activities based on neighborhood associations on Disaster Management and Volunteer Day (Jan. 17) and during Disaster Management Volunteer Week (Jan. 15-21).

(F) Prize-winning Posters of the Disaster Management Poster Contest

(P) Disaster Management Fair

(5) Local Voluntary Disaster Management Organizations and Volunteer Activities

When a disaster occurs, it is important for local residents to take the initiative in performing urgently required activities such as fighting fires, fighting floods, search and rescue, and evacuation in order to help disaster management activities proceed smoothly. For this reason, residents aware of the need for solidarity in the community establish local voluntary disaster management organizations. These organizations prepare materials and machinery in the region, and practice disaster management drills etc. routinely. As of April 2001, about 57.9% of the households are participating in local voluntary disaster management organizations.

Various groups, including the Japan Red Cross Society, work as volunteers. To encourage these groups, the Government and local governments promote the preparation of a learning environment by the dissemination of pertinent information through public relations, education and preparation of an activity base.

(4) Disaster Management Drill

When a disaster occurs or when it is feared that a disaster will occur, the organizations involved in emergency response — those who collect and distribute information about the post-disaster situation and conduct search and rescue operations etc.

— must work in close cooperation and respond appropriately and in a timely manner.

Disaster management drills are conducted in order to confirm and verify that the disaster management system of each organization is capable of smoothly carrying out the required activities should a disaster occur. Furthermore, disaster management drills are a perfect opportunity for citizens to think about disaster management, as residents participate in training activities or watch such activities on television.

On September 1st, Disaster Management Day, the government and related disaster management organizations mutually cooperate to hold wide-ranging, large-scale disaster management drills in regions all over Japan. Additionally, in each region, drills based on past disasters are carried out throughout the year.

In recent years, practical disaster management drill methods like role-playing exercises have been introduced. In such drills, the participant is not given any disaster information beforehand and must make judgments and respond to the situation which is based upon the information that is provided during the training session.

(P) Comprehensive Drill for Disaster Management

(P) Fire Fighting Contest by Local Residents

(F) Local Voluntary Disaster Management Organizations

(P) Making a Local Hazard Map

(P) Inspecting and Investigating the Local Area

3 Disaster Emergency Response

In the case of an emergency, the national and local governments must immediately collect and analyze information on the state and scale of the damage and exchange this information with related persons and organizations. After this, the system for executing disaster emergency response is established. The contents of disaster emergency response include providing advice or directions regarding evacuation, fighting fires, rescuing victims, securing emergency transportation, emergency recovery of public facilities etc. In municipalities and prefectures where a disaster actually occurs, disaster emergency responses such as establishing a headquarters for emergency measures are conducted by the municipal government and the prefectural government with full mobilization of their resources. Furthermore, at the time of a large-scale disaster, the Government may establish a Headquarters for Major Disaster Management (headed by the Minister of State for Disaster Management) or Headquarters for Urgent Disaster Management (headed by the Prime Minister) and promote emergency measures.

As a nation, the director general of each ministry and agency gather at the Prime Minister's official residence immediately after a disaster occurs. Utilizing the information collected from pertinent organizations and images of the disaster-stricken area provided by a helicopter from a related ministry or agency such as the Defense Agency or National Police Agency, damage is estimated by the Early Evaluation System (EES). With this information, it is possible for the members to better understand the damage information, which is then analyzed and immediately reported to the Prime Minister so that the basic policy can be decided promptly. In case of large-scale disasters that exceed the response capabilities of the local government, wide-scale support for disaster emergency response from the National Police Agency, Fire and Disaster Management Agency and/or Japan Coast Guard is available and according to requests from the prefectural governor, the Self-Defense Forces can be dispatched for emergency response activities. There are also instances in which the Government establishes an On-site Disaster Management Headquarters at the actual site of the disaster by dispatching a governmental investigation team to the stricken area in order to obtain more detailed information so that prompt measures are taken.

(P) A Regular Joint Meeting : at Mt.Usu On-site Disaster Management Headquarters

(F) Disaster Emergency Response of the Cabinet Office

(P) Searching for Missing People in the event of the Great Hanshin-Awaji Earthquake (Kobe City)

(P) Relief Activities after the Tokai Region Torrential Rains

4 Disaster Recovery and Reconstruction

The objective of promoting the recovery and reconstruction of a disaster-stricken area is to aid victims to return to normal life, restore facilities with the intention of preventing disasters in the future and implementing fundamental development plans that focus on safety in the community. In view of the decline in social activities in a community following a disaster, recovery and reconstruction measures are conducted as swiftly and as smoothly as possible.

At the time of the Great Hanshin-Awaji Earthquake in January 1995, one of the biggest disasters causing major damage in recent years, the government established the Headquarters for Reconstruction of the Hanshin-Awaji Area, which was headed by the Prime Minister. Comprehensive reconstruction measures were promoted with the Government acting as the supervising body. Following completion of the headquarters, the Coordinating Committee for Reconstruction of the Hanshin-Awaji Area by related ministries and agencies was established. In the case of the

Mt. Usu Eruption Disaster, the Mt. Usu Eruption Disaster Recovery and Reconstruction Council was established in March 2000 and the State Minister for Disaster Management took office as chairman.

Utilizing the above-mentioned means, the councils take the opinions of the local society into account and work in cooperation with related ministries and agencies to devise various measures to assist areas in recovery and reconstruction matters.

(P) Restoration of the Highway which Collapsed in the Great Hanshin-Awaji Earthquake

- Collapsed highway (Jan. '95)
- Restoration work on the highway
- Restored highway (Sep. '96)

(F) Contents of Disaster Recovery and Reconstruction Measures

① Disaster Recovery Project

The recovery of damaged public engineering facilities, educational facilities, welfare facilities and agricultural, forestry and fishery facilities is either conducted directly by the Government or put into practice by the local government with subsidies from the Government.

② Disaster Relief Loans

Persons engaged in agriculture, forestry or fishery, small enterprises and low-income people who incurred damage are eligible for a variety of low interest loans with rather generous conditions as compared to normal ones.

③ Disaster Compensation and Insurance

Damaged enterprises or persons engaged in agriculture, forestry or fishery business can obtain compensation for economic losses. Also, earthquake insurance is provided by the Government.

④ Tax Reduction or Exemption

For the affected persons, measures are taken for the reduction, exemption and postponed collection of income and residential taxes.

⑤ Tax Allocation to Local Governments and Local Bonds

For the affected local governments, measures such as delivery of special tax allocations and permission to issue local bonds are taken.

⑥ Designation of Extreme-Severity Disaster

When a disaster causes extremely severe damage, it is designated a "extreme-severity disaster." Various special measures are to be taken for disaster recovery projects.

⑦ Assisting the Reconstruction Plan

Assistance is provided for the local government reconstruction plans that should be quickly and accurately formulated and executed.

⑧ Assistance for the Recovery of Victims Livelihood

Assistance is provided for victims to restore their self-supporting livelihood. Disaster condolence money, disaster impediment sympathy money, money for support of reconstructing livelihoods of disaster victims and loans such as disaster support funds and livelihood welfare funds are available.

(P) Inside One of the Shelters (Kobe City)

(P) Temporary Housing Following the Mt.Usu Volcano Eruption

5 Information and Telecommunication System

In order to carry out disaster preparation measures, emergency disaster measures and restoration measures smoothly, collecting, processing, analyzing and transmitting information of the disaster quickly and accurately is a prerequisite.

In Japan, in addition to collecting and analyzing information about disasters via meteorological disaster management information, river/basin information or road disaster information systems, exclusive disaster management communications networks such as the Central Disaster Management Radio Communications System which connects national organizations, the fire disaster management radio network which connects fire fighting organizations, and the prefectural and municipal government disaster management radio communications networks which connect not only disaster management organizations of the local government but also the local residents have been established.

(F) Disaster Management Related Communication Network

Assuming that public telephone lines would be jammed due to excessive traffic or damage caused by the disaster, the Cabinet Office prepared the Central Disaster Management Radio Communications System for the purpose of securing communications between designated administrative and public organizations. In addition to the preparation of a fixed communications network for telephone and facsimile hotlines, a circuit for transmitting visual data has been prepared so that images from helicopters etc. can be received and teleconferencing meetings can be held. A communications system that utilizes a satellite communications circuit has also been constructed to backup the terrestrial communications network.

(F) Outline of the DPRC System

6 Earthquake Disaster Countermeasures

(1) Present State of Earthquake Disaster Countermeasures and Future Developments

Japan's earthquake disaster management programs are put into practice in accordance with the Five-Year Plan for the Emergency Earthquake Disaster Management Project formed by prefectural governors and the Special Measures for National Finance based on this plan. These are based on the Special Measures Act for Earthquake Disaster Management enacted in July 1995 in response to lessons learned from the Great Hanshin-Awaji Earthquake that occurred in January. There are good results such as active preparation of earthquake disaster management facilities.

However, there is much apprehension and a sense of urgency regarding the possibility of the occurrence of the Southern Kanto Earthquake of which the hypocenter is directly under the region, the Tokai earthquake and the Tohankai and Nankai Earthquake which are all capable of causing immense damage. This threat suggests that the earthquake-proofing of buildings and the establishment of an earthquake disaster management system that ensures appropriate response during an earthquake disaster are required.

The establishment of a practical risk management system requires:

- ① Clarification of roles and objectives of the Government and the local government, and construction of an effective contact network.
- ② Establishment of a wide-area disaster management system.
- ③ Promotion of local disaster management measures with the partnership of citizens, companies, NPOs and administrations.
- ④ Participation of various groups and organizations in disaster management so as to actualize a society that works together for disaster management.

Also required are new measures that correspond to the recent remarkable changes in Japan's societal situation such as the slowing down of economic growth, low birthrate and the shift to an aging society. It is therefore important to implement the introduction of market principles for disaster management, promote effective and efficient measures utilizing both hardware and software sides in spite of a limited budget, and utilize the latest technologies such as information technology.

(F) Distribution of the Epicenters of Earthquakes Causing Damage (from 1885)

(2) Observation System

The Meteorological Agency monitors earthquake activity utilizing a network of seismic intensity indicators and seismographs positioned throughout Japan. When an earthquake occurs, the hypocenter is located immediately and tsunami forecasts and other earthquake information such as seismic intensity are reported.

The promotion of surveys and studies about earthquakes and monitoring adjustments are determined by the Headquarters for Earthquake Research Promotion (Ministry of Education, Culture, Sports, Science and Technology) under the Earthquake Disaster Management Special Measures Act and in cooperation with related administrative organizations and universities. In addition, research on earthquake prediction among related organizations is conducted based upon the New Observation Research Plan for Earthquake Prediction proposed by the Geology Division of the Science and Technology Council (advisory committee of the Ministry of Education, Culture, Sports, Science and Technology), and also related organizations exchange scientific information about earthquake prediction within the Coordination Committee for Earthquake Prediction (private advisory organization to the Geographical Survey Institute).

(F) Continuous Earthquake Observation Network in the Tokai Area

(3) Mitigating and Responding to the Tokai Earthquake

Concerning earthquakes that occur along the Suruga Trough, the Ansei-Tokai Earthquake of 1854 occurred along the Nankai Trough causing destruction in the vicinity of the Suruga Trough simultaneously. However, there was little damage caused along the Suruga Trough by the Tonankai Earthquake of 1944. According to these statistics, approximately 150 years has passed with no destruction along the Suruga Trough. Considering this in combination with the ensuing deformation of the earth's crust in and around Suruga Bay, the possibility for the occurrence of a large-scale earthquake along the Suruga Trough is high. This is what we refer to as the "Tokai Earthquake."

A prediction system for the Tokai Earthquake has been prepared, and comprehensive monitoring is being conducted with real-time processing of the observation data which is believed to be effective for predicting the earthquake just before it occurs. Furthermore, in areas subject to intensified measures against earthquake disasters (263 municipalities, 8 prefectures), as designated under the Large-Scale Earthquake Countermeasures Special Act established in June 1978, in addition to increasing monitoring and measurement activities for predicting earthquakes, evacuation warning systems assuming the utilization of prediction were constructed through creation of the Basic Plan for Earthquake Disaster Management (drafted by the Central Disaster Management Council) and the Intensified Plan for Earthquake Disaster Management (drafted by designated administrative and public organizations) and preparing the Emergency Plan for Earthquake Disaster Management (drafted by private companies and others).

The preparation of evacuation sites, evacuation routes, firefighting pumps, wells for fighting fires and other equipment falls under special stipulations in the tax system based on the Special Measures for National Finance Concerning Urgent Earthquake Measure Improvement for Areas Requiring Intensified Measurement to Prevent Earthquake Disasters, enacted in May 1980.

(F) Areas to Strengthen Earthquake Disaster Management Measures Concerning the Tokai Earthquake
(F) Number of Municipalities Strengthening Earthquake Disaster Management Measures Concerning the Tokai Earthquake

(4) Mitigating and Responding to the Southern Kanto Region Earthquake

The potential of an earthquake measuring in the range of magnitude 7.0 occurring directly under the southern Kanto region, a vital location with heavy economic and industrial activity in Japan, has been pointed out. In December 1998, the Central Disaster Management Council established the Guidelines for Emergency Activities for the Prevention of Earthquake Disasters in the Southern Kanto Region, and in April 1992, General Principles Regarding Countermeasures for Earthquakes Occurring Directly Below the Southern Kanto Region. Both were revised in June 1998 based on lessons learned from the Great Hanshin-Awaji Earthquake and proposals from the Expert Committee on Earthquake Countermeasures for Large Cities.

Based on the above-mentioned information, organizations involved in disaster management are carrying out various measures for the Southern Kanto Region.

(F) The Sphere of Regions where there is Possibility of Extreme Damage by an Earthquake Occurring Directly Underneath the Southern Kanto Region

(P) Disaster Management Drills Practiced by 7 Prefectures and Cities of the Southern Kanto Region

(P) The Government Practicing a Role-Playing Simulation of the Tokai Earthquake

(P) Shizuoka Prefecture Practicing a Role-Playing Simulation of a Large-Scale Disaster

(5) Mitigating and Responding to the Tohankai and Nankai Earthquakes

The Tohankai and Nankai earthquakes which are interplate earthquakes with magnitudes of nearly 8 have occurred at intervals of 100 to 150 years. Recently they have occurred in 1944 and 1946, so it is feared that massive earthquake/tsunami damage will be caused by a large-scale earthquake in the first half of this century. Accordingly, it is important to steadily implement countermeasures from now on.

Learning from the Great Hanshin-Awaji Earthquake, the Expert Committee on Earthquake Countermeasures for Large Cities made proposals to the Central Disaster Management Council regarding ways to improve the earthquake disaster management countermeasures for the southern Kanto, Kinki and Chubu regions. Regarding the Kinki and Chubu regions, it is believed that disaster management countermeasures for earthquakes that may occur directly under these regions should be implemented immediately, other than Tohankai and Nankai earthquakes. As a result, the Special Survey Committee for the Tohankai and Nankai Earthquakes etc. was established by the Central Disaster Management Council in October 2001. The study of specific earthquakes, earthquake movement, estimation of tsunami wave height, estimation of damage and how to implement earthquake disaster management countermeasures is being conducted. The study is scheduled to be finished by the end of 2002, after which the findings will be reported to the Central Disaster Management Council.

(F) Probable Source Region of the Tohankai and Nankai Earthquakes

(6) Mitigating and Responding to Tsunami Hazards

Japan is an island nation surrounded on all side by ocean. As such, an immense amount of damage can be caused by tsunami. In the past, the Sanriku Earthquake Tsunami of 1933 killed 3,064 people, the Nansei Nihonkai-Chubu Earthquake Tsunami of 1983 killed 100 people and the Hokkaido-Nansei-oki Earthquake of 1993 killed 167 people.

Therefore to protect coastal areas, measures for avoiding tsunami hazards such as promoting quick announcement and transmitting of tsunami forecast information and construction, improvement of sea walls and sea wall watergates etc. are taken.

(7) Earthquake Disaster Management Information System

The Great Hanshin-Awaji Earthquake reminded all how important it is to quickly assess the extent of damage, implement appropriate measures first and of the need to share information and coordinate efforts among related agencies and authorities. The Disaster Management Bureau of the Cabinet Office is developing a Disaster Information System (DIS) that will quickly determine the extent of damage, enable related agencies and authorities to share information and provide support to make quick, accurate decisions when implementing emergency measures.

① Early Estimation System (EES)

The Early Estimation System (EES) enables an assessment of the amount of damage caused by an earthquake to be evaluated within a short period of time and utilizing limited information. Introduced in April 1996, the objective of the EES is to provide information capable of enabling quick, proper judgment that leads the government to an initial setup.

A database containing information on geographical, ground, building and population conditions throughout Japan has been created for the EES. It is utilized to assess seismic mesh distribution based on seismic information from the Meteorological Agency and damage to buildings and human life. The EES begins operation automatically when an earthquake of seismic intensity 4 or larger on the Japanese scale is detected and produces an assessment report within 30 minutes of the occurrence of the earthquake.

② Emergency Measure Support System (EMS)

The objective of the Emergency Measure Support System (EMS) is to enable various related agencies and authorities to share information during an emergency and support implementation of various emergency measures

by the government.

The EMS possesses a database of information on infrastructure facilities such as roads, railways and disaster management facilities such as fire stations and hospitals. It displays damage information together with information on the situation of emergency measures taken on maps that can be shared by related agencies and authorities.

(F) Flow Diagram of Earthquake Damage Estimation

(F) Estimated Distribution of Seismic Intensity in Heisei Geiyo Earthquake

7 Storm and Flood Countermeasures

(1) Improvements in Meteorological Observation and Forecast and Warning Systems

Meteorological conditions including typhoons, low-pressure areas and front activities must be known exactly in order to prevent and/or reduce storm or flood damage by precisely forecasting weather influence and quickly announcing and disseminating forecasts and warnings. The Japan Meteorological Agency conducts meteorological observations utilizing radar, satellites and observation instruments located throughout the country, and makes forecasts and warnings based upon this data. The information for river water level and rainfall amount in basins is provided by a comprehensive river/basin information system and is used extensively.

(2) Promotion of Comprehensive Flood Control Measures

① River Flood Control Measures

River flood control projects are systematically promoted under the 9th Seven-Year Flood Control Project Plan introduced in 1997. Flood control programs are promoted emphasizing the development of a safe social infrastructure, risk management for waters that exceed the designed flood stage level etc.

② Promotion of Flood Control and Storm Surge Countermeasures

Based on the flooding of small and medium-sized rivers and the occurrence of urban flooding, the Flood Control Act was revised and new regulations were enacted from July 2001. The objective of the revised act is to expand and improve flood forecast rivers, designate and announce areas where inundation is predicted and prepare flood warning and communications systems that will ensure the smooth, quick evacuation of areas in danger of flooding.

An underground shopping district and basements were heavily damaged during flood disasters in June and July 1999 and a storm surge hazard was experienced at the time of a typhoon in Kumamoto Prefecture in September 1999. Also heavy rain caused urban flooding in which utilities were damaged, in the Tokai region in September 2000 and approximately 61,000 residents were advised or ordered to evacuate their homes. These disasters led government related organizations to conduct studies and make urgent proposals regarding matters that should be promoted.

(P) The Tokai Region Torrential Rains in 2000

(3) Promotion of Comprehensive Sediment Disaster Countermeasures

Japan is a country subject to debris flow, landslides, slope failure and other sediment disasters. The Outline for Promoting Sediment Disaster Countermeasures was introduced in March 1988 with the objective of promoting national land conservation projects and improving forecasting, warning and evacuation systems. Countermeasures are comprehensively promoted following the stipulations of the Outline. Regarding sediment disaster countermeasures, related ministries and agencies made arrangements concerning the promotion of matters that required special emphasis.

In April 2001, the Sediment Disaster Management Countermeasures for Sediment Disaster Prone Areas Act was enacted for the purpose of clarifying areas considered prone to landslide disaster, preparing evacuation warning systems, limiting development, regulating building construction and promoting structure transfers.

(P) The Hiroshima Prefecture Torrential Rains Disaster

(P) Coastal Conservation Facilities (Kochi Beach, Kochi Prefecture)

(4) Promotion of Coastline Conservation

In order to prevent storm surge disasters caused by waves and erosion on coastal shores, improvement of coastline conservation facilities and surrounding environments are being systematically carried out in accordance with the 6th Seven-Year Plan for Coastline Projects, introduced in 1996.

8 Volcano Disaster Countermeasures

(1) Observation System

A variety of phenomena can occur when a volcano erupts including lava flows, pyroclastic flows and/or ash fall and mud flows, and any of these can cause extensive damage. Various types of equipment such as seismographs, "GPS" have been setup in the vicinities of volcanos for the purpose of monitoring earthquake activity, crustal deformation etc. These facilities are monitored and the data from them is analyzed by the Meteorological Agency. If anything abnormal is found, the Agency announces the information to draw attention and warn related authorities and agencies. The Volcano Eruption Prediction Council (founded in the Meteorological Agency) conducts

comprehensive judgments regarding volcanic activity.

The monitoring research performed for volcano eruption prediction is carried out by related organizations based on the 6th Volcano Eruption Prediction Plan (fiscal years 1999–2003) proposed by the Geodesy Division of the Science and Technology Council (advisory committee of the Ministry of Education, Culture, Sports, Science and Technology).

(2) Countermeasures Based on the Active Volcano Disaster Special Countermeasures Act

The following countermeasures are applied in accordance with the Active Volcano Disaster Special Countermeasures Act enacted in April 1978 (a revision of the Improvement of Evacuation Facilities in Vicinity of Active Volcanos Act enacted in July 1973): ①Improvement of facilities based on designation of areas for emergency evacuation facilities improvement. ②Improvement of disaster prevention facilities for people engaged in agriculture. ③Improvement of ash fall control facilities based on designation of areas of ash fall prevention and removal. ④Volcanic ash removal. ⑤Promotion of soil conservation and soil erosion prevention projects.

By March 2001, the regions in the vicinity of Sakura-jima Island, Mt. Aso, Mt. Usu, Izu-Oshima Island, Mt. Tokachidake and Mt. Unzendake were designated as areas for emergency evacuation facilities improvement, and measures to prepare evacuation facilities have been implemented.

(P) Mt.Usu Prevention Measures against Debris Flow

•Restoration Work at Mt.Usu under Remote Control

(3) Preparing a Volcano Hazard (Disaster Management) Map

The Volcano Hazard Map provides a graphical indication of the areas predicted to be influenced by an eruption together with evacuation facilities. It is a key component utilized in determining disaster management countermeasures. At the time of the Mt. Usu eruption disaster in 2000, residents were familiar with the Volcano Hazard Map. Progress has been made according to the establishment of the Mt. Fuji Volcano Disaster Management Conference by related organizations and agencies of the Government and the prefectural and municipal governments.

Given the environment (e.g., hot springs and beautiful landscapes) offered by volcanic mountains, it is important to plan to live in harmony with them. The Volcano Hazard Map has this role.

(F) Classification of Volcanos

(F) Hazard Map of Mt.Usu

(P) The Fumes with Volcanic Gas Continually Rises from Miyake-jima : July, 2001

9 Nuclear Disaster Countermeasures

The Special Measures of Nuclear Disaster Act was enacted following the critical accident at the JCO uranium processing plant in September 1999. The act clarifies reporting standards and stipulates the requirement of a systematic communications link between the Government and the local government bodies so as to ensure prompt response at the time of a disaster, and improve the timeliness of the nation's emergency response system. The act also requires that a remote emergency response control center be setup when a nuclear disaster occurs and that national and local authorities involved meet at a single centralized location where pertinent information can be shared in common and emergency measures implemented under mutual cooperation. There are currently 21 such locations designated in Japan. In addition to this, the Council for Joint Measures on Nuclear Disasters is to be established, and the Government, the local government and companies involved in the nuclear power industry join together every year and cooperate in conducting comprehensive drills to prepare for nuclear disasters.

(F) Emergency Response at the Time of Nuclear Disasters

10 Other Disaster Countermeasures

(1) Snow Disaster Countermeasures

In Japan approximately one-half of the country is subject to heavy snowfall during the winter months, and are therefore designated "heavy snowfall areas," under the Special Countermeasures for Heavy Snowfall Area Act. Various countermeasures including securing transportation and communications and improving national land conservation facilities are carried out.

(F) Designated Areas of Heavy Snowfall and Special Heavy Snowfall

(2) Large Accident Countermeasures

In response to changes concerning transportation and infrastructure in recent years, such as the formation of a system for traffic and transportation in great volume, more frequent use of various hazardous materials and increased construction of high-rise buildings, underground shopping malls and massive roadways, accident disaster measures have been taken and placed in the Basic Disaster Management Plan. These include measures taken to deal with Marine Disaster, Aviation Disaster, Railroad Disaster, Road Disaster, Hazardous Materials Disaster, Large-Scale Fire Disaster and Forest Fire Disaster.

- (P) Responding to the Accident at the JCO Uranium Conversion Building
 - (P) A Fire at a Building in Kabuki-cho, Shinjuku Ward
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VI International Cooperation

1 Disasters Throughout the World

Approximately 1.5 million lives were lost and property damage exceeded 952 billion dollars as the result of natural disasters in the 25-year period from 1975 to 1999 in all the world. Since the year 2000 there have been disasters such as the earthquake of Western India, torrential rains in South Asia caused by seasonal winds and also in Southeast Asia caused by monsoons and so on.

(F) The Percentage of the Occurrence of Natural Disasters, Casualties and the Amount of Damage in Regions all over the World. (1996–2000)

2 Japan's International Cooperation in Disaster Relief

Japan has suffered many natural disasters, and has developed many innovative disaster countermeasures as a result of its vast experiences. Today, the country is working hard in the promotion of international cooperation in the field of disaster management.

The Japanese government promotes international cooperation activities in four areas : ① Technical cooperation, such as providing training courses for specialists from other disaster-prone countries and the dispatch of specialists to such countries. ② Granting of funds. ③ Providing loans. ④ Multilateral cooperation through United Nations organizations.

In 1987, the Japan Disaster Relief Team Dispatch Law was enacted, leading to organizational arrangements that allow and promote comprehensive international emergency disaster relief activities (e.g., providing relief goods) The country's non-governmental organizations, such as the Japan Red Cross Society, are also active in this area; especially in terms of emergency disaster relief assistance.

(P) Medical Support after the Gujarat, India, Earthquake of January 2001

(P) Rescuing Victims Buried Alive Following the Kocaeli, Turkey, Earthquake of August 1999

3 Working on the United Nations International Strategy for Disaster Reduction

In 1999 the 54th General Assembly of the United Nations adopted the International Strategy for Disaster Reduction (ISDR), successor program to the International Decade for Natural Disaster Reduction (IDNDR). Secretary-General proposed in the Assembly to arrange a UN system and organization to promote this activity requiring each nation to maintain and strengthen the National Committee set up during the decade, in addition to starting new activities.

Activity objectives include:

- 1) Increasing public awareness of risks that natural, technological and environmental hazards impose on modern-day society.
- 2) Obtaining participation of public authorities concerning disaster prevention.
- 3) Obtaining participation of local residents to create disaster-safe communities.
- 4) Proceed with reduction of economic and social losses of disasters.

Japan continues to actively promote international cooperation in the area of disaster management. The Japan National Committee for International Disaster Management was established to promote activities and has as its members section chiefs of many related ministries and agencies.

4 Asian Disaster Reduction Center

It has been recognized that it is crucial to promote international cooperation among regions that share aspects of disaster vulnerability and disaster management measures to add further momentum to existing measures, taking advantage of the "IDNDR". The need to promote multilateral disaster management cooperation in the Asian region where disasters occur frequently was especially emphasized at the ministerial-level Asian Natural Disaster Reduction Conference held in Kobe City in 1995, attended by delegates from 28 countries in Asia and other regions.

The Asian Disaster Reduction Center, located in the city of Kobe, Hyogo Prefecture, started activities in July 1998. It promotes multilateral cooperation for disaster management in the Asian region, under close ties with 24 participating countries who gather and provide disaster related information, promote studies and research in disaster management cooperation, collect information for multilateral emergency disaster relief activities, and carry out disaster management training and education programs and other activities.

(P)World Conference on Natural Disasters