EARTHQUAKE INSURANCE IN JAPAN

October 2022

General Insurance Rating Organization of Japan (GIROJ)

Preface

Japan is a country that has large numbers of natural disasters due to such things as typhoons, earthquakes and volcanic eruptions, and, in particular, as it is the world's most earthquake-afflicted country, massive earthquake disasters have occurred frequently.

The general (non-life) insurance system in Japan commenced in the latter half of the 19th century, when Japan was reincarnated into a modern state. However, though the necessity for earthquake insurance was proclaimed and considered every time an earthquake disaster occurred, there was great difficulty in establishing such insurance, since there was a possibility of causing huge amounts of loss once a large-scale earthquake occurred.

As a result of considerations by the general insurance companies and the government, with the Niigata Earthquake in 1964 as the turning point, by limiting the coverage and amount insured and other means, and through acceptance of reinsurance by the government, earthquake insurance systems for residences and household goods were finally established in 1966.

Afterwards, in response to the various needs of the insurance users whenever earthquake disaster occurred, the earthquake insurance systems have been revised many times and the coverage and amount insured, etc., have been broadly improved.

In addition, in order to maintain more reasonable rate, reconsideration has been given in rating for earthquake insurance, in reflection of the results, etc., of Japan's world class, leading edge earthquake research.

This book explains about "earthquake insurance in Japan," which is characterized in these various ways, and we hope it will assist you in understanding the subject more deeply.

There are two types of earthquake insurance in Japan--one for residences and the one for offices and factories, etc.--and this book deals with the former.

March, 2003

General Insurance Rating Organization of Japan
(GIROJ)

Publication of the 4th Edition

Earthquake Insurance in Japan has been expanded and revised in the fourth edition to reflect the following changes that have taken place in earthquake insurance in Japan since the publication of the third edition in July 2014.

1. Damage classifications were subdivided in January 2017; "Half loss" has been divided into "large half loss" and "small half loss," creating four classifications, "total loss," "large half loss," "small half loss" and "partial loss."

2. The Standard Full Rates of earthquake insurance were revised in January 2017, January 2019, January 2021 and October 2022.

3. The Enforcement Order for the Act on Earthquake Insurance and the Regulation for Enforcement of the Act on Earthquake Insurance were amended in April and October 2016, April 2017, February and April 2019 and April 2021, altering the liability sharing between the Japanese Government and insurance companies.

October, 2022

General Insurance Rating Organization of Japan
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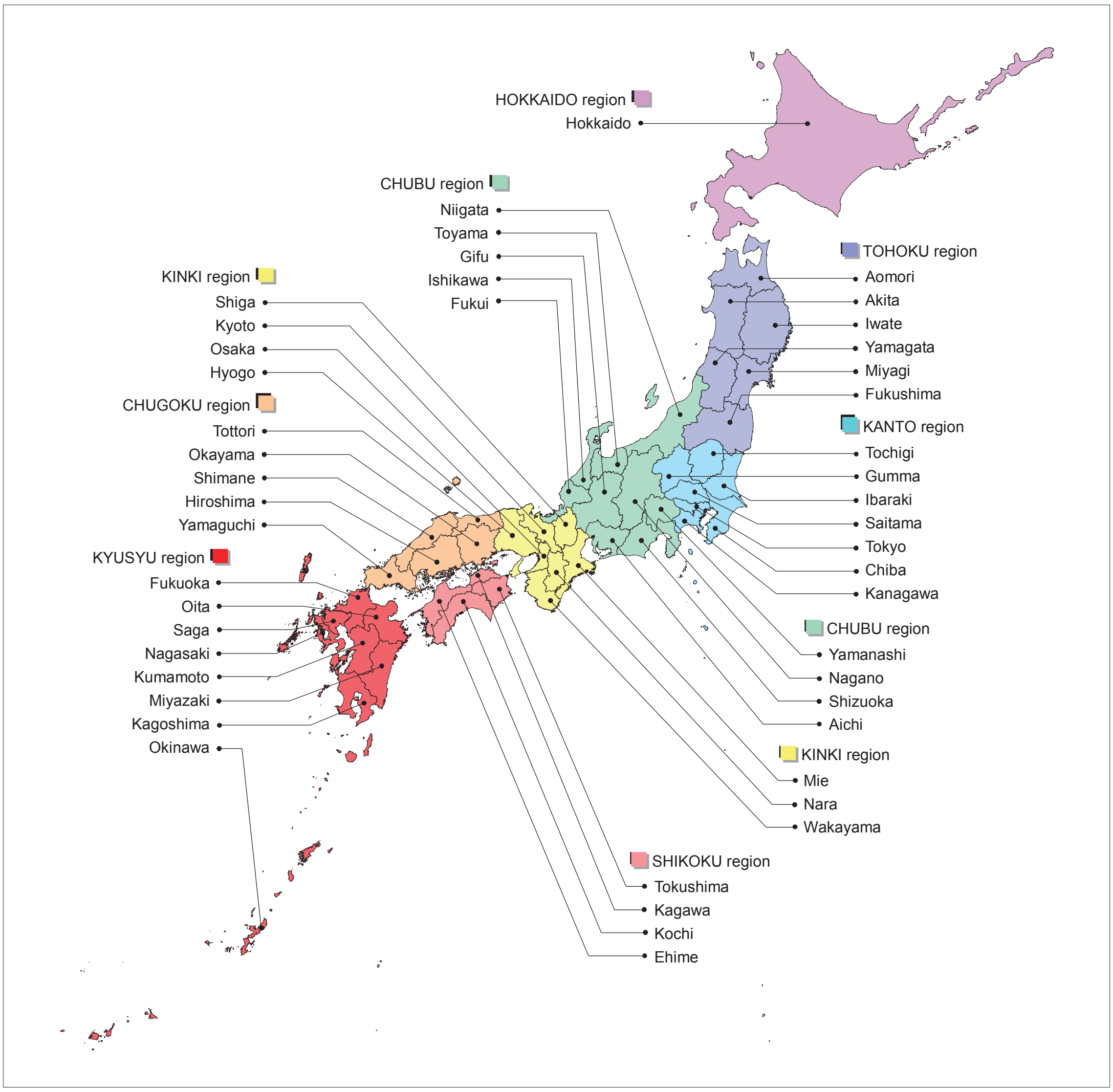
Map of Japan


HOKKAIDO region
Hokkaido
CHUBU region
Niigata
Toyama
Gifu
Ishikawa
Fukui
TOHOKU region
Aomori
Akita
Iwate
Yamagata
Miyagi
Fukushima
KINKI region
Shiga
Kyoto
Osaka
Hyogo
CHUGOKU region
Tottori
Okayama
Shimane
Hiroshima
Yamaguchi
KANTO region
Tochigi
Gumma
Ibaraki
Saitama
Tokyo
Chiba
Kanagawa
KYUSYU region
Fukuoka
Oita
Saga
Nagasaki
Kumamoto
Miyazaki
Kagoshima
Okinawa
CHUBU region
Yamanashi
Nagano
Shizuoka
Aichi
KINKI region
Mie
Nara
Wakayama
SHIKOKU region
Tokushima
Kagawa
Kochi
Ehime

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Section 1 Seismic Risk in Japan

1.1 Seismic Activity in the Japanese Archipelago and Surrounding Areas

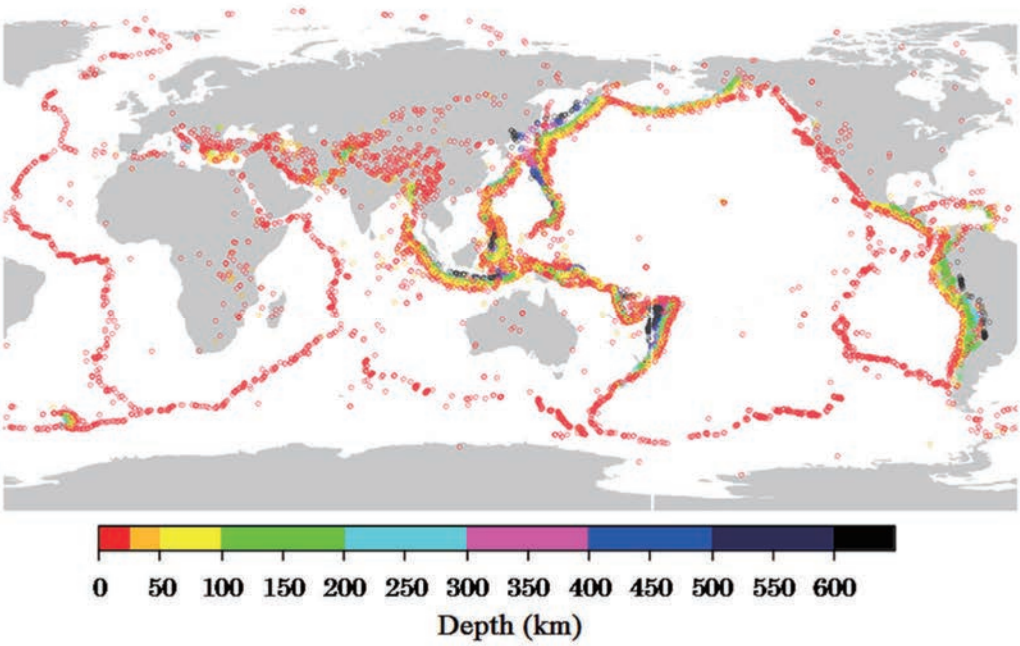
1.1.1 Distribution of earthquakes

Figure 1.1.1 plots the epicenters of earthquakes from 1970 to 2018. It is clear from this figure that there are regions with many earthquakes and regions with few, and that earthquakes do not occur equally by region. Upon precise observation, it is also recognizable that the earthquake epicenters are distributed in thin, long zones, as if to draw a pattern on the earth. For example, in the coastal areas on the continent and in the island arc facing the Pacific Ocean, epicenters continue in a narrow range, surrounding the Pacific Ocean. From a worldwide point of view this is an area with numerous earthquakes, and it’s called the Circum-Pacific seismic belt. In particular, the west side of said--from the Kamchatka Peninsula to the Japanese archipelago, Indonesia and New Zealand--is an area with extreme numbers of earthquakes. The map of Japan is covered with dots indicating seismic epicenters, a testimony to the very frequent occurrence of earthquakes in Japan.

Japan is located in an area that could be termed an earthquake epidemic zone, about 10% of the earthquakes in the world, limited to the earthquakes of magnitude 6 and over, 20% of the earthquakes in the world have occurred around the Japanese archipelago. Considering the fact that the land area of Japan is just 0.3% of the entire world, this is quite a high frequency.

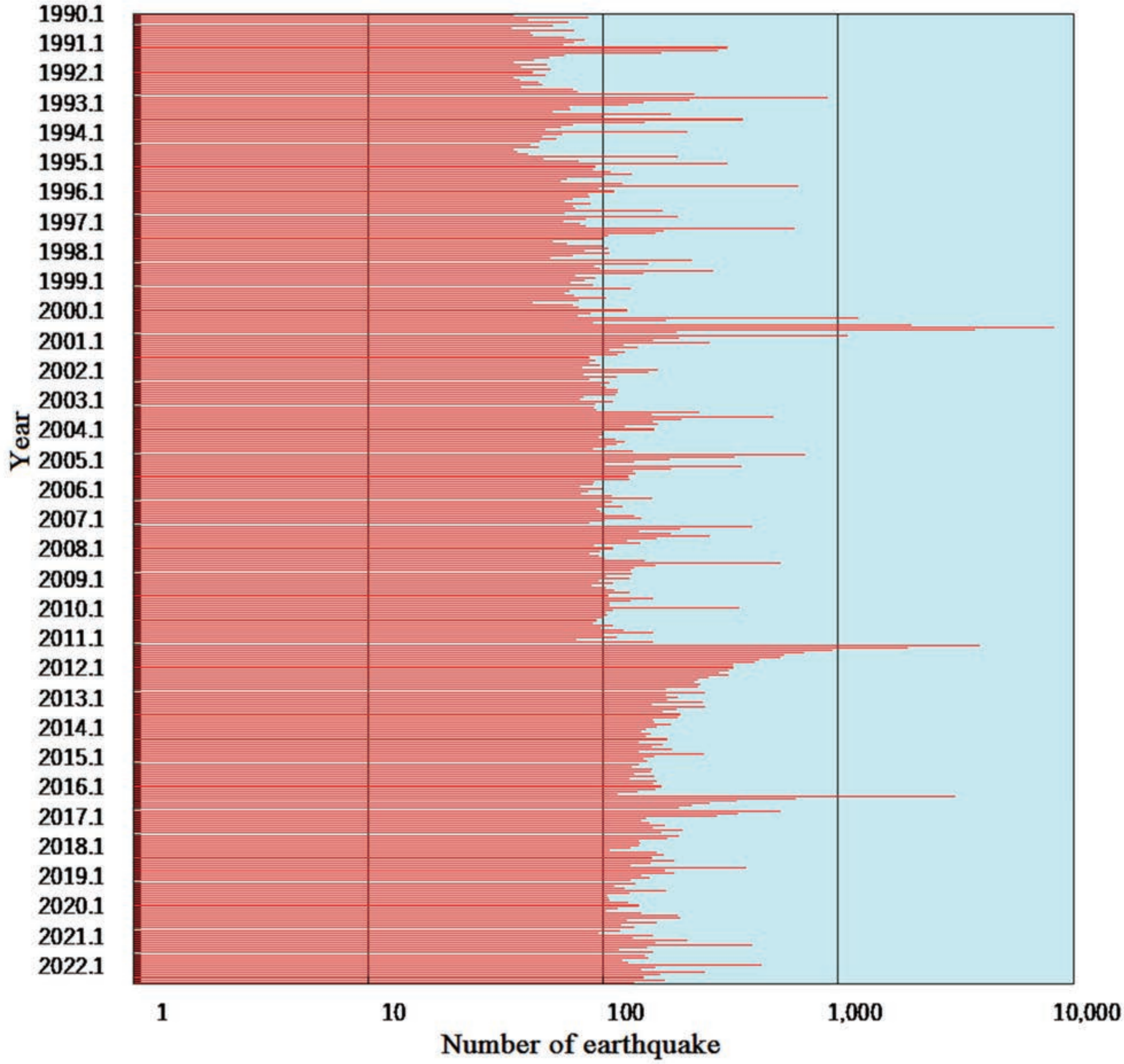
Figure 1.1.2 is the trend in monthly numbers of felt earthquakes that occur in and around Japan from 1990 to July 2022. There are months in which extremely large numbers of felt earthquakes occur, effected by aftershocks from large earthquakes or earthquake swarms, and so forth; however, even without considering these, earthquakes occur in Japan about 50 to 100 times per month, and are felt as many as 1,000 times per year.

Figure 1.1.3 plots the epicenters of earthquakes of magnitude 5.5 or higher that occurred on the coast of Japan from 1970 to 2018. The Japanese archipelago is

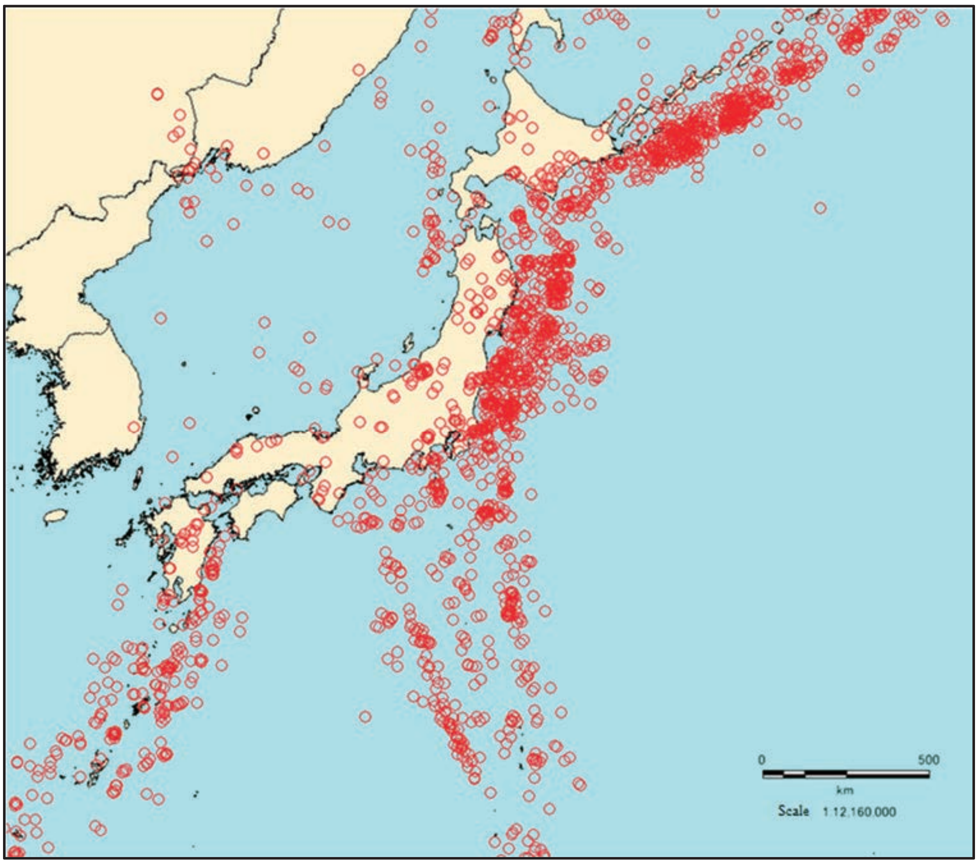


(Fig. 1.1.1) Epicenter distribution of earthquakes from 1970 to 2018 (M5.5 or higher)
Created from GEM Foundation and the International Seismological Centre data

almost covered with red marks indicating epicenters and this tells us about the large number of earthquakes in Japan. Observing the earthquake occurrence status in this area from the macro point of view, the following can be said: The Pacific coast area of East Japan and the area from Kyushu to Nansei islands have extremely many earthquakes. A belt-like distribution as seen in **figure 1.1.1** can clearly be seen in **figure 1.1.3**. Observing this in greater detail, there is a great deal of shading seen everywhere, even in the belt-like distribution. In other areas as well, at a more precise level, many differing densities of epicenters can be seen, and it is recognizable that seismic activity displays different aspects in every area.



(Fig. 1.1.2) Trend in monthly number of felt earthquakes occurred in and around Japan from 1990 to July 2022
Created from Japan Meteorological Agency date



(Fig. 1.1.3) Epicenter distribution of earthquakes from 1970 to 2018 (M5.5 or higher)

Created from GEM Foundation and the International Seismological Centre data

1.1.2 Earthquake occurrence mechanism

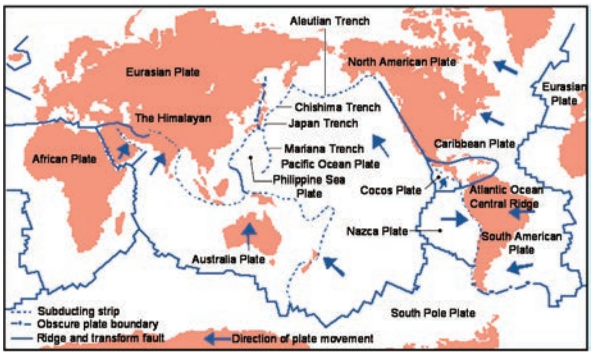
At present, many researchers support that the occurrence mechanism of earthquakes can be explained by the theory of plate tectonics. According to this theory, the earth is covered with over ten pieces of bedrock called “plates.” Approximately several tens of kilometers thick and with no space between them, the plates are moving in different directions each other (**figures 1.1.4** and **1.1.5**). Crustal deformation is taking place at the interplates, with such things as the building of mountain chains due to the crushing of plates, or the formation of trenches from one plate sinking beneath another. It is explained that earthquakes are a phenomenon of deformation energy being released at once by the destruction of the plates themselves or the occurrence of sliding between the plates, etc., when deformation energy accumulated in the plates reaches its limit from such crustal deformation.

Therefore, seismicity tends to be active near the interplates. In fact, as becomes clear when comparing the interplates in **figures 1.1.4** or **1.1.5** and the belt-like epicenter distributions seen in **figures 1.1.1** and **1.1.3**, the location of both is almost the same.

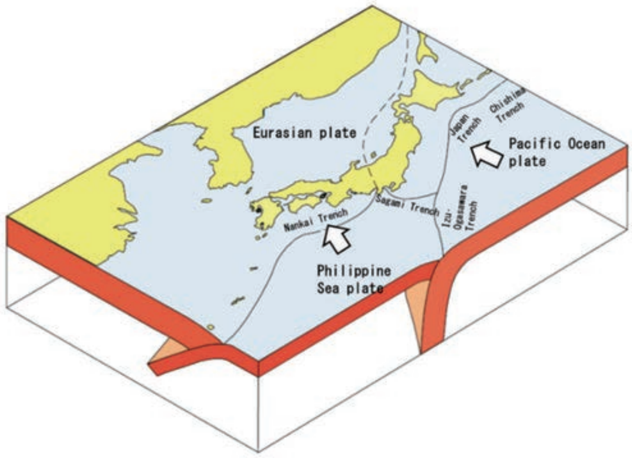
Especially at the interplates in **figure 1.1.4**, said to be a subduction zone, there is a much higher number of occurrences of earthquakes than in other interplates. Japan is located in an area next to such a subduction zone, and it can be considered that very frequent occurrence of earthquakes in and around Japan is due to such a geographical environment.

Figure 1.1.6 indicates the distribution of the depth of earthquakes taking place in the Japanese archipelago and surrounding areas. Most of these earthquakes can be classified into three types according to place of occurrence and mechanism (**figure 1.1.7**).

As indicated in **figure 1.1.5**, at least three plates exist on the periphery of the Japanese archipelago, and it is said that the earthquakes occur by very complicated mechanisms.



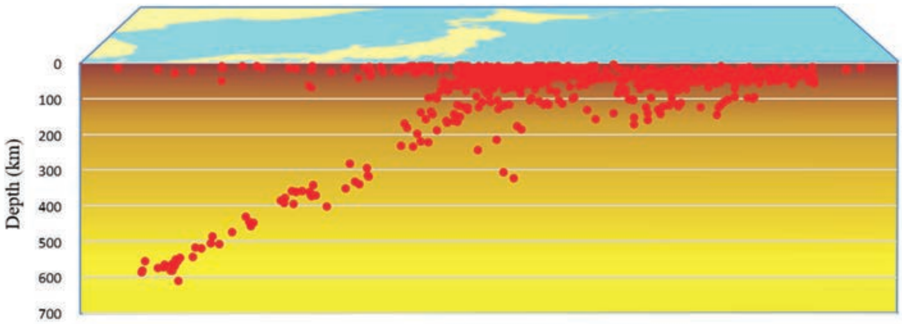
(Fig. 1.1.4) World interplates
Reprint from the website of the Headquarters for Earthquake Research Promotion



(Fig. 1.1.5) Bottom topography and interplates on the periphery of Japan

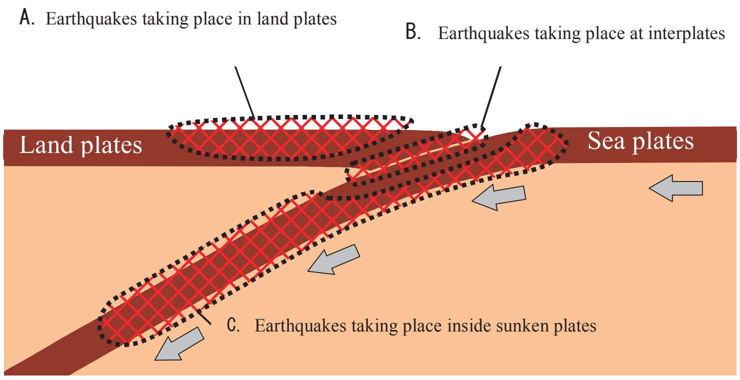
Dotted line indicates unclear interplates (touched up reprint from the website of the Headquarters for Earthquake Research Promotion).

This can be roughly simplified as seen in **figure 1.1.7**, and types of earthquakes can be classified as A, B and C.



(Fig. 1.1.6) Distribution of the depth of earthquakes taking place in the Japanese archipelago from 1970 to 2018 (M5.5 or higher)

Created from GEM Foundation and the International Seismological Centre data



(Fig. 1.1.7) Types of earthquakes grouped by place of occurrence

A. Earthquakes taking place in land plates

The sea plate is moving in the direction of the land plate several centimeters per year, though the speed is different among the areas, as shown in **figure 1.1.7**. It can be said that the land plate on which the Japanese archipelago is riding is in a state of being continuously pushed by the sea plate. Therefore, strong compressive force is working in the range of A, and when the plates come to be unable to withstand the force, a portion of the plates is destroyed and cracks (faults) form. Earthquakes occur at such times.

Earthquakes such as the 1995 Hyogo-ken Nanbu Earthquake, the 2004 Niigata Chuetsu Earthquake and the 2016 Kumamoto Earthquake are classified as this type of earthquake. Since faults are the weak parts of plates that are destructible, it is considered that when the deformation again reaches its limit after a long period--from a thousand to several tens of thousands of years--the same boundary of a fault will be destroyed. In other words, earthquakes are considered to take place repeatedly on the faults.

In many cases, since the destruction of faults occurs in a range of from several kilometers to several tens of kilometers underground, faults cannot be found from the surface ground. However, as a fault causing a great earthquake is of a large size itself, there are times when a portion of the fault will reach the surface ground. It is said that there are about 2,000 active faults existing in and around Japan and these could be termed traces of past great earthquakes. Their locations, amounts of slide, age of surrounding geological layers, etc., constitute precious clues for specifying the places of occurrence and scales of great earthquakes that have been taking place repeatedly, along with the history that caused these earthquakes. Therefore, investigation of active faults is vitally important for earthquake disaster prevention.

B. Earthquakes taking place at interplates

The land plates and sea plates are contiguous in the area of B in **figure 1.1.7**. Ordinarily, high pressure is operating between these and both plates are firmly fixed against one another. Since the sea plates are moving so as to sink down beneath the land plates, the land plates are pushed down as if being drawn into the sea plates. When deformation reaches the limit of the force sticking the plates together, sliding takes place in the area of B and deformation energy of land plates is released with a rush, causing earthquakes. In many cases this type of earthquake is concurrent with tidal waves, as crustal deformation in the area of sea bottoms is massive.

Due to sea plate subduction, deformation energy is supplied to land plates continuously. Thus, like earthquakes from active faults, this type of earthquake also occurs repeatedly in the same area. However, while the activity cycle of earthquakes taking place on active faults is generally a period of as long as from several thousand years to several tens of thousands of years, that of earthquakes occurring repeatedly at interplates is considered to be comparatively short periods of from several tens of years to several hundred years. For example, as for the type of earthquake that has occurred off the shore of Miyagi Prefecture, according to historic records, such occurred on extremely short intervals averaging 36 years (**table 1.1.1**). Additionally, in the case of this type of earthquake, it is not rare for such to be M8 class or more in size and bring the risk of causing massive damage. Earthquakes such as the 2011 off the Pacific coast of Tohoku Earthquake are classified as this type of earthquake.

(Table 1.1.1) Occurrence history of Miyagi-ken-oki Earthquake

Earthquake occurrence year	Scale	Interval
1897	M7.4	
		39 years
1936	M7.4	
		42 years
1978	M7.4	
		27 years
2005	M7.2	

Created from *Long-term Evaluation of Seismic Activities along the Japan Trench* (Headquarters for Earthquake Research Promotion; 2019)

C. Earthquakes taking place inside sunken plates

These are earthquakes that take place due to the destruction of the interiors of sunken sea plates. As recognizable in **figures 1.1.6** and **1.1.7**, this type of earthquake takes place even at fairly deep locations, with the depth sometimes exceeding 500 kilometers. In addition, in case such takes place in a shallow location, crustal deformation at the sea bottom portion becomes massive and there are some cases of such becoming an earthquake concurrent with a tidal wave. The 1993 Kushiro-oki Earthquake, the 1994 Hokkaido Toho-oki Earthquake, the 2001 Geiyo Earthquake, etc., fell under this type of earthquake.

1.2 Seismic Risk Evaluation

1.2.1 Seismic risk

What is the risk indicated by “seismic risk?” The meaning of such differs depending on the situation of those requesting risk evaluations. For example, for the owners of a building, such will be the possibility of causing losses to the target objects, and for those who are investigating site locations for factories or those advancing city planning, there may be cases where they will request information about the possibility of the occurrence of earthquakes, or the expected intensity of ground motion. When it comes to "seismic risk," as for the specific indices under consideration, primarily the following things can be named:

a. place of occurrence
b. scale of earthquake
c. time and probability of occurrence
d. size of seismic motion
e. size of predicted damage

Among these indices, **a.** to **c.** are indices with regard to the occurrence of earthquakes themselves, and such could be termed a sort of earthquake prediction information. On the basis of these, **d.** "strength of seismic motion at the evaluation point" (earthquake hazard[note]) and **e.** "damage to the target objects" (earthquake risk[note]) are calculated. However, depending on the case, earthquake hazard and earthquake risk, sometimes mean different things. Earthquake hazard is defined here as "evaluation of the possibility of being hit by strong seismic motion," and earthquake risk is defined as "direct economic loss incurred due to earthquake."

1.2.2 Earthquake prediction

Earthquake prediction can be roughly divided into two kinds. One is prediction of future earthquakes from about several weeks to immediately before the occurrence of said, as in "an M7 class earthquake will occur in Tokyo within 72 hours" (short-term prediction). The other is prediction of the occurrence of earthquakes over a long period from the present, from several years to 50 or 100 years, or longer (long-term prediction).

Though the boundary between these two kinds of predictions is not clear, their characters are completely different. Since short-term prediction is information given just before the occurrence of an earthquake, it is highly effective in arousing the disaster prevention consciousness in people, even if just temporarily. Additionally, it is possible to perform some measures such as evacuating dangerous buildings or not using trains, so such can be said to be extremely effective information for protecting human lives.

On the other hand, in long-term prediction, there is a tendency to think that there will be some delay before the occurrence of an earthquake, and the effect is low on improving disaster prevention consciousness compared to short-term prediction. However, earthquake-resistance remodeling of buildings or infrastructure, reinforcement of disaster prevention facilities, etc., is conducted politically, and reductions not only of loss of human life, but also of economic loss can be expected. When it comes to earthquake prediction, many people visualize short-term prediction, but long-term prediction is very important information as well for earthquake disaster prevention.

(Note) Earthquake hazard expresses occurrence probability of earthquakes, the largest seismic motion expected at a given point, the probability of occurrence there, or the activity cycle, and in many cases it indicates the risk of inflicting damage, the intensity of phenomena and the probability of occurrence. On the other hand, seismic risk is used in the meaning of "occurrence probability of uncertain damage or expected loss." In many cases damage and loss here especially indicate economic loss. Sometimes it is expressed by the following formula:

Risk = Value of the target object × Degree of damage × Occurrence probability.

In such cases, value of the target object times the degree of damage indicates the size of damage (strength), and risk is quantified by multiplying the occurrence probability (uncertainty) by such. Quantification of seismic risk is extremely important for determination of premium rates of earthquake insurance, and in addition, it is used in the field of risk management, etc., for companies.

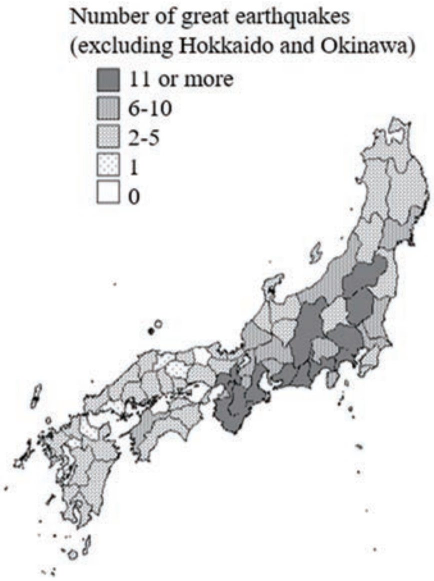
(1) Short-term prediction

It has long been said that great earthquakes are concurrent with precursor phenomena. For example, at the time of the Great Kanto Earthquake, many stories of experiences of precursor phenomena were reported, as in '*thunder like gunfire was heard, huge schools of sardines retraced the rivers, wells dried out, fireballs were seen, etc.*' At the time of the Hyogo-ken Nanbu Earthquake, there were reports of anomalous radio wave transmission, with higher levels of noise at locations closer to Kobe. These are considered to occur as a result of various phenomena in the critical situation just before an earthquake, and short-term prediction mainly treats these phenomena as precursor phenomena, and is conducted on the basis of said. This type of earthquake prediction research is very interdisciplinary in nature, and studies are being conducted in many places around the world including Greece, China, Russia, Italy, and Taiwan.

In Japan, disaster prevention countermeasures for just prior to the occurrence of the Tokai Earthquake are stipulated by the Large Scale Earthquake Countermeasures Act (Law No.73 of 1978) set forth in 1978. In the area where damage of the Tokai Earthquake is concerned, systems are in operation to detect abnormalities just prior to the occurrence of earthquakes using observation equipment such as seismometers, strain meters and tilt meters, and it had been thought that the occurrence of the Tokai Earthquake was the only instance for which short-term prediction is possible. In the event abnormalities are seen in crustal deformation, etc., and when such are judged to be Tokai Earthquake precursor phenomena, under this Act, various social activities are supposed to be regulated in the area covering the eight prefectures centered on Shizuoka Prefecture (areas under intensified measures against earthquake disasters, including Mie, Aichi, Gifu, Nagano, Yamanashi, Kanagawa and Tokyo). However, a report published by the Working Group on Consideration of How to Respond to a Disaster based on Earthquake Observation and Assessment along the Nankai Trough under the Cabinet Office, "How to Respond to a Disaster based on Earthquake Observation and Assessment along the Nankai Trough (Report)" published in September 2017 indicated that "There is no established scientific technique to highly accurately predict the time of occurrence, location, or scale of an earthquake at present and so accurate earthquake prediction presumed in the existing earthquake disaster response control measures based on the Large Scale Earthquake Countermeasures Act is not possible. Therefore, the existing earthquake disaster response control measures based on the Large Scale Earthquake Countermeasures Act needs to be amended." In response to these remarks, the government is currently considering how to respond to a disaster when an abnormal event has been observed along the Nankai Trough and a mechanism for implementing a disaster response.

(2) Long-term prediction

If we include ones of similar type, long-term prediction has been conducted since relatively ancient times. It is possible to find articles in Japan on past great earthquakes in ancient documents, and it is possible to observe historic earthquakes over a very long period. The oldest earthquake article concerns one in 416 A.D., and from that time on, over approximately 1600 years, it is possible to grasp the location and scale of the earthquakes that have occurred in the past. The listing up of past earthquakes chronologically based on this information is called the "earthquake catalog," and this is being used in various ways in the field of earthquake disaster prevention. It was in 1899 that the practical earthquake catalog was compiled in Japan for the first time. Using said, Fusakichi Omori (Professor in the Seismology Dept., Tokyo Imperial University) counted the numbers of occurrences of earthquakes and indicated them on a map (**figure 1.2.1**). Though the probability of



(Fig. 1.2.1) Distribution map of great earthquakes in Japan

The great earthquakes from 416 to 1860 are counted. Great earthquakes here are defined as "those with collapse of basin, cracking, significant housing damage, loss of human lives, etc." (Created from Omori (1899) with limiting areas where earthquake records were available at that time.)

occurrence of earthquakes in the future is not mentioned here, average activity cycles were obtained statistically and frequency of earthquakes depending on the regions was referred, and this was the forerunner of long-term prediction.

Akitsune Imamura (Professor in the Seismology Dept., Tokyo Imperial University) closely examined the earthquake catalog and discovered that there is periodicity in the great earthquakes besetting Tokyo. In 1905, he issued the thesis that there was a possibility of the occurrence of a great earthquake in Tokyo in the future within 50 years. It is said that this long-term prediction was an attempt to promote countermeasures against earthquakes in Tokyo and had no definite grounds in a seismological sense; however, since the Great Kanto Earthquake occurred in 1923 after this thesis, it became a topic of discussion for predicting said.

As a theory similar to this, Hiroshi Kawasumi (President of Earthquake Research Institute, University of Tokyo) announced the theory in 1970 that the "occurrence periodicity of strong ground motion in the southern part of Kanto region is 69±13 years." According to this theory, the probability of occurrence of a great earthquake reached its peak in 1992, 69 years after the Great Kanto Earthquake in 1923, and that such would occur by 2005. It caused a response from society at the time as the earthquake disaster prevention plan for Tokyo was planned based on it.

Earthquakes that occur at the boundaries between tectonic plates, or interplate earthquakes, have relatively short cycles of activity. As a result, in many cases, their past occurrences can be determined from historical records. One interplate earthquake which has the potential to recur in the near future, causing damage over a relatively large area, is an earthquake in the Nankai Trough. Historical documents reveal that earthquakes have occurred at intervals of 90 to 150 years after 1361 in this area. The Headquarters for Earthquake Research Promotion has been conducting long-term evaluations of earthquake activities, which predict the size of earthquakes and the probability of occurrence of them within a certain period, based on historical records and observations.

After the 1995 Hyogo-ken Nanbu Earthquake, which brought about a renewed awareness of the dangers of earthquakes taking place on active faults, greater efforts have been focused on the investigation of active faults. There are approximately 2,000 active faults in Japan, and among them, long-term evaluations have been conducted for those having a high level of potential earthquake damage with researching their locations, records of past activity, and other attributes by the Headquarters for Earthquake Research Promotion. In recent years, as the initial evaluations of these active faults have been completed, the Headquarters has begun introducing new evaluation techniques for greater accuracy and reliability and conducting regional evaluations that cover seismic activity at multiple active faults distributed within a region, in addition to evaluations of individual active faults as in the past.

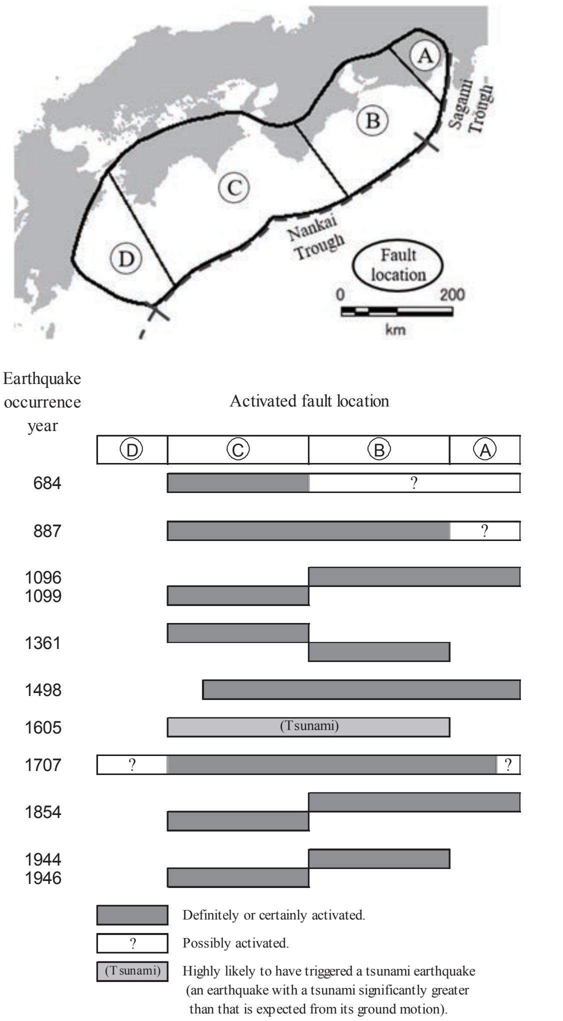
Besides what has been stated up to this point, there is a way of thinking with regard to long-term prediction called seismic gap. As earthquakes are phenomena of the release of deformation energy accumulated in plates, earthquakes should not occur in the areas until energy is sufficiently accumulated. In other words, in an area in which great earthquakes have occurred historically, but where an earthquake has not occurred for a long period (seismic gap), the energy is accumulated and thus an earthquake is thought to be impending in this concept.

This concept is easy to understand for earthquakes at interplates whose activity cycles are relatively short, and there is a research report stating that an earthquake occurred off the eastern shore of Hokkaido that filled in the seismic gap. Additionally, as there have been no great earthquakes that have taken place in the area from Suruga Bay to Enshu nada (area A in **figure 1.2.2**) since the Ansei Tokai Earthquake in 1854, such is considered to be a seismic gap.

Newly acquired knowledge concerning topography, historical records, and seismic activity is being used to refine the determination of potential hypocentral regions and seismic risk.

1.2.3 Earthquake hazard evaluation

The first example of practical earthquake hazard evaluation in Japan is the so-called Kawasumi map (**figure 1.2.3**) created by Hiroshi Kawasumi in 1951. Using the distance-seismic motion strength theorem, Kawasumi calculated the distribution of force of seismic motion of earthquakes that occurred from 679 to 1948, and by the frequency of such, mapped out the earthquake hazards all over Japan. This was the first earthquake hazard map created in Japan. Though the Kawasumi map was created to set up regional seismic coefficients for building design in the Building



(Fig. 1.2.2) History of massive earthquakes taking place along the Nankai Trough

Created from *Long-term Evaluation of Seismic Activities in the Nankai Trough (2nd Edition)* (Headquarters for Earthquake Research Promotion; 2013)

[Reference] Characteristics and estimated damage of massive earthquakes that occurred along the Nankai Trough.

M8 class great earthquakes have occurred repeatedly at short intervals of 100 to 200 years in the area along the Nankai trough (A, B, C and D in the figure). It is thought that at least 5,000 people died, 59,000 houses were destroyed and 18,000 houses were swept away in total by the 1707 Hoei Earthquake (M8.6, the estimations are taken from *Chronological Scientific Table*), in which it is believed three earthquakes hit areas A to C simultaneously. In addition, it is estimated that if earthquakes occur in areas A to D simultaneously, the magnitude of the earthquakes will be in the M9 class, with up to 320,000 deaths and up to 2.4 million buildings and houses completely destroyed or burned (*Damage Assumption for Nankai Trough Huge Earthquake (Preliminary Report)* by Central Disaster Management Council; 2012).

Standards Act of the time, afterwards it greatly influenced research with regard to earthquake hazard evaluation, and this method was developed so that numerous earthquake hazard maps were created.

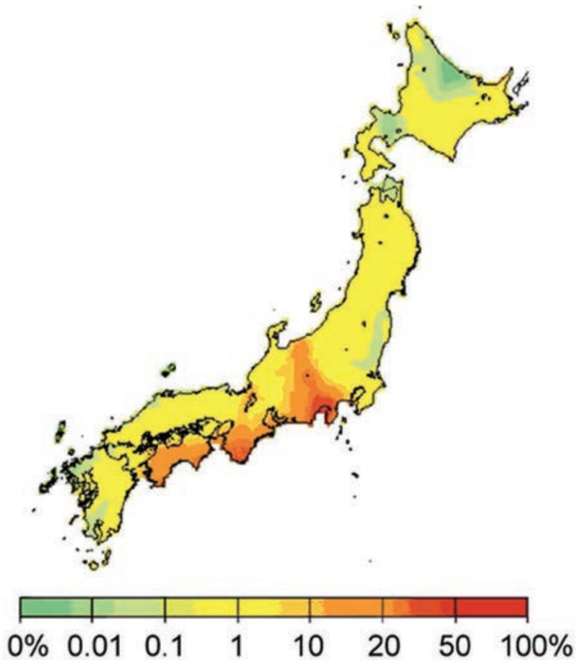
Exemplified by the Kawasumi map, until the 1980s earthquake hazard maps were statistical obtainments of average hazards from the earthquake record of the past. It is considered that one of the reasons why study in this field has developed is that since the history of Japan is long and records of past earthquakes were left over, it was possible to set up a long statistical period. However, earthquakes taking place at interplates, of which the activity cycles are short, are one thing, but the activity cycles of earthquakes at active faults is long, normally from 1000 years to several tens of thousands of years, and it is difficult to evaluate correctly the earthquake hazards with just historical materials from 1600 years. Additionally, not only the average hazard from the past earthquake record, but also the necessity of consideration of the imminence of earthquake have become recognized, and hazard evaluation using the above stated long-term prediction information has begun to be used. For example, the Property and Casualty Insurance Rating Organization of Japan (present General Insurance Rating Organization of Japan) has created earthquake hazard maps of the probability of maximum instrumental seismic intensity for the 50 years from 2000 being 5.5 or higher, with consideration of the imminence of earthquakes using the seismicity history of active faults and interplates (**figure 1.2.4**).

Based on the above-mentioned long-term assessment, the Headquarters for Earthquake Research Promotion published earthquake hazard maps (Probabilistic Seismic Hazard Maps, 2005 Edition) including the "Distribution map of areas with probability of ground motions greater than or equal to seismic intensity 6-lower (instrumental seismic intensity 5.5) occurring within 30 years" in March 2005. The maps were renewed every year till the 2010 Edition. However, many problems with the probabilistic approach to

(Fig. 1.2.3) Kawasumi map

Peak acceleration distribution expected to occur once in 100 years on average (gal)

Reprinted from Osaki (1983), original figure from Kawasumi (1951)



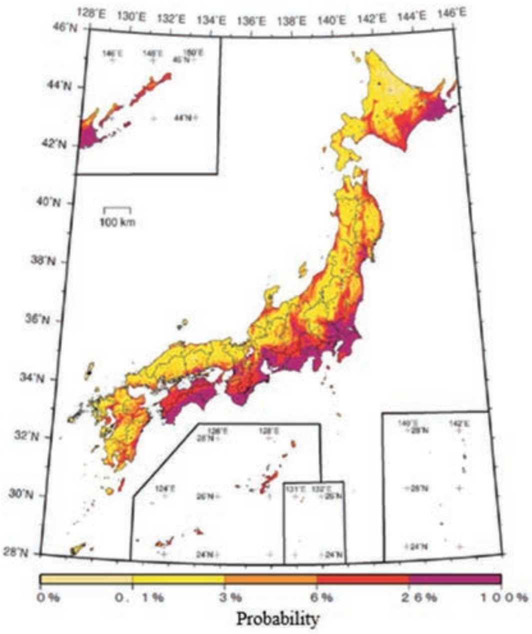
(Fig. 1.2.4) Probability of maximum instrumental seismic intensity for the 50 years from 2000 being 5.5 or higher (intensity 6-lower or higher)

Reprinted from Property and Casualty Insurance Rating Organization of Japan (2000) seismic hazard maps came into focus after the 2011 off the Pacific coast of Tohoku Earthquake, and publication of the 2011 Edition was postponed. The Headquarters examined issues and published a report summarizing the interim examination results up to that point in December 2012 and 2013. Then, the Headquarters published the 2014 Edition of the Probabilistic Seismic Hazard Maps which reflected all the examination results in light of the 2011 off the Pacific coast of Tohoku Earthquake in December 2014. The maps have been revised even after the 2014 Edition (the latest edition is the 2020 Edition (**figure 1.2.5**)) and are expected to be further revised.

1.2.4 Evaluations of seismic risk

In recent years, seismic risk management has come to be widely conducted not only by companies overseas but also inside Japan as well. Seismic risk management evaluates the seismic risk to which a building (or factory, company, etc.) is exposed, and then takes some sort of countermeasures for it. For example, for a building in an area where there is a fear of the occurrence of a great earthquake, it predicts the damage due to an earthquake and sets appropriate earthquake insurance or implements earthquake-resistance reinforcement upon consideration of cost-effectiveness. The important thing is recognizing the seismic risk correctly and to performing effective countermeasures. Therefore, seismic risk evaluation is important for conducting seismic risk management. Reflecting such circumstances, consulting firms dealing in seismic risk are very aggressive in Japan and major construction companies, etc., are developing seismic risk evaluation software as well.

As for seismic risk evaluation, though it has been widely put to practical use, many uncertainties remain regarding earthquake hazards and risks. The continuous research is indispensable for improving accuracy of the evaluation.



(Fig. 1.2.5) Distribution map of probabilities of suffering an earthquake with an intensity 6-lower or higher within the next 30 years from 2020 (an example of the Probabilistic Seismic Hazard Maps)

Touched up reprint from *National Seismic Hazard Maps for Japan, 2020 Edition* (Headquarters for Earthquake Research Promotion; 2021)

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Section 2 Earthquake Damage of Buildings in Japan

Japan is elongated and has a variety in weather and climate from north to south, with disasters frequently occurring all over the country. It has suffered from various disasters in the past, due to fire, as a matter of course, but also to earthquakes, volcanic eruptions, tidal waves, heavy rain, floods, windstorms, heavy snow and cold, etc. Due to this kind of environment, it is difficult to avoid disaster no matter what kind of area is used for building sites.

It's necessary to take on these disasters squarely in order to secure safe and reliable buildings in Japan, with various types of disaster countermeasures being required. Even if disasters are suffered, devices are required to secure safety and to prevent the expansion of damage.

2.1 Modernization of Buildings

2.1.1 Characteristics of wooden structure buildings

Wood is used for many of Japan's small-scale buildings, such as residences. Though wood has shortcomings, such as being combustible, decayable, rife with such things as knots in timber, inconsistent strength and cases of deformation over long periods, wooden buildings in Japan have positive air ventilation and are suitable for the summer weather of moisture and high temperatures. Additionally, wooden buildings have created a characteristic wooden culture for each region with a long tradition.

The things that have been feared in connection with wooden buildings from ancient times are earthquakes, lightning and fires. The first things to be attempted for wooden buildings historically were fire prevention countermeasures, and this was in the latter half of the 19th century, when Japan was becoming a modern nation and scientific investigation had started. To prevent major fires, Tokyo Prefecture at that time advanced the promotion of mud walled structure in 1870, road reconstruction and a change to brick construction for buildings in Ginza, and a change to tiled roofs in 1872; as a result, the prevention of major fires in cities was vastly improved.

2.1.2 Buildings with steel structure or reinforced concrete structure

It is said that the first full scale building using a steel frame in Japan was a three-story factory built in 1894. The use of steel as a structural material had begun earlier in the fields of civil engineering and shipbuilding than in construction, and though steel materials were at first imported.

The civil engineering field was the forerunner for steel reinforced concrete structures as well, just as it had been for steel structures. The manufacturing of concrete in Japan commenced in 1875, at first being only used as mortar for joints or as foundation concrete for brick or stone construction. Later on, reinforced concrete structures, that are concrete reinforced by steel frames, were introduced in Japan, and the first building with a reinforced concrete structure was built in 1905. It became clear in the San Francisco Earthquake of 1906 that steel reinforced concrete structures are superior in their earthquake-resistance capacity and fireproofing, and the full-scale study of steel reinforced concrete structures commenced in Japan.

2.2 Earthquake Damage of Buildings

Brick and stone buildings were introduced in urban construction as a part of modernization during the Meiji period, in the latter half of the 19th century. Although these buildings were fire resistant and durable, they lacked earthquake resistance and were heavily damaged in the 1891 Nobi Earthquake. Wooden buildings were also heavily damaged because of the weight of roof tiles, which were recommended for fire prevention, combined with the relative lack of braces or other structural members that resist horizontal forces.

Intensive research on earthquake resistance for buildings was begun after that earthquake. With additional knowledge concerning the behavior of brick and stone buildings in earthquakes, architectural design began to reflect the situation in Japan. After the lessons of the San Francisco Earthquake of 1906, reinforced concrete construction and steel construction became the central focus of government policies.

Research was also promoted on the earthquake resistance of wooden buildings. The Earthquake Disaster Prevention Survey Group, which was founded in the year after the Nobi Earthquake, issued structural guidelines for the reconstruction of housing in Sakata, Yamagata Prefecture after the 1894 Shonai Earthquake, setting course toward the modern approach of ensuring earthquake-resistance capacity in framework construction.

In the Great Kanto Earthquake which occurred in 1923, fires following the quake caused particularly serious losses. This disaster left approximately 105,000 persons dead or missing, 211,000 houses completely or partially destroyed, and 212,000 houses burned down. It also demonstrated the effectiveness of the approach taken to earthquake resistance after the Nobi Earthquake, as reinforced concrete buildings survived relatively intact while brick and stone buildings suffered catastrophic damage. The Urban Building Act was amended in 1924, a year after the Great Kanto Earthquake, resulting in the first building code in Japan to specify earthquake-resistance design.

In the 1948 Fukui Earthquake, damage to wooden buildings was extremely severe, while reinforced concrete buildings remained standing except for a department store, confirming the earthquake resistance of reinforced concrete construction.

In the 1964 Niigata Earthquake, liquefaction damage in the sandy soil was prominent. Nearly all of the reinforced concrete buildings in the city of Niigata collapsed when their foundations were damaged by soil liquefaction. This drew attention to the phenomenon of liquefaction, a different mode of earthquake damage than the previously experienced direct structural damage to buildings due to earthquake shaking motions.

In the 1968 Tokachi-oki Earthquake and the 1978 Miyagi-ken-oki Earthquake, a great deal of shear failure occurred in reinforced concrete buildings.

The Building Standards Act was amended in 1971 and 1981 with major changes in earthquake-resistance standards, based on the lessons learned from damage in these major earthquakes as well as research findings in the advancing field of seismic engineering.

The Hyogo-ken Nanbu Earthquake in 1995, which was the first major earthquake after the rapid growth of the economy with the epicenter in a city, caused many buildings and structures to collapse. The earthquake caused great damage not only to wooden buildings, but also to reinforced concrete structures, which were thought to be highly resistant to earthquakes. Damage to many buildings and structures, both wooden buildings and reinforced concrete structures built before 1981, was observed in a damage survey, which clarified that earthquake resistance differs depending on the age of construction. It was also found that the presence of termite damage or decay affected the damage to buildings and structures in wooden buildings.

In the 2011 off the Pacific coast of Tohoku Earthquake, the tsunami completely washed away many wooden houses and other buildings in municipalities along the Pacific coast. Soil liquefaction also caused damage in former river channels and reclaimed land over a very wide area ranging from the Tohoku region to the Kanto region. It is said that the earthquake damage to buildings directly caused by the ground motion was relatively light, considering the scale of the earthquake and seismic intensity measurements at various locations. Many buildings that had received proper seismic retrofitting and renovation escaped damage; however, in buildings that were designed according to earthquake-resistance standards before 1981, damage was caused by reasons such as

insufficient yield strength.
In the 2016 Kumamoto Earthquakes, Kumamoto and Oita Prefectures were hit by large shocks multiple times, including two earthquakes with a maximum seismic intensity of 7 observed in Mashiki-machi. Although the earthquake-resistance standards set after 1981 were recognized as effective in preventing collapse damage, collapse damage was also seen in buildings and structures built after the introduction of the standards.
The 2018 Hokkaido Eastern Iburi Earthquake caused significant subsidence of the ground in Kiyota-ku, Sapporo due to liquefaction, and buildings and structures were tilted regardless of their structure or year of construction due to differential settlement in their foundations.
As discussed above, building damage in past earthquakes has shown various characteristics in relation to seismic movements, tsunamis, soil liquefaction and other factors, and necessary measures have been considered. In recent years, technologies to reduce damage, such as seismically isolated structures, have also been developed and becoming popular.

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Chapter 2 Earthquake Insurance System in Japan

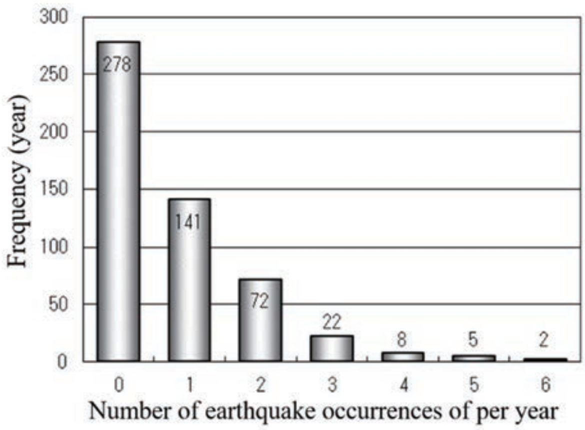
Section 1 Difficulties of Making Seismic Risk Insurable

Every time a great earthquake disaster occurred after the latter half of the 19th century in Japan, establishment of insurance compensating for losses due to earthquake was talked about and there were concrete suggestions made as well for insurance systems. However, due to the uniqueness of the seismic risk, etc., there was difficulty in arriving at the realization of them. This was due to such facts as that it is difficult to use the occurrence frequency and scale of loss of destructive earthquakes in the “law of large numbers,” that there is a possibility that earthquake disaster will at times cause huge amounts of loss, and there is a large fear of adverse selection.

1.1 Non-Applicable Law of Large Numbers

General insurance premiums are generally computed according to the law of large numbers. Large amounts of data are compiled and analyzed by statistical methods to determine appropriate and stable insurance premium rates. For example, in recent years, there are about 20,000 building fires in Japan each year. On the other hand, the number of destructive earthquakes occurrences is, even in Japan, one of the world’s top countries for earthquakes, is very low compared to other disasters. According to Chronological Scientific Table, in which appear the major destructive earthquakes that have occurred in the past in Japan, that number is less than 500. This is the record for the past approx. 1,600 years, and the further back on the record we go, the fewer the destructive earthquakes are. We consider that this is because as we go back further, there is less and less population, and moreover since the residential areas are limited, even when earthquakes occurred, there is no damage and thus no record.

So, if we take the approx. 500 years from the past to the present, about 400 destructive earthquakes have occurred, and if the average occurrence number per year is obtained for this period, the result is even less than one. **Figure 2.1.1** is a graph of frequency grouped by occurrence numbers for destructive earthquakes per year for these approx. 500 years. According to this figure, the years with not even one earthquake occurring occupy more than half of this period. Meanwhile, there is one year in which destructive earthquake occurred as many as six times. Thus, there’s a wide data spread for the occurrence of destructive earthquakes every year. Observing Japan as a whole and using a long period of several hundred years, the approximate frequency of occurrence can be estimated; however, it is very difficult to guess whether or not a destructive earthquake will occur in a certain single year.



(Fig. 2.1.1) Frequency distribution of occurrences of earthquakes per year for the past approx. 500 years

Created from *Chronological Scientific Table* (National Astronomical Observatory of Japan; 2021)

Next, when we consider the damage due to earthquakes, that damage differs greatly due to such things as place of earthquake occurrence, scale (magnitude), seasons and times. For example, the extent of the damage varies tremendously depending on whether an earthquake occurs in a metropolitan area or in a region with small population, or whether the scale is large or small. Additionally, since the number of outbreaks of fire at times of earthquake has something to do with the usage status of burner equipment, such differs as well largely depending on the seasons and times of the earthquake occurrence. The spread of fire also largely differs depending on the density of buildings or fireproofing rate of cities, etc.; and, moreover, tsunamis sometimes occur in cases of earthquakes where the hypocenters are in maritime areas, and there are cases where coastal areas suffer great damage. Such characteristics make it difficult to grasp earthquake damage statistically.

It is possible to predict to some extent the number of occurrences of earthquake disasters over the long run, but difficult over the short run, and besides the scale of damage differs greatly due to such things as place of earthquake occurrence, scale, seasons and times. Due to such reasons, it is assumed that seismic risk is the kind of risk to which it is difficult to apply the law of large numbers, which is a precondition for general insurance.

1.2 Losses of Possibly Huge Amounts

When a great earthquake occurs, since the afflicted area covers a very wide range, sometimes the losses can be huge. The area afflicted by the Great Kanto Earthquake, which occurred in 1923, covered seven prefectures centering on Tokyo and Kanagawa, with the approximate number of dead and missing reaching 105,000, and massive damage to housing, of which 211,000 were totally or partially destroyed and 212,000 were burned down approximately. The insured amount for fire insurance by general insurance companies that covered the damaged buildings at that time was a total of about ¥1,600 million; however, the net assets of the general insurance companies were only about ¥200 million. If the general insurance companies had borne the obligation to pay insurance claims, most of the general insurance companies could not have completed the payment.

The number of big cities has increased together with the development of Japan's economy, and on top of this the scale of cities has become gigantic. Therefore, the accumulation of risk from earthquakes becomes larger and larger year by year. If a large-scale earthquake should occur in such a big city, there is a possibility for the losses to be massive, and the payment capability of privately owned insurance companies alone would never be enough to compensate all.

1.3 Fear of Adverse Selection

In order to operate the earthquake insurance system stably over the long run, standardization and decentralization of risk must be attempted through the participation of a large number of policyholders. When so-called "adverse selection" occurs, that is, when only people from some regions participating in the insurance, or participation in insurance is concentrated only during certain period, operation and management of the insurance system have come to experience impediments.

Japan is located in the Circum-Pacific seismic belt, and in the past many destructive earthquakes have occurred there. In the future there is a possibility as well of the occurrence of earthquakes in any of the regions nationwide, from Hokkaido to Okinawa.

However, if we observe Japan more precisely, due to such things as the circumstances of the occurrence of destructive earthquakes of the past, and the location of interplates or active faults, it cannot necessarily be said that Japan is uniform overall in terms of seismic risk. On the Pacific side, in particular from the Kanto to the Shikoku regions, huge earthquakes have occurred many times in the past, inflicting massive damage every time.

Because of such factors, the consciousness of the habitants towards seismic risk is different in every region. Therefore, there is a possibility that only habitants who feel there is a high seismic risk will contract earthquake insurance. Or, it is also considered that people will contract earthquake insurance only in periods when seismic risk is high, such as when earthquake swarm are ongoing or the imminence of an earthquake occurrence is loudly proclaimed. In this way, there is very high possibility that regional or temporal adverse selection will occur concerning earthquake insurance, and there is a fear of concentrations of seismic risk. These things make the operation of insurance systems difficult.

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Section 2 Needs and Concepts of Earthquake Insurance

People in the ancient times in Japan had no other recourse but to give up on countermeasures against earthquakes as “earthquake disaster is a natural calamity.” An earthquake of which the hypocenter was Yokohama occurred in 1880 with numerous chimneys being broken and houses also suffering damage. Using this earthquake as an impetus, the “Seismological Society” was established and scientific research on earthquakes commenced. The magnitude 8.0 Nobi Earthquake, of which the hypocenter was the Mino and Owari regions (present Gifu and Aichi Prefectures) occurred in 1891, and there was extremely serious damage with more than 7,000 dead, approximately 140,000 completely destroyed buildings and approximately 80,000 partially destroyed buildings, etc. With this earthquake disaster as a start, opinion began to emerge in the construction industry about improvement of construction methods for the earthquake-resistance capacity of wooden buildings. The Imperial Earthquake Investigation Committee was established in the following year and investigations began of the earthquake-resistance capacity of wooden buildings.

In parallel with such movements, loud proclamation commenced of the necessity of earthquake insurance systems in order to expedite swift restoration from earthquake disasters. The following specific suggestions were made afterwards concerning the concept of earthquake insurance; however, due to financial problems, etc., none of the suggestions were realized.

Paul Mayet’s Government-Operated Insurance Theory

A German economics doctor, Paul Mayet, was invited by the Japanese Government, and he proposed a national compulsory insurance system in 1878, referring to the public insurance system in Germany and adjusting that to the actual situation of Japan concerning the five disasters of earthquake, fire, storm, flood and war. However, since other countries in the world had situations of mere governmental oversight and not interference in their insurance systems, this proposal was not adopted.

The Commerce and Industry Agency’s Outline Draft of an Earthquake Insurance System

Taking the advantage afforded by the event of the Great Kanto Earthquake in 1923, the issue of the establishment of an earthquake insurance system was taken up again. The Commerce and Industry Agency of the Japanese Government put together in 1934 its “Outline Draft of an Earthquake Insurance System,” in which earthquake insurance was to be incidental to fire insurance compulsorily. Concerning this outline draft, since the insurance industry disapproved of such compulsory attachment of incidental earthquake insurance to fire insurance, the Commerce and Industry Agency didn’t submit the bill to the Diet and it wasn’t realized.

Earthquake Insurance by the Wartime Specific General Insurance Act

An earthquake insurance system was implemented in 1944, in the middle of WWII, constituted in order to calm the public mind and for the maintenance of order under the Wartime Specific General Insurance Act. However, the period for implementation was short, at one year and eight months.

While the income from insurance premiums for the period when this system was implemented was ¥87,500,000, since major earthquake disasters occurred one after another, such as the Tonankai Earthquake in 1944 and the Mikawa Earthquake in 1945, ¥239,000,000 was paid out in insurance claims.

The Earthquake Insurance Bill After the Fukui Earthquake

The magnitude 7.1 Fukui Earthquake with the Fukui Plain as its hypocenter occurred in 1948, and huge damage was suffered due to this earthquake, with 3,769 dead, 36,184 houses completely destroyed, 11,816 houses partially destroyed and 3,851 burned down.

As a consequence of this earthquake disaster, the Ministry of Finance in 1949 mapped out the "Earthquake Insurance Act Summary Draft," a compulsory attachment of earthquake insurance to fire insurance. However, the general insurance industry submitted dissenting opinions against this compulsory insurance system, and on top of this there were financial problems in the Government, so a Cabinet decision could not be made, and it could not be realized.

Earthquake Insurance System Study by the General Insurance Industry

A study for an earthquake insurance system was performed by Japan's general insurance industry. In 1952, the insurance industry created a tentative proposal in which earthquake insurance covering residences and households was to be incidentally attached to fire insurance optionally, with the Government doing reinsurance. However, since the Government could not find a way to perform the reinsurance, this tentative proposal was not realized.

Later on, the general insurance industry advanced study by establishing expert committees, and in 1964, they mapped out two plans, one of which was to attach it automatically and the other to attach it optionally at a fixed insured amount to comprehensive householders insurance, and started the investigation of reinsurance. At this point (1964), the Niigata Earthquake occurred. Due to this earthquake, the study of an earthquake insurance system greatly advanced to another stage, from the fundamental research stage to concrete investigations for implementation.

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Section 3 Establishment of the Earthquake Insurance System

3.1 Background of Establishment

The Niigata Earthquake (M 7.5) occurred on June 16, 1964, around 1:00 pm, with a hypocenter off the shore of Niigata Prefecture. The damage from this earthquake spread nine prefectures including Yamagata Prefecture, Akita Prefecture and centering on Niigata Prefecture, with 26 dead, 447 injured. As for damage to residences, 1,960 were completely destroyed, 6,640 were half destroyed, 15,297 were flooded and 67,825 were partially damaged. As for buildings other than residences, 16,283 suffered damage, and ships, roads, bridges, railways, banks, etc., suffered great damage. Additionally, the damage due to ground liquefaction inside Niigata City was also significant.

This earthquake disaster was focused on in at the Diet and a resolution was passed that the establishment of an earthquake insurance system should be swiftly investigated.

In such a situation, Kakuei Tanaka, the Minister of Finance at that time, convened a general meeting of the Insurance Council and consulted with them concerning concrete measures in order to contribute to the stabilization of the livelihood of the nation at times of earthquake disasters without notice.

The Insurance Council performed deliberations concerning to cover or not to cover earthquake disaster, insurable property and losses to be covered, prevention of adverse selection, ways for the nation to be involved, the amount to be insured, the limit of total payments, the sharing of liability between the Government and private insurance companies, etc.

The Insurance Council discussed such with great deliberations and in 1965 made its report on an earthquake insurance system.

In order to attempt the commencement of an actually achievable system, it was unavoidable that the specifics of the insurance system in the report contained various restrictions, due to various problems such as the financial burden of the Government.

3.2 Implementation of the Earthquake Insurance System

Specifics of the earthquake insurance established in 1966 were as follows:

(1) Losses to be covered
Losses due to earthquakes, volcanic eruptions or tsunami, and only in case of total loss (including economically total loss) shall such be covered.
(2) Insurable property
Buildings used for residential use and movables for living (household goods).
(3) Method of contract
Contract shall be made incidental to householders' comprehensive insurance and storekeepers' comprehensive insurance (automatic attachment).
(4) Amount insured and limit amount to be paid
Such shall be 30% of the amount insured of householders' comprehensive insurance and storekeepers' comprehensive insurance; however, ¥900,000 for buildings and ¥600,000 for household goods shall be the limit amount to be paid.
(5) Premium rate
The premium rates and figures of Zone are as displayed in **table 2.3.1** and **figure 2.3.1**.
(6) Limit of total payment amount for insurance claims due to a single earthquake, etc., shall be ¥300 billion.

3.3 Enactment of the Act on Earthquake Insurance

Upon the implementation of an earthquake insurance system, the Government announced officially the "Act on Earthquake Insurance, Enforcement Order, Regulation for Enforcement" and "Earthquake Reinsurance Special Accounting Act, Enforcement Order, Regulation for Enforcement," and came into force in 1966.

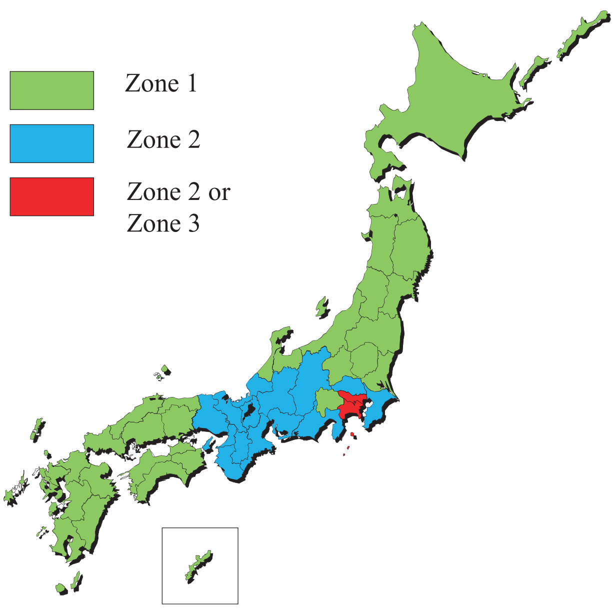
(Table 2.3.1) Premium rates and Zone at the time of establishment of earthquake insurance

(yen per 1,000 yen amount insured)

Structural classification of buildings			Class A bldgs	Class B bldgs
Zone	Zone 1	Hokkaido, Aomori, Iwate, Miyagi, Akita, Yamagata, Fukushima, Ibaraki, Tochigi, Gumma, Niigata, Toyama, Ishikawa, Yamanashi, Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Tokushima, Kagawa, Ehime, Kochi, Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima, Okinawa*	0.60	2.10
	Zone 2	Tokyo (excluding Zone 3), Kanagawa (excluding Zone 3), Saitama, Chiba, Fukui, Nagano, Gifu, Shizuoka, Aichi, Mie, Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama	1.35	3.60
	Zone 3	Sumida-ku, Koto-ku and Arakawa-ku of Tokyo, Tsurumi-ku, Naka-ku and Nishi-ku in Yokohama City of Kanagawa, and Kawasaki-shi area east of Tokaido Line	2.30	5.00

* Okinawa was added in 1972 after reversion to Japanese administration.

(Note) "Class A buildings" refer to fireproof buildings and semi-fireproof buildings.
All other buildings are classified as "class B buildings."



(Fig. 2.3.1) Map of Zone at the time of establishment of earthquake insurance

The earthquake insurance system was subject to the backing of the nation, and because of the necessity to perform stable management of the system, and for contribution to the stabilization of the lives of the victims, the coverage details, payment standards, amounts of underwriting limit, reinsurance, accounting treatment, etc., were specifically stipulated in laws.

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Section 4 Transition of Earthquake Insurance System

The earthquake insurance system established in 1966 was quite restricted due to the uniqueness of the seismic risk. However, owing to changes in the social and economic circumstances afterwards, along with the experiences from several great earthquake disasters, etc., policyholders expressed various needs. In order to deal with these, many revisions were made, such as raising the limit of insurable amount, improving the coverage, raising the limit of the total amount of insurance claims to be paid, changes in premium rates, etc. (refer to the appendix).

Major revisions concurrent with changes in the premium rates are as follows:

4.1 1980 Revision

The Miyagi-ken-oki Earthquake (M 7.4) occurred on June 12, 1978. Huge damage was wreaked by this earthquake, centered on Miyagi Prefecture, with 1,183 houses completely destroyed, 5,574 partially destroyed, and a large amount of partial damage occurred. Since the damage of partial destruction and partial damage, which occurred massively in this earthquake, was not covered by the earthquake insurance, policyholders requested improvement of the coverage. There was even discussion in the Diet concerning the coverage of this earthquake insurance. Additionally, there was an investigation by the Insurance Council, and the report entitled "Concerning the Revision of the Earthquake Insurance System" was submitted in 1979 (refer to the attachment). In accordance with this report, broad revision of the earthquake insurance system was expedited.

A summary of the revision is as follows. Note that the insurance premium rates were increased by 14.7% nationwide on average in this revision.

(1) Introduction of half-loss coverage

In addition to total loss coverage, half loss coverage was newly introduced into the coverage. As for buildings, in addition to total loss, half loss was covered, and as for movables for living, in addition to total loss, losses which were not total, but rather were movables for living contained in buildings that were themselves more than half loss, was to be covered as half loss.

It was determined that the payment method for half loss was 50% of the amount insured for buildings, and 10% of the amount insured for movables for living to be paid respectively.

(2) Changes of attachment method and attachment target contracts

Out of consideration of policyholder convenience, the attachment method was changed to "automatic attachment in principle," in which if the policyholder desired not to attach the earthquake insurance, they could do so, for all fire insurance types that were the targets of attachment of earthquake insurance.

(3) Raising of proportion insured and limit amount insured

The proportion insured, which had been uniformly 30% of the amount of fire insurance, was extended to be in the range of from 30% to 50%, and the amount of earthquake insurance was determined to be set within that range. Concurrent with this, the limit of amount insured was raised, from ¥2,400,000 to ¥10,000,000 for buildings, and from ¥1,500,000 to ¥5,000,000 for movables for living.

(4) Revision of premium rates

According to the outlines of the Insurance Council's Report ((1) concerning differences between areas, etc., as earthquake insurance had been an automatic attachment up to then, the public position had been not to make the difference so great; however, concurrent with the changes in the underwriting method, seismic risk needed to be reflected in the rates as fully as possible, (2) buildings and movables for living were to be on separate systems), Zone was changed to a five-class system from three, and the rates for buildings and movables for living were separated.

4.2 1991 Revision

The Chiba-ken Toho-oki Earthquake (M6.7) occurred on December 17, 1987 causing massive damage centering on Chiba Prefecture, bringing about complete destruction of 16 houses, and approximately 70,000 with partial damage. Additionally, at the time of the Izuhanto-oki Earthquake Swarm, which had occurred from July to August 1989, a large amount of partial damage occurred. However, since partial damage was not covered by the earthquake insurance, policyholders requested that partial damage should also be covered. Subject to said, an investigation was performed, and revision was implemented in 1991.

A summary of the revision is as follows. Note that the insurance premium rates were decreased by 9.1% nationwide on average in this revision.

(1) Introduction of partial loss coverage

In addition to total and half loss coverage, partial loss coverage was newly introduced for the coverage. As for buildings, total loss, half loss and partial loss were covered, and as for movables for living, in addition to total loss, losses which were not total, but rather were movables for living contained in buildings that were themselves more than half lost, were to be covered as half, and movables for living contained in buildings that were partially lost, were to be covered as partial loss.

It was determined that the payment method for partial loss was 5% of the amount insured both for the buildings and for the movables for living, and it was to be paid respectively.

(2) Revision of premium rates

Since partial loss coverage was introduced as an improvement for the coverage, premium rates for earthquake insurance were revised.

4.3 1996 Revision

The Hyogo-ken Nanbu Earthquake (M7.3) occurred on January 17, 1995, centered on Hyogo Prefecture, and causing massive damage. According to the announcement by the Fire Defense Agency, damages reached as high as 6,437 dead and missing, more than 40,000 injured, more than 240,000 houses totally or half destroyed, more than 7,000 houses totally or half burned down. This earthquake occurred on active faults close to a big city with highly developed urban functions and dealt a severe shock to the society and the economy.

Interest in earthquakes in the Kansai region was very low at that time, but, stimulated by this earthquake, interest in earthquake insurance became higher and the number of the earthquake insurance policies increased vastly.

After the Hyogo-ken Nanbu Earthquake, subject to requests by policyholders, improvement of coverage details, raising of the limit amount of participation and reconsideration of premium rates were performed and these revisions was made in 1996.

In order to pay the insurance claims quickly to suffering policyholders, the method was employed in earthquake insurance of making loss assessment for movables for living (cases of half or partial loss) and loss assessment of buildings the same. Therefore, even though they suffered serious damage to their movables for living due to this earthquake, there were cases in which victims could not get sufficient amount for earthquake insurance claims paid because there was zero or only slight damage to their buildings, and this created confusion among policyholders. In order to avoid such a situation, there was a request that loss assessment for movables for living should be by the method of using the degree of damage to movables for living themselves.

Additionally, there were many opinions that the limit of participation at that time of ¥10,000,000 for buildings and ¥5,000,000 for movables for living, and that the configuration of payments for half loss of movables for living being 10% of the amount insured were insufficient and such should be raised.

Subject to these requests, improvement of coverage details for movables for living, raising of the limit amount of participation and reconsideration of premium rates were performed in January 1996.

A summary of the revision is as follows. Note that the insurance premium rates were increased by 0.6% nationwide on average in this revision.

(1) Changes in loss assessment standards for movables for living

Concerning loss assessment for movables for living, as for half and partial losses, the assessment method of using the degree of damage to buildings was changed to an assessment method using the degree of damage to movables for living themselves.

(2) Changes in payments for half loss of movables for living

The payment rate for half loss of movables for living was raised from 10% to 50% of the amount insured.

(3) Raising of participation limit amount

The participation limit amount was raised and as for buildings, such was changed to ¥50,000,000 from ¥10,000,000, and for movables for living, to ¥10,000,000 from ¥5,000,000.

(4) Revision of premium rates

Concurrent with the improvement in coverage details for movables for living, premium rates were revised, and rates for buildings and movables for living were set as the same. Zone was unchanged.

Damage to movables for living in the Hyogo-ken nanbu Earthquake

Damage to houses in the Hyogo-ken Nanbu Earthquake

4.4 2001 Revision

Exceedingly many buildings suffered damage in the Hyogo-ken Nanbu Earthquake. As a result of research and study by numerous scholars and experts concerning the damage situation, it was verified that the degree of damage clearly differs depending on differences in earthquake-resistance capacity of buildings.

Due to such facts, there was a request that earthquake-resistance capacity of residences should be more fully reflected in premium rates or earthquake insurance from such groups as the “Association of Diet Members to Protect Japan from Earthquakes,” formed after the Hyogo-ken Nanbu Earthquake (later renamed the “Association of Diet Members to Protect the Nation from Natural Disasters,” with about 140 members) and the “Investigation Committee concerning the System of Residence Rebuilding Support for Victims” in the National Land Agency, and from the Government’s “Three Year Deregulation Promotion Plan (re-revised).”

On the other hand, in October 2000, the Ministry of Construction (present the Ministry of Land, Infrastructure and Transportation) began enforcing the Housing Performance Indication System under the

Houses destroyed and houses safe from destruction in the Hyogo-ken Nanbu Earthquake

Housing Quality Assurance Act (hereinafter referred to as the "Quality Assurance Act"). Through this, earthquake-resistance capacity of residences began to be evaluated properly by the "earthquake-resistance class" index.
On the basis on these situations, two kinds of discount systems in accordance with earthquake-resistance capacity of residences were newly introduced and additionally, basic rates were lowered.
A summary of the revision is as follows. Note that the insurance premium rates were decreased by 15.9% nationwide on average in this revision.

(1) Basic rates
The basic rates were revised while Zone was unchanged.
(2) Discount rates
As a discount system for residences with high earthquake-resistance capacity, the construction age discount rate and the earthquake-resistance class discount rate were introduced. However, in case of the earthquake-resistance class discount rate being applied, the application of the construction age discount rate could not be applied.
a. Construction age discount rate
The construction age discount rate was introduced, a discount on premium rates for houses newly constructed under the ongoing the Building Standards Act, in other words, for houses newly constructed after June 1, 1981, in case the construction period of the building is confirmed with documents such as building registration certificates. This discount rate was 10%.
b. Earthquake-resistance class discount rate
The earthquake-resistance performance of buildings is indicated as earthquake-resistance class (prevention of collapse, etc. of the structural frame)(note 1) in the building performance appraisals by the Housing Performance Indication System of the Quality Assurance Act(note2), or in earthquake-resistance performance appraisals by seismic evaluation. The earthquake-resistance class discount rate, a discount on the premium rate on the basis of these, was introduced. The applicable discount rate was 30% for the earthquake-resistance class of 3, the highest earthquake-resistance performance, 20% for class 2, the second highest earthquake-resistance performance, and 10% for class 1.

(Note 1) Earthquake-resistance class by the Housing Performance Indication System under the Quality Assurance Act is appraised in the following 3 classes according to the capacity against seismic force.
Class 3: Earthquake-resistance capacity of a degree so as not to be destroyed or collapsed, etc., by force 1.5 times greater than the seismic force provided in the Building Standards Act.
Class 2: Earthquake-resistance capacity of a degree so as not to be destroyed or collapsed, etc., by force 1.25 times greater than the seismic force provided in the Building Standards Act.
Class 1: Earthquake-resistance capacity of a degree so as not to be destroyed or collapsed, etc., by the seismic force provided in the Building Standards Act.
(Note 2) Earthquake-resistance capacity certificates on buildings issued by designated residence capacity certificate organizations set forth in the Quality Assurance Act or designated confirmation inspection organizations set forth in the Building Standards Act.

4.5 2005 Revision

At that time, the premium rates calculated by the General Insurance Rating Organization of Japan were limited to those applied to the policies with insurance periods (policy periods) of one year. Those for policies with insurance periods of two to five years (long-term policies) were calculated by each insurance company separately.

In response to the growing needs of policyholders for long-term policies, for ensuring soundness of the earthquake insurance system and protection of the interests of policyholders, the General Insurance Rating Organization of Japan calculated the long-term coefficients applied to the premium rates for the long-term policies (coefficients multiplied by the premium rates for one year insurance contracts; as shown in **table 2.4.1**) and filed it to the Commissioner of the Financial Services Agency in 2004. The coefficients came into effect in 2005.

In conjunction with this, the General Insurance Rating Organization of Japan also computed coefficients for unexpired rates for use in premium calculations where refunds or charges may be required for unexpired long-term policies.

No change was made to the insurance premium rates for one year insurance contracts.

(Table 2.4.1) Long-term coefficient at the time of the revision in 2005

Policy period	Long-term coefficient
2 years	1.90
3 years	2.75
4 years	3.60
5 years	4.45

4.6 2007 Revision

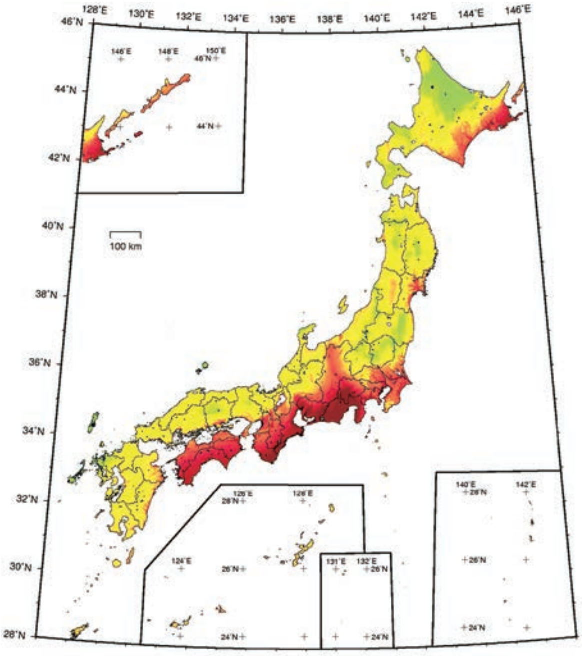
The Government enacted the Act on Special Measures for Earthquake Disaster Countermeasures in July 1995, when the Hyogo-ken Nanbu Earthquake struck. The Headquarters for Earthquake Research Promotion was established with the objective of elucidating the responsibility for the survey and research on earthquakes that should be directly linked to administrative policies based on the Act and to promote an integrated survey and research.

As one of the present surveys and research subjects that should be promoted, the Headquarters for Earthquake Research Promotion focused on preparing the Probabilistic Seismic Hazard Maps intended to make full use of the maps for disaster management and published the results of the survey and research in March 2005. The Probabilistic Seismic Hazard Maps are maps on which the intensity of earthquake motions (tremors) and the probability of earthquake motion occurrence in the subject area are predicted and shown (**figure 2.4.1**).

The Probabilistic Seismic Hazard Maps are compiled with a nationwide uniform standard after discussion of many researchers. Though Chronological Scientific Table had been used to calculate the insurance rates since the establishment of the earthquake insurance system, in this revision, the insurance rates were revised based on the data regarding earthquake source models used in preparing the maps.

The Government placed the seismic retrofitting of buildings as one of the top priorities of anti-earthquake measures and amended the Act on Promotion of Seismic Retrofitting of Buildings in November 2005 to improve environments for aggressive promotion of the earthquake-resistance diagnoses of buildings that were constructed before the Building Standards Act was amended to the current earthquake-resistance standards.

The whole concept of an earthquake insurance discount system in accordance with the earthquake-resistance diagnoses and the seismic retrofitting of buildings was given in the Policy for Urgent Countermeasures for Seismic Retrofitting of Buildings decided by the Central Disaster Management Council in September 2005 and in the proposal advanced by the Council for Promotion of Earthquake Disaster Prevention of Buildings of the



(Fig. 2.4.1) Distribution map of probabilities of suffering an earthquake with an intensity 6-lower or higher within the next 30 years from 2005

Reprint from *National Seismic Hazard Maps for Japan, 2005 Edition* (Headquarters for Earthquake Research Promotion; 2005)

Ministry of Land, Infrastructure and Transport (in June 2005), and the earthquake insurance system was expected to play a certain role in society. Further, a proposal to study the earthquake insurance discount system for seismically isolated buildings, in addition to the seismic retrofitting of buildings, was advanced at the meeting of the Ministry in June 2005.

Under these circumstances, the Ministry gave the official notice in September 2006 to add seismically isolated buildings to the Japanese Housing Performance Indication System from April 2007 onward, which allows seismically isolated buildings to be checkable from the System. In addition, the Ministry presented to local public authorities the standard form of the report on the results of earthquake-resistance diagnoses of buildings carried out by local public authorities in September 2006. Following the fact that it was made possible to objectively check if buildings had equivalent level of earthquake resistance to the properties that had already been subjected to the discount for the construction age and the discount for the earthquake-resistance class (Class 1), it was decided to expand the discount system and add the discount for seismically isolated buildings and the earthquake-resistance diagnosis.

A summary of the revision is as follows. Note that the insurance premium rates were decreased by 7.7% nationwide on average in this revision.

(1) Basic rates

The basic rates were revised, and Zone was changed. Note that measures to avoid drastic changes, which limit the maximum increase rate for prefectures where insurance premium rates sharply change, have been implemented, which means basic rates may be different in the same Zone.

(2) Discount rates

The seismically isolated buildings discount rate and the earthquake-resistance diagnosis discount rate were newly added. However, these two types of discount, the construction age discount rate and the earthquake-resistance class discount rate cannot be applied together.

a. Seismically isolated buildings discount rate

For residential buildings assessed to be seismically isolated in the housing performance evaluation report, and contents in such residential buildings, this discount rate was 30%.

b. Earthquake-resistance diagnosis discount rate

For residential buildings confirmed through earthquake-resistance diagnoses or seismic retrofitting to comply with the current earthquake-resistance standards (Ministry of Land, Infrastructure and Transport Public Notice No. 185 of 2006) provided in the Building Standards Act, and contents in such residential buildings, this discount rate was 10%.

4.7 2010 Revision

The growing use of new types of construction materials sometimes made it difficult to clearly classify building structures in a manner that reflected the actual risk, based on the conventional criteria for structural classification of buildings. For greater clarity in the classification process, the basis for structural classification of buildings was changed from the materials and specifications of major structural components (pillars, outer walls, roofs, etc.) to the types of buildings (concrete structure, steel structure, wooden structure, etc.) and the legally mandated building performance standards (fireproof buildings, semi-fireproof buildings and ordinance semi-fireproof buildings).
To mitigate the rise in costs for policyholders whose insurance premiums would rise sharply under the new approach to structural classification, a policy was introduced to limit basic rate increases to 30% of the previous basic rate. This limit does not apply to new fire insurance policies; it is for fire insurance policies that are renewed after the revision with continued earthquake coverage.

4.8 2014 Revision

The Ministry of Finance formed a Project Team to consider changes to be made in the earthquake insurance system (robustness and marketability) based on the aftermath of the 2011 off the Pacific coast of Tohoku Earthquake. In November 2012, the Project Team issued a report on its findings. The report's recommendations concerning rates included equalizing the differences among premiums in Zones and clarifying the earthquake-resistance class discount system.
The Headquarters for Earthquake Research Promotion issued a report in December 2012. Part of this report was the 2012 Edition of the Probabilistic Seismic Hazard Maps based on existing methodology, which include a new earthquake source model for the off the Pacific coast of Tohoku Earthquake and other revised earthquake source models in the area of the Japan Trench. The insurance premium rates were revised based on these changes.
A summary of the revision is as follows. Note that the insurance premium rates were increased by 15.5% nationwide on average in this revision.

(1) Basic rates
The basic rates were revised, and Zone was changed.
Note that measures to avoid drastic changes, which limit the maximum increase rate for prefectures where insurance premium rates sharply change, have been implemented, which means basic rates may be different in the same Zone.
(2) Discount rates
After reevaluation of the relationship between seismic shaking and damage to buildings in light of actual damage, the discount rate for seismically isolated buildings and earthquake-resistance Class 3 buildings was raised from 30% to 50%, and the discount rate for earthquake-resistance Class 2 buildings was raised from 20% to 30%.

4.9 2017 Revision

In December 2014, the Headquarters for Earthquake Research Promotion published the 2014 Edition of the Probabilistic Seismic Hazard Maps reflecting a series of examination results in light of the 2011 off the Pacific coast of Tohoku Earthquake, in which earthquake source models have been significantly revised.
In order to follow up on the status of measures, etc., pertaining to issues summarized in the Report of the Project Team for the Earthquake Insurance System, follow-up meetings of the “Project Team for the Earthquake Insurance System” had been held at the Ministry of Finance starting from November 2013. In

June 2015, a report summarizing the examination results entitled, "Brief Summary of Discussions in the Follow-up Meetings by the 'Project Team for the Earthquake Insurance System'" (hereafter, a "Discussion Summary") was published.

The Discussion Summary mentioned that "half loss" should be divided so that the three damage classifications will be subdivided into four damage classifications in order to enhance compensation for policyholders who seriously suffered damage while reducing the differences in the insurance payment rates. In addition, because there is a concern that the sense of burden among policyholders may increase due to a significant increase in insurance premium rates, some commented that "it should be possible to increase insurance premium rates in stages to obtain the understanding of policyholders, from the viewpoint of ensuring earthquake insurance signup rates." In response, the compensation details were improved, and the insurance premium rates were revised.

As a result of the update of the earthquake source models used for the calculation of insurance premium rates to the 2014 Edition of the Probabilistic Seismic Hazard Maps, etc., the insurance premium rates needed to be increased by 19.0% nationwide on average. Therefore, in light of the comments in the Discussion Summary, it was determined to increase the insurance premium rates in three stages, resulting in a 5.1% increase in the nationwide average in the first revision.

A summary of the revision is as follows.

(1) Subdivision of damage classifications (**table 2.4.2**)
"Half loss" has been divided into "large half loss" and "small half loss," creating four classifications, "total loss," "large half loss," "small half loss" and "partial loss."
The payment rates were determined to be 60% and 30% of the insurance amount for large half loss and small half loss, respectively.
(2) Basic rates
The basic rates were revised, and Zone was changed. Note that measures to avoid drastic changes, which limit the maximum increase rate for prefectures where insurance premium rates sharply change, have been implemented, which means basic rates may be different in the same Zone.

(Table 2.4.2) Damage classifications and payment rates

Before revision		After revision	
Total loss	100%	Total loss	100%
Half loss	50%	Large half loss	60%
		Small half loss	30%
Partial loss	5%	Partial loss	5%

4.10 2019 Revision

The revision in 2017 was the first revision after it was determined that the insurance premium rates would be increased in three stages. Although the Probabilistic Seismic Hazard Maps were revised thereafter, the insurance premium rates and the long-term coefficients were revised in response to the persistent situation where the insurance premium rates needed to be increased and the situation where a revision of the interest rate (assumed interest rate) used for calculating the long-term coefficients needed to be revised in light of the recent interest rate situation.

Due to update of data including the earthquake source models used for the calculation of the insurance premium rates, the required increased rate in the nationwide average during the remaining two revisions in the three staged revision was reduced to 8.7% compared to 13.2%, which had been expected at the time of the revision in 2017. As a result, the nationwide average rate was increased by 3.8% in the second revision. In addition, the long-term coefficients were increased for long-term contracts with a policy period of 3 to 5 years.

A summary of the revision is as follows.

(1) Basic rates
The basic rates were revised while Zone was

unchanged.
Note that measures to avoid drastic changes, which limit the maximum increase rate for prefectures where insurance premium rates sharply change, have been implemented, which means basic rates may be different in the same Zone.
(2) Long-term coefficients
The long-term coefficients were revised (**table 2.4.3**).

(Table 2.4.3) Long-term coefficient at the time of the revision in 2019

Policy period	Long-term coefficient
2 years	1.90
3 years	2.80
4 years	3.70
5 years	4.60

4.11 2021 Revision

The revision in 2019 was the second revision after it was determined that the insurance premium rates would be increased in three stages. The revision of the Probabilistic Seismic Hazard Maps, etc., were made and the situation where the insurance premium rates needed to be increased persisted thereafter. The interest rate (assumed interest rate) used for calculating the long-term coefficients also needed to be revised in light of the recent interest rate situation. In response to the above, the insurance premium rates and the long-term coefficients were revised.
Due to update of data including the earthquake source models used for the calculation of the insurance premium rates, the required increased rate in the nationwide average at the final revision of the three staged revision was increased to 5.1% compared to 4.7% which had been expected at the time of the revision in 2019. In contrast, the nationwide average increased rate through the three staged revision in total was decreased to 14.7% compared to 19.0%. In addition, the long-term coefficients were increased for long-term contracts with a policy period of 3 to 5 years.
A summary of the revision is as follows.

(1) Basic rates
The basic rates were revised while Zone was unchanged.
Note that measures to avoid drastic changes, which limit the maximum increase rate for prefectures where insurance premium rates sharply change, have been implemented, which means basic rates may be different in the same Zone.
(2) Long-term coefficients
The long-term coefficients were revised (**table 2.4.4**).

(Table 2.4.4) Long-term coefficient at the time of the revision in 2021

Policy period	Long-term coefficient
2 years	1.90
3 years	2.85
4 years	3.75
5 years	4.65

4.12 2022 Revision

The insurance premium rates were increased in three stages from the revision in 2017. Due to this incremental process, the insurance premium deficit was generated during 2017 to 2020. Based on the Discussion Summary, an amount equivalent to the deficit was determined to be added to the future insurance premium rates. The addition of premium is expected to last approximately 10 years.
In response to the revision of the Probabilistic Seismic Hazard Maps, etc., and the situation where the interest rate (assumed interest rate) used for the calculation of the long-term coefficients needed to be revised in light of the recent interest rate situation, the insurance premium rates and the long-term coefficients were

revised.

As a result of the addition of the premium to compensate for the premium deficit generated during the three staged revision and update of data including the earthquake source models used for the calculation of the insurance premium rates, the nationwide average rate was decreased by 0.7%. In addition, the long-term coefficient was increased for long-term contracts with a policy period of 5 years.

A summary of the revision is as follows.

(1) Basic rates

The basic rates were revised, and Zone was changed. Note that measures to avoid drastic changes, which limit the maximum increase rate for prefectures where insurance premium rates sharply change, have been implemented, which means basic rates may be different in the same Zone.

(2) Long-term coefficients

The long-term coefficients were revised (**table 2.4.5**).

(Table 2.4.5) Long-term coefficient at the time of the revision in 2022

Policy period	Long-term coefficient
2 years	1.90
3 years	2.85
4 years	3.75
5 years	4.70

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Section 5 Specifics of Earthquake Insurance

Since the Government is undertaking the reinsurance for the earthquake insurance, necessary laws have been constituted, such as the "Act on Earthquake Insurance." Pursuant to these laws, object of insurance, losses to be covered, payment methods of insurance claims, participation method, amounts insured, etc., are set forth.
Specifics of earthquake insurance as of October 2022 are as follows.

5.1 Object of Insurance

The coverage of earthquake insurance policies is limited to buildings for residential use and/or movables for living (households and personal properties) pursuant to the Act on Earthquake Insurance. Specifically, the scope of the object of insurance is set forth as follows:

a. Buildings for residential use
This shall consist of buildings, all of or part of which are provided for residential use.

b. Movables for living
This shall consist of furniture, equipment and clothing used for living and other movables usually necessary for living; provided, however, that gemstones, semiprecious, noble metals, pearls and the products of said, products of tortoiseshell, coral, amber, ivory, cloisonné enamel, calligraphic works and paintings, antiques, artworks and crafts with the value of one piece or one pair exceeding ¥300,000 are excluded.

5.2 Losses to Be Covered

Losses to be covered in earthquake insurance are losses arising concerning the object insured due to fire, destruction, burial or flood directly or indirectly caused by earthquake, volcanic eruption or tsunami due to said (hereinafter referred to as the "Earthquake, etc."), and, moreover, the degree of loss is total loss, large half loss, small half loss or partial loss.
Total loss, large half loss, small half loss and partial loss are defined in earthquake insurance as follows:

(1) Total loss
Buildings:
Cases in which the amount of loss of major structural parts of the building (framework (pillars, beams, etc.), foundations, roofs, outer walls, etc.) comes to no less than 50% of the market value of the relevant building, or cases in which floor space burned and lost or washed away comes to no less than 70% of the total floor space of the relevant building. The amount of loss includes minimum expenses considered to be directly necessary for the recovery of foundations, etc., for the restoration of the building (land re-grading

Debris flow disaster due to volcanic eruption of Mt. Unzen-Fugendake

Tsunami damage due to the off the Pacific coast of Tohoku Earthquake

expenses, etc.) (same as large half loss, small half loss and partial loss). Additionally, in case buildings for residential use become incapable of being lived in because of the occurrence of imminent dangers due to landslide or other disasters cause by Earthquakes, etc., the buildings shall be deemed to be total loss.
Movables:
Cases in which the amount of loss of movables comes to no less than 80% of the market value.

(2) Large half loss
Buildings:
Cases in which the amount of loss of major structural parts of the building comes to no less than 40% and no more than 50% of the market value of the relevant building, or cases in which floor space burned and lost or washed away come to no less than 50% and no more than 70% of the total floor space of the relevant building.
Movables:
Cases in which the amount of loss of movables come to no less than 60% and no more than 80% of the market value.

(3) Small half loss
Buildings:
Cases in which the amount of loss of major structural parts of the building comes to no less than 20% and no more than 40% of the market value of the relevant building, or cases in which floor space burned and lost or washed away come to no less than 20% and no more than 50% of the total floor space of the relevant building.
Movables:
Cases in which the amount of loss of movables come to no less than 30% and no more than 60% of the market value.

(4) Partial loss
Buildings:
When the amount of loss of major structural parts of the building comes to no less than 3% and no more than 20% of the market value of the building, or when a building for residential use is flooded above the floor level or flooded in excess of 45 centimeters from the ground because of water damage due to floods, etc., caused by Earthquake, etc., shall also be deemed to be partial loss.
Movables:
Cases in which the amount of loss of movables come to no less than 10% and no more than 30% of the market value.

5.3 Payment Method of Insurance Claims

Payment methods of insurance claims shall be as follows, the same for both buildings for residential use and movables for living.

(1) Total loss
The entire amount insured of earthquake insurance (100%) shall be paid; provided, however, that such shall be limited to the insurable value.

(2) Large half loss
An amount equivalent to 60% of the amount insured shall be paid; provided, however, that such shall be limited to an amount equivalent to 60% of insurable value.

(3) Small half loss
An amount equivalent to 30% of the amount insured shall be paid; provided, however, that such shall be limited to an amount equivalent to 30% of insurable value.

(4) Partial loss
Amount equivalent to 5% of the amount insured shall be paid; provided, however, that such shall be limited to an amount equivalent to 5% of insurable value.

5.4 Participation Method

Earthquake insurance policies shall be participated in through policies incidental to fire insurance for residences covering buildings for residential use or movables for living (hereinafter referred to as the "the principal contract").

Additionally, when a warning statement against earthquake disaster under the Large Scale Earthquake Countermeasures Act (Law No.73 of 1978) targeting the Tokai Earthquake (hereinafter referred to as the "Warning Statement") has been issued, concerning the object of insurance located in the area designated as the Area under Intensified Measures against Earthquake Disaster under the said Act during the period from the time when the Warning Statement was issued till the day of issuance of the statement of withdrawal of the warning against the earthquake disaster, no new earthquake insurance policies may be entered into; provided, however, that earthquake insurance policies that had been entered into by the time the Warning Statement was issued and expired after the Warning Statement, can be renewal, if the Insured and object insured are the same, and if the amount is the same or lower.

5.5 Amount Insured

The amount insured for the earthquake insurance policies is set forth under the Act on Earthquake Insurance as being equivalent to an amount no less than 30% and no more than 50% of the amount insured of the principal contract, and said amount is set forth in the enforcement ordinance as limited to 50 million yen for buildings for residential use and 10 million yen for movables for living.

5.6 Earthquake Insurance Standard Rates

The premium rates of the earthquake insurance are calculated from the following formula:

premium rates = basic rates
× discounts (100% - discount rates)
× long-term coefficients
(in case of long-term contracts).

(1) Basic rates

The basic rates and Zone are shown in **table 2.5.1** and **figure 2.5.1**, respectively.

(2) Discount rates

a. Seismically isolated buildings discount rate

In case residential buildings assessed to be seismically isolated in the housing performance evaluation report, a 50% discount is applied to the buildings or movables for living contained in the relevant buildings.

b. Earthquake-resistance class discount rate

In case the earthquake-resistance class in the residence capacity certificates by the Housing Performance Indication System of the Quality Assurance Act, or the earthquake-resistance capacity certificates by seismic evaluation fall under the following, the following discounts are applied to the buildings or movables for living contained in the relevant buildings.

<Earthquake-resistance class>	<discount rate>
Class 3	50%
Class 2	30%
Class 1	10%

c. Earthquake-resistance diagnosis discount rate

In case residential buildings confirmed through earthquake-resistance diagnoses or seismic retrofitting to comply with the earthquake-resistance standards (Ministry of Land, Infrastructure and Transport Public Notice No. 185 of 2006 or No. 1061 of 2013) provided in the Building Standards Act, a 10% discount is applied to the buildings or movables for living contained in the relevant buildings.

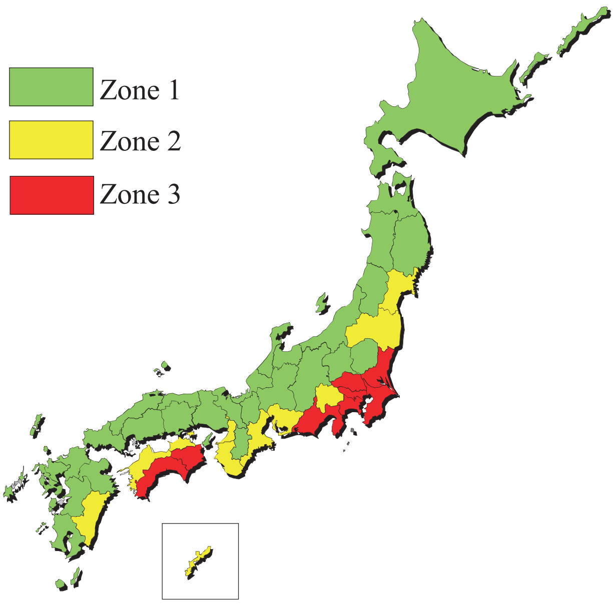
(Table 2.5.1) Basic rate

(yen per 1,000 yen amount insured)

Structural classification of buildings			Class A bldgs	Class B bldgs	
					Rates with a transitional measure
Zone	Zone 1	Hokkaido, Aomori, Iwate, Akita, Yamagata, Tochigi, Gumma, Niigata, Toyama, Ishikawa, Fukui, Nagano, Gifu, Shiga, Kyoto, Hyogo, Nara, Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Kagoshima	0.73	1.12	1.12
	Zone 2	Fukushima	1.16	1.95	1.63
		Miyagi, Yamanashi, Aichi, Mie, Osaka, Wakayama, Kagawa, Ehime, Miyazaki, Okinawa	1.16	1.95	1.95
	Zone 3	Ibaraki, Tokushima, Kochi	2.30	4.11	2.97
		Saitama	2.65	4.11	3.43
		Chiba, Tokyo, Kanagawa, Shizuoka	2.75	4.11	4.11

(Note 1) "Class A buildings" refer to fireproof buildings, semi-fireproof buildings, ordinance semi-fireproof buildings, etc. All other buildings are classified as "class B buildings."

(Note 2) The rates with a transitional measure are applied to buildings reclassified as "class B buildings" from "class A buildings" based on the new criteria for structural classification of buildings revised on January 1, 2010, provided that the buildings are covered by existing earthquake insurance riders on fire insurance policies that were in place before the revision.



(Fig. 2.5.1) Map of Zone

d. Construction age discount rate

In case a building was constructed newly after June 1, 1981, a 10% discount is applied to the buildings or movables for living contained in the relevant buildings.

However, no more than one discount from above a.-d. can be applied at one time.

(3) Long-term coefficients

The long-term coefficients shall be as in **table 2.5.2** concerning insurance periods of two-to-five year.

(Table 2.5.2) Long-term coefficient

Policy period	Coefficient
2 years	1.90
3 years	2.85
4 years	3.75
5 years	4.70

Section 6 Reinsurance and Liability Reserves

6.1 Reinsurance

Normally, reinsurance contracts are made between private insurance companies; however, in the earthquake insurance systems of Japan, reinsurance contracts are performed not only with private insurance companies, but also with the Government. The major reasons for such are the following two points:

(1) Earthquakes have a possibility to cause extremely massive losses and it is difficult for private insurance companies to share the risk alone.

(2) In order to standardize the risk for great earthquakes, which occur at a low frequency, the income and outgo of insurance in the extraordinarily long run must be considered, and it is difficult for private insurance companies alone, which consider the short-term balance of insurance, to manage stably.

In order for the Government to undertake reinsurance contracts for earthquake insurance, the Act on Earthquake Insurance has been constituted. This Act sets forth that the reinsurance partners for the Government shall be reinsurance companies. Therefore, Japan Earthquake Reinsurance Company, Ltd. (hereinafter referred to as the "J.E.R."), which only handles reinsurance of earthquake insurance, was established in 1966 together with the establishment of earthquake insurance.

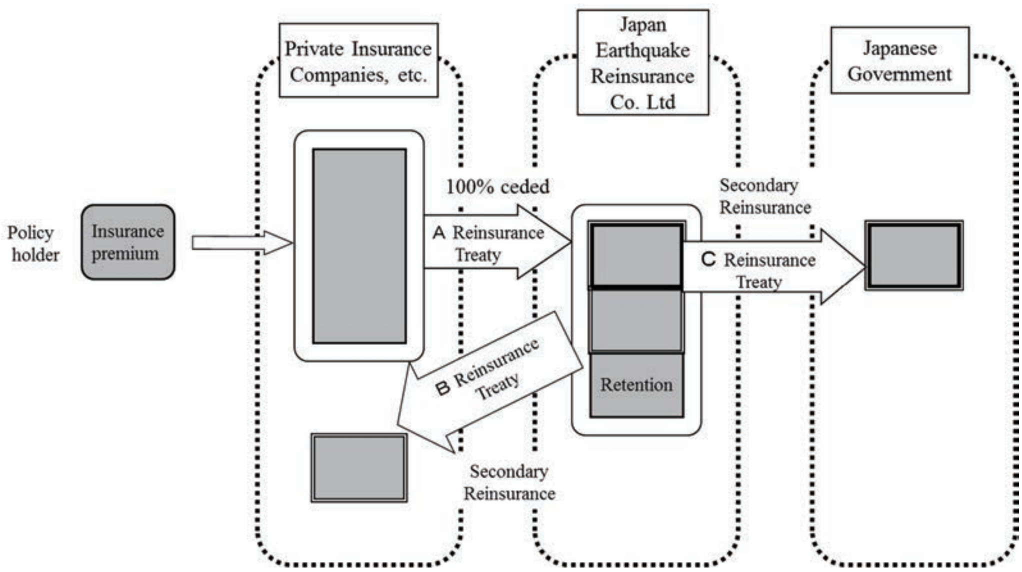
6.1.1 Reinsurance structure

The earthquake insurance systems in Japan are operated subject to the undertaking of reinsurance by the Government. The mechanism of this reinsurance is as in **figure 2.6.1**.

(1) Reinsurance agreement from private insurance companies to the J.E.R.

Private insurance companies selling earthquake insurance inside Japan in accordance with the Act on Earthquake Insurance execute the Earthquake Reinsurance Treaty (A) (hereinafter referred to as the "A Reinsurance Treaty") with the J.E.R.

In accordance with this A Reinsurance Treaty, private insurance companies shall have the J.E.R. perform reinsurance of all the insurance liability of the undertaken earthquake insurance contracts and the J.E.R. shall undertake it.



(Fig. 2.6.1) Structure of earthquake reinsurance

(2) Reinsurance agreement from the J.E.R to the private insurance companies

Of the reinsurance liability undertaken pursuant to the A Reinsurance Treaty in above (1), the J.E.R. performs reinsurance for respective private insurance companies of a part of the remainder of the liability after the Government performs reinsurance. This part is executed between J.E.R. and each private insurance companies for the risk diversification of the J.E.R., and is called Earthquake Reinsurance Treaty (B) (hereinafter referred to as the “B Reinsurance Treaty”).

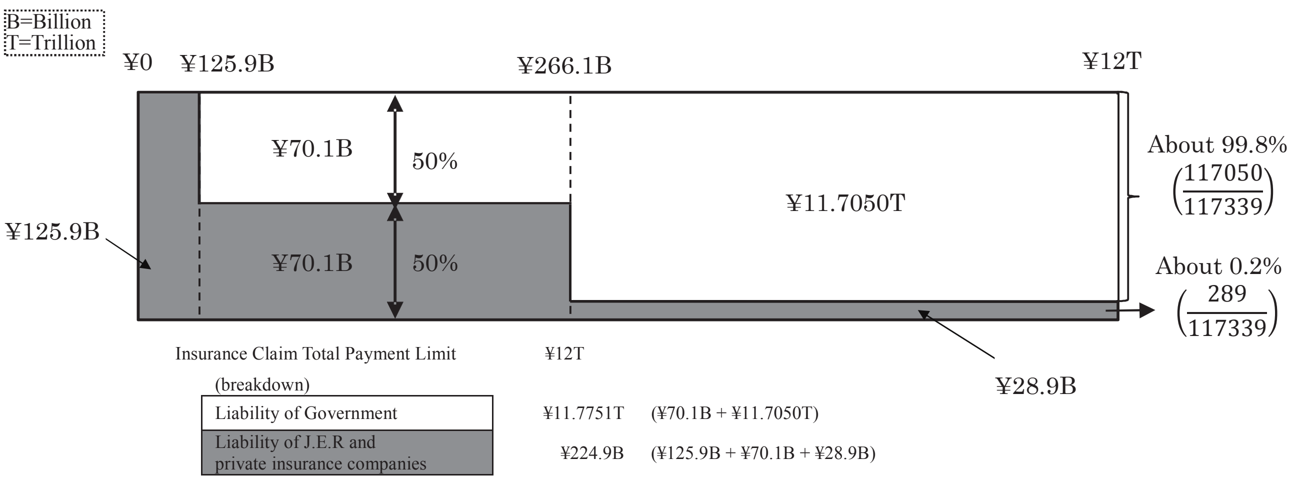
(3) Reinsurance agreement from the J.E.R. to the Japanese Government

The J.E.R., under the reinsurance agreement with the Government, performs reinsurance again with the Government of part of the reinsurance liability which was undertaken from the direct insurance company pursuant to the A Reinsurance Treaty in above (1). This reinsurance agreement with the Government is called “Excess of Loss Reinsurance” (hereinafter referred to as the “C Reinsurance Treaty”) and is the method by which reinsurance claims are to be paid in case the total payment of insurance claims due to a single Earthquake, etc., exceeds a certain amount.

6.1.2 Liability sharing of insurance companies and Japanese Government

Burden sharing and the total maximum liability of insurance companies (the J.E.R. and the private insurance companies, etc.) and the Government for insurance claims to be paid due to a single Earthquake, etc., are stipulated in the Enforcement Order and the Regulation for Enforcement of the Act on Earthquake Insurance. **Figure 2.6.2** illustrates the liability of share of insurance companies and the Government as of April 2021, and this is called the “earthquake reinsurance scheme.” The horizontal axis of this figure is the amount of the payment of insurance claims due to a single Earthquake, etc., and the vertical axis is the proportion of burden of insurance companies and the Government. That is, in accordance with this scheme, payment of up to 125.9 billion yen shall be borne 100% by the insurance companies and concerning the payment amount of 125.9 billion yen and up to 266.1 billion yen, insurance companies and the Government shall each bear 50% of the payment of insurance claims. Moreover, the Government shall bear about 99.8% (117050/117339) and insurance companies the remaining about 0.2% (289/117339) of payments for amounts exceeding 266.1 billion yen.

Noted that two or more Earthquakes, etc., having occurred within 72 consecutive hours shall be deemed collectively to be a single Earthquake, etc., provided,



(Fig. 2.6.2) Liability sharing of insurance companies and Japanese Government

however, that this shall not apply to the situation where the areas affected do not overlap at all.

As indicated in **figure 2.6.2**, the insurance claim total payment limit (the Aggregate Limit) due to a single Earthquake, etc., is stipulated to be 12 trillion yen as of April 2021. This payment limit is determined so that “there should be no obstacle to payment of insurance claims even in case a huge earthquake of the Great Kanto Earthquake class should occur,” and the burden of share of insurance companies for this amount is 224.9 billion yen, while the burden of share of the Government for this amount is 11.7751 trillion yen.

It is stipulated that in case the total amount of insurance claims to be paid due to a single Earthquake, etc., exceeds 12 trillion yen, the Aggregate Limit, the respective insurance claims can be reduced and paid in accordance with the proportion of the Aggregate Limit to the total amount of insurance claims to be paid.

6.2 Liability Reserves

As for insurance premiums paid by policyholders, both insurance companies and the Government are obligated by the Act to accumulate the total amount of such, excluding the portion of necessary expenses for contracts, as liability reserves in preparation for future earthquake disasters. Additionally, it is obligated that all the investment profits from the accumulated liability reserves also be accumulated as liability reserves.

Insurance companies are respectively accumulating the insurance premiums distributed in accordance with the respective burden of share as liability reserves, and are also accumulating all the investment profits from the accumulated liability reserves as liability reserves. The J.E.R. is managing and performing investment of these liability reserves in lump sum so as to pay insurance claims quickly to the victims of earthquake disasters.

The Government is accumulating the reinsurance premiums obtained and all the investment profits from the liability reserves as liability reserves. These liability reserves are accumulated separately from general accounting, under the Act on Special Accounts.

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Chapter 3 Rating Method of Earthquake Insurance

Section 1 Requirements for Premium Rates and Rating

1.1 Requirements and Procedures of Earthquake Insurance Rate

Premium rates for earthquake insurance are stipulated as “Standard Full Rates” in the Act on Non-life Insurance (General Insurance) Rating Organizations (Law No. 193 of 1948, hereinafter referred to as the “Rating Organization Act”). There are two lines of insurance having Standard Full Rates: earthquake insurance under the Act on Earthquake Insurance and automobile liability insurance under the Automobile Liability Security Act (Law No. 97 of 1955). Since these kinds of insurance have the strong social and public nature, the principle of each Standard Full Rate is stipulated by those laws.
Premium rates for earthquake insurance must meet the “three principles of premium rates” (the rating by a rating organization must be reasonable and adequate, and must not be unfairly discriminatory) provided in Article 8 of the Rating Organization Act. The specific requirements of the three rating principles are provided in Article 5 of the Cabinet Office Ordinance on Non-life Insurance (General Insurance) Rating Organizations (hereinafter referred to as the “Cabinet Ordinance”) as follows:

(1) Definition of “reasonable”
Insurance statistics and other basic data used for rating is objective, accurate and sufficient, and the rating calculation method is scientific as it is based on actuarial science.

(2) Definition of “adequate”
The rating is at a level that enables a person who is attempting to apply for the insurance contract to conclude the contract and that allows the soundness of the operation at the insurance company that uses the Standard Full Rates to be maintained.

(3) Definition of “not be unfairly discriminatory”
The risk category and level associated with the rate are appropriately set based on the actual risk difference and expenses expected to be incurred following underwriting of the contract.

Premium rates for earthquake insurance are set forth additionally, in the Act on Earthquake Insurance, as “the premium rates for earthquake insurance contracts covered by the Government reinsurance shall be required to be as low as possible to the extent of equilibrium of income and outgo being maintained” and “the reinsurance premium rates for the Government reinsurance operation shall be required to be reasonably established so as to have the reinsurance premium income compensate for reinsurance claims paid in the long run.”

1.1.1 Standard Full Rates
The Standard Full Rates are calculated by Non-life Insurance (General Insurance) rating organizations (hereinafter referred to as the “Rating Organizations”) filed with the Financial Services Agency under the Rating Organization Act and determined through such procedures as examinations. Insurance companies that are members of Rating Organizations can use these Standard Full Rates and, additionally, procedures with the Financial Services Agency can be simplified.
Rating of the Standard Full Rates and provision of such for the use of members by the Rating Organizations is in principle an exemption of application of the Act on Prohibition of Private Monopoly and Maintenance of Fair Trade (Anti-Monopoly Act; Law No. 54 of 1947).

1.1.2 Procedures from calculation of Standard Full Rates to use of them
Procedures from calculation of Standard Full Rates by the Rating Organizations to use of them by members are performed in the following procedural steps,

which are all set forth in the Rating Organization Act and the Cabinet Ordinance.

(1) Filing of Standard Full Rates

When a Rating Organization calculates Standard Full Rate, such Standard Full Rates must be filed with the Commissioner of the Financial Services Agency. The details of filing are as follows, and cases of changing filed Standard Full Rates will be the same.

a. Standard Full Rates
b. pure premium rates relating to Standard Full Rates
c. expense loading relating to Standard Full Rates
d. rating methods for Standard Full Rates
e. reasons for filing
f. projected loss ratio
g. projected operating cost ratio
h. other matters for reference in the examination of whether or not the relevant Standard Full Rates are in conformance with the stipulations of Article 8 of the Rating Organization Act

(2) Public announcement and notification of members

When performing filing of Standard Full Rates, Rating Organizations must announce promptly the details of them publicly in official gazette, and notify the members of such. All members shall also be notified together the day filing is accepted by the Commissioner of the Financial Services Agency.

(3) Notification to the Fair Trade Commission

When accepting a filing of Standard Full Rates, the Commissioner of the Financial Services Agency must notify the Fair Trade Commission.

(4) Examination

The Commissioner of the Financial Services Agency examines as to whether filed Standard Full Rates are in conformance with the "three principles of premium rates" stipulated in the Rating Organization Act (hereinafter referred to as the "Conformity Examination"). When it is judged that filed Standard Full Rates are not in conformance with the three principles of premium rates, the Commissioner of the Financial Services Agency must order the withdrawal of the filing or the filing of an amendment with the Rating Organizations.

The examination period in principle is ninety days from the day filing is accepted; however, the Commissioner of the Financial Services Agency may reduce or extend to a period judged appropriate.

When receiving an order for reduction or extension of the above stated examination period, or for withdrawal of the filing or the filing of an amendment, the Rating Organizations must notify their members promptly.

(5) Official announcement

Concerning the filed Standard Full Rates, when the period of Conformity Examination in above (4) lapses without issuance of an order for withdrawal of filing or filing of amendment, the Commissioner of the Financial Services Agency must make an official announcement promptly of the relevant Standard Full Rates in an official gazette.

(6) Filing of use and deemed permission

When attempting to use Standard Full Rates after the lapse of the period of Conformity Examination in above (4), the members of Rating Organizations may file the use of the rates with the Commissioner of the Financial Services Agency.

When members of Rating Organizations attempt to utilize Standard Full Rates, they must file with the Commissioner of the Financial Services Agency by the utilization commencement day of the documents in which are inscribed the types of insurance of the Standard Full Rates and planned utilization commencement date.

Additionally, members are deemed to have acquired permission under the Insurance Business Act as of the day of performing this filing. By this "deemed permission" system, member insurance companies can utilize Standard Full Rates through easy procedures.

1.1.3 Security of openness and transparency

From the viewpoint that this insurance has strong social and public nature, there are provisions for the security of openness and transparency of Standard Full Rates in the Rating Organization Act, etc. Details are as follows:

(1) Public announcement
When performing filing of Standard Full Rates with the Commissioner of the Financial Services Agency, Rating Organizations must publicly announce promptly the following matters in official gazette:

a. filed Standard Full Rates
b. date of filing of Standard Full Rates with the Commissioner of the Financial Services Agency
c. place for access to the schedule in which the Standard Full Rates is inscribed (hereinafter referred to as the "Standard Full Rates Schedule") and basic materials for the calculation of the Standard Full Rates
d. place for acceptance of request for issuance of the Standard Full Rates Schedule and the amount, in case of charging actual expenses for it

As well as placing official announcements in official gazette, Rating Organizations place the announcements in the nationwide editions of daily newspapers, and thus attempt to inform not only policyholders, the insured and other interested parties (hereinafter referred to as the "Interested Parties") but also the general public of such thoroughly.
The Rating Organizations also provide information concerning the filing details of reason for filing, etc., through press release.

(2) Access to materials
Interested Parties may make a request for inspection of the filed Standard Full Rates Schedule and documents in which the calculation methods for the rates are inscribed, and Rating Organizations must provide access to the documents by Interested Parties. Rating Organizations must also provide facilities for hearing Interested Parties' opinions on the calculation of the relevant Standard Full Rates.

(3) Official announcement
Concerning filed Standard Full Rates, when the period of Conformity Examination lapses, the Commissioner of the Financial Services Agency must announce promptly the relevant Standard Full Rates (publishing them in official gazettes).

(4) Preparation of announcement details
When there is an announcement in above (3), the members of the Rating Organizations must be ready at their head office or branch office, etc., for documents which inscribe the details of the announcement, and provide access to them by Interested Parties.

(5) Proposal of objections by Interested Parties
In case of holding objections concerning Standard Full Rates for which there has been the official announcements in above (1) or the announcements in above (3), the Interested Parties may raise an objection in writing to the Commissioner of the Financial Services Agency. In case that an objection raised, the Commissioner of the Financial Services Agency must ask for an appearance by the person rising it and the Director of the Rating Organizations filing the Standard Full Rates, and perform open hearings.
Additionally, as for the open hearings, detailed provisions are given in the "Cabinet Office Ordinance on Open Hearings."

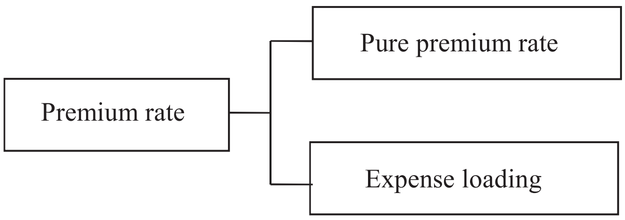
1.2 Composition of Earthquake Insurance Rate and Rating

1.2.1 Composition of premium rates for earthquake insurance

As in **figure 3.1.1**, a premium rate for earthquake insurance is, like other insurance, composed of a pure premium rate and an expense loading.

Pure premium rates are to be appropriated to the insurance claims to be paid arising from earthquake disasters, etc., which will occur in the future.

Expense loading is to be appropriated to the expenses of operating the earthquake insurance, and the paperwork cost of insurance policies, adjustment costs at the time of payment of insurance claims, and the commissions to be paid to agencies.



(Fig. 3.1.1) Composition of premium rate

1.2.2 Rating of pure premium rates

Even in Japan, which is recognized around the world as a country of earthquakes, the number of occurrences of earthquake disasters is very small, compared to other disasters. According to the "Table of eras of major destructive earthquakes on the periphery of Japan" appearing in Chronological Scientific Table, the number of occurrences of destructive earthquakes per year is about one in the most recent 100 years. Therefore, from the data on short periods, the "law of large numbers," the basic of rating method, is not applicable. So, from 1966, when the earthquake insurance system was established, pure premium rates for earthquake insurance were calculated using Chronological Scientific Table as long-term hypocenter nationwide data with certain accuracy and objectivity.

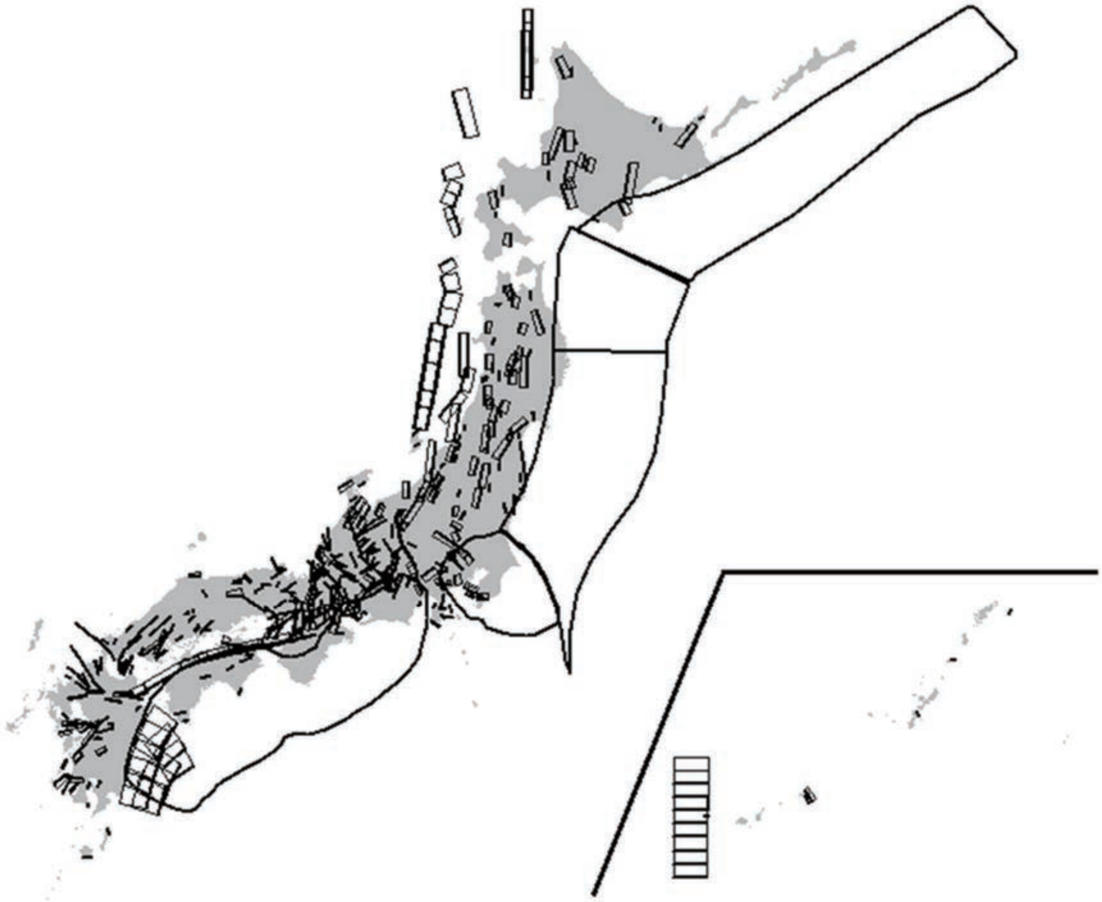
Seismological study in Japan developed into a nationwide scale in the wake of the 1995 Southern Hyogo Prefecture Earthquake. In March 2005, the Headquarters for Earthquake Research Promotion released Probabilistic Seismic Hazard Maps reflecting the latest findings.

The Probabilistic Seismic Hazard Maps are compiled with a nationwide uniform standard after discussion of many researchers. Since the revision of premium rates in 2007, therefore, the earthquake source models used in preparing the Maps (**figure 3.1.2**) have been used to calculate pure premium rates for earthquake insurance.

In rating pure premium rates, it is necessary to estimate losses in the case of the occurrence of earthquakes. The estimation of losses due to earthquakes is a very difficult operation, since there are various factors concerned such as scale, place of occurrence, seasons and times of occurrence of earthquakes, and building status, urban structures and fireproofing rate, and moreover these are in a complicated relation to each other. Thus, in case the above stated destructive earthquakes used for the preparation of the Probabilistic Seismic Hazard Maps should occur in the present situation, in the same places and in the same scale, approximately how much the insurance claims to be paid from earthquake insurance would be is estimated through damage estimation simulation from respective earthquakes. Pure premium rates for earthquake insurance are calculated by computing the estimated insurance claims to be paid per year from this data.

1.2.3 Calculation of expense loading

To participate in an earthquake insurance, the method of participation by attaching to fire insurance has been adopted. Concerning the paperwork for earthquake insurance policies, through adoption of the method of attaching earthquake insurance to fire insurance, the



(Fig. 3.1.2) Example of earthquake source faults

Created by excerpting earthquake source models of "Probabilistic Seismic Hazard Maps, 2020 Edition"
(Example of earthquakes at active faults and trench-type earthquakes for which long-term evaluations have been conducted by the Headquarters for Earthquake Research Promotion)

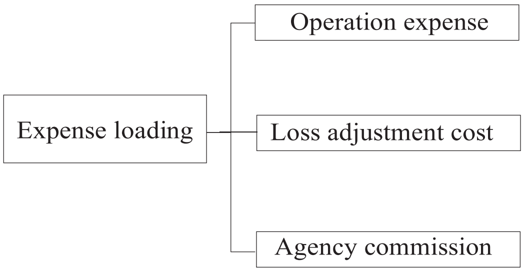
portion overlapping with fire insurance can be reduced, so it becomes possible to decrease the cost of paperwork. In addition, it is natural for insurance companies, privately owned companies, to build-in profits to the insurance they sell, but since earthquake insurance has the strong social and public nature, and moreover since the Government is acceptance the reinsurance, profits are not included into earthquake insurance rates.

The loading for earthquake insurance is composed of operation expenses, loss adjustment costs and agency commissions, as in **figure 3.1.3**. The method of calculating these is as follows.

The operating expense of earthquake insurance is calculated on the basis of actual condition surveys for the time each general insurance company contract.

Loss adjustment costs are calculated in conformity with the calculation methods for pure premium rates. Specifically, by performing damage assumption simulations in the case where the destructive earthquakes used for the preparation of the Probabilistic Seismic Hazard Maps are repeated in the present, the estimated number of payment cases of earthquake insurance due to the respective earthquakes is obtained. The loss adjustment costs are calculated by accumulating the expenses relating to this adjustment.

Agency commissions are to be paid as commissions when agencies that have consignment contracts with insurance companies sell insurance policies, and calculated on the basis of actual condition surveys for agencies.



(Fig. 3.1.3) Composition of expense loading

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Section 2 Estimation of Earthquake Damage for Rating for Earthquake Insurance

2.1 Factors and Forms of Earthquake Damage

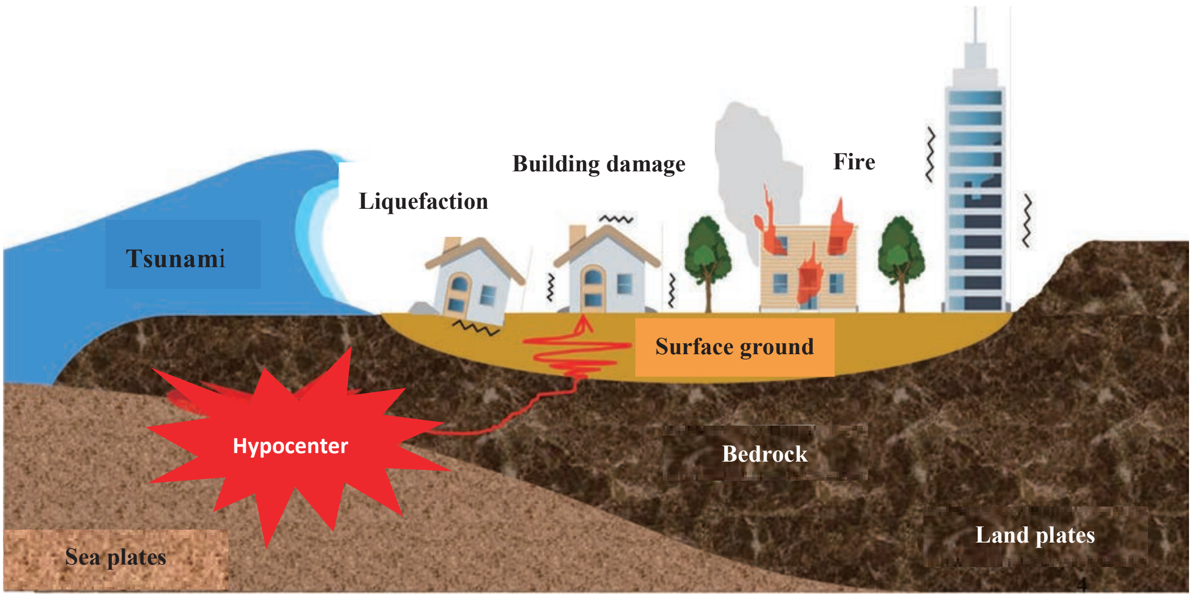
2.1.1 Earthquake damage estimation

Grasping quantitatively what kind and how much damage will occur in the case of the occurrence of earthquake is called "earthquake damage estimation," and in Japan it has been performed as one link in the disaster prevention countermeasures of governing bodies.

Especially, after the Hyogo-ken Nanbu Earthquake, most prefectures and cabinet ordinance designated cities started forecasting earthquake damage. They make full use of the results in regional disaster prevention measures and release them to local residents. In recent years, as for the national Government, the Working Group on Measures Against Great Earthquakes Along the Chishima Trench and the Japan Trench of the Central Disaster Prevention Council released damage estimates for large-scale earthquakes in these trenches in 2021. With regards to local governments, the Tokyo Metropolitan Government released damage estimates for earthquakes directly striking the capital in 2022.

A variety of factors affect the extent of earthquake damage. These include the scale and location of the earthquake, the seasons and times of the day, building structure, the proportion of fireproof structures in a city, distance from the waterfront, elevation, etc. Generally, when predicting earthquake damage, various events, such as the predicted earthquake tremor, liquefaction and tsunami, and the resulting physical and human damage including destruction, fire, etc., of buildings and facilities, are systematized as shown in **figure 3.2.1**, and damage is quantitatively assessed in order using these various factors as parameters.

The concept of the damage prediction in the rating of pure premium rates for earthquake insurance is essentially the same as that of the estimation of earthquake damage performed by the Government and



(Fig. 3.2.1) Image for estimation of earthquake damage

local governments.
In the following sections, factors intimately related to earthquake damage and forms of earthquake damage are organized.

2.1.2 Factors in earthquake damage

Here, the following factors are discussed: the scale and location of an earthquake, differences in the ground that affect the amplification of tremors and liquefaction, building structure and construction age that affect the destruction of a building, seasons and times of occurrence of an earthquake as well as the building usage in terms of how it affects the outbreak of fire, city structures related to the spread of fire, and the distance from the waterfront and elevation that affect whether buildings are swept away by tsunami.

Magnitude of earthquakes

JMA magnitude is used in Japan for indicating the scale of earthquakes, and generally speaking, if the magnitude is M5 or lower class, there are few cases of damage being caused, while if magnitude is M6 or higher class, such is in many cases concurrent with damage, although it also depends on the location of occurrence of earthquakes. As a difference of 1 magnitude means about 32 times difference in terms of energy, M8.0 huge earthquakes are equivalent to 1,000 times the scale of M6.0 earthquakes.
By looking at the number of occurrences of earthquakes grouped on a scale, there is a tendency that the smaller the magnitude is, the more frequent the occurrence becomes and the greater the magnitude is, the less frequent. According to past earthquake data, in approximate terms, M6 class earthquakes occur in Japan about several ten times per year, M7 class earthquakes occur about once a year and M8 or higher class earthquakes occur about once in ten years.

Place of occurrence

Damage from earthquakes differs largely due to the scale of them, as well as having something intimately to do with the place of occurrence. Even if a great earthquake should occur, if there are few residents and buildings, etc., the damage will be small; however, if such should occur near a big city, there have been cases of even an M6 class earthquake causing huge damage. As in the Hyogo-ken Nanbu Earthquake, in case of the occurrence of an M7 class earthquake near a big city, the damage could be extremely massive.
As stated in Chapter 1, Section 1, the land of Japan is formed along an interplates-area where there are many earthquakes, and the southern Kanto region, including the metropolitan area in particular, is a place where multiple plates are contiguous to each other, and in the past as well great earthquakes have numerous times occurred along the lines of the Great Kanto Earthquake. The southern Kanto region is not only a concentration of populations or buildings, etc., but also a center of politics and the economy, and should a great earthquake menace this area, the damage of such would be beyond measure.
Earthquakes having epicenters in ocean areas are sometimes accompanied by tsunamis. The tsunami of the 2011 off the Pacific coast of Tohoku Earthquake caused extensive damage in the Pacific coastal regions.

Geometry of earthquake source faults

The process of an earthquake starts with the rupture of a certain point within a fault (hypocenter); the rupture gradually progresses along with the fault, ending in a wide range of fault offset. This fault causing the earthquake is called an earthquake source fault. The earthquake source fault of earthquakes of large magnitude is considered to be large.
The damage of earthquakes is closely related to a distance from the earthquake source fault; for example, if the Nankai Trough Earthquake hypothesized by the Headquarters occurred concurrently, the earthquake source fault would extend as long as 700 km, causing extensive damage. Therefore, it is necessary to evaluate the geometry of a hypocenter appropriately.

Types of ground

As indicated in **figure 3.2.1**, it can be considered that ground can be roughly separated into the surface ground and the bedrock below it. Generally, the surface ground is soft, and the bedrock is hard. Seismic waves occurring at the hypocenter pass through the bedrock and reach the surface layer directly under the observation point. When seismic waves pass from the hard bedrock to the soft surface ground, these waves are amplified. Depending on the type of this surface ground, the way in which seismic waves are amplified differs greatly, and generally the softer the surface ground is, the greater the amplification rate will be. This is the reason why earthquake tremor at the surface ground is larger in soft ground than in hard ground, even though the distances from the hypocenter are almost the same.

Additionally, the occurrence of liquefaction has a lot to do with the type of ground. Disaster due to liquefaction of ground occurs due to the fact that the force supporting structures is lost, since water and soil particles included inside the ground are mixed and fluidized by seismic ground motion. Because of this, the entire building sometimes sinks, or subsidence, transfer or tumbling, etc., of it will occur. Liquefaction is likely to occur in such artificial land as manmade land, and buildings are likely to suffer damage. Large-scale liquefaction took place in the 2011 off the Pacific coast of Tohoku Earthquake, damaging many dwellings.

Structure of buildings and construction age

As for damage grouped by building structure, compared with non-wooden buildings such as steel reinforced concrete structures or steel frame structures, damage is greater for wooden buildings. This can be stated as a general tendency; however, there are, among wooden structure buildings, buildings high earthquake-resistance capacity for which sufficient design and execution against earthquakes have performed.

Additionally, the relation of a building's construction age to damage has become clear from earthquake damage research, etc. In particular, the fact has become clear from the damage data from the Hyogo-ken Nanbu Earthquake and the Kumamoto Earthquake, etc., that buildings from after the new earthquake-resistance standards which were introduced in 1981 have superior earthquake-resistance capacity compared to previous ones.

Seasons and times of the day of earthquake occurrence

Earthquake damage also differs by seasons and times of the day, etc., of earthquake occurrence, and the thing most affected is fire caused by earthquake. In case an earthquake occurs in winter, when more heating equipment are used, the number of fires will be greater compared to summer, etc., and in case an earthquake occurs in the evening, when more burner equipment is being used for the preparation of meals, etc., it is anticipated that the number of fires will be greater compared to such times as dawn. Moreover, concerning the danger of the spread of fire, weather conditions such as wind speed are also important factors having deep relevance.

Building usage

Building usage is considered to be a factor affecting the outbreak of fires during earthquakes. For example, when considering the outbreak of fire differentiated by building usage, the outbreak rate from eating house where fire instrument usage frequency is high is anticipated to be higher than from offices where fire instrument usage frequency is low. Therefore, it is considered that the outbreak of fires from busy streets will be great.

Building structure and density in urban areas

The building structure and density in urban areas as a whole greatly affects the spread of fire there. In the

Hyogo-ken Nanbu Earthquake, the area damaged by large-scale fire spread was packed with old wooden houses. Although the possibility of the destructive fires of a decade ago has been decreased, areas where land readjustment delays the expansion of roads and the rebuilding of old wooden houses remain vulnerable to fires in Japan. This means the risk of large-scale earthquake fires still exists.

Distance from the waterfront and elevation

In the coastal areas where a tsunami hits, the closer to the waterfront and the lower the areas, the more likely flooding and damage will occur when a tsunami strikes land. In addition, the distance tsunami can run up on land varies depending on conditions such as the configuration, etc. of rivers and bayside.

2.1.3 Forms of earthquake damage

The size of earthquake damage differs due to the place of occurrence, the scale of the earthquake, etc., and moreover the forms of damage appear to vary. Such things are named as:

- deformation or destruction of buildings and civil engineering structures such as roads, bridges and dams
- collapse or movement of the landforms (soil fall, earth-fall, landslide)
- subsidence due to the liquefaction of ground
- occurrence of tsunami.

Among these, the following three are considered to be the risk factors with the greatest effect among the forms of physical disaster that earthquake insurance policyholders are anticipated to suffer:

(1) risk of destruction of buildings due to seismic ground motion and liquefaction
(2) risk of burning down of buildings due to fire caused by earthquake
(3) risk of washing away of buildings due to tsunami

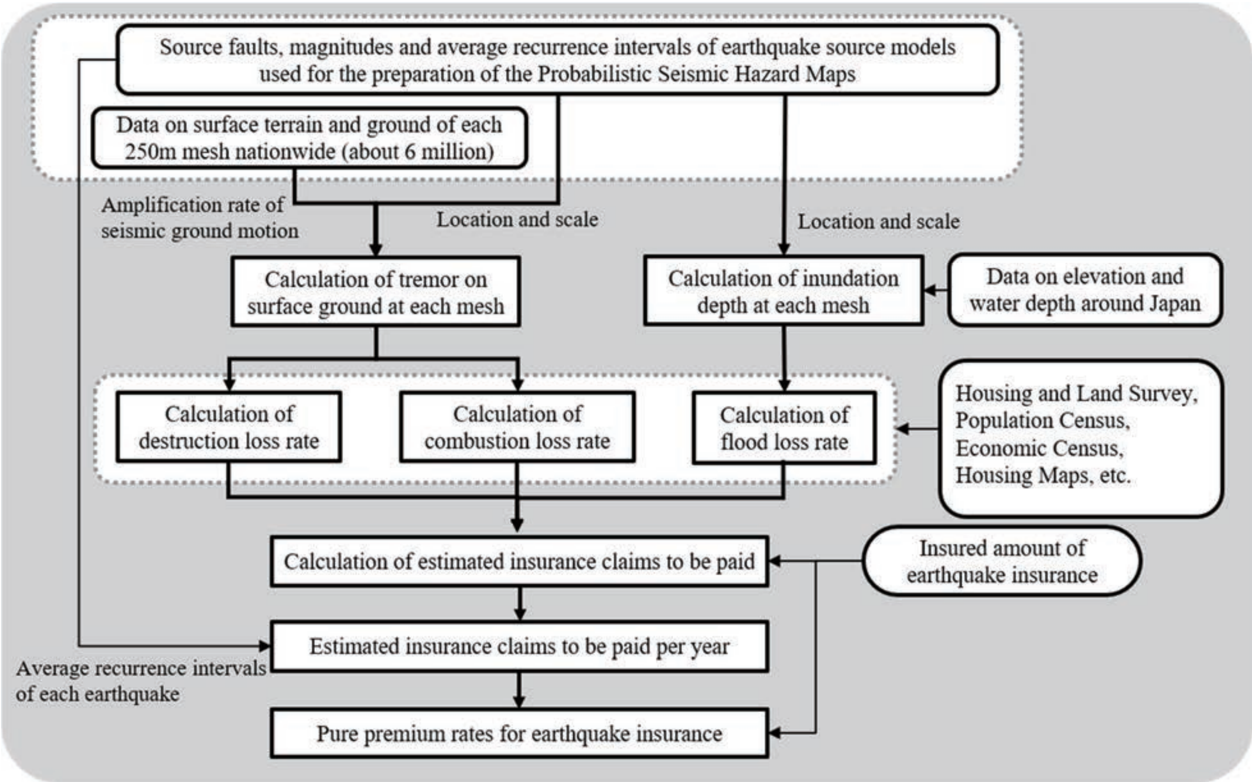
Damage estimation is performed in earthquake insurance focusing on these three as risk factors in earthquake disasters.

2.2 Estimation of Earthquake Damage

In rating pure premium rates for earthquake insurance, since earthquake insurance has fewer examples of insured events than other kinds of insurance covering other disaster such as fire insurance, damage data from the past alone is insufficient. Therefore, damage is estimated by performing simulations of earthquakes that may occur in the future occurring in the present day. An outline of the estimation method is stated here in accordance with **figure 3.2.2**.

First, based on the assumption that earthquakes used for the preparation of the Probabilistic Seismic Hazard Maps should occur now, the size of the seismic ground motion in the estimated damage area (for each municipality) will be forecast considering the characteristics of the ground. The destruction rate of buildings due to the seismic ground motion and liquefaction is then estimated. Additionally, the number of outbreaks of fire in the damage area is obtained from the size of seismic ground motion, and then, calculation of the spread of fire is performed and thus the ratio of fire destruction due to earthquake fire is estimated. On top of this, in case of earthquakes occurring in maritime areas, the ratio of wash away due to tsunami is also estimated. Calculations of estimated insurance claims to be paid is performed by combining these damage rates with the present earthquake insurance policy status in the damage area, and from such the estimated insurance claims to be paid per year is obtained. The pure premium rate is obtained by dividing it by the insured amount of earthquake insurance.

Damage estimation simulation in the rating for earthquake insurance is explained in detail in the following.



(Fig. 3.2.2) Flow of pure premium rate calculations in earthquake insurance

2.2.1 Assumed earthquakes

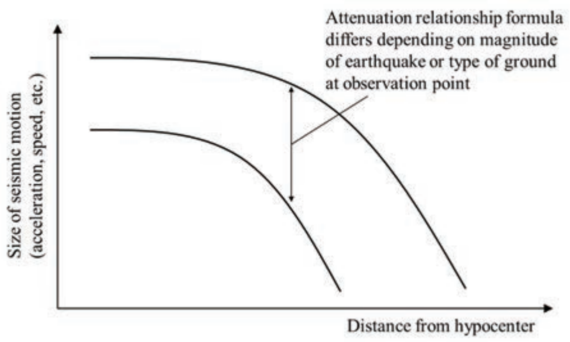
It is difficult to accurately predict where and when an earthquake will happen and how big it will be even with modern science. Meanwhile, it is known that an earthquake that occurs near a large plate boundary or an active fault repeatedly occurs at the same location, and so it is thought that predicting the size and recurrence interval of an earthquake for a long period is possible to some extent. The earthquake source models used for the Probabilistic Seismic Hazard Maps published by the Headquarters for Earthquake Research Promotion can be thought of as models that are compiled based on nationwide unified standards through discussions on such long-term predictions regarding the occurrence of earthquakes among many researchers. These earthquake source models are used to calculate pure premium rates for earthquake insurances.

2.2.2 Estimation of seismic ground motion

Attenuation relationship formula

The greater the magnitude is, the greater the seismic ground motion becomes. Additionally, seismic ground motion becomes greater as it gets closer to the hypocenter and lesser as it gets further from the hypocenter. The formula displaying these relations is called the "attenuation relationship formula," and **figure 3.2.3** shows it with the vertical axis being the size of seismic ground motion and horizontal axis being the distance from the hypocenter. Through use of this, the size of the seismic ground motion at arbitrary points can be obtained.

In earthquake insurance, estimation of seismic ground motion is performed using the attenuation relationship formula in which the magnitude and type of earthquakes (crustal, intraplate, or interplate), etc., are reflected.



(Fig. 3.2.3) Example of attenuation relationship formula

Seismic ground motion and ground characteristics

The magnitude of seismic ground motion obtained with the attenuation relationship formula does not take into consideration the tendency of ground tremors. The harder the ground is, the smaller the tremors will be, and the softer the ground is, the larger the tremors will be. The tendency of ground tremors is said to be closely linked with the classification of the surface terrain; for example, the ground of mountainous land and hilly land is hard, which makes it unlikely to be susceptible to tremors. The ground of such terrain tends to be less susceptible to tremors than that of lowlands and reclaimed land even with the same distance from the hypocenter. The simulation evaluates the tendency of ground tremors with focus on surface terrain and other elements, and computes the intensity of tremors at each point by reflecting the tendency in the seismic ground motion obtained with the attenuation relationship formula.

2.2.3 Estimation of loss due to destruction of property

Estimation of damage directly caused by seismic ground motion

Tremor-caused building destruction and damage, a phenomenon where buildings and contents are destroyed directly by seismic ground motion, shows a high correlation between the frequency of loss and the intensity of seismic ground motion. Upon the rating of pure premium rates for earthquake insurance, therefore, the frequency of loss is calculated based on a relation (damage function) between the intensity of seismic ground motion obtained in 2.2.2 and the frequency of loss of buildings.

As stated before, previous studies show that earthquake damage to buildings differs depending not only on their structure but also on their construction period, so the damage function is given by structure and by construction period.

Estimation of damage due to liquefaction of ground

Advancing urbanization has resulted in the shortage of land for housing; more houses are being built on soft ground and artificial ground. This may increase liquefaction damage when an earthquake occurs.

As stated before, liquefaction of the ground has a close relationship with the microtopography at the point. Therefore, in accordance with methods used in research papers focusing on this relationship, the data of the nationwide microtopography used in the Probabilistic Seismic Hazard Maps is used for the calculation of the frequency of loss due to liquefaction.

2.2.4 Estimation of loss due to burnout of property

One of the things of greatest concern among the various forms of disaster taking place at the time of earthquakes is earthquake fire. Since there are many wooden buildings in Japan, large fires have been happened several times in the past, and **table 3.2.1** gives examples of major earthquake fires that occurred in the past.

Estimation is performed here by dividing earthquake fire into two processes: “outbreak process” and “fire spread process.”

Outbreak process

Upon the earthquake insurance rating, fire outbreak rate is calculated in accordance with the method used by the Tokyo Fire Department for fire outbreaks caused by fire appliances/electric heating appliances, electric appliances/wirings, and leaked gas, which are major causes of fire for general residences.

In this method, fire outbreak rate is calculated based on experiments and actual cases in Hyogo-ken Nanbu Earthquake for assumed fire outbreaks due to the overturning and falling of fire appliances, etc., interior wiring short circuits and other causes. In accordance with this method, fire outbreak rate is calculated based on the intensity of seismic ground motion obtained in 2.2.2, together with rate of fire outbreak per building that leads to the expansion of fire spread.

Fire spread process

The distance between adjacent buildings is calculated by using map data from which the shape of individual buildings across Japan can be identified. The damage ratio (ratio of fire destruction) of an earthquake fire is calculated by determining whether the fire will spread or not by taking into account the building structure based on the identified distance while applying the fire outbreak rate. In this model, a higher density of buildings with a narrower road width and a higher ratio of wooden buildings lead to a higher ratio of fire destruction.

2.2.5 Estimation of loss due to washing away of property

Earthquakes taking place in maritime areas sometimes are concurrent with tsunami and cause damage. **Table 3.2.2** is of earthquakes in the past concurrent with great tsunami damage in Japan.

As is understandable from **table 3.2.2**, many of the earthquakes concurrent with tsunami have been of large magnitudes, mostly M8 or higher class earthquakes.

Tsunami occurrence is due to the occurrence of rapid changes in the ocean floor by earthquakes. Upon the rating of pure premium rates for earthquake insurance, the distribution of upheaval and subsidence of ocean floors by fault movement is first calculated for earthquakes assumed to cause tsunami. Then, the

(Table 3.2.1) Example of earthquakes concurrent with notable fires in Japan (after the Meiji period)

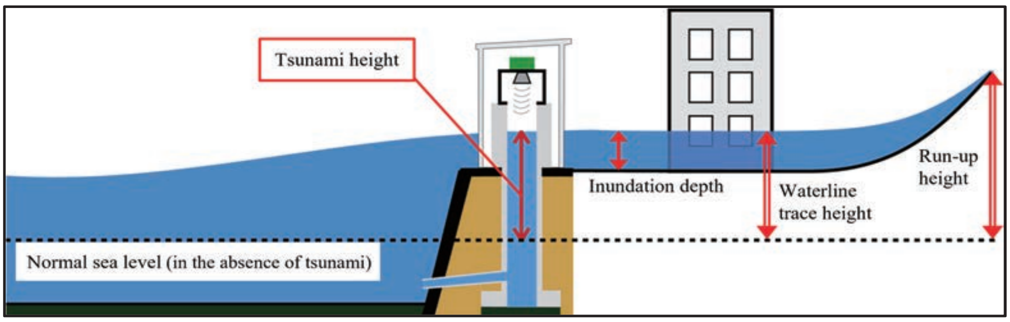
Name of earthquake	Occurrence date	Damage status
Great Kanto Earthquake M7.9	September 1, 1923 11:58 a.m.	More than 105,000 dead or missing, 109,000 residences completely destroyed, 102,000 half destroyed and 212,000 completely burned down (including those with completely or half destroyed) as a whole.
Kita Tajima Earthquake M6.8	May 23, 1925 11:09 a.m.	428 dead, 1,295 houses completely destroyed and 2,180 completely burned down.
Kita Tango Earthquake M7.3	March 7, 1927 6:27 p.m.	2,925 dead and 12,584 houses completely destroyed (5,106 residences and 7,478 others) as a whole. 3,647 completely burned down in Kyoto.
Nankai Earthquake M8.0	December 21, 1946 4:19 a.m.	1,330 dead, 11,591 houses completely destroyed, 23,487 half destroyed, 1,451 washed away and 2,598 completely burned down.
Fukui Earthquake M7.1	June 28, 1948 4:13 p.m.	3,769 dead, 36,184 houses completely destroyed, 11,816 half destroyed and 3,851 completely burned down.
Hyogoken-Nanbu Earthquake M7.3	January 17, 1995 5:46 a.m.	6,437 dead or missing, 104,906 residencies completely destroyed, 144,274 half destroyed and 7,132 completely or half burned down.

Created from *Materials for Comprehensive List of Destructive Earthquakes in Japan, 599-2012* (2013), and *Chronological Scientific Table* (2021) initial tsunami water level is obtained on the basis on the distribution being consistent with the fluctuations of the sea level. Based on this initial water level, Tsunami propagation, including run-up onto land, is calculated based on land elevation data combined with ocean water depths around the islands of Japan in order to determine the inundation depth at each location (**figure 3.2.4**). The rate of damage due to a tsunami (rate of loss due to washing away of property) is calculated according to the ratio of actual damage to inundation depths in the 2011 off the Pacific coast of Tohoku Earthquake.

(Table 3.2.2) Example of earthquakes concurrent with tsunami in Japan (after the Meiji period)

Name of earthquake and tsunami	Occurrence date	Damage area and details
Meiji Sanriku Earthquake M8.2	June 15, 1896	Tsunami struck from Hokkaido to Miyagi. 21,959 dead, 8,000 to 9,000 houses washed away or completely or half destroyed.
Showa Sanriku Earthquake M8.1	March 3, 1933	Tsunami struck the Pasific coast and caused significant damage along the Sanriku Coast. 3,064 dead or missing, 4,034 houses washed away, 1,817 destroyed and 4,018 flooded.
Tonankai Earthquake M7.9	December 7, 1944	Tsunami struck Shizuoka, Aichi, Mie, etc. 1,223 dead or missing, 17,599 residences completely destroyed, 36,520 half destroyed and 3,129 washed away.
Nankai Earthquake M8.0	December 21, 1946	Tsunami struck from Shizuoka to Kyushu. 1,330 dead, 11,591 houses completely destroyed, 23,487 half destroyed, 1,451 washed away and 2,598 burned down.
Chile Earthquake Tsunami Mw9.5	May 23, 1960	Tsunami caused damage especially along the south coast of Hokkaido, the Sanriku Coast and the Shima Peninsula. 142 dead or missing, more than 1500 houses completely destroyed and 2,000 half destroyed.
Nihonkai Chubu Earthquake M7.7	May 26, 1983	Akita was most severely damaged. Distant areas such as Shimane were also damaged. 104 dead, 934 houses completely destroyed, 2,115 half destroyed and 52 washed away in Japan.
Hokkaido Nansei-oki Earthquake M7.8	July 12, 1993	Tsunami caused severe damage. 230 dead or missing, 601 residences completely destroyed and 455 flooded.
Off the Pacific Coast of Tohoku Earthquake M9.0	March 11, 2011	Most damage caused by massive tsunami. 22,303 dead or missing, 122,005 residences completely destroyed and 11,275 flooded.

Created from *Materials for Comprehensive List of Destructive Earthquakes in Japan, 599-2012* (2013), *Chronological Scientific Table* (2021) and *White Paper on Fire Service* (2022)



(Fig. 3.2.4) Tsunami height and inundation depth

Touched up reprint from the website of the Japan Meteorological Agency

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Chapter 4 Laws and Regulations for Buildings and Disaster Victim Support

Section 1 Laws and Regulations for Buildings

1.1 Building Standards Act

Because of the fact that the quality of buildings had declined after WWII, the Building Standards Act (Law No. 201) was constituted in 1950 in order to attempt the improvement of quality and disaster prevention, and thus protect the health and property of the nation, and through this the reinforcement of structural safety standards of buildings was attempted.

In addition, through the experience of major urban fires, which had been frequently occurring, along with the threat of major fires in urban areas due to the bombing during WWII, the prevention of major urban fires, for which there had been no protection until then, was required. With such as a background, the promotion of fire preventive wooden structure and policies on fireproofing of roofs and outer walls were factored into the Building Standards Act. As a result, fireproof wooden buildings spread nationwide, with roofs covered with incombustible materials, and outer walls made of such difficult-to-burn materials as mortar.

Later on, from research on damage by great earthquakes in the past such as the Miyagi-ken-oki Earthquake of 1978, the insufficiency of the earthquake-resistance capacity of buildings up to then was pointed out. Thereupon, based on research related to seismic engineering, the Building Standards Act were revised in 1981, and major revisions to the earthquake-resistance standards were introduced.

The provision of the Building Standards Act before the 1981 revision is generally described as a “specification provision,” that specifies permitted building materials and structures. Any construction of buildings using other materials and structures used to be required the authorization of the minister for each of the materials and structures. However, it was becoming difficult to specify all the materials and structures due to the progress of technologies, and the revised Building Standards Act was enacted in three stages: in June 1998, May 1999 and June 2000, introducing the concept of “performance-based provision,” where required structural performance for buildings is specified. Note that this revision had no effect on the earthquake-resistance standards introduced in 1981.

1.2 Act on Promotion of Seismic Retrofitting of Buildings

The effectiveness of the earthquake-resistance standards that had been implemented in 1981 was proved in the results in the Hyogo-ken Nanbu Earthquake of 1995. However, the fact that old buildings constructed before the introduction of the earthquake-resistance standards in 1981 suffered great damage in this earthquake became an issue and the earthquake-resistance capacity of existing buildings was highlighted. As a result, in order to improve safety against earthquakes of existing buildings that have highly public character and are used by many and unspecified persons, the Act on Promotion of Seismic Retrofitting of Buildings (Law No. 123) was enacted in October 1995.

Then, the earthquake-proofing of buildings was also considered as one of the main components in the outlines of measures formulated for each major earthquake (the Tokai Earthquake (May 2003), the Tonankai/Nankai Earthquake (December 2003), the Tokyo Metropolis Direct Earthquake (September 2005), etc.) and the Policy for Emergency Measures for Earthquake-Proofing of Buildings formulated by the Central Disaster Management Council in September 2005. Meanwhile, this Act was revised in November 2005 (enacted in January 2006), with focus on Promotion of Planned Earthquake Resistance, Strengthening of Guidance, etc. for Buildings and Expansion of Support Measures.

Another revision was made in November 2013 to further promote the improvement of the safety of buildings and structures for earthquakes in preparation for large scale earthquakes. This revision provided that large buildings such as hospitals and schools that were used by large numbers of the general public were subject to earthquake-resistance diagnoses and disclosure of the test results. The revision also provided that houses, small buildings, etc. including condominiums were additionally required to be carried out earthquake-resistance diagnoses and retrofitting as necessary, on a best effort basis.

1.3 Housing Quality Assurance Act

In Japan, defective housing or destruction of buildings due to shoddy construction has been viewed as an issue, and the incident in which defective houses were sold by “Akita-ken Wooden Housing Corporation” in Chiba Prefecture, in particular, became a major social issue. In the context of these circumstances, in 1999, the Housing Quality Assurance Act (Law No. 81) was constituted to promote the quality guarantee of housing, to protect the interests of homebuyers, and to settle the out-of-court disputes regarding housing promptly and appropriately. The following measures were determined in this Act:

(1) establishment of residential performance display standards, and introduction of evaluation system based on the standards
(2) preparation of an out-of-court dispute settlement system solely for residences
(3) fulfillment of defect warranty systems with regard to contracting agreements and sale and purchase agreements for the acquisition of newly built residences

In October 2000, Housing Performance Indication System for newly built residences were implemented, and the level of earthquake resistance became subject to assessment as the earthquake-resistance class. Then in December 2002, the system was implemented additionally for existing houses.
For existing houses, an evaluation system based on the guidelines for earthquake-resistance evaluation formulated by the Ministry of Land, Infrastructure and Transport was also implemented in October 2001, limited to earthquake-resistance class.
Furthermore, seismically isolated buildings were added to the Japanese Housing Performance Labeling Standards, which stipulate the operation of the Housing Performance Indication System, in April 2007.

1.4 Long-Life Housing Promotion Act

The Basic Act for Housing (Law No. 61), which was enacted in June 2006, promotes a transition to a stock-oriented housing policy. Its goal is to reduce the cost burden of housing and stabilize and improve social welfare through the long-term use of housing, which can reduce waste generated from the demolition and removal of housing, reduce the environmental burden, and reduce expenses from rebuilding homes.
To that end, the Long-Life Housing Promotion Act (Law No. 87) was enacted in June 2009, creating a certification program for plans concerning the construction and maintenance of stable housing, or quality long-term housing that can be used in good condition for many years.
This certification system was initially targeted at newly built residences. In April 2016, long-life quality housing certification standards pertaining to additions and betterments were established to promote long-term use of housing through repair and maintenance, allowing existing housing to be certified as long-life quality housing.
The long-life quality housing is promoted by tax breaks, preferential mortgage interest rates, detailed housing records that enable appropriate repair and renovation planning, etc.

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Section 2 System for Disaster Victim Support

2.1 Disaster Victim Support System

In the Hyogo-ken Nanbu Earthquake, an enormous number of houses suffered damage, forcing 320,000 people to live as evacuees at more than 1,200 evacuation sites including schools. Afterwards, 48,300 emergency temporary houses were constructed for the victims. These temporary houses were used for five years after the earthquake.

On the other hand, many donations for the relief of the victims were collected from all over the nation, the amount of which exceeded 170 billion yen. Because of the number of victims, however, the amount of distribution per victim was small. It was not enough to compensate each victim, and this one of the reasons for delayed housing reconstruction. This prolonged the stay of the victims at temporary houses, resulting in solitary deaths among the elderly a few years after the earthquake.

To cope with these situations, local government, various organizations, and political parties discussed measures for supporting disaster victims in house rebuilding and in restoring their lives.

At present, Japan provides tax relief, credit measures and various financing programs. This section gives an overview of the Act on Support for Reconstructing Livelihoods of Disaster Victims (Law No. 66) established in May 1998.

2.2 Act on Support for Reconstructing Livelihoods of Disaster Victims

2.2.1 Enforcement (November 1998)

After the occurrence of the Hyogo-ken Nanbu Earthquake, through subsequent discussions by political parties and citizens' groups, including bill drafting, the Act on Support for Reconstructing Livelihoods of Disaster Victims was enacted as legislation by the Diet members in May 1998 and put into force in November of the same year.

This Act stipulates that disaster victims whose house has been totally destroyed or suffer similar damage are entitled to support grants of not more than one million yen as expenses for purchasing household goods necessary for reconstructing their lives. Although the Act limits the purpose for which such support grants were used, it was still epoch-making in providing financial support, not loans.

2.2.2 Revision of April 2004

Although the Act was epoch-making in providing financial support, not loans as stated above, it was criticized for the strict requirements for designation of the areas covered and for provision of support grants based on annual income. In addition, it had been also argued that residences were essential to victims' return to normal life. Therefore, Article 2 of the supplementary provisions of the Act stipulated how the rebuilding of houses should be supported. The Special Committee on Measures against Disasters at the House of Representatives also stated in a supplementary resolution that "the government should take necessary measures based on comprehensive consideration of the enforcement status of the Act within five years after its enactment."

In response to these developments, the Committee on House Rebuilding Support for Disaster Victims (a committee established under the National Land Agency, chaired by Prof. Osamu Hiroi, the University of Tokyo) and the Federation of Diet Members for Protecting People against Natural Disasters held various discussions. In July 2002, the Central Disaster Management Council approved the Recommendations for the Reinforcement of the Disaster Prevention System made by the Expert Examination Committee on Basic Disaster Prevention Plans.

Recommendations for the Reinforcement of the Disaster Prevention System (excerpts)

For support for reconstructing livelihoods of disaster victims, the national government and local government should, based on their own roles, further improve support measures so as to meet the needs of disaster victims, including the review of the Act on Support for Reconstructing Livelihoods of Disaster Victims.

The stable supply of housing is one of the most important issues in support for the restoration of self-sufficient lives of disaster victims.

However, if individual houses owned as private property collapse partially or totally, compensating the damage of such property from public funds involves problems: for example, whether it will ensure the equity between households that own their house and those that rent their house, and whether it will not undermine people's motivation for preserving their own property through self-help efforts. Basically, the solution is to subscribe an earthquake insurance policy or participate in a mutual aid program.

From the viewpoint of supporting the restoration of the lives of disaster victims, it is important for public administrative bodies to provide those in desperate need for support, whether they own a house or not, with comprehensive support for securing housing, including the reduction of financial burden for rebuilding, repairing, or renting houses. The national government should, in coordination with prefectural governments and related organizations, take support measures to secure the stable supply of housing, in addition to current support for procurement of household goods necessary for livelihood reconstructing.

The National Governors' Association adopted the Emergency Resolution on the Establishment of a System for Supporting Natural Disaster Victims in July 2003 and formed the Agreement on the Contribution of Operating Funds for the Establishment of the House Rebuilding Support System in October of the same year. As a result, the revised Act was approved in March 2004 and enacted in the following month.

This revision introduced the system for supporting the stable supply of housing. This system provides support grants of not more than two million yen for demolition expenses for rebuilding houses, house rents and other expenditure that are actually borne by disaster victims who lose their residence (including those who live in a rented house), in addition to support already offered by the old Act regarding living expenditures to be allocated for the purchase of necessary contents.

2.2.3 Revision of December 2007

In April 2004 when the Act was revised, the Special Committee on Measures against Disasters at the Houses of Representatives and Councilors stated in a supplementary resolution that "the government should comprehensively review the Act based on consideration of its enforcement status within four years after its enactment." Furthermore, major disasters took place after the revision, including the Niigata Chuetsu Earthquake in 2004 and the earthquake that originated offshore westward of Fukuoka Prefecture in 2005. Accordingly, the Committee on Support System for Reconstructing Livelihoods of Disaster Victims (a committee established under the Cabinet Office, chaired by Extraordinary Professor Shigeru Ito, Waseda University) was established in March 2007 for review of the Act. In addition, in accordance with the draft submitted by the governing and opposition parties to modify the requirements for support grants, the Act was revised in November 2007 and enacted in the next month.

The revised Act abolished the support grants requirements regarding annual income and the age of householders and adopted a flat-rate provision of support grants according to the degree of house damage and manner of house reconstruction. Furthermore, the use of support grants is not restricted. This revision was significant in providing a solution to the issues involved in covering loss of private property with public funds which had been long discussed (for example, in the Recommendations for the Reinforcement of the Disaster Prevention System as aforementioned).

The summary of the system after the revision is shown below:

□ Natural disasters covered by the Act

(1) Cities, towns, and villages suffering damage that falls under Item 1 or 2 of Paragraph 1 of Article 1 of the Order for Enforcement of the Disaster Relief Act

(2) Cities, towns, and villages where 10 or more households have had their house totally destroyed

(3) Prefectures where 100 or more households have had their house totally destroyed

(4) Cities, towns, and villages (limited to those with a population of less than 100,000) in a prefecture that has a city, town or village specified in item (1) or (2) above, where 5 or more households have had their house totally destroyed

(5) Cities, towns, and villages (limited to those with the population of less than 100,000) where 5 or more households have had their house totally destroyed, next to any of the municipalities and prefectures specified in items (1) through (3) above

□ Households entitled to support grants

(1) Households which have had their house totally destroyed

(2) Households which have had their house partially destroyed or have had the land on which their house is built damaged and have their house demolished for any unavoidable reason

(3) Households which are expected to remain unable to live in their house for a long time due to prolonged hazardous conditions caused by disaster

(4) Households which have had their house partially destroyed and find it difficult to live in it without large-scale repairs (households with a largely-destroyed house)

□ Support grants will be provided in sum total of items (1) and (2) below, up to 3,000,000 yen, or, for single-person households, an amount equivalent to three-fourths of items (1) and (2) below.

(1) Support grants based on the degree of house damage

Degree of house damage	Amount of support grant
Totally-destroyed house (i.e., households specified in items (1) through (3) above)	1,000,000 yen
Largely-destroyed house (i.e., households specified in item (4) above)	500,000 yen

(2) Support grants based on the manner of house reconstruction*

Manner of house reconstruction	Amount of support grant
Construction or purchase	2,000,000 yen
Repair	1,000,000 yen
House rent (excluding public housing)	500,000 yen

*For a household which constructs or purchases a house (or repairs an existing one) after temporarily renting, 2,000,000 yen (or 1,000,000 yen) will be provided in total.

2.2.4 Revision of August 2011

After the 2011 off the Pacific coast of Tohoku

Earthquake, it became clear that disaster victims could be vulnerable to seizure of monies received from the Support System of Disaster Victims, a fund that provides assistance for people whose livelihoods have been significantly impaired by natural disasters to rebuild their lives, because there were no provisions prohibiting seizure. To ensure that such payments go to help people reconstruct their livelihoods, the Act was amended to prohibit seizure, etc. of support grants from the Support System for Disaster Victims.

The Act was also amended to prohibit seizure, etc. of disaster condolence grants and disaster disability condolence grants under the Act on Provision of Disaster Condolence Grants.

2.2.5 Revision of December 2020

After the Heavy Rain Event of July 2020, in order to provide assistance for people whose livelihoods had been significantly impaired by natural disasters to rebuild their lives by ensuring stable housing, households whose houses had been partially destroyed and had difficulty living without considerable repairs (households with a mediumly-destroyed house) were added to those entitled to support grants of the Support System for Disaster Victims.

The Act was revised in November 2020 and enacted in the next month. The revised Act applies retroactively to the support grants for the disaster victims by natural disasters occurred after July 3rd, 2020.

The summary of the revision is shown below:

□ Households entitled to support grants

(1) Households which have had their house totally destroyed

(2) Households which have had their house partially destroyed or have had the land on which their house is built damaged and have their house demolished for any unavoidable reason

(3) Households which are expected to remain unable to live in their house for a long time due to prolonged hazardous conditions caused by disaster

(4) Households which have had their house partially destroyed and find it difficult to live in it without large-scale repairs (households with a largely-destroyed house)

(5) Households which have had their house partially destroyed and find it difficult to live in it without considerable repairs (households with a mediumly-destroyed house)

□ Support grants will be provided in sum total of items (1) and (2) below, up to 3,000,000 yen, or, for single-person households, an amount equivalent to three-fourths of items (1) and (2) below.

(1) Support grants based on the degree of house damage

Degree of house damage	Amount of support grant
Totally-destroyed house (i.e., households specified in items (1) through (3) above)	1,000,000 yen
Largely-destroyed house (i.e., households specified in item (4) above)	500,000 yen

(2) Support grants based on the manner of house reconstruction*

For totally- and largely-destroyed houses (i.e., households specified in items (1) through (4) above)

Manner of house reconstruction	Amount of support grant
Construction or purchase	2,000,000 yen
Repair	1,000,000 yen
House rent (excluding public housing)	500,000 yen

For mediumly-destroyed houses (i.e., households specified in item (5) above)

Manner of house reconstruction	Amount of support grant
Construction or purchase	1,000,000 yen
Repair	500,000 yen
House rent (excluding public housing)	250,000 yen

* For a household which constructs or purchases a house (or repairs an existing one) after temporarily renting, the highest amount among the above will be provided.

<References>

Cabinet Office. *Summary of the Programs Concerning Disaster Victim Support.* (2022).
Cabinet Office. *Summary of the Bill to Amend the Act on Support for Reconstructing Livelihoods of Disaster Victims.* (2020).

Attachment

(Concerning Act on Earthquake Insurance)

Attachment 1.1. THE ACT ON EARTHQUAKE INSURANCE

Attachment 1.2. ENFORCEMENT ORDER FOR THE ACT ON EARTHQUAKE INSURANCE

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(Concerning Insurance Council)

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REMARKS:

Please note that this English translation is prepared for the convenience of foreign nationals, and the authentic texts of the act, orders, regulations and reports contained herein are those written in the original Japanese language.

THE ACT ON EARTHQUAKE INSURANCE

Law No. 73, May 18, 1966
as amended by Law No. 45, June 2 of 2017

(Objective)

ARTICLE 1. The objective of this act is to promote the diffusion of earthquake insurance by having the Government reinsure the earthquake insurance liabilities of insurance companies, etc. thereby helping to stabilize the livelihoods of the victims of earthquake, etc.

(Definitions)

ARTICLE 2. Under this act, “Insurance Companies, etc.” shall refer to persons granted a non-life insurance business licence under Paragraph 5 of Article 3 of the Insurance Business Act (Law No. 105 of 1995) or a foreign non-life insurer’s business license under Paragraph 5 of Article 185 of the same act or employees of persons granted a licence under Paragraph 5 of Article 219 of the same act (referred to as “Insurance Companies” in Article 9-2), or such juridical persons carrying on the business of mutual aid related to fires in conformity with other acts and designated by the Minister of Finance.

2. Under this act, “Earthquake Insurance Contracts” shall refer to non-life insurance contracts (including mutual aid contracts related to fires, as described below) conforming to the requirements mentioned below.

(1) The object of the insurance is a building for residential use and/or household and personal goods only.

(2) Loss or damage (limited only to that those prescribed under the Cabinet Orders) due to fire, destruction, burial or being carried away in s flood, resulting directly or indirectly from an earthquake or volcanic eruption, or tsunami following the event (hereinafter referred to as “earthquake, etc.”) is covered by the amount prescribed under the Cabinet Orders.

(3) The contract is incidental to specific non-life insurance contracts.

(4) The insured amount is equivalent to an amount no less than 30% and no more than 50% of the insured amount in the principal non-life insurance contract (when that amount exceeds the amount prescribed under the Cabinet Orders, then the insured amount shall be the amount prescribed under the Cabinet Orders).

3. Under this act, “insurance”, “insurance claims” and “insurance liability” shall be changed to read respectively “mutual aid”, “mutual aid claims” and “mutual aid liability” in respect of mutual aid contracts.

(Reinsurance by Government)

ARTICLE 3. The Government shall be able to enter into a reinsurance agreement with the insurance companies, etc. as the third party reinsuring insurance the liabilities undertaken by insurance companies, etc. under earthquake insurance contracts.

2. The reinsurance agreement described the preceding paragraph provides for payment, when the total amount of insurance claims to be paid for single earthquake, etc. under all earthquake insurance contracts held by the other party exceeds the amount prescribed under the Cabinet Orders, in such proportions applicable to each layer of that excess amount prescribed under The Cabinet Orders.

3. The total amount of reinsurance claims to be paid by the Government for any one earthquake, etc. shall be required to be within the limit not to exceed the amount set by decision of the Diet for each year.

4. Two or more earthquakes, etc. occurring within 72 consecutive hours shall be deemed to be one earthquake, etc. This, however, shall not apply when the situation where the affected areas do not overlap at any point.

(Reduction in the Insurance Claims to Be Paid)

ARTICLE 4. When the total amount of the insurance claims to be paid for any one earthquake, etc. under all earthquake insurance contracts covered by the reinsurance agreement of the Government under the stipulations of Paragraph 1 of the preceding article exceeds the total of the amount to be borne by all of the insurance companies, etc. the insurance companies shall be able to reduce the amount of insurance claims to be paid by them, under the prescriptions of the Cabinet Orders. This shall be in accordance with the reinsurance agreement and the amount contributed by the Government under the stipulations of Paragraph 3 of the same article.

(Suspension of Signing New Earthquake Insurance Contracts When an Earthquake Warning Statement Has Been Issued)

ARTICLE 4-2. When a warning statement about an impending earthquake disaster is issued under the stipulations of Paragraph 1 of Article 9 of the Large Scale Earthquake Countermeasures Act (Law No.73 of 1978, hereafter called “warning statement” in this article), the insurance companies, etc. shall not enter into any new earthquake insurance contracts for object located in the area (designated as an Area under Intensified Measures against Earthquake Disaster under the stipulations of Paragraph 1 of Article 3 of the same act covered by the warning statement) that are covered by the reinsurance agreement of the Government (except those prescribed by the Cabinet Orders) from the time the warning statement is issued until the day warning statement is withdrawn under the stipulations of Paragraph 3 of Article 9 of the same act. (Should the large-scale earthquake referred to in the warning statement occur, the suspension shall end on the day designated by the Minister of Finance through a public notice after consultation with the Earthquake Insurance Council).

2. Matters relating to the suspension of signing new earthquake insurance contracts when a warning statement have been issued (including the occurrence of the large-scale earthquake referred to in the warning statement), in addition to those matters stipulated in the preceding paragraph, shall be prescribed under the Cabinet Orders.

(Insurance Premium Rates and Reinsurance Premium Rates)

ARTICLE 5. The premium rates for earthquake insurance contracts covered by the Government reinsurance shall be required to be as low as possible while maintaining equilibrium between income and expenses.

2. The reinsurance premium rates for the Government reinsurance operation shall be required to be reasonable in order to ensure adequate reinsurance premium income to compensate for reinsurance claims paid over the long term.

(Application for Inquisition)

ARTICLE 6. Insurance companies, etc. shall be able to apply for inquisition to the Minister of Finance for inquisition of complaints regarding the matters concerning the Government reinsurance.

2. When the application for inquisition is made under the stipulations of the preceding paragraph, the Minister of Finance shall make inquires at the Earthquake Insurance Council and come to a decision.

3. An application for inquisition under Paragraph 1 shall be deemed to be a juridical demand in respect of interruption of prescription.

(Earthquake Insurance Council)

ARTICLE 7. The Earthquake Insurance Council may be established under the Ministry of Finance in accordance with the Cabinet Orders.

2. In addition to dealing with the matters falling under its jurisdiction as stipulated under Article 4-2 and Paragraph 2 of the preceding article, the Earthquake Insurance Council shall, in a situation where reinsurance claims are to be paid, investigate and deliberate on the matters regarding the amount of the reinsurance claims and reduction in the amount of reinsurance claims to be paid under the stipulations of Article 4, in response to an inquiry by the Minister of Finance.

3. In addition to the matters stipulated in the two preceding paragraphs, matters for the organization and management of the Earthquake Insurance Council shall be prescribed under the Cabinet Orders.

(Measures to Be Taken by the State)

ARTICLE 8. Upon recognizing that there is especially necessary for the purpose of payment of insurance claims under the earthquake insurance contracts, the Government shall endeavor to assist insurance companies, etc. in arranging for or accommodating them with funds.

(Report and Inspection)

ARTICLE 9. When recognizing necessity for securing sound operation of the Government reinsurance undertaking stipulated in this act, the Minister of Finance shall be able to require the insurance companies, etc. carrying on earthquake insurance business to submit the reports on that business or to make his staff enter the offices of the insurance companies, etc. to inspect the books, documents and other items.

2. The staff of the Minister of Finance entering and inspecting under the stipulations of the preceding paragraph shall be required to carry a certificate identifying their status and to exhibit the same to the persons concerned.

3. The authority for entry and inspection under the stipulations of Paragraph 1 shall not be construed as approved for criminal investigation.

(Consultations)

Article 9-2. When attempting to perform the dispositions indicated in each items of Paragraph 1 of Article 311-2 of the Insurance Business Act, the Prime Minister shall consult with the Minister of Finance in advance, regarding reinsuring insurance liabilities undertaken by insurance companies, etc. under earthquake insurance contracts.

(Notices)

Article 9-3. The Prime Minister shall notify the Minister of Finance in advance of the facts and details when the case falls under Clause (1), and without delay when the case falls under any one of Clauses (2)-(4).

(1) When issuing orders for changes, and besides with regard to earthquake insurance contracts relating to the reinsurance by the Government, due to the provisions of Articles 131, 203 or 229 of the Insurance Business Act.

(2) When a license application is submitted as set forth in Paragraph 1 of Article 4, Paragraph 1 of Article 187, or Paragraph 1 of Article 220, of the Insurance Business Act, and there is a description with regard to the earthquake insurance contracts relating to the reinsurance by the Government in the Business Plan attached thereto.

(3) When an application submitted for authorization of the changes set forth under Paragraph 1 (including cases where it is applied mutatis mutandis by Article 207 of said Act) of Article 123 or Paragraph 1 of Article 255, of the Insurance Business Act, with regard to the earthquake insurance contracts relating to the reinsurance by the Government.

(4) When the filing due to the provisions in Paragraph 1 of Article 9-3 of the Act on the Non-Life Insurance Rating Organizations (Law No. 193 of 1948) is submitted and such is in regard to the earthquake insurance contracts relating to the reinsurance by the Government.

2. After receiving the notification under the preceding Paragraph, when recognizing the necessity for securing sound operation of the Government reinsurance undertaking stipulated in this act, the Minister of Finance shall be able to state his opinion to the Prime Minister.

3. The Prime Minister shall respect the opinion when the Minister of Finance states his opinion as stipulated under the preceding Paragraph.

(Delegation of Authority to the Commissioner of Financial Services Agency)

Article 9-4. The Prime Minister shall delegate the authority under this act (except those prescribed by the Cabinet Orders) to the Commissioner of the Financial Services Agency.

(Enforcement Stipulations)
ARTICLE 10. The procedures for enforcing this act and other matters necessary for its execution shall be prescribed in Finance Ministry Ordinances.

(Penal Stipulations)
ARTICLE 11. Persons failing to report or falsifying the report stipulated in Paragraph 1 of Article 9 or having refused, hindered or evaded the inspection stipulated in the same paragraph shall be subject to a penal fine of not more than ¥30,000.

2. When a representative or proxy, employee or other worker of insurance companies, etc. has committed the illegal acts, stipulated in the preceding paragraph with regard to the business of the insurance company, etc., in addition to penalizing the person who committed the illegal act, the insurance companies, etc. shall be subject to the penalty stipulated in the preceding paragraph.

ENFORCEMENT ORDER
FOR THE ACT ON EARTHQUAKE INSURANCE

Cabinet Order No.164, May 31, 1966
as last amended by
Cabinet Order No. 91, March 31, 2021

(Amount and Loss or Damage to Be Covered)

ARTICLE 1. Listed below are the categories of loss or damage prescribed in the Cabinet Orders stipulated in Item (2) of Paragraph 2 of Article 2 of the Act on Earthquake Insurance (hereinafter referred to as "the act"). and the amount prescribed in the Cabinet Orders stipulated under Item (2) of the same paragraph shall be the amount prescribed in the same item, in accordance with the classification of loss or damage mentioned in the same item.

(1) Total loss of a building for residential use (hereinafter referred to as "residential building") (when the amount of loss of or damage to the main structural part of the residential building is 50% or more of the current value of the residential building or when 70% or more of the residential building of the floor space has been lost by fire or carried away in flood): the total insured amount

(2) Large half loss of a residential building (when the amount of loss of or damage to the main structural part of the residential building is equivalent to 40% or more but less than 50% of the current value of the residential building or when 50% or more but less than 70% of the total floor space has been lost by fire or carried away in flood): 60% of the insured amount

(3) Small half loss of a residential building (when the amount of loss of or damage to the main structural part of the residential building is equivalent to 20% or more but less than 40% of the current value of the residential building or when 20% or more but less than 50% of the total floor space has been lost by fire or carried away in flood): 30% of the insured amount

(4) Partial loss of a residential building (when the amount of loss of or damage to the main structural part of the residential building is equivalent to 3% or more but less than 20% of the current value of the residential building): 5% of the insured amount

(5) Total loss of the household and personal goods (when the amount of loss or damage to the household and personal goods is 80% or more of the current value of the household and personal goods): the total insured amount

(6) Large half loss of the household and personal goods (when the amount of loss or damage to the household and personal goods is 60% or more but less than 80% of the current value of the household and personal goods): 60% of the insured amount

(7) Small half loss of the household and personal goods (when the amount of loss or damage to the household and personal goods is 30% or more but less than 60% of the current value of the household and personal goods): 30% of the insured amount

(8) Partial loss of the household and personal goods (when the amount of loss or damage

to the household and personal goods is 10% or more but less than 30% of the current value of the household and personal goods): 5% of the insured amount

2. "The current value" within each item of the preceding paragraph is the value of the insured object at the time immediately before the loss or damage occurred and at the place it is located.

3. The amount of loss of or damage to the main structural part of the residential building stipulated in Item (1) to Item (4) of Paragraph 1 includes the minimum expenses directly necessary for restoring the ground, etc. for the purpose of the restoring the residential building to its condition before it was damaged by the earthquake, etc. stipulated in Item (2) of Paragraph 2 of Article 2 of the act (hereinafter referred to as "earthquake, etc.").

4. When a residential building has become uninhabitable because of the imminent threat of landslide or other hazards resulting directly or indirectly from an earthquake, etc., the residential building shall be deemed to a total loss as prescribed in Item (1) of Paragraph 1.

5. When a residential building has suffered a damage from being submerged above the floorboards or the similar damage provided in Ministry of Finance Ordinances due to water disaster related to flood, etc. resulting directly or indirectly from an earthquake, etc. (excluding the situation where the residential building has suffered a total loss, large half loss, small half loss or partial loss as prescribed in Item (1) to Item (4) of Paragraph 1), the residential building shall be deemed to have suffered a partial loss as prescribed in Item (4) of Paragraph 1.

(Limits of the Amount Insured)

ARTICLE 2. The amount to be prescribed in the Cabinet Orders stipulated in Item (4) of Paragraph 2 of Article 2 of the act shall be ¥50,000,000 for a residential building and ¥10,000,000 for the household and personal goods. However, when an earthquake insurance contract is already in force for the residential building or household and personal goods, the insured amount shall be calculated by subtracting, respectively, from these amounts, the insured amount from the earthquake insurance contract already in force.

(Reinsurance Agreement)

ARTICLE 3. The amount prescribed in the Cabinet Orders stipulated in Paragraph 2 of Article 3 of the act shall be ¥125.9 billion when the other party of the agreement stipulated in the same paragraph is a non-life insurance company stipulated in Paragraph 4 of Article 2 of the Insurance Business Act (Law No. 105 of 1995), that accepts the reinsurance of insurance liabilities stipulated in Paragraph 1 of Article 3 of the act. Out of the total amount of insurance claims stipulated under the same paragraph, the proportions for each layer prescribed in the Cabinet Orders stipulated under Paragraph 2 of the same article shall be, 50/100 for the part exceeding ¥125.9 billion but not more than ¥266.1 billion and 117050/117339 for the part exceeding ¥266.1 billion (The proportions are established in the Ministry of Finance Ordinances for cases where the amount of the excess part exceeds the amount provided in the Ministry of Finance Ordinances giving consideration to the limit of the liability to be borne by the Government stipulated in Paragraph 3 of the same article).

(Reducing the Insurance Claims)

ARTICLE 4. Reducing the insurance claims stipulated in Article 4 of the act shall be done in the case of a single earthquake, etc., by multiplying the insured amount in each contract by the proportion of the sum of the amount to be borne by all insurance companies, etc. and the amount of the limit of the Government contribution stipulated in the same article to the total amount of insurance claims paid stipulated under the same article as the insurance claim to be paid.

(Exception for Entering into an Earthquake Insurance Contract When a Warning Statement Is Issued, etc.)

ARTICLE 5. The earthquake insurance contracts prescribed in the Cabinet Orders stipulated under Paragraph 1 of Article 4-2 of the act shall be those to be contracted continuously upon expiry of the policy periods of earthquake insurance contracts having been entered into prior to the warning statement stipulated under the same paragraph which conform to the requirements listed below.

(1) The insured and the object of insurance are the same as those of previous contract.

(2) The amount insured does not exceed that of the previous contract.

2. In a situation where the Minister of Finance revokes or alters the date it has designated through the public notice under the stipulations of Paragraph 1 of Article 4-2 of the act, it shall make a public notice to that effect after consulting with the Earthquake Insurance Council.

3. The public notice by the Minister of Finance under the stipulations of Paragraph 1 of Article 4-2 of the act and the prescription of the preceding paragraph shall be made in the official gazette.

(Establishing an Earthquake Insurance Council, etc.)

ARTICLE 6. An Earthquake Insurance Council (hereinafter referred to as “the Council”) shall be established to handle any of the matters described below.

(1) When the large-scale earthquake related to the warning statement stipulated in Paragraph 1 of Article 4-2 of the act occurs; the Council will be established to deliberate on the date to be designated by the Minister of Finance as the last day of the period during which entering into new earthquake insurance contracts covered by the Government reinsurance is to be prohibited.

(2) When insurance companies, etc. have applied to the Minister of Finance for inquisition under the stipulations of Paragraph 1 of Article 6 of the act: the Council will be established to examine for application.

2. In addition to the matters mentioned in each item of the preceding paragraph, the Minister of Finance shall establish and consult with the Council on the matters relating to the amount of the reinsurance claims and a reduction in the amount of insurance claims to be paid under the stipulations of Article 4 of the act.

3. While the Council is established, if there arises a need to dispose of matters stipulated under Paragraph 2 of Article 7 of the act other than those that existed at the time of the

Council' establishment, the Council shall also dispose of these other matters.

4. The Council shall be abolished when it has disposed of the matters given to it under the prescriptions of the preceding three paragraphs.

5. When the Council is to be established under the prescriptions of Paragraph 1 and Paragraph 2 or is to be abolished under the prescriptions of the preceding paragraph, the Minister of Finance shall make a public notice to that effect in the official gazette.

ARTICLE 7. The Council shall be consisted of ten or fewer members.

2. The members shall be appointed by the Minister of Finance from among persons of learning and experience or from among experts in field of non-life insurance.

3. The members shall be relieved of their positions when the Council is abolished under the prescriptions of Paragraph 4 of the preceding article.

4. The members shall serve on a part-time basis.

ARTICLE 8. The council shall have a chairperson.

2. The chairperson shall be elected by the council from among its members and shall preside over the affairs of the Council.

3. When unavoidable circumstances prevent the chairperson from performing his or her duties, a member previously designated by the chairperson shall act as a proxy.

4. The Council shall neither commence proceedings nor adopt any resolutions without the presence of the chairperson or the member acting as chairperson's proxy under the prescriptions of the preceding paragraph and the majority of the members.

5. The proceedings of the Council shall be decided by the majority of the members present, and in case of a tie, the decision by chairperson shall prevail.

6. The general administrative matters of the Council shall be disposed of by the Financial System Stabilization Division of the Minister's Secretariat of the Ministry of Finance.

7. The procedure of the proceedings and other necessary matters for managing the Council, in addition to those prescribed under each of the preceding paragraphs, shall be determined by the chairperson after consulting with the Council.

(The Powers Not Entrusted to the Commissioner of the Financial Services Agency)

ARTICLE 9. The powers stipulated under Article 9-4 of the act shall be the powers pursuant to the stipulations of Article 9-2 of the act relating to the dispositions mentioned in Item (3) of Paragraph 1of Article 311-2 of the Insurance Business Act.

REGULATION FOR ENFORCEMENT OF THE ACT ON EARTHQUAKE INSURANCE

Ministry of Finance Ordinance No. 35, June 1, 1966
as last amended by
Ministry of Finance Ordinance No. 14, March 31, 2019

The Regulation for Enforcement of the Act on Earthquake Insurance shall be enacted as described below to conform with the stipulations of Article 10 of the Act on Earthquake Insurance (Law No. 73 of 1966) and Paragraph 3 of Article 88 of the Insurance Business Act (Law No. 41 of 1939).

(Scope, etc. of the Insurable Property)

ARTICLE 1. A building for residential use (hereinafter referred to as a "residential building") as stipulated in Item (1) of Paragraph 2 of Article 2 of the Act on Earthquake Insurance (hereinafter referred to as "the act") shall be defined as a building used for residential purpose in its entirety or in part, while the household and personal goods stipulated in the same item shall refer to household furniture, appliances, clothing and other movable goods necessary for ordinarily living, the household and personal goods do not include precious stones, semiprecious stones, precious metals, pearls and products made from these materials, nor do they include tortoiseshell works, coral works, amber works, ivory works, cloisonne works, as well as paintings, writings, curios and artistic handicrafts, with a values exceeding ¥300,000 per item or each set.

2. The specific non-life insurance contracts stipulated in Item (3) of Paragraph 2 of Article 2 of the act include the falling type of insurance.

(1) Fire insurance
(2) Fire mutual insurance
(3) Building endowment insurance
(4) Long term refund in expire insurance

(Residential Building Submerged, etc. Above the Floorboards)

ARTICLE 1-2. The damage to residential buildings that is covered by the Ministry of Finance Ordinances stipulated in Paragraph 5 of Article 1 of the Enforcement Order for the Act on Earthquake Insurance (Cabinet Order No. 164 of 1966, hereinafter referred to as "the Order") shall be defined as damage due to submersion above the floorboards (including floors made of tatami or of wood.) of that part of the building used as a residence or damage due to flooding in excess of 45 cm above the ground directly under the residential building.

(Reinsurance Agreement)

ARTICLE 1-3. The Ministry of Finance Ordinances stipulated in Article 3 of the Order shall be ¥11.7339 trillion, and the proportion to be provided in Ministry of Finance

Ordinances stipulated in the same article shall be the proportion of the amount calculated by subtracting ¥28.9 billion from the part exceeding ¥266.1 billion out of the total amount of insurance claims stipulated under Paragraph 2 of Article 3 of the act to the amount of the excess.

(Time of Occurrence of Tsunami)
ARTICLE 2. With respect of tsunami, the time of the occurrence of earthquake, etc. stipulated in Paragraph 4 of Article 3 of the act shall, be the time at when it strikes the Japanese land.

(Reduction, etc. in the Insurance Claims to Be Paid)
ARTICLE 3. When the circumstances stipulated under Article 4 of the act have occurred, the Minister of Finance shall make a public notice to that effect as well as announce the proportion of the amount of each individual contract that is paid.

2. When the circumstances provided in the preceding paragraph occur, the insurance companies, etc. shall be able to make payments based on rough estimates for insurance claims covered by the Government reinsurance.

(Application for Inquisition)
ARTICLE 4. The application for inquisition stipulated in Paragraph 1 of Article 6 of the act must include following information.

(1) The name and address of the insurance company, etc.
(2) A description of the matters relevant to reinsurance for which the application for inquisition is made
(3) The purport of the application for inquisition
(4) The reason for the application for inquisition
(5) The evidence
(6) The date of the application for inquisition

2. Insurance companies, etc. shall be required to attach documentary evidences, if any, to the application form prescribed under the preceding paragraph.

(Withdrawal of Application for Inquisition)
ARTICLE 5. The insurance companies, etc. shall be required, when intending to withdraw the application for inquisition, to make it in writing.

(Certificate of Identification for Inspection)
ARTICLE 6. The form of the certificate stipulated under Paragraph 2 of Article 9 of the act shall be shown separately.

(Method of Calculating Underwriting Reserves of Earthquake Insurance)
ARTICLE 7. As regards the underwriting reserves for earthquake insurance, insurance companies, etc. shall be required, in each business year, to set aside cumulatively, as

contingency reserve, the total amount of the amount (hereinafter referred to as "net pure premiums") subtracted the amount mentioned in Item (2) from the amount mentioned in Item (1) and the amount (hereinafter referred to as "the investment income") of investment income accruing from the assets relating to the earthquake insurance.

(1) The total amount of premiums income and reinsurance return premiums in each business year

(2) The total amount of reinsurance premiums and cancellation return premiums paid during the business year, and the operating expenses in the business year from which the loss adjustment cost and the expenses disbursed for advertising or publicity for promoting the diffusion of earthquake insurance (hereinafter referred to as "expenses for advertising/publicity") and reinsurance commission received are subtracted

2. In a situation where there are earthquake insurance contracts with unexpired insurance periods exceeding one year at the end of each business year, the insurance companies, etc. shall set aside, as an unearned premium reserve, an amount corresponding to the unexpired periods from the total amount of the net pure premiums and the expected interest (the investment income expected to accrue during the insurance periods in computing the premiums of insurance contracts with the insurance period exceeding one year) that has accrued by the end of the business year. The amount of the risk reserve to be set aside under the stipulations of the preceding paragraph shall be the total amount of the net pure premiums and the investment income in the business year with the addition of unearned premium reserve at the end of the last preceding business year, minus the amount to be set aside as the unearned premium reserve at the end of the business year.

3. When there is an agreement to refund all or part of a premium at the maturity of the insurance period, a reserve for the refund shall be set aside. The refund reserve is in addition to the risk reserve provided in Paragraph 1 and the unearned premium reserve provided in the preceding paragraph. In computation of the risk reserve provided in Paragraph 1, the amount to be allocated for the refunds shall be subtracted from the premium income provided in Item (1) of the same paragraph and the already paid maturity refunds shall be added to the total amount prescribed in Item (2) of the same paragraph.

4. When the insurance companies have paid the insurance claims and the loss adjustment cost, set aside an outstanding payment reserve, disbursed expenses for advertising/publicity or investment losses (the losses of working asset of earthquake insurance, hereinafter referred to as "investment losses") during each business year, they shall withdraw the total amount of the net insurance claims paid (the insurance claims paid during the business year from which reinsurance claims recovered during the business year are deducted, same below), the reserve for outstanding claims (excluding the net insurance claims paid and the reserve for outstanding claims both corresponding to the reserve for outstanding claims set aside during the preceding business year, same below), the loss adjustment cost and the expenses for advertising/publicity and investment losses from the contingency reserve brought forward from the preceding business year. The same shall apply to the amount of interest paid on any debt for payment of insurance claims and loss adjustment cost.

5. Concerning the preceding paragraph, if the total amount of the net insurance claims paid,

the loss adjustment cost, the reserve for outstanding claims, the expenses for advertising/publicity, the investment losses and the interest paid exceeds the amount of the contingency reserve, the excess amount shall be subtracted from the amount of the contingency reserve to be set aside during the business year under the stipulations of Paragraph 1. In such a situation, if the amount of the contingency reserve to be set aside is less than the excess, the deficit shall be subtracted from the amount of contingency reserve to be set aside in the following and subsequent business years under the stipulations of the same paragraph.

6. If, part of the amount of the net insurance claims paid and the amount of the reserve for outstanding claims set aside in each business year corresponding to the reserve for outstanding claims set aside in the preceding business year falls short of the amount of the reserve for outstanding claims set aside in the preceding business year, the deficit shall be added to the contingency reserve to be set aside under the stipulations of Paragraph 1.

7. The amount of that part having become unnecessary to be refunded out of the reserve for refunds provided under Paragraph 3 shall be transferred to the contingency reserve.

Report Concerning the Earthquake Insurance System

April 23, 1965
To: Kakuei Tanaka, Minister of Finance

Taizo Ishizaka,
Chairman of the Insurance Council

Concerning the detailed measures for the establishment of earthquake insurance systems about which the Council was consulted on July 13, 1964, the opinions of the Council are summarized as in the Exhibit, and We are hereby reporting such.

In Japan, which has experienced great societal and economic damage due to earthquakes, the establishment of earthquake insurance is one of the most important concerns for insurance systems, and investigation and discussion about such have been performed since the commencement of such systems. However, since the frequency and damage levels, etc., of earthquakes are difficult to grasp statistically, and moreover since there is a possibility that the scale of the losses due to such can sometimes be extraordinarily huge, there are countless difficulties in adopting earthquake insurance into the insurance systems, and notwithstanding the general requests, except for the special case of during wartime, no universal earthquake insurance system capable of contributing to the stabilization of the livelihood of the general people has been realized up to this day.

However, when this is viewed over a long period, the total amount of damage by repeated earthquakes is considered to be not necessarily that much greater than damage by fire, it would not necessarily be impossible to incorporate such into the insurance systems if the state, which can consider the income and outgo on the basis of long periods exceeding the normal company base is involved, and moreover measures to avoid so-called adverse selection are performed, along with measures to avoid excess accumulation of losses from earthquakes, and the like.

This Council has discussed various problems concerning the establishment of earthquake insurance systems from the above point of view and reached the following approximate conclusions.

There are still numerous problems to be solved in this insurance that have been of concern for many years; however, concerning this insurance, which by its essence embraces difficult problems, it is considered that the urgent task is first to attempt the commencement of actually feasible systems, rather than wishing for ideal ones from the beginning. In the future, we would wish to have Government and non-life insurance companies implement the specifics more fully as well with even more enthusiasm, meeting the needs of society.

Summary of Earthquake Insurance System

(1) Insurable Property (Scope of Object)

The objective of this system is considered to be to contribute toward the stabilization of the livelihood of general people at times of earthquake disaster, so it is appropriate that the property insurable be residences (including simultaneous use residences with stores, etc.) and household goods.

(2) Covered Risks

a. Concerning the cause of losses, not only earthquakes, but also tsunami and volcanic eruptions, arising due to causes similar to earthquakes should be included.

b. Among the events befalling the objects of the insurance due to said reasons, as for events other than fire, loss adjustment is considered to be difficult; however, taking into consideration the requests of the general public, not only fire risks, but also the risks of destruction, burying and washing-away should be covered.

c. As for the losses to be covered, from the problem of actual business, that is, the difficulty of loss adjustment at the time of earthquakes, and from the point of view of freedom from small losses, partial losses should not be covered and coverage should be for total losses only; however, cases that are not total losses physically but are economically equivalent to total losses should be total losses.

(3) Method of Underwriting

Considering the characteristics of earthquake disasters, the public position should be automatic attachment. In such cases, following the recent general insurance trend of generalization, such should be automatically attached to householders' comprehensive insurance or storekeepers' comprehensive insurance handled by non-life insurance companies; however, on the other hand, it would be reasonable if a way were opened to be able to take out fire insurance with earthquake insurance attached as an option.

(4) Premium Rates

a. As for premium rates, considering the character of this insurance, it would be desirable for such to be as low as possible, by such means as squeezing the expense rates to the utmost.

b. From the principle of determination of premium rates, it is natural that there should be quite a difference between rates in accordance with the area, ground or structure; however, due to the character of this insurance, it would be appropriate to make that difference not so large.

(5) Complementary Measures by the Government

a. The Government would underwrite reinsurance by the excess of loss reinsurance method in order to cover huge earthquake losses that cannot be covered by the funds of private insurance companies.

b. As for the burden of private insurance companies, endangering the ability of companies to meet their liabilities concerning other existing insurance should be avoided; however, in the light of society's request for this insurance and the public nature of the non-life insurance business, as much as possible of the burden should be taken up.

c. On the other hand, when there is a special necessity arising in private insurance companies for the payment of insurance claims, such as the difficulty of converting owned assets into cash, the Government should pay special consideration concerning the procuration, accommodation, etc., of the required funds.

(6) Payment of Claims

a. The amount of insurance claims to be paid has little social relevance unless such contributes to a reasonable extent to the restitution of things suffering losses due to earthquake; but on the other hand, the burden of insurance premiums on policyholders subject to automatic attachment and the burden of the insurance claims on the state and insurance companies must be considered. Additionally, considering the sociality of this system, and for avoiding the accumulation of losses due to a single disaster, an insurability limit for each property should be established. Taking into consideration these points, for the time being, at the commencement of these systems, policy should be that the amount of claims to be paid should be at least 30% of the contracted amount of the attached insurance, and moreover, the payment limit for each contracted property should be 900,000 yen for residences and 600,000 yen for households, totaling about 1.5 million yen.

b. In case of the occurrence of extraordinarily huge earthquake disasters, the total amount of insurance claims to be paid should be limited as determined in advance, and in case the total amount of losses exceeds the limit, the insurance claims to be paid under the respective contracts should be reduced in accordance with the proportion exceeded.

The limit of the amount of total insurance claims to be paid should be determined by comprehensively taking into consideration the diffusion status of the insurance, the burden of insurance premiums on policyholders, the burden capacity of insurance companies, the financial status of the nation, and so forth; however, considering the purpose of the establishment of the earthquake insurance system, it would be desirable that such be an amount of an extent that reduction of claims to be paid would not occur, even in the case of the great earthquake disasters that could be foreseen for Japan.

(7) Other

Concerning whether or not the associations performing the mutual aid business similar to fire insurance under special laws should cover earthquake risk in the future, or what kind of measures would be required in such cases, etc., as the characters and coverage capacity, etc. of the associations differ from each other, and such is an issue relating to the forms of regulations relevant to associations, it is not appropriate to discuss said categorically, so taking into consideration the enforcement status of earthquake insurance according to this plan, and as necessary, while paying attention to a balance with the above stated contents, such should be investigated respectively and deliberately in the Government.

Contents of Primary Discussions Concerning Issues for the Investigation of Earthquake Insurance System

(1) The Possibility of Earthquake Insurance

The reasons why universal earthquake insurance has not yet been capable of realization until today, except for the example of the one under the Wartime Specific Non-Life Insurance Law, which ended after an extremely short life, even though Japan has been said to be an earthquake country, are, first of all, that it's difficult to use the law of large numbers on such things as earthquakes in the frequency, in the scale of losses. Secondly, there is a possibility that the losses caused can sometimes be extraordinarily huge. Incidentally, among the earthquakes that occurred in the 97 years from the first year of the Meiji era (1868) to 1964, there are 72 occasions for which damage records are existent, and by estimating the amount of losses that the insured ordinary properties (residence, store, office, etc.) would suffer at present, supposing such should recur today, the total loss amounts for said period would be about 2.4 trillion yen, and out of this, it is assumed that a loss of about 2 trillion yen would arise from a Great Kanto Earthquake recurrence alone. In other words, compared to fire, which is almost leveling off in frequency and amount of loss, it is characteristic of earthquakes that on the one hand there are years without any damage, and on the other hand once earthquakes do occur, extraordinarily huge damages are caused suddenly, so the coverage capacity of private non-life insurance companies alone could never ever deal with such.

Therefore, earthquake insurance has been a concern since the introduction of modern insurance systems in Japan, and solutions for said problem have been attempted several times up to the present. Additionally, using the recent Niigata Earthquake as a positive stimulus, the necessity of earthquake insurance has become a social concern again, and the realization of such is strongly desired in the Diet as well, where there was a resolution that the establishment of said should be fundamentally investigated and that further preparations and enhancement of the non-life insurance systems in Japan should be attempted.

This Council was consulted for deliberations on concrete measures concerning earthquake insurance, and we could not help investigating the question of whether it would be possible to cover earthquake disasters with insurance systems. Needless to say, this poses extremely difficult issues. However, when viewing such over a long period, since the total amount of damage by earthquakes is not necessarily considered to be so much larger than the amount of damage from fires, even private insurance could sufficiently deal with such if huge earthquake disasters were excluded. Therefore, it would not necessarily be impossible to incorporate such into the insurance systems if the state, which can consider the income and outgo on the basis of long periods exceeding the normal company base is involved, and moreover measures to avoid so-called adverse selection are performed, along with measures to avoid excess accumulation of losses from earthquakes, and the like.

Thereupon we performed investigation of issues concerning the design of the insurance as follows, on the basis of the recognition that the objective of the establishment of this insurance system would be to contribute to the stabilization of the livelihood of the general people at times of earthquake disasters.

(2) The Insurable Property

Concerning the insurable property, that is, the objects to be insured, though there is an opinion that these should be areas that contribute directly to the recovery of production facilities that suffered damage (industrial risks) but, at present, in the field of fire insurance for business as well, as for industrial risks such as factories or storehouses, it is determined that the risk due to earthquakes is covered by special clause for earthquake risk coverage, and from the point of view that the objective of the establishment of this system is to contribute to the stabilization of livelihood of the general people at times of earthquake disasters, as for the objects to be insured, residential buildings and so-called simultaneous use residences, which are used simultaneously with stores, etc., should be considered first.

As for movables, there was an opinion that such should be excluded since loss adjustment is difficult; however, from the present situation in which there are many who do not possess houses, and also the possibility that disasters could become even more massive in human terms since a tightfisted mentality concerning trying to save households would operate at such times, we reconciled our opinions to include households among the insurable property.

(3) Risk Covered

a. As for the causes of losses, there was an opinion that such should be limited to earthquakes and an opinion that volcanic eruptions and tsunami by earthquake should be included. The grounds for the opinion that such should be limited to earthquakes were that the risk of volcanic eruptions and tsunami are regionally determined, so depending on the method of underwriting, there is a fear of adverse selection; however, at present both are exempted in ordinary insurance, and also since these are disasters arising due to the same cause as earthquakes, we reached the conclusion also that such should not be excluded from the viewpoint of an even societal balance.

(Note) When classifying the estimated amount of damages (converted to market value) to general risks due to the earthquakes from 1868 to 1964, grouped by cause, damages due to volcanic eruptions in this period were extremely slight, with washing-away damage due to tsunami at about 11 billion yen, the amount of fire damage due to earthquakes at about 1.5 trillion yen, and destruction damage, etc., due to earthquake at about 800 or so billion yen.

b. Next, the scope of risks covered, that is, concerning losses befalling the objects of insurance due to the causes indicated in a., there was an opinion that such should be limited to fire, and an opinion that not only fire, but also destruction, burying and washing-away should be included. The grounds for the opinion that such should be limited to fire were that making correct loss adjustments is considered to be difficult for damage by destruction and burying, etc. Thus it wouldn't be appropriate for this insurance, which would be concurrent with major disasters, that if said were limited to fire risks, the rates could be relatively low, and that from the viewpoint of the coverage capacity of the insurer, if it were limited to fire, the claims to be paid could be made large, etc. On the other hand, there was the counter argument that if only fire risks were covered, there would be such problems as that fire fighting by the people themselves would be passive and moreover there would be a danger of creating moral hazard. And, additionally loss by fire after destruction could not be an insurable event. Finally, from the point of view of attempting a balance among the victims due to the same disaster, and also from the request by the general public toward this insurance, there was a strong opinion that to cover fire risks alone would be an inept solution and merely a half-fulfillment of society's demands, and we arrived at the conclusion that the scope of coverage should not be limited to fire but should include destruction, burying and washing-away.

c. As for the losses that are to be covered, whether or not total loss such as total loss by fire or complete collapse alone should be covered, or whether or not a particular loss such as half loss by fire or half collapse should be covered became an issue. One of the reasons for the opinion that partial loss should be excluded was the actual problem of the difficulty of loss adjustment, and taking into consideration that partial loss coverage is not so meaningful, considering the fact that the payment amounts themselves for this insurance would be small because of the insuring conditions or payment conditions which are stated later, it was determined that only total loss would be covered. However, handling of cases in which a physically less than total loss is equivalent to a total loss in economic terms became an issue, and there were no objections to such being included under total loss. At any rate there were strong opinions that since loss adjustment at the time of earthquakes would be concurrent with many difficulties in actuality, performance of joint adjustment by all of the companies may be necessary.

d. In relation to the insurable risks, we performed investigation concerning establishment of natural disaster insurance, including wind or water damage due to typhoons, etc., together with earthquakes; however, since there is specificity as for the time and area for wind and water damage, there is an extremely strong fear of adverse selection, and then the amount of payments could be huge due to such. And in addition there are many problems from the viewpoint of methods of underwriting or rates, etc. We considered it to be appropriate to make efforts towards the establishment of earthquake insurance for the time being, and as for wind and water damage insurance, to await future investigation.

(4) Methods of Underwriting

As for the methods of underwriting the insurance contracts, it would be difficult for such to be established as insurance through a voluntary and independent insurance system due to the characteristics of earthquake disasters, and since it would be necessary to have many participants universally, it would be necessary to adopt the method of attaching such automatically to existing fire insurance for dwellings. The problem is to what existing insurance such should be attached. At present, in the field of fire insurance for dwellings there are ordinary fire insurance and comprehensive insurance (householder's comprehensive insurance, storekeeper's comprehensive insurance), the latter of which has a wider scope of coverage compared to the former, and whether said should be automatically attached to both of these or automatically attached only to comprehensive insurance became an object of discussion.

The first method of said being automatically attached to both ordinary fire insurance and comprehensive insurance (i.e., the method of deleting the immunity clause due to earthquakes in fire insurance policy conditions) is as it were a method of leaving no selection for policyholders, and though the most participants universally could be obtained, it would not be appropriate to take away the freedom of general policyholders and have them bear such an expense of additional insurance premiums, and also the more universal the policyholders were, the greater the amount of loss that would accumulate due to a single risk, and thus such would create more and more problems for insuring conditions and payment conditions as stated later.

Therefore, the method of leaving room for selection, that is, the plan to attach said automatically to comprehensive insurance is considered to be the most appropriate. In this case, due to the even more serious request for a public aspect because of the involvement of the state in this insurance, we must consider the problem of automatic attachment to specific insurance; however, generalization of insurance is at present the world trend, and since so-called all-risk insurance is considered to be the goal to which non-life insurance should strive in the future, there is no particular issue here. However, on the other hand, since it would be inappropriate to ignore policyholders who desire coverage of earthquake risk only, exclusive or fire risks, there was a strong opinion that we must think out separately the method for opening a way for voluntary attachment to ordinary fire insurance. However, the method of voluntary attachment has problems since it would cause the scale of insurance groups to be unstable, and thus make the prediction of income and outgo difficult, and there is the problem remaining that if the premium rate in such cases were to be higher than the rate of automatic attachment to comprehensive insurance due to the problem of adverse selection, etc., opening the way for voluntary attachment would be meaningless, so it is necessary to be sufficiently deliberate about implementation.

(Note) Concerning the internal and external examples with regard to methods of undertaking, in the case of Japan’s Wartime Specific Non-Life Insurance Law, policies were capable of being made both by the method of automatic attachment to fire insurance and by voluntary and standalone earthquake insurance, and from examples of foreign countries, it has been reported that in countries where serious disaster insurance systems have been adopted (Spain, New Zealand), there is a public position that such is automatically attached to fire insurance and comprehensive insurance, etc., without any room for selection, while in countries where voluntary systems such as standalone earthquake insurance or seismic risk expanded coverage, have been adopted (US, Canada, etc.), there are problems such as the vicious cycle of increasing premium rates and the arbitrariness of participants, along with the difficulty of prediction of income and outgo.

(5) Premium Rates

a. Concerning premium rates, even if the state does the reinsurance, rates should have a rational basis in terms of commercial profit, and from the character of this insurance, for example as for expense rates, it is desired that such should be squeezed to as low as possible without being trapped by the computation of ordinary rates.

b. From the principle of determination of premium rates, it is natural that there should be quite a difference between rates in accordance with the area, ground or structure; however, due to the character of this insurance, it would be appropriate to make that difference not so large.

c. In any event, the opinion was strong that it is proper that the increased proportion of insurance premium burden of the policyholders due to automatic attachment of earthquake insurance should be limited to within at most about 50%.

(6) Insurance Organizations

Concerning insurance organizations, though there was the opinion that due to the characteristics of earthquake insurance, we should not be corralled in by the common examples of business insurance, and that such should be handled under national management and be compulsory insurance, there are various issues in compulsory insurance systems, and rather than a purely national insurance, it would be more efficient socially and economically to activate the existing private non-life insurance organizations, and moreover taking into consideration that private insurance companies, etc., have a reasonable extent of coverage ability along with the positive attitude to take on earthquake insurance, it is considered that it would be more reasonable to fulfill the objective in a form in which the state would complement the private lack of capacity from a position of being able to consider long-term income and outgo.

These methods of complement by the state were considered: a. state perform reinsurances, b. the state loans to the insurance companies, c. the state performs loss compensation to the insurance companies, d. a semi-official special corporation performs earthquake insurance, e. insurance companies cover losses up to a certain amount and for losses exceeding such, the state would offer support in some form, etc.

The last method is the one adopted in Laws on Compensation for Nuclear Damage, and as it is problematic to perform financial support to policyholders only at the time of disaster, in addition, in the case of said Law, there are special circumstances such as the liability without fault imposed on commercial nuclear operators, the policy to foster the nuclear business, and the contents of support by the state being uncertain, etc., and it was determined that it would not be appropriate to adopt this method for earthquake insurance.

In the plan for establishing a special corporation, the private insurance companies and the state would perform joint investment, and the insurance companies would function as deputies in the business of underwriting policies; however, the problem is that the coverage capacity is for the time being limited to their capital, and it would be difficult to secure equity participation in advance to the extent sufficient to be able to perform the payments expected in earthquake insurance, so this plan was not adopted.

Next, the method of the state performing loss compensation was the one used in the Wartime Specific Non-Life Insurance Law, and it is superior to the plan for a special corporation since prior equity participation is not required; however, it could be equivalent to nationally-managed insurance depending on how it is handled, and additionally there is the difficult problem of how single-year losses and profits could be incorporated into earthquake insurance, which has in an actual sense the character of long-term insurance.

Therefore, as result of comparison and investigation of the merits and demerits of each method, we came to the conclusion that the method of having the state perform reinsurance at a fair charge would be most the rational. Of course, even though it is subject to the collection of reasonable reinsurance fees by the state, since the occurrence of losses due to earthquake is unpredictable, the payment of reinsurance preconditioned by collections that are never correctly predictable is problematic from the standpoint of taxpayers, so there was an opinion that rather than this, the method of long-term, low interest loans might be more appropriate. However, the fact of insurance companies bearing a huge amount of loan debts for long periods would make their coverage capacity toward general insurance contracts extremely weak, and it would also be recognized to be problematic for international credibility since the insurance industry had not been a borrower, so after all it was determined that the method of the having the state perform reinsurance would be most appropriate. However, even in the case of the reinsurance method by the state, as a situation expected to occur of the difficulty of exchanging company owned assets into cash concerning the privately borne portion, it is going to be necessary to think the special loan method out.

For the method in the case of reinsurance by the state, a. the method of reinsurance of a certain proportion all the time, and b. the method of reinsurance of losses exceeding a certain amount were considered, and as for the proportional reinsurance method in a., the Government having to make payment for all small losses would be cumbersome, and since support by the Government would not be necessary for losses within the scope of private coverage capacity even in earthquake disasters, it was recognized that the excess loss reinsurance method of b., in which the retention limit of private insurance companies is obvious, would be more appropriate. Additionally, concerning the specifics of the excess loss reinsurance method, various methods can be considered, and there was also a concept in which the reinsurance would be separated into two stages, with the state covering a certain proportion in the first stage and the state underwriting the reinsurance of the entire amount in the second stage.

(7) The Payment Conditions and the Amount of Insurance Claims

How to decide insurance claims to be paid was the point with the largest number of issues in the progress of the deliberations, in relation to expected amounts of losses, coverage capacity of private insurance companies, financial capacity of the nation, rates, etc.

a. Since earthquake damage can sometimes be extraordinarily huge, for example, paying the whole of the insured amount of attached comprehensive insurance is considered to be impossible, even with the financial capacity of the nation, so there is the problem that arises of coverage proportions or payment proportions concerning earthquake disasters. However, when considering a fixed rate insurance claim payment proportion for all cases preconditioned on the return of an extraordinarily great earthquake such as the Great Kanto Earthquake, it would naturally be unavoidable to set the proportion low; however, then there is the problem that such does not accommodate society's request for earthquake insurance. Therefore, recognizing the actual fact that in the case of extraordinarily great disasters, it can be expected that neither the Government nor insurance companies have sufficient capacity to deal with said, and for the greater protection of policyholders in the case of earthquake disasters of the normally possible extent, it is possible to consider a method of setting stages of payment proportions in accordance with the degree of disaster, and to heighten the payment proportion in the case of relatively small scale losses. However, such a method poses numerous difficulties such as: it would harm fairness among the policyholders, there being no precedent examples among existing kinds of insurance, payment to each policyholder would become impossible unless all loss adjustments were finished, it would not be realistic since the right relationship between policyholder and insurer would become muddled concerning losses arising near the boundary of the loss amounts for which payment proportions are different, and it would be almost impossible to set up rational premium rates, etc.--so this was not adopted.

b. Accordingly, it was determined that the payment proportion should be a fixed rate, and in such cases, even if such were set as low, it would not necessarily be possible to say that an extraordinary disaster would not occur, so it is inescapable to consider a system in which, in preparation for such an extraordinary disaster, the limit of burden would be determined in advance, and in case of the occurrence of an extraordinary disaster exceeding such a limit, the insurance claims to be paid under the respective contracts would be reduced in accordance with the proportion of the total amount of loss to the limit amount, in other words, a system of peaking-out of the total amount of insurance claims to be paid. There were dissenting opinions toward this concept if it were preconditioned by the involvement by the nation, such as that an effective remedy should be displayed in the very case of occurrence of extraordinary huge losses, and that for policyholders the possibility of reduction of insurance claims to be received, the key of insurance, is perhaps persuasive at the time of taking the policies out but not at the time of suffering a disaster, and there is a possibility of a fear of causing an unpredictable situation for insurers, and that such would harm fairness among policyholders; however, we came to the conclusion that this peaking-out system would be unavoidable since there is a limit to the burden capacity of the non-life insurance companies and the financial capacity of the nation. However, needless to say, such a system is not desirable for a purpose of earthquake insurance after all, and it should rather be said to be unavoidable that the limit should be as high as possible and also that deliberate consideration would desirable so policyholders could gain sufficient understanding in advance.

c. Next, concerning how to determine the amounts of insurance claims to be paid specifically, society's request for this insurance and premium rates became issues. In the case of this insurance as well, in order to consider that insurable interest is in the compensation of proprietary loss, there would be no objection to the point that insurance claims to be paid would be meaningless in a social sense unless such could contribute a reasonable extent to the restoration of the things suffering damages due to earthquake. However, in the other aspects, considering the fact that the burden capacity of the insurers has limits, and that it would be inappropriate to force policyholders to bear an excess burden of insurance premiums for earthquake insurance, since the public position is automatic attachment, it would be unavoidable that the payment rates, etc., should be by themselves restricted. Moreover, because of the fact that it would not be necessary to remedy extremely large amounts of personal assets by insurance in which the nation is involved, and it would be necessary to avoid the accumulation of losses due to a single disaster as much as possible, it would be necessary to set up the limit for the insuring amount for each contracted object.

Taking into consideration the above points, we came to the conclusion that the public position for the amount of insurance claims to be paid would be no less than 30% of the amount insured of the principle insurance contract to which such is incidental, and besides, it was determined that an insuring restriction of about 3 million yen for buildings and 2 million yen for households would be performed, and it seems appropriate to set up a payment limit of 900,000 yen for residences, and 600,000 yen for households, for a total about 1.5 million yen.

d. Though there is the extremely difficult problem of what we should consider to be extent of the coverage capacity of the Government and private companies, we came to the following conclusion with regard to such. For non-life insurance companies, endangering their liability for other existing insurance by performance of this insurance should be avoided, and though we have to consider the increase of payments due to maritime insurance and business properties earthquake insurance, etc., in the case of the occurrence of earthquake disaster, at the same time, in the light of society's requests for this insurance and the public character of the non-life insurance business, as much burden should be borne as possible. On the other hand, as for the burden limit of the Government in the case of the occurrence of extraordinarily huge disasters, since huge amounts of funding are required for disaster restoration of communal facilities, the procurement of financial funds in such cases can be problematic, and the amount of the limit of burden by the Government and reinsurance premium rate should be reasonably stipulated by having these mutually related.

However, if this insurance is adopted, effort should be made so that a situation of reduction of insurance claims to be paid would not occur even in the case of the return of an event of at least the size of Great Kanto Earthquake.

(Note) It is reported that even in the case of the return in 1966 of an earthquake disaster of the size of Great Kanto Earthquake, the total amount of insurance claims to be paid under the above conditions would not reach 300 billion yen, and non-life insurance companies would make efforts to cover about 30 billion yen for the time being.

However, it would be necessary to raise the limit of the total insurance claims to be paid in accordance with increases in the predicted payment amounts after the improvement of diffusion of the insurance, and also to raise the limit of burden by the insurance companies in accordance with increases in the coverage capacity.

(8) Other

Concerning whether or not associations performing the mutual aid business similar to fire insurance under special laws are to cover earthquake risk in the future, and if so, whether or not such should be accepted, and what kind of measures would be required in such cases, etc., were issues at this Council.

Concerning this, as the character or coverage capacity, etc. of the associations are different, it would not be appropriate to discuss them categorically; however, at least, for these associations to cover earthquake risk, such should be preconditioned on maintenance of soundness of the associations, sufficient legal regulations and supervision being performed from the point of view of protection of policyholders, methods for risk diffusion to all over the nation being taken, having reasonable coverage capacity for the predicted accumulation of losses, etc.

On the other hand, it would be natural for systematic adjustment concerning the system for which the Government performs reinsurance to be attempted between the insurance business and the mutual aid business, which is similar to insurance; however, preparations have been insufficient at the present stage and this Council decided not to come to any conclusion on this occasion.

It is considered that these problems should be respectively and deliberately investigated on the part of the Government, taking into consideration the actual development of the plans in the above that we investigated, and considering balance in the contents in accordance with necessity.

Report of the Insurance Council [extract]

June 14, 1979

To: Ippei Kaneko, Minister of Finance

Shuzo Hayashi, Chairman of the Insurance Council

In response to the recent changes in the environment of the insurance business, the Council determined to perform deliberations from a new point of view concerning system for future insurance business at the 39th General Meeting on November 7, 1978, and as results of the accumulated of investigations since then, the opinions of the Council are summarized as in the Exhibit, and We are hereby reporting such.

Section 2 Concerning Earthquake Insurance System Revisions

The earthquake insurance system was commenced in 1966, and in the approximately 10 several years since then, partial improvement concerning the details has been performed as necessary; however, until now overall reconsideration has not been conducted for the systems. Nonetheless, from recent trends of public opinion, etc., we have recognized that fundamental reconsideration is necessary; the Council has discussed concerning various issues since last year and reached the following conclusions.

Outline of Earthquake Insurance System Revisions

Among the ongoing system, concerning the “insurable properties” (scope of objects), “covered risks” (causes of events and forms of risk) and “insurance mechanisms” (reinsurance by the Government by the excess of loss reinsurance method), there are no systemic issues for the continuation of these; however, revisions should be performed on the following points.

1. Matters requiring revisions and the details of the revisions

(1) Concerning the losses to be covered

It is stipulated in the ongoing system that only total loss shall be covered; however, partial loss coverage should be introduced in some form for the enhancement of the system.

The primary reason why the ongoing system originally stipulated that coverage should be only for total loss is the quantitative and qualitative difficulty of loss adjustment at the time of earthquake disasters. In other words, it is actually impossible to say that making payments on insurance claims in accordance with the respective loss ratios in the case of earthquake disasters, and even if we introduced partial loss coverage, it is judged that there would be no other way but to make payments at a certain rate in accordance with the approximate stage of the damage.

It is desirable that loss adjustment standards of the non-life insurance companies and national damage certification standards be consistent concerning this type of insurance; however, as for the latter, at present integrated standards have been created with regard to total destruction, total burn down, washing away and half destruction and half burn down of residences, and there are no specific standards set up for partial loss. Moreover, as for household goods, the national damage certification standards do not at all refer to such at present.

As stated later, in the deliberations on this occasion, the measure of having different insurance handling for cases of huge earthquakes and for cases of mid-to-small earthquakes was not adopted, assuming the case of earthquake disasters covering large areas and considering the loss adjustment ability of non-life insurance companies on such occasions, due to such requests as mass disposition, rapidity of adjustment, and fairness. If there are certifying documents with regard to the affliction issued generally by public organizations on the basis of the national damage certification standards, it will be unavoidable to adopt the method, etc., of referring to said, and taking into consideration these situations concerning the buildings for residential use and household goods, a realistic policy should utilize the following method.

a. Concerning buildings for residential use, partial losses that are to be covered should be limited to cases of half loss (cases equivalent to partial destruction and partial burn down of the national damage certification standards), and while the entirety of the amount insured of the earthquake insurance is paid in the case of total loss, in the case of half loss, half the amount of such should be paid. Additionally, concerning the coverage of partial losses as well, which are not to the extent of half loss, various measures were discussed; however, we came to the conclusion that said is impossible in the present situation where we cannot attain an appropriate means of solution concerning adjustment capability and fairness among the victims.

b. Concerning the household goods, the difficulty of loss adjustment is even greater, qualitatively and quantitatively, compared to cases of buildings, and we recognize that it would be impossible to introduce half loss coverage on the basis of individual adjustments. As for the possible methods of adjustment, we recognize that there is no other way but to pay some kind of benefits in accordance with the loss certification of the buildings containing the household goods. On the other hand, the damage level of the household goods does not necessarily correspond to the damage level of buildings containing such, and excluding special cases such as destruction by fire and washing-away, it is recognized that the loss proportion of the household goods as a whole is relatively light.

Therefore, in case the household goods is not in the status of total loss but the building containing such has damage of more than half loss, it is reasonable to pay flat benefits at a low rate such as about 10% of the amount insured of the earthquake insurance also in the sense of avoiding unfair results among the insured of the household goods.

(2) Concerning the payment of insurance claims (restrictions on contracted amounts)

As stated later, from the characteristics of earthquake disasters, earthquake insurance is contracted incidental to the fire insurance for dwelling; however, it is impossible to pay the entire amount insured of the principal contracts even with the financial capacity of the nation, and moreover we recognize that it is not necessary to go so far as to remedy an extremely large amount of personal assets using insurance in which the state is involved, and likewise in the ongoing systems, there should be a limit set to the insuring proportion and insuring amount for each of the contracted objects.

As for the insuring proportion, there is a general criticism that the ongoing 30% gives too small a compensation, and the raising of said is recognized to be necessary; however, since there is a limit to the coverage capacity of the private insurance companies and financial capacity of the nation, it is appropriate to set 50% as the upper limit. At the same time, considering the point of the burden of premiums on policyholders, it should be determined that more space for selection be left for policyholders as for the amount insured, it should be determined that an amount within a scope of 30% to 50% of the amount insured of the principal contract can be selected as the amount insured for the earthquake insurance.

The reason why the lower limit is 30% is that amounts of earthquake insurance of less than 30% are recognized to make little sense in terms of society.

As for the limit of the insuring amount, such makes little sense in terms of society unless it contributes greatly to the restoration of the buildings and household goods suffering losses due to earthquake, and at that time the weight of the number of contracts undergoing insured amount restrictions due to the limit amount, present day standard construction costs per dwelling and the amount of household goods retained in the standard family, etc., should be considered. At the same time, as for restrictions on insurance in which the state is involved, the burden of insurance claims on the state and non-life insurance companies, etc. should be considered. Comparing these points, it is desirable that such should be ten million yen for buildings for residential use, and such should be five million yen for household goods.

(3) Concerning undertaking methods

From the characteristics of earthquake insurance, arbitrary and independent insurance systems are difficult to establish, so the adoption is unavoidable of the method of earthquake insurance incidental to the existing fire insurance for dwelling as is presently done; however, as stated above, by expanding the scope of losses to be covered and raising the insuring proportion and the limit of the insuring amount, it is expected that the burden of insurance premiums on policyholders will increase, so the method of ongoing automatic attachment to comprehensive insurance is a problem. However, to make such completely arbitrary is not realistic either from the standpoint of the diffusion rate and predictions of income and outgo, etc., so the method of automatic attachment in principle to all fire insurance for dwelling should be adopted.

Additionally, as stated above, as for the amount insured of earthquake insurance, as it is permitted to select between 30% to 50% of the amount insured of fire insurance to which such is incidental, the selective undertaking method of total loss only coverage or partial loss only coverage concerning the loss to be covered should not be adopted since quite a deal of turmoil can be expected at the time of undertaking as well as when damage is suffered.

(4) Concerning premium rates

Concerning premium rates, it is needless to say that, due to the nature of this insurance, such should be as low as possible by squeezing operating cost to the utmost. Concerning the differences, etc., among the areas, at present, the principle is not to make the difference so large, considering the point of automatic attachment; however, concurrent with the changes in the undertaking method, it is desirable that calculations should be made so that the degree of risk will be reflected in the rates as fully as possible. Additionally, at such time, buildings and household goods should be under separate systems.

2. Other matters deliberated

(1) The Council again discussed concerning the handling of extraordinarily great disasters that was mentioned as an issue in the Report Concerning Earthquake Insurance Systems in 1965. In other words, when preconditioned by the re-occurrence of extraordinarily great earthquakes such as the Great Kanto Earthquake and setting up a fixed rate insurance claims payment ratio for all cases, setting such ratio low would be unavoidable as a matter of course, so we deliberated on the possibilities concerning measures for greater protection of policyholders in the case of earthquake disasters of the normally possible extent, compared to cases of huge disasters.

However, the conclusion was the same as the result of the previous discussions: such method, first of all, does not go well with the original purpose of earthquake insurance systems, and in addition, there are various difficulties in actual issues such as that stipulation clear standards for separating huge disasters and mid-to-small disasters is difficult, and thus this was not adopted.

Additionally, there was a discussion that huge disasters of the Great Kanto Earthquake class should be handled separately, outside of the insurance systems, but this was a discussion of hoping for infinite financial capacity in the nation, and the Council was unable to approve such an idea.In conclusion, we will follow the idea and method of peaking-out in ongoing systems.

(2) Private non-life insurance companies should share their roles as much as possible in response to society's requests concerning this insurance; however, at the same time, the situation of them

being incapable of fulfilling their liabilities concerning other insurance should be avoided, and imposing burdens that would make difficult the continuation of business activity after the occurrence of huge disasters would be problematic. Therefore, it is necessary that the limit amount of liability of private non-life insurance companies should be stipulated according to a certain standard so that burdens exceeding the balance of liability reserves of earthquake insurance will be accepted socially in the character of private business, and coverage will be of the amount judged to be generally expected.

Additionally, concerning the funds for payment of insurance claims, when payments exceeding the balance of the liability reserves of earthquake insurance must be made as a matter of course, even within the scope of the balance, and when there is a special necessity arising in private insurance companies, such as difficulty of conversion of owned assets into cash, the Government should pay special consideration concerning the procurement, accommodation, etc., of the required funds.

(3) In the progress of the deliberations, the insufficiency of the methods for ensuring comprehension among policyholders concerning this insurance in the non-life insurance business sector became a frequent issue. As there are more matters that will be left to the choice of policyholders in the future, the whole business sector should make the utmost efforts towards thorough comprehension, and especially, concerning the details of total loss and half loss, explanations should be made on the basis of documentation at the time of underwriting policies so that sufficient comprehension be ensured.

(4) In the case of the occurrence of unfortunate trouble with policyholders at the time of suffering disasters, in order to attempt early settlement of such, preparations should be advanced in normal times so that, as soon as a disaster happens, a claim disposition organization can be installed in each region, including fair third parties, with the right timing.

(5) Finally, we recognize that it is necessary to take some measures so that in a situation where a warning statement against earthquake disaster under the stipulations of the Large Scale Earthquake Countermeasures Act (Law No. 73 of 1978) has been issued, insurance companies can reject the undertaking of contracts.

Report of the Project Team for the Earthquake Insurance System [extract]

November 2012

Conclusion

To conclude this report, we will note the issues for revising the earthquake insurance system which must be addressed in three stages: first, the most pressing issues; second, other issues that require prompt attention; and third, issues that will require further debate.

First, the most pressing issue is that private reserves were severely depleted in the Great East Japan Earthquake, while other massive earthquakes are anticipated in the future. Urgent steps should be taken to improve the resilience of the earthquake insurance system.

Next, insurance premium rates and marketability are issues that require prompt attention although their solutions will require more time. The source models of the Headquarters for Earthquake Research Promotion, which provide the basis for computation of earthquake insurance premium rates, are currently undergoing revision, as stated earlier; and insurance premium rates will need to be revised according to the new source models. The effects of revised source modeling cannot yet be foreseen, and there are still elements of uncertainty; however, the project team's report indicates the framework and general directions of the revision in relation to premium rates and marketability. The details of premium rate revisions and marketability will need to be worked out in the future using the revised source models, based on this report.

The project team has been able to determine certain directions for the most pressing issue, which is the need for ways to make up for the shortfall during the period after private reserves are exhausted and before a supplementary budget is provided; and for other issues requiring prompt attention, namely equalizing the differences among premium rates in earthquake insurance zones and clarifying the earthquake resistance class discount system. However, continued debate will be needed on other issues such as discounting or augmenting rates based on location and introducing an option for 100% coverage with benefits payable only in the event of a total loss. The administration will need to work intensively to improve earthquake insurance as a source of peace of mind in earthquake-prone Japan, based on this report. Also, in revising the earthquake insurance system, it will be necessary for both the public sector and the private sector to make every effort to obtain the understanding of the general public by means of thorough explanations, including the very purpose and spirit of the earthquake insurance system, from the standpoint of promoting more widespread use of earthquake insurance.

Brief Summary of Discussions in the Follow-up Meetings by the "Project Team for the Earthquake Insurance System" [extract]

June 2015

Introduction

The "Project Team for the Earthquake Insurance System" (hereafter, the "Earthquake Insurance PT") was established under the Ministry of Finance in April 2012 to consider points to be revised with regard to the earthquake insurance system in light of the Great East Japan Earthquake. After having 12 discussions, the Earthquake Insurance PT compiled a report (hereafter, the "Report of the Earthquake Insurance PT") in November of the same year.

The Report of the Earthquake Insurance PT summarized various issues for a future review of the earthquake insurance system while stating in its general remarks that "the current system could in general be considered to have effectively functioned even for the Great East Japan Earthquake. While maintaining the basic framework of the current system, necessary revisions should be made so that it will be improved to serve its role providing a sense of security."

Since November 2013 when about one year had passed from the publication of the Report of the Earthquake Insurance PT, the PT has held three follow-up meetings, in which the situations, etc. surrounding the issues summarized in the report, issues that have already been dealt with, and the status of progress of issues that have continued to be dealt with in the non-life insurance industry were confirmed and the chairman summed up the meetings.

The chairman's summary indicated that another follow-up meeting should be held mainly to discuss issues such as "simplification of claim assessment," "subdivision of the damage classification" and "claim assessment of appurtenances to the condominium." Because there was progress in consideration of these issues in the non-life insurance industry, the PT resumed the follow-up meeting in February 2015 and has discussed the issues seven times since its fourth meeting.

This abstract briefly summarizes the outcome of the discussions in the follow-up meetings about the four topics of "simplification of claim assessment," "claim assessment of appurtenances to the condominium," "subdivision of the damage classification" and "earthquake insurance premium rates."

The non-life insurance industry, the General Insurance Rating Organization of Japan, the Financial Services Agency, the Ministry of Finance, and other parties concerned are expected to proceed with consideration based on this brief summary.

IV. Earthquake insurance premium rates

Earthquake insurance premium rates were revised in July 2014 in light of the issues related to earthquake insurance zone, location premium, location discount, and discount for earthquake-resistant construction summarized in the Report of the Earthquake Insurance PT.

The General Insurance Rating Organization of Japan conducted verification based on the new hazard map published by the Headquarters for Earthquake Research Promotion in December 2014 and as a result reported the need for a significant rise in earthquake insurance premium rates. Accordingly, the Earthquake Insurance PT discussed matters to be noted when revising earthquake insurance premium rates and remaining issues.

According to the framework for earthquake insurance premium rates, the General Insurance Rating Organization of Japan calculates the rates, and the Financial Services Agency examines the rates upon receipt of a notification from the Organization. The revision of the rates to be made is also required to be appropriately considered and conducted by both parties in light of the summary in the Report of the Earthquake Insurance PT and recent discussions.

(1) Impact of the update of earthquake source models, etc. on earthquake insurance premium rates
The General Insurance Rating Organization of Japan verified the earthquake insurance rates based on the update of earthquake source models, etc. and reported results that indicate the need for a 28% rise in premium rates on a nationwide average assuming the current damage classification. Meanwhile, the Organization indicated that implementing Plan (3) (Note from editor) with regard to the subdivision of the damage classification will result in a reduction of the rise in earthquake insurance premium rates to 19% on a nationwide average.

Note from editor: In the Follow-up Meetings by the "Project Team for the Earthquake Insurance System," the non-life insurance industry reported that Plans (1) to (3) below were plausible with regard to the division of the current "half loss" into "large half loss" and "small half loss."

Classification			Plan (1)	Plan (2)	Plan (3)
Buildings	Proportion of damage to the main structural parts	Total loss	50% or more		
		Large half loss	30% to 50%	35% to 50%	40% to 50%
		Small half loss	20% to 30%	20% to 35%	20% to 40%
		Partial loss	3% to 20%		
	Proportions of floor area burned down or washed away	Total loss	70% or more		
		Large half loss	40% to 70%	45% to 70%	50% to 70%
		Small half loss	20% to 40%	20% to 45%	20% to 50%
		Partial loss	—		
Household goods	Proportion of damage to household goods	Total loss	80% or more		
		Large half loss	50% to 80%	55% to 80%	60% to 80%
		Small half loss	30% to 50%	30% to 55%	30% to 60%
		Partial loss	10% to 30%		

(2) The revision of earthquake insurance premium rates to be made

Risks of earthquake damage should be reflected in earthquake insurance premium rates swiftly and appropriately in terms of actuarial science. In addition, from the viewpoint of robustness of the earthquake insurance system, it is pointed out that a rise in earthquake insurance premium rates should be done once and that the earthquake insurance system and earthquake insurance premium rates should be as simple as possible.

On the other hand, there is a concern that the sense of burden on the policyholders will increase because while the earthquake insurance premium rates were just increased by 15.5% on a nationwide average in July 2014, the raise to be made this time will increase that level even when the damage classification is subsidized. Accordingly, from the viewpoint of ensuring the earthquake insurance signup rate, it is possible that the rates may be raised gradually to obtain the understanding of policyholders.

The non-life insurance industry must carefully give easy-to-understand explanations to policyholders and consumers about the reasons behind the revision of the rates as well as the purpose of raising the rates in stages, if that happens.

(3) Matters to be noted when raising the earthquake insurance premium rates in stages

If the earthquake insurance premium rates are to be raised in stages, the following issues need to be noted:

1) Until the earthquake insurance premium rates are raised to the level that is appropriate in terms of actuarial science, there will be a premium income shortage for the predicted risk of earthquake damage (the expected value for claims paid per year; there will be an uncovered portion). If this situation persists, there is a risk that the robustness of the earthquake insurance system may be lost.
2) To secure revenue generation covering the expenditures of the earthquake insurance system for the long term, at least the portion with insufficient premium income needs to be eliminated by adding the corresponding amount to the earthquake insurance premium rates for the following years. This will place the burden of the uncovered portion that existed before the new policyholders signed up for earthquake insurance on the new policyholders. If it takes a long time until the earthquake insurance premium rates have been raised to a level that is appropriate in terms of actuarial science, the burden of the uncovered portion will be large, and as a result, the period in which a corresponding amount is added to the insurance premium rates will be long, which may increase the sense of unfairness among policyholders.
3) If earthquake insurance premium rates are raised in several stages, the period over which earthquake insurance premium rates are raised will be longer, which may damage the trust of policyholders and consumers toward the earthquake insurance system and earthquake insurance premium rates.

(4) Matters to be noted regarding differences within an earthquake insurance zone

For the current earthquake insurance premium rates, differences are provided for the three earthquake insurance zones (groups of the same insurance premium rates) among prefectures according to the risk of earthquake damage. However, measures to avoid drastic changes where the increase rate is limited to 30% for each prefecture have been taken to avoid a significant increase in earthquake insurance premium rates, and accordingly, several different earthquake insurance premium rates are applied even in the same zone.

If, as a result of the revision to be made this time, the number of prefectures where earthquake insurance premium rates that are different from the original rate for the respective zone increases further, the premium rate system will become more difficult to understand and the reliability of the risk information communication function held by earthquake insurance premium rates may be lost, as mentioned in the Report of the Earthquake Insurance PT. In addition, it is necessary to note that a reduction in premium income as a result of the measures to avoid drastic changes also affects the levels of earthquake insurance premium rates in other regions.

Therefore, before making a final revision to the earthquake insurance premium rates this time, it is required that the measures to reviewed to avoid drastic changes so that the existing number of earthquake insurance premium rates applicable to the same zone will not increase further (that is, the differences within an earthquake insurance zone will not expand).

In addition, it is necessary to remember to consider the direction for reducing the number of earthquake insurance premium rates applicable to the same zone from the current one (that is, reducing the differences within an earthquake insurance zone) in the future.

(5) Remaining issues regarding earthquake insurance premium rates

1) Differences between earthquake insurance zones

Differences in insurance premium rates between earthquake insurance zones (hereafter, "insurance premium rate differences between zones") have thus far been dealt with through integration of zones, etc. However, the differences may increase through a reflection of a revision, etc. of the hazard maps in earthquake insurance premium rates.

Handling of insurance premium rate differences is summarized as follows in the Report of the Earthquake Insurance PT:

- Different earthquake insurance premium rates are given by classifying prefectures into earthquake insurance zones according to a risk such as proximity to a fault.
- Earthquakes causing major damage have been frequently occurring in zones with low earthquake insurance premium rates, and so in the short term the zone classification does not necessarily match the actual damage. While there is a limitation in earthquake source models, making fine differences only in insurance premium rates lacks rationality.
- For earthquake insurance, which is expected play a role as a mechanism of social solidarity, making extreme differences in the rates is not appropriate.
- Insurance premium rate differences should be reviewed in the direction of leveling them to the extent a rational explanation can be given. However, this leveling of insurance premium rate differences needs to be considered along with encouraging people to consider earthquake proofing by providing a discount for earthquake-resistant construction and campaigns for signing up for earthquake insurance.

Meanwhile, risks of large earthquakes have the characteristic of being leveled over the extreme long-term, which does not necessarily match the insured period of policyholders, and so there are some persons who point out that extreme insurance premium rate differences are not desirable.

As for the handling of a discount for earthquake-resistant construction, the discount rate was increased to up to 50% in an attempt to enhance the incentive to consider earthquake proofing when the earthquake insurance premium rates were revised in July 2014. As a result, even for contracts signed in an earthquake insurance zone with a high earthquake insurance premium rate, etc., if a discount for earthquake-resistant construction is applied as a result of making earthquake-proof houses, the premium rate differences with other contracts signed in an earthquake insurance zone with a low earthquake insurance premium rate will be compensated for.

In addition, if a location premium or location discount to be described later can be applied, even for contracts signed in a zone with a high earthquake insurance premium rate, if the location of the contracts is on land with low location risk, the premium rate differences will be reduced thanks to a discounted premium rate.

Therefore, it is necessary to consider this matter in terms of not only superficial differences between zones, but also the mechanism of a discount for earthquake-resistance construction.

2) Location premium and location discount

In order to improve the risk control functionality of the earthquake insurance system, it is best for location risks such as tsunami risks in coastal areas, etc. to be reflected in earthquake insurance premium rates. However, there is an issue regarding whether the reliability of risk calculation can be enhanced to the extent policyholders can be satisfied with insurance premium rate differences depending on the location.

This issue also needs to be considered from the viewpoint of clarifying variations in the earthquake insurance premium rates in circumstances where revisions to the earthquake insurance premium rates can continue to be considered due to updates of the earthquake source models used in hazard maps, etc.

The General Insurance Rating Organization of Japan has been conducting “research on the reliability of risk calculation” for this matter for two years from 2014, and whether this item should be put into practice needs to be considered based on the results of the research.

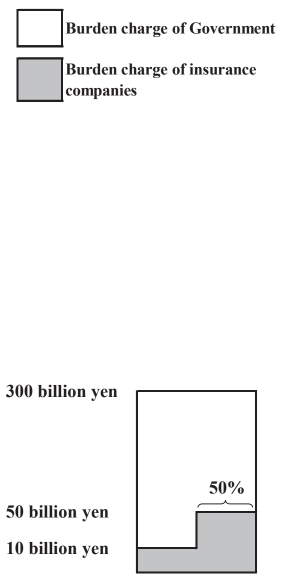
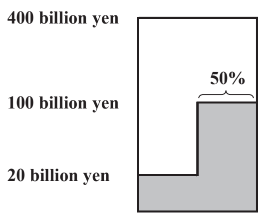
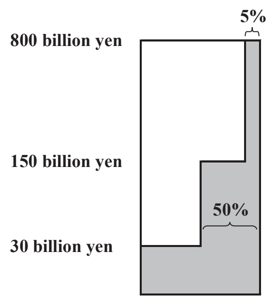
Appendix

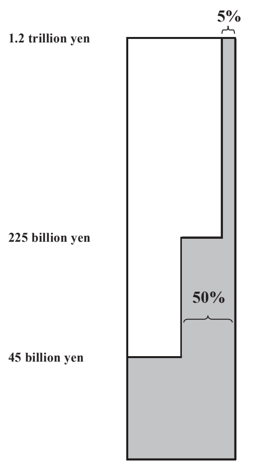
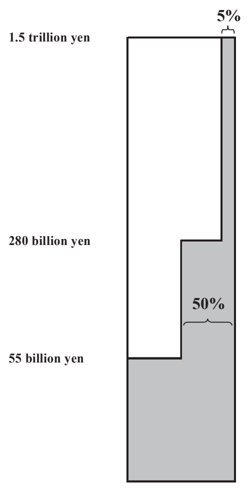
Appendix 1. Transition of Earthquake Insurance System

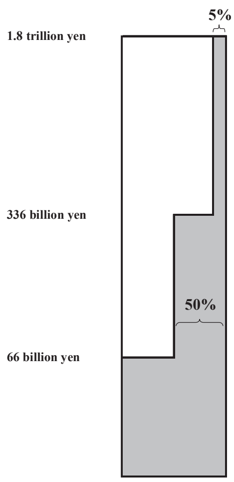
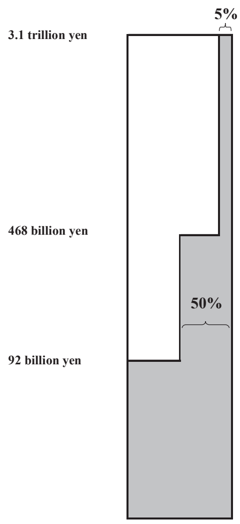
Appendix 2. Transition of Earthquake Insurance Premium Rate

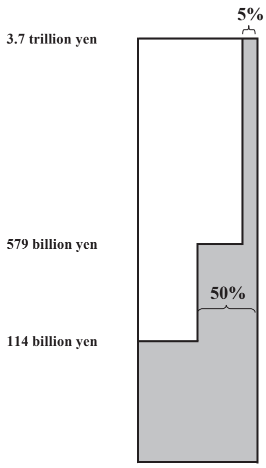
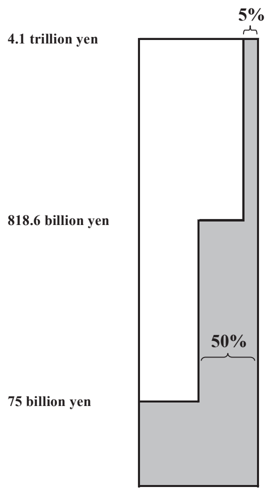
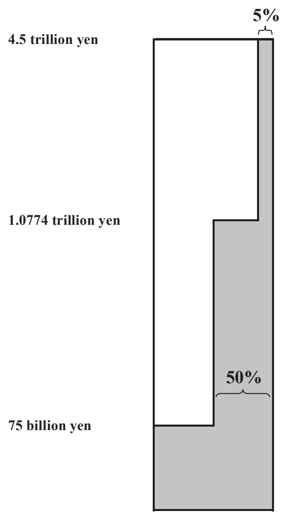
Appendix 3. Explanation of the Seismic Intensity Scale of
the Japan Meteorological Agency

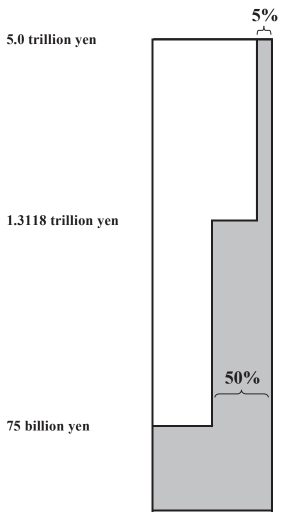
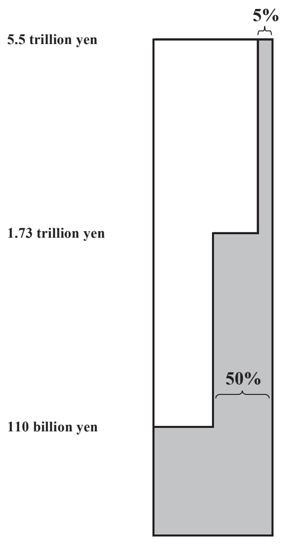
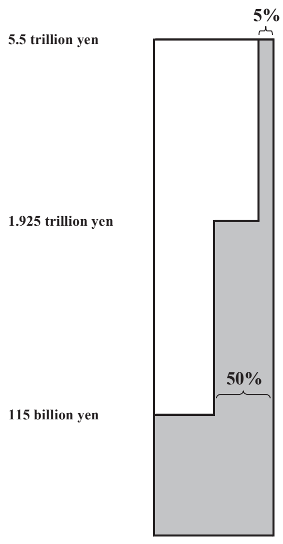
Transition of Earthquake Insurance System

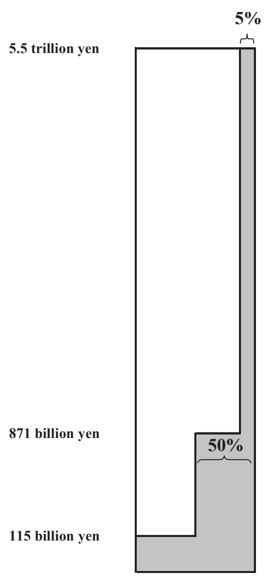
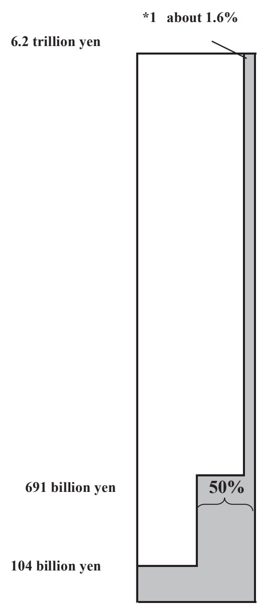
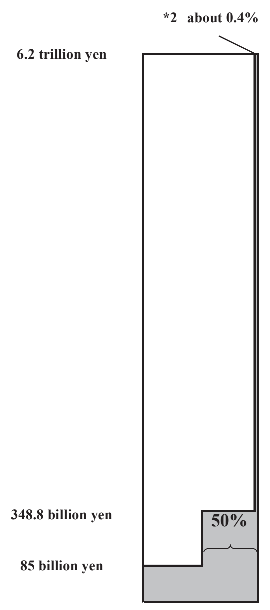
	June 1, 1966 (established)	May 1, 1972	April 1, 1975
Property insured	**Buildings for residential use Household and personal goods**	**Same as to the left**	**Same as to the left**
Insured event	**Earthquake, volcanic eruptions, tsunami**	**Same as to the left**	**Same as to the left**
Coverage condition	**Total loss only**	**Same as to the left**	**Same as to the left**
Payment proportion of insurance claim (for the amount insured)	**Total loss: 100%**	**Same as to the left**	**Same as to the left**
Attachment proportion	**30% of amount insured of fire insurance to which it is attached**	**Same as to the left**	**Same as to the left**
Limit amount of participation	**Buildings: 900 thousand yen Households: 600 thousand yen**	**Buildings: 1.5 million yen Households: 1.2 million yen**	**Buildings: 2.4 million yen Households: 1.5 million yen**
Method of attachment and target insurance	**Automatically attached to the following insurances:** Householders' comprehensive insurance (including monthly premium) Storekeepers' comprehensive insurance (including monthly premium) Monthly residence insurance Monthly commercial insurance	**In addition to left, in principle automatically attached to the following insurances:** Long-term comprehensive insurance Building renewal insurance	**In addition to left, voluntarily attached to the following insurances:** Ordinary fire insurance (including monthly premium) Residential fire insurance (including monthly premium) Dwellers' comprehensive insurance (including monthly premium) Postal life fire insurance, fire mutual insurance Long-term insurance with maturity refund
Reinsurance scheme			
Limit of total amount of insurance claims to be paid due to a single earthquake, etc.	**300 billion yen** Breakdown Government: 270 billion yen Private sector: 30 billion yen	**400 billion yen** Breakdown Government: 340 billion yen Private sector: 60 billion yen	**800 billion yen** Breakdown Government: 677.5 billion yen Private sector: 122.5 billion yen

	April 1, 1978	July 1, 1980	April 1, 1982
Property insured	**Same as to the left**	**Same as to the left**	**Same as to the left**
Insured event	**Same as to the left**	**Same as to the left**	**Same as to the left**
Coverage condition	**Same as to the left**	**Buildings: total loss, half loss** **Households: total loss, half loss**	**Same as to the left**
Payment proportion of (for the amount insured)	**Same as to the left**	**Total loss: 100%** **Half loss: Buildings 50%** **Households 10%**	**Same as to the left**
Attachment proportion	**Same as to the left**	**30% to 50% of amount insured of fire insurance to which it is attached**	**Same as to the left**
Limit amount of participation	**Same as to the left**	**Buildings: 10 million yen** **Households: 5 million yen**	**Same as to the left**
Method of attachment and target insurance	**Same as to the left**	**In principle automatically attached to the fire insurance**	**Same as to the left**
Reinsurance scheme		**Same as to the left**	
Limit of total amount of insurance claims to be paid due to a single earthquake, etc.	**1.2 trillion yen** Breakdown Government: 1.01625 trillion yen Private sector: 183.75 billion yen	**Same as to the left**	**1.5 trillion yen** Breakdown Government: 1.2715 trillion yen Private sector: 228.5 billion yen

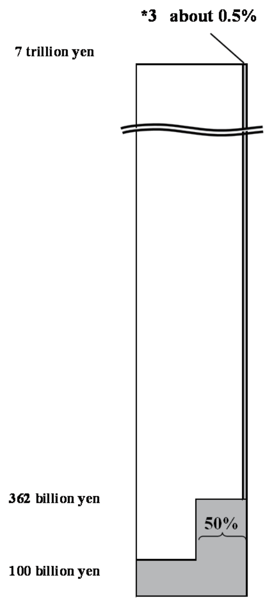
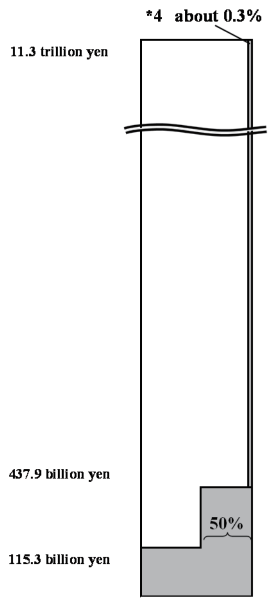
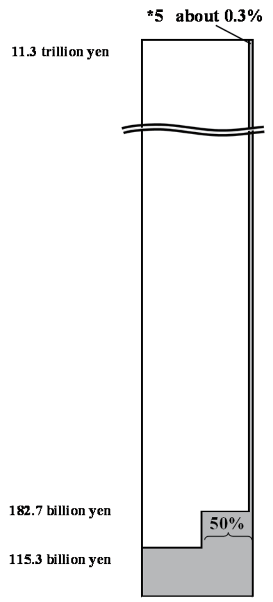
	April 1, 1991	June 24, 1994	October 19, 1995	January 1, 1996
Property insured	**Same as to the left**	**Same as to the left**	**Same as to the left**	**Same as to the left**
Insured event	**Same as to the left**	**Same as to the left**	**Same as to the left**	**Same as to the left**
Coverage condition	**Buildings: total loss, half loss, partial loss** **Households: total loss, half loss, partial loss**	**Same as to the left**	**Same as to the left**	**Same as to the left**
Payment proportion of (for the amount insured)	**Total loss: 100%** **Half loss: Buildings 50%** **Households 10%** **Partial loss: 5%**	**Same as to the left**	**Same as to the left**	**Total loss: 100%** **Half loss: 50%** **Partial loss: 5%**
Attachment proportion	**Same as to the left**	**Same as to the left**	**Same as to the left**	**Same as to the left**
Limit amount of participation	**Same as to the left**	**Same as to the left**	**Same as to the left**	**Buildings:** **50 million yen** **Households:** **10 million yen**
Method of attachment and target insurance	**Same as to the left**	**Same as to the left**	**Same as to the left**	**Same as to the left**
Reinsurance scheme	**Same as to the left**			
Limit of total amount of insurance claims to be paid due to a single earthquake, etc.	**Same as to the left**	**1.8 trillion yen** Breakdown Government: 1.5258 trillion yen Private sector: 274.2 billion yen	**3.1 trillion yen** Breakdown Government: 2.6884 trillion yen Private sector: 411.6 billion yen	

	April 1, 1997	April 1, 1999	April 1, 2002
Property insured	**Same as to the left**	**Same as to the left**	**Same as to the left**
Insured event	**Same as to the left**	**Same as to the left**	**Same as to the left**
Coverage condition	**Same as to the left**	**Same as to the left**	**Same as to the left**
Payment proportion of insurance claim (for the amount insured)	**Same as to the left**	**Same as to the left**	**Same as to the left**
Attachment proportion	**Same as to the left**	**Same as to the left**	**Same as to the left**
Limit amount of participation	**Same as to the left**	**Same as to the left**	**Same as to the left**
Method of attachment and target insurance	**Same as to the left**	**Same as to the left**	**Same as to the left**
Reinsurance scheme			
Limit of total amount of insurance claims to be paid due to a single earthquake, etc.	**3.7 trillion yen** Breakdown Government: 3.19745 trillion yen Private sector: 502.55 billion yen	**4.1 trillion yen** Breakdown Government: 3.48913 trillion yen Private sector: 610.87 billion yen	**4.5 trillion yen** Breakdown Government: 3.75267 trillion yen Private sector: 747.33 billion yen

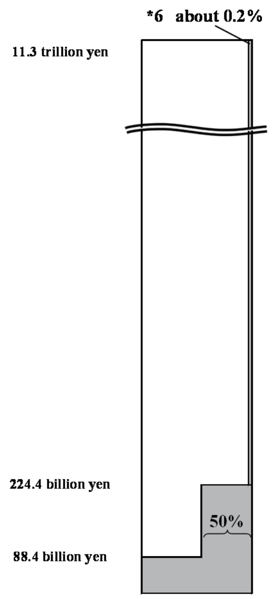
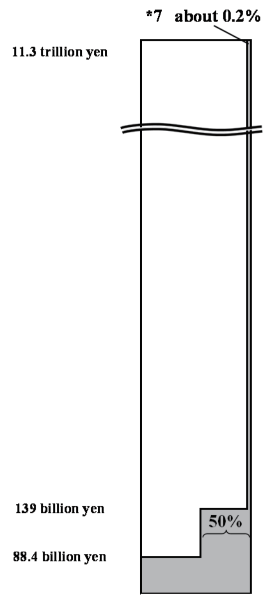
	April 1, 2005	April 1, 2008	April 1, 2009
Property insured	**Same as to the left**	**Same as to the left**	**Same as to the left**
Insured event	**Same as to the left**	**Same as to the left**	**Same as to the left**
Coverage condition	**Same as to the left**	**Same as to the left**	**Same as to the left**
Payment proportion of insurance claim (for the amount insured)	**Same as to the left**	**Same as to the left**	**Same as to the left**
Attachment proportion	**Same as to the left**	**Same as to the left**	**Same as to the left**
Limit amount of participation	**Same as to the left**	**Same as to the left**	**Same as to the left**
Method of attachment and target insurance	**Same as to the left**	**Same as to the left**	**Same as to the left**
Reinsurance scheme			
Limit of total amount of insurance claims to be paid due to a single earthquake, etc.	**5.0 trillion yen** Breakdown Government: 4.12219 trillion yen Private sector: 877.81 billion yen	**5.5 trillion yen** Breakdown Government: 4.3915 trillion yen Private sector: 1.1085 trillion yen	**5.5 trillion yen** Breakdown Government: 4.30125 trillion yen Private sector: 1.19875 trillion yen

	May 2, 2011	April 6, 2012	May 16, 2013
Property insured	**Same as to the left**	**Same as to the left**	**Same as to the left**
Insured event	**Same as to the left**	**Same as to the left**	**Same as to the left**
Coverage condition	**Same as to the left**	**Same as to the left**	**Same as to the left**
Payment proportion of insurance claim (for the amount insured)	**Same as to the left**	**Same as to the left**	**Same as to the left**
Attachment proportion	**Same as to the left**	**Same as to the left**	**Same as to the left**
Limit amount of participation	**Same as to the left**	**Same as to the left**	**Same as to the left**
Method of attachment and target insurance	**Same as to the left**	**Same as to the left**	**Same as to the left**
Reinsurance scheme			
Limit of total amount of insurance claims to be paid due to a single earthquake, etc.	**5.5 trillion yen** Breakdown Government: 4.77555 trillion yen Private sector: 724.45 billion yen	**6.2 trillion yen** Breakdown Government: 5.712 trillion yen Private sector: 488 billion yen	**6.2 trillion yen** Breakdown Government: 5.9595 trillion yen Private sector: 240.5 billion yen

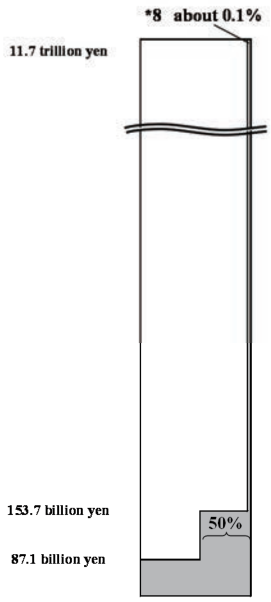
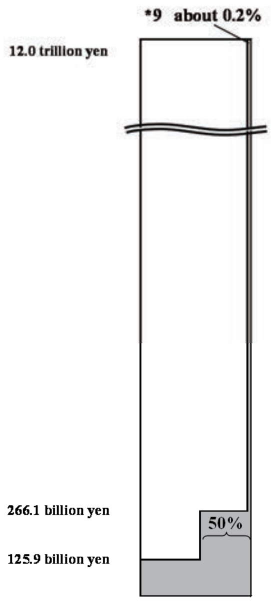
*1 $\frac{905}{55090}$ *2 $\frac{236}{58512}$

	April 1, 2014	April 1, 2016	October 19, 2016
Property insured	**Same as to the left**	**Same as to the left**	**Same as to the left**
Insured event	**Same as to the left**	**Same as to the left**	**Same as to the left**
Coverage condition	**Same as to the left**	**Same as to the left**	**Same as to the left**
Payment proportion of insurance claim (for the amount insured)	**Same as to the left**	**Same as to the left**	**Same as to the left**
Attachment proportion	**Same as to the left**	**Same as to the left**	**Same as to the left**
Limit amount of participation	**Same as to the left**	**Same as to the left**	**Same as to the left**
Method of attachment and target insurance	**Same as to the left**	**Same as to the left**	**Same as to the left**
Reinsurance scheme			
Limit of total amount of insurance claims to be paid due to a single earthquake, etc.	**7 trillion yen** Breakdown Government: 6.7386 trillion yen Private sector: 261.4 billion yen	**11.3 trillion yen** Breakdown Government: 10.9902 trillion yen Private sector: 309.8 billion yen	**11.3 trillion yen** Breakdown Government: 11.1178 trillion yen Private sector: 182.2 billion yen

*3 $\frac{304}{66380}$ *4 $\frac{332}{108621}$ *5 $\frac{332}{111173}$

	January 1, 2017	April 1, 2017	February 14, 2019
Property insured	**Same as to the left**	**Same as to the left**	**Same as to the left**
Insured event	**Same as to the left**	**Same as to the left**	**Same as to the left**
Coverage condition	**Total loss, Large half loss Small half loss, Partial loss**	**Same as to the left**	**Same as to the left**
Payment proportion of insurance claim (for the amount insured)	**Total loss: 100% Large half loss: 60% Small half loss: 30% Partial loss: 5%**	**Same as to the left**	**Same as to the left**
Attachment proportion	**Same as to the left**	**Same as to the left**	**Same as to the left**
Limit amount of participation	**Same as to the left**	**Same as to the left**	**Same as to the left**
Method of attachment and target insurance	**Same as to the left**	**Same as to the left**	**Same as to the left**
Reinsurance scheme	**Same as to the left**		
Limit of total amount of insurance claims to be paid due to a single earthquake, etc.	**Same as to the left**	**11.3 trillion yen** Breakdown Government: 11.1268 trillion yen Private sector: 173.2 billion yen	**11.3 trillion yen** Breakdown Government: 11.1695 trillion yen Private sector: 130.5 billion yen

*6 $\frac{168}{110756}$ *7 $\frac{168}{111610}$

	April 1, 2019	April 1, 2021
Property insured	**Same as to the left**	**Same as to the left**
Insured event	**Same as to the left**	**Same as to the left**
Coverage condition	**Same as to the left**	**Same as to the left**
Payment proportion of insurance claim (for the amount insured)	**Same as to the left**	**Same as to the left**
Attachment proportion	**Same as to the left**	**Same as to the left**
Limit amount of participation	**Same as to the left**	**Same as to the left**
Method of attachment and target insurance	**Same as to the left**	**Same as to the left**
Reinsurance scheme		
Limit of total amount of insurance claims to be paid due to a single earthquake, etc.	**11.7 trillion yen** Breakdown Government: 11.5662 trillion yen Private sector: 133.8 billion yen	**12.0 trillion yen** Breakdown Government: 11.7751 trillion yen Private sector: 224.9 billion yen

*8 $\frac{134}{115463}$

*9 $\frac{289}{117339}$

Note: See p. 46 for details of the reinsurance scheme as of April 1, 2021.

Transition of Earthquake Insurance Premium Rate

Enforcement date	Contents
June 1, 1966 (established)	

(yen per 1,000 yen amount insured)

Structural classification of buildings			Class A bldgs	Class B bldgs
Zone	Zone 1	Hokkaido, Aomori, Iwate, Miyagi, Akita, Yamagata, Fukushima, Ibaraki, Tochigi, Gumma, Niigata, Toyama, Ishikawa, Yamanashi, Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Tokushima, Kagawa, Ehime, Kochi, Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima, Okinawa*	0.60	2.10
	Zone 2	Tokyo (excluding Zone 3), Kanagawa (excluding Zone 3), Saitama, Chiba, Fukui, Nagano, Gifu, Shizuoka, Aichi, Mie, Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama	1.35	3.60
	Zone 3	Sumida-ku, Koto-ku and Arakawa-ku of Tokyo, Tsurumi-ku, Naka-ku and Nishi-ku in Yokohama City of Kanagawa, and Kawasaki-shi area east of Tokaido Line	2.30	5.00

* Okinawa was added in 1972 after reversion to Japanese administration.

＜Structural classification of buildings＞

“Class A buildings” refer to fireproof buildings and semi-fireproof buildings.

All other buildings are classified as “class B buildings.”

Enforcement date	Contents
July 1, 1980	

(yen per 1,000 yen amount insured)

Structural classification of buildings			Class A bldgs		Class B bldgs	
			Buildings	Households	Buildings	Households
Zone	Zone 1	Hokkaido, Fukushima, Gumma, Toyama, Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Tokushima, Kagawa, Ehime, Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima, Okinawa	0.70	0.50	2.30	1.70
	Zone 2	Aomori, Iwate, Miyagi, Akita, Yamagata, Ibaragi, Tochigi, Niigata, Ishikawa, Yamanashi, Kochi	0.80	0.60	2.90	2.00
	Zone 3	Fukui, Nagano, Gifu, Mie, Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama	1.40	1.00	3.70	2.60
	Zone 4	Saitama, Chiba, Aichi	1.60	1.10	4.20	3.00
	Zone 5	Tokyo, Kanagawa, Shizuoka	1.80	1.30	4.80	3.40

＜Structural classification of buildings＞

Same as above

<table>
<tr><th>Enforcement date</th><th>Contents</th></tr>
<tr><td>April 1, 1991</td><td>
(yen per 1,000 yen amount insured)
<table>
<tr><th colspan="3" rowspan="2">Structural classification of buildings</th><th colspan="2">Class A bldgs</th><th colspan="2">Class B bldgs</th></tr>
<tr><th>Buildings</th><th>Households</th><th>Buildings</th><th>Households</th></tr>
<tr><td rowspan="4">Zone</td><td>Zone 1</td><td>Hokkaido, Fukushima, Shimane, Okayama, Hiroshima, Yamaguchi, Kagawa, Fukuoka, Saga, Kagoshima, Okinawa</td><td>0.50</td><td>0.35</td><td>1.60</td><td>1.20</td></tr>
<tr><td>Zone 2</td><td>Aomori, Iwate, Miyagi, Akita, Yamagata, Ibaragi, Tochigi, Gumma, Niigata, Toyama, Ishikawa, Yamanashi, Tottori, Tokushima, Ehime, Kochi, Nagasaki, Kumamoto, Oita, Miyazaki</td><td>0.70</td><td>0.50</td><td>2.20</td><td>1.55</td></tr>
<tr><td>Zone 3</td><td>Saitama, Chiba, Fukui, Nagano, Gifu, Aichi, Mie, Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama</td><td>1.40</td><td>0.95</td><td>3.10</td><td>2.20</td></tr>
<tr><td>Zone 4</td><td>Tokyo, Kanagawa, Shizuoka</td><td>1.80</td><td>1.30</td><td>4.75</td><td>3.30</td></tr>
</table>
＜Structural classification of buildings＞
Same as above
</td></tr>
</table>

<table>
<tr><th>Enforcement date</th><th>Contents</th></tr>
<tr><td>January 1, 1996</td><td>
(yen per 1,000 yen amount insured)
<table>
<tr><th colspan="3">Structural classification of buildings</th><th>Class A bldgs</th><th>Class B bldgs</th></tr>
<tr><td rowspan="4">Zone</td><td>Zone 1</td><td>Hokkaido, Fukushima, Shimane, Okayama, Hiroshima, Yamaguchi, Kagawa, Fukuoka, Saga, Kagoshima, Okinawa</td><td>0.50</td><td>1.45</td></tr>
<tr><td>Zone 2</td><td>Aomori, Iwate, Miyagi, Akita, Yamagata, Ibaragi, Tochigi, Gumma, Niigata, Toyama, Ishikawa, Yamanashi, Tottori, Tokushima, Ehime, Kochi, Nagasaki, Kumamoto, Oita, Miyazaki</td><td>0.70</td><td>2.00</td></tr>
<tr><td>Zone 3</td><td>Saitama, Chiba, Fukui, Nagano, Gifu, Aichi, Mie, Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama</td><td>1.35</td><td>2.80</td></tr>
<tr><td>Zone 4</td><td>Tokyo, Kanagawa, Shizuoka</td><td>1.75</td><td>4.30</td></tr>
</table>
＜Structural classification of buildings＞
Same as above
</td></tr>
</table>

<table>
<tr><th>Enforcement date</th><th>Contents</th></tr>
<tr><td>October 1, 2001</td><td>
1. Basic rate
(yen per 1,000 yen amount insured)
<table>
<tr><th colspan="3">Structural classification of buildings</th><th>Class A bldgs</th><th>Class B bldgs</th></tr>
<tr><td rowspan="4">Zone</td><td>Zone 1</td><td>Hokkaido, Fukushima, Shimane, Okayama, Hiroshima, Yamaguchi, Kagawa, Fukuoka, Saga, Kagoshima, Okinawa</td><td>0.50</td><td>1.20</td></tr>
<tr><td>Zone 2</td><td>Aomori, Iwate, Miyagi, Akita, Yamagata, Ibaragi, Tochigi, Gumma, Niigata, Toyama, Ishikawa, Yamanashi, Tottori, Tokushima, Ehime, Kochi, Nagasaki, Kumamoto, Oita, Miyazaki</td><td>0.70</td><td>1.65</td></tr>
<tr><td>Zone 3</td><td>Saitama, Chiba, Fukui, Nagano, Gifu, Aichi, Mie, Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama</td><td>1.35</td><td>2.35</td></tr>
<tr><td>Zone 4</td><td>Tokyo, Kanagawa, Shizuoka</td><td>1.75</td><td>3.55</td></tr>
</table>
＜Structural classification of buildings＞
Same as above
<hr>
2. Discount rate
Following discount rates are applied to basic rate above.
(1) Construction age discount rate
10% discount, in case a building was constructed newly after June 1, 1981
(2) Earthquake resistance class discount rate
earthquake resistance class 3: 30% discount
earthquake resistance class 2: 20% discount
earthquake resistance class 1: 10% discount
(Note: discount rate cannot be applied together.)
</td></tr>
</table>

<table>
<tr><th>Enforcement date</th><th>Contents</th></tr>
<tr><td>April 1, 2005</td><td>
1. Basic rate
Same as above
<hr>
2. Discount rate
Same as above
<hr>
3. Coefficient
(1) Long-term coefficient
<table>
<tr><th>Policy period</th><th>Coefficient</th></tr>
<tr><td>2 years</td><td>1.90</td></tr>
<tr><td>3 years</td><td>2.75</td></tr>
<tr><td>4 years</td><td>3.60</td></tr>
<tr><td>5 years</td><td>4.45</td></tr>
</table>
(2) Return premium coefficient*
Omitted

* The return rate of an unearned premium in a lump-sum premium for a long-term policy in the case of modification or cancellations.
</td></tr>
</table>

Enforcement date	Contents
October 1, 2007	

1. Basic rate

(yen per 1,000 yen amount insured)

Structural classification of buildings			Class A bldgs	Class B bldgs
Zone	Zone 1	Iwate, Akita, Yamagata, Fukushima, Tochigi, Gumma, Toyama, Ishikawa, Fukui, Tottori, Shimane, Yamaguchi, Fukuoka, Saga, Nagasaki, Kumamoto, Kagoshima	0.50	1.00
	Zone 2	Hokkaido, Aomori, Miyagi, Niigata, Nagano, Gifu, Shiga, Kyoto, Hyogo, Nara, Okayama, Hiroshima, Oita, Miyazaki, Okinawa	0.65	1.27
	Zone 3	Kagawa	0.65	1.56
		Ibaraki, Yamanashi, Ehime	0.91	1.88
		Saitama, Osaka	1.05	1.88
	Zone 4	Tokushima, Kochi	0.91	2.15
		Chiba, Aichi, Mie, Wakayama	1.69	3.06
		Tokyo, Kanagawa, Shizuoka	1.69	3.13

(Note) Rate increases are capped in order to avoid drastic increases in rates. Because of this, rates may differ among the prefectures that belong to the same Zone.

＜Structural classification of buildings＞

Same as above

2. Discount rate

Following discount rates are applied to basic rate above.

(1) Construction age discount rate

10% discount, in case a building was constructed newly after June 1, 1981

(2) Earthquake resistance class discount rate

earthquake resistance class 3: 30% discount

earthquake resistance class 2: 20% discount

earthquake resistance class 1: 10% discount

(3) Seismic isolated buildings discount rate

30% discount

(4) Seismic resistance diagnosis discount rate

10% discount

(Note: discount rate cannot be applied together.)

3. Coefficient

Same as above

Enforcement date	Contents
January 1, 2010	1. Basic rate; 2. Discount rate; 3. Coefficient (see below)

1. Basic rate

(yen per 1,000 yen amount insured)

Structural classification of buildings			Class A bldgs	Class B bldgs
Zone	Zone 1	Iwate, Akita, Yamagata, Fukushima, Tochigi, Gumma, Toyama, Ishikawa, Fukui, Tottori, Shimane, Yamaguchi, Fukuoka, Saga, Nagasaki, Kumamoto, Kagoshima	0.50	1.00
	Zone 2	Hokkaido, Aomori, Miyagi, Niigata, Nagano, Gifu, Shiga, Kyoto, Hyogo, Nara, Okayama, Hiroshima, Oita, Miyazaki, Okinawa	0.65	1.27
	Zone 3	Kagawa	0.65	1.56
		Ibaraki, Yamanashi, Ehime	0.91	1.88
		Saitama, Osaka	1.05	1.88
	Zone 4	Tokushima, Kochi	0.91	2.15
		Chiba, Aichi, Mie, Wakayama	1.69	3.06
		Tokyo, Kanagawa, Shizuoka	1.69	3.13

(Note 1) Rate increases are capped in order to avoid drastic increases in rates. Because of this, rates may differ among the prefectures that belong to the same Zone.

(Note 2) For buildings covered by existing earthquake insurance riders on fire insurance policies that were in place before the January 1, 2010 revision of the criteria for structural classification of buildings, the increase in premium rates due to reclassification from "class A buildings" to "class B buildings" based on the new criteria is capped at 30%.

＜Structural classification of buildings＞

"Class A buildings" refer to fireproof buildings, semi-fireproof buildings, ordinance semi-fireproof buildings, etc.

All other buildings are classified as "class B buildings."

2. Discount rate

Same as above

3. Coefficient

Same as above

<table>
<tr><th>Enforcement date</th><th>Contents</th></tr>
<tr><td rowspan="3">July 1, 2014</td><td>
1. Basic rate
(yen per 1,000 yen amount insured)
<table>
<tr><th colspan="3">Structural classification of buildings</th><th>Class A bldgs</th><th>Class B bldgs</th></tr>
<tr><td rowspan="8">Zone</td><td>Zone 1</td><td>Iwate, Akita, Yamagata, Tochigi, Gumma, Toyama, Ishikawa, Fukui, Nagano, Shiga, Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Fukuoka, Saga, Nagasaki, Kumamoto, Kagoshima</td><td>0.65</td><td>1.06</td></tr>
<tr><td rowspan="2">Zone 2</td><td>Fukushima</td><td>0.65</td><td>1.30</td></tr>
<tr><td>Hokkaido, Aomori, Miyagi, Niigata, Yamanashi, Gifu, Kyoto, Hyogo, Nara, Kagawa, Oita, Miyazaki, Okinawa</td><td>0.84</td><td>1.65</td></tr>
<tr><td rowspan="4">Zone 3</td><td>Ibaraki, Ehime</td><td>1.18</td><td>2.44</td></tr>
<tr><td>Tokushima, Kochi</td><td>1.18</td><td>2.79</td></tr>
<tr><td>Saitama, Osaka</td><td>1.36</td><td>2.44</td></tr>
<tr><td>Chiba, Tokyo, Kanagawa, Shizuoka, Aichi, Mie, Wakayama</td><td>2.02</td><td>3.26</td></tr>
</table>
(Note 1) Rate increases are capped in order to avoid drastic increases in rates. Because of this, rates may differ among the prefectures that belong to the same Zone.
(Note 2) For buildings covered by existing earthquake insurance riders on fire insurance policies that were in place before the January 1, 2010 revision of the criteria for structural classification of buildings, the increase in premium rates due to reclassification from “class A buildings” to “class B buildings” based on the new criteria is capped at 30%.

＜Structural classification of buildings＞
Same as above
</td></tr>
<tr><td>
2. Discount rate
Following discount rates are applied to basic rate above.
(1) Construction age discount rate
10% discount, in case a building was constructed newly after June 1, 1981
(2) Earthquake resistance class discount rate
earthquake resistance class 3: 50% discount
earthquake resistance class 2: 30% discount
earthquake resistance class 1: 10% discount
(3) Seismic isolated buildings discount rate
50% discount
(4) Seismic resistance diagnosis discount rate
10% discount

(Note: discount rate cannot be applied together.)
</td></tr>
<tr><td>
3. Coefficient
Same as above
</td></tr>
</table>

Enforcement date	Contents
January 1, 2017	1. Basic rate; 2. Discount rate; 3. Coefficient (below)

1. Basic rate

(yen per 1,000 yen amount insured)

Structural classification of buildings			Class A bldgs	Class B bldgs
Zone	Zone 1	Iwate, Akita, Yamagata, Tochigi, Gumma, Toyama, Ishikawa, Fukui, Nagano, Shiga, Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Fukuoka, Saga, Nagasaki, Kumamoto, Kagoshima	0.68	1.14
		Hokkaido, Aomori, Niigata, Gifu, Kyoto, Hyogo, Nara	0.81	1.53
	Zone 2	Fukushima	0.74	1.49
		Miyagi, Yamanashi, Kagawa, Oita, Miyazaki, Okinawa	0.95	1.84
		Ehime	1.20	2.38
		Osaka	1.32	2.38
		Aichi, Mie, Wakayama	1.71	2.89
	Zone 3	Ibaraki	1.35	2.79
		Saitama	1.56	2.79
		Tokushima, Kochi	1.35	3.19
		Chiba, Tokyo, Kanagawa, Shizuoka	2.25	3.63

(Note 1) Rate increases are capped in order to avoid drastic increases in rates. Because of this, rates may differ among the prefectures that belong to the same Zone.

(Note 2) For buildings covered by existing earthquake insurance riders on fire insurance policies that were in place before the January 1, 2010 revision of the criteria for structural classification of buildings, the increase in premium rates due to reclassification from "class A buildings" to "class B buildings" based on the new criteria is capped at 30%.

＜Structural classification of buildings＞

Same as above

2. Discount rate

Same as above

3. Coefficient

Same as above

Enforcement date	Contents
January 1, 2019	(see below)

1. Basic rate

(yen per 1,000 yen amount insured)

Structural classification of buildings			Class A bldgs	Class B bldgs
Zone	Zone 1	Iwate, Akita, Yamagata, Tochigi, Gumma, Toyama, Ishikawa, Fukui, Nagano, Shiga, Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Fukuoka, Saga, Nagasaki, Kumamoto, Kagoshima	0.71	1.16
		Hokkaido, Aomori, Niigata, Gifu, Kyoto, Hyogo, Nara	0.78	1.35
	Zone 2	Fukushima	0.85	1.70
		Miyagi, Yamanashi, Kagawa, Oita, Miyazaki, Okinawa	1.07	1.97
		Ehime	1.20	2.24
		Osaka	1.26	2.24
		Aichi, Mie, Wakayama	1.44	2.47
	Zone 3	Ibaraki	1.55	3.20
		Saitama	1.78	3.20
		Tokushima, Kochi	1.55	3.65
		Chiba, Tokyo, Kanagawa, Shizuoka	2.50	3.89

(Note 1) Rate increases are capped in order to avoid drastic increases in rates. Because of this, rates may differ among the prefectures that belong to the same Zone.

(Note 2) For buildings covered by existing earthquake insurance riders on fire insurance policies that were in place before the January 1, 2010 revision of the criteria for structural classification of buildings, the increase in premium rates due to reclassification from "class A buildings" to "class B buildings" based on the new criteria is capped at 30%.

＜Structural classification of buildings＞

Same as above

2. Discount rate

Same as above

3. Coefficient

(1) Long-term coefficient

Policy period	Coefficient
2 years	1.90
3 years	2.80
4 years	3.70
5 years	4.60

(2) Return premium coefficient*

Omitted

* The return rate of an unearned premium in a lump-sum premium for a long-term policy in the case of modification or cancellations.

Enforcement date	Contents
January 1, 2021	

1. Basic rate

(yen per 1,000 yen amount insured)

Structural classification of buildings			Class A bldgs	Class B bldgs	
					Rates with a transitional measure
Zone	Zone 1	Hokkaido, Aomori, Iwate, Akita, Yamagata, Tochigi, Gumma, Niigata, Toyama, Ishikawa, Fukui, Nagano, Gifu, Shiga, Kyoto, Hyogo, Nara, Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Fukuoka, Saga, Nagasaki, Kumamoto, Kagoshima	0.74	1.23	1.23
	Zone 2	Fukushima	0.97	1.95	1.26
		Miyagi, Yamanashi, Kagawa, Oita, Miyazaki, Okinawa	1.18	2.12	1.63
		Aichi, Mie, Osaka, Wakayama, Ehime	1.18	2.12	2.12
	Zone 3	Ibaraki	1.77	3.66	2.29
		Saitama	2.04	3.66	2.64
		Tokushima, Kochi	1.77	4.18	2.29
		Chiba, Tokyo, Kanagawa, Shizuoka	2.75	4.22	3.93

(Note 1) Rate increases are capped in order to avoid drastic increases in rates. Because of this, rates may differ among the prefectures that belong to the same Zone.

(Note 2) The rates with a transitional measure are applied to buildings reclassified as “class B buildings” from “class A buildings” based on the new criteria for structural classification of buildings revised on January 1, 2010, provided that the buildings are covered by existing earthquake insurance riders on fire insurance policies that were in place before the revision.

＜Structural classification of buildings＞

Same as above

2. Discount rate

Same as above

3. Coefficient

(1) Long-term coefficient

Policy period	Coefficient
2 years	1.90
3 years	2.85
4 years	3.75
5 years	4.65

(2) Return premium coefficient*

Omitted

* The return rate of an unearned premium in a lump-sum premium for a long-term policy in the case of modification or cancellations.

Enforcement date	Contents
October 1, 2022	1. Basic rate

(yen per 1,000 yen amount insured)

Structural classification of buildings			Class A bldgs	Class B bldgs	
					Rates with a transitional measure
Zone	Zone 1	Hokkaido, Aomori, Iwate, Akita, Yamagata, Tochigi, Gumma, Niigata, Toyama, Ishikawa, Fukui, Nagano, Gifu, Shiga, Kyoto, Hyogo, Nara, Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Kagoshima	0.73	1.12	1.12
	Zone 2	Fukushima	1.16	1.95	1.63
		Miyagi, Yamanashi, Aichi, Mie, Osaka, Wakayama, Kagawa, Ehime, Miyazaki, Okinawa	1.16	1.95	1.95
	Zone 3	Ibaraki, Tokushima, Kochi	2.30	4.11	2.97
		Saitama	2.65	4.11	3.43
		Chiba, Tokyo, Kanagawa, Shizuoka	2.75	4.11	4.11

(Note 1) Rate increases are capped in order to avoid drastic increases in rates. Because of this, rates may differ among the prefectures that belong to the same Zone.

(Note 2) The rates with a transitional measure are applied to buildings reclassified as "class B buildings" from "class A buildings" based on the new criteria for structural classification of buildings revised on January 1, 2010, provided that the buildings are covered by existing earthquake insurance riders on fire insurance policies that were in place before the revision.

＜Structural classification of buildings＞

Same as above

2. Discount rate

Same as above

3. Coefficient

(1) Long-term coefficient

Policy period	Coefficient
2 years	1.90
3 years	2.85
4 years	3.75
5 years	4.70

(2) Return premium coefficient*

Omitted

* The return rate of an unearned premium in a lump-sum premium for a long-term policy in the case of modification or cancellations.

Explanation of the Seismic Intensity Scale of the Japan Meteorological Agency

(March 2009)

Notes on using this table:

1. The seismic intensity values reported by the Meteorological Agency are measured by seismometers, which are generally placed at ground level or on the ground floor of buildings. This explanation describes what happens and what kinds of damage occur in the area where a certain seismic intensity is measured. Seismic intensity levels are not determined according to the situations described.

2. Seismic motions are highly dependent on ground and topography. Seismic intensity is a value measured by a seismometer at a certain location, and seismic intensity values may vary from place to place, even within the same municipality. Even within the same building, the strength of shaking depends on the story and location, and shaking is generally stronger for the upper stories of a mid- to high-rise building than the ground floor.

3. Even when the seismic intensity is the same, the amount of damage may vary because of differences in the amplitude (amount of shaking), frequency (periodicity of repeated shakes), and duration (length of shaking) of seismic motions, as well as differences in the building or structure and differences in the ground.

4. The descriptions in this explanation are based on the kinds of damage that are typically observed when a certain seismic intensity is measured, but the actual damage may be more or less than described. Also, not all of the situations described for a seismic intensity level may necessarily occur in each case.

5. This explanation is primarily based on observed damage from earthquakes in recent years. It is reviewed approximately every five years and revised if necessary; for example, if new observations show that the descriptions of damage are no longer valid because of improved earthquake resistance in buildings and structures.

Seismic intensity	How it feels	What happens indoors	What happens outdoors	Wooden buildings (housing)		Reinforced concrete buildings (housing)	
				Low earthquake resistance	High earthquake resistance	Low earthquake resistance	High earthquake resistance
0	Nothing is felt, but seismographs record a tremor.	-	-				
1	Some people sitting quietly indoors feel a slight tremor.	-	-				
2	Most people sitting quietly indoors feel a tremor. If asleep, some are awakened.	Hanging objects such as light fixtures sway slightly.	-				
3	Most people in buildings feel shaking. If walking, some people feel shaking. If asleep, most are awakened.	Dishes in cupboards may rattle.	Electric wires swing slightly.				
4	Most people are startled. If walking, most feel shaking. If sleeping, nearly all are awakened.	Hanging objects such as light fixtures swing widely, and dishes in cupboards rattle noisily. Unstable objects may fall over.	Electric wires swing widely. Some notice shaking while driving vehicles.				
5-lower	Most people are frightened and hold onto something for support.	Hanging objects such as light fixtures swing violently. Dishes in cupboards and books on shelves may fall. Most unstable objects fall over. Furniture that is not fixed in place may move, and unstable furniture may fall.	Some windows may break. Electric poles sway. Streets may be damaged.	-	Slight cracks may be seen in walls, etc.		
5-upper	It is difficult to move around, and most people find it impossible to walk without holding onto something.	Many dishes in cupboards and books on shelves fall. TV sets may fall off their stands. Furniture that is not fixed in place may fall.	Window panes may break and fall. Unreinforced concrete block walls may collapse. Poorly installed vending machines may topple. Driving is difficult and some drivers stop their vehicles.	-	Cracks may be seen in walls, etc.	-	Cracks may be seen in walls, beams, pillars, and other members.
6-lower	It is difficult to remain standing.	Most furniture that is not fixed in place moves and may fall. Some doors cannot be opened.	Wall tiles and window panes may break and fall.	Slight cracks may be seen in walls, etc.	Many cracks are seen in walls, etc., and some cracks may be large. Roofing tiles may fall. Buildings may lean, and some may collapse.	Cracks may be seen in walls, beams, pillars, and other members.	Many cracks are seen in walls, beams, pillars, and other members.
6-upper	Standing is impossible, and people can only crawl. Shaking is so strong that people cannot move about and may be thrown.	Almost all furniture that is not fixed in place moves, and much of it falls.	Wall tiles and window panes in many buildings are broken and fall. Almost all unreinforced concrete block walls collapse.	Cracks may be seen in walls, etc.	Many large cracks are seen in walls, etc. Many buildings lean or collapse.	Many cracks are seen in walls, beams, pillars, and other members.	Walls, beams, pillars, and other members may lean and show X-shaped cracks. Ground-level and middle story pillars may collapse.
7		Almost all furniture that is not fixed in place moves and falls, and some is thrown.	Wall tiles and window panes in even more buildings are broken and fall. Even some reinforced concrete block walls may collapse.	Many cracks are seen in walls, etc. Some buildings may lean.	Even more buildings lean or collapse.	Even more cracks are seen in walls, beams, pillars, and other members. Ground-level and middle stories may be deformed and some may lean.	Many walls, beams, pillars, and other members lean and show X-shaped cracks. Many ground-level and middle story pillars collapse.

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