

# **Extract of the 2017 White Paper on Fire Service**

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**Fire and Disaster Management Agency  
(FDMA)**

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Section 1

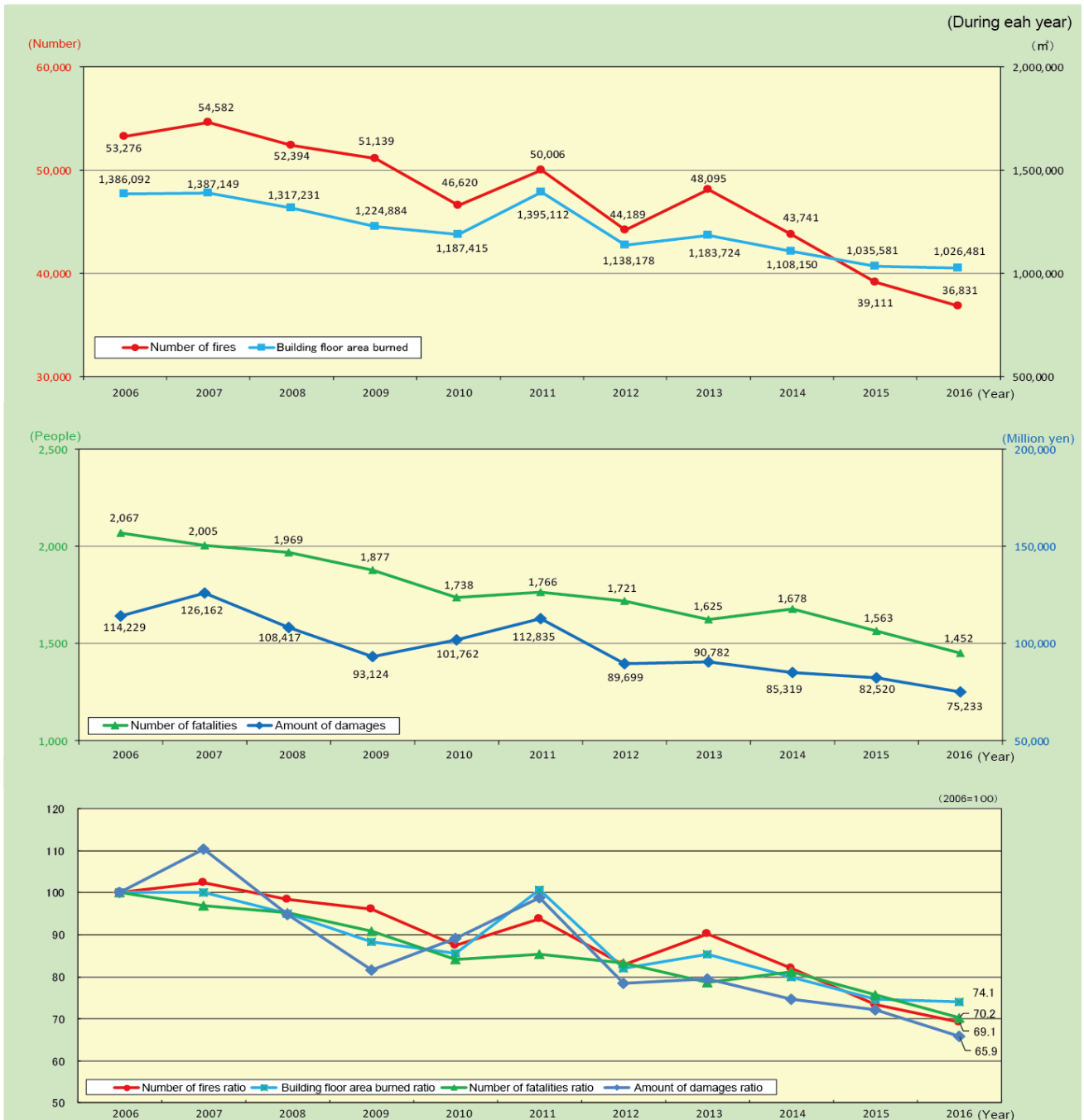
# Fire Prevention

## Current Status and Recent Trends with Fires

Looking at the number of fires over the past ten years reveals that this number has largely been trending downwards since 2006. The number of fires that occurred in 2016 came to 36,831, falling by 2,280 (5.8%) compared to the previous year, which is 69.1% of the number from

ten years prior (the number of fires in 2006). Furthermore, the number of fatalities from fires has also largely been trending downward since 2006. The number of fatalities from fires in 2016 came to 1,452, a decrease of 111 (7.1%) compared with the previous year, or 70.2% that from ten years ago (based on the number of fatalities from fires in 2006) (Fig. 1-1-1, Table 1-1-1).

Fig. 1-1-1 Changes in the number of fires and their trends



(Notes) 1 Prepared from Fire Reports

2 See the left axis for the number of fires, number of fatalities, number of fires ratio, building floor area burned ratio, number of fatalities ratio, and amount of damages ratio, and the right axis for the building floor area burned and the amount of damages

3 The number of fires ratio, building floor area burned ratio, number of fatalities ratio, and amount of damages ratio are ratios found by taking the values from 2006 to be 100

**Table1-1-1 Status of fires**

(During each year)

Classification	Unit	2006	2015 (A)	2016 (B)	Change (B) - (A) (C)	Rate of change (C) / (A) × 100 (%)
No. of fires	Fires	53,276	39,111	36,831	△ 2,280	△ 5.8
Building fires		31,506	22,197	20,991	△ 1,206	△ 5.4
Forest fires		1,576	1,106	1,027	△ 79	△ 7.1
Vehicle fires		6,243	4,188	4,053	△ 135	△ 3.2
Ship fires		102	97	72	△ 25	△ 25.8
Aircraft fires		1	7	3	△ 4	△ 57.1
Other fires		13,848	11,516	10,685	△ 831	△ 7.2
No. of buildings burned	Buildings	42,612	31,780	30,032	△ 1,748	△ 5.5
Totally destroyed		8,867	7,131	6,722	△ 409	△ 5.7
Half destroyed		3,092	1,834	1,728	△ 106	△ 5.8
Partially destroyed		12,921	8,538	7,968	△ 570	△ 6.7
Minor fire		17,732	14,277	13,614	△ 663	△ 4.6
Building floor area burned	m <sup>2</sup>	1,386,092	1,035,581	1,026,481	△ 9,100	△ 0.9
Building surface area burned	m <sup>2</sup>	143,185	112,797	112,652	△ 145	△ 0.1
Forest area burned	a	82,925	53,844	38,411	△ 15,433	△ 28.7
Fatalities	People	2,067	1,563	1,452	△ 111	△ 7.1
Injured	People	8,541	6,309	5,899	△ 410	△ 6.5
No. of households affected	Households	29,144	19,701	18,335	△ 1,366	△ 6.9
Totally destroyed		6,533	4,416	4,064	△ 352	△ 8.0
Half destroyed		2,466	1,439	1,253	△ 186	△ 12.9
Partially destroyed		20,145	13,846	13,018	△ 828	△ 6.0
No. of people affected	People	73,898	44,443	40,970	△ 3,473	△ 7.8
Amount of damages	Millions	114,229	82,520	75,233	△ 7,287	△ 8.8
Building fires		107,699	75,754	68,914	△ 6,840	△ 9.0
Forest fires		134	255	157	△ 98	△ 38.4
Vehicle fires		2,895	2,165	2,293	128	5.9
Ship fires		342	579	488	△ 91	△ 15.7
Aircraft fires		2	496	920	424	85.5
Other fires		2,240	3,079	2,048	△ 1,031	△ 33.5
Explosions		917	193	412	219	113.5
Fire outbreak rate	Fires/10,000	4.2	3.1	2.9	△ 0.2	-

- (Notes)
- 1 Prepared from Fire Reports
  - 2 The figures for each year are calculations of the fires that occurred between January - December. The same holds true in this section hereafter unless otherwise noted.
  - 3 "Building fires" refer to fires that burn buildings or the contents contained therein. The same holds true in this section hereafter unless otherwise noted.
  - 4 "Forest fires" refer to fires that burn forests, wilderness, or grassland. The same holds true in this section hereafter unless otherwise noted.
  - 5 "Vehicle fires" refer to fires that burn automotive vehicles, railway vehicles, trailer vehicles, or their cargo. The same holds true in this section hereafter unless otherwise noted.
  - 6 "Ship fires" refer to fires that burn ships or their cargo. The same holds true in this section hereafter unless otherwise noted.
  - 7 "Aircraft fires" refer to fires that burn aircraft or their cargo. The same holds true in this section hereafter unless otherwise noted.
  - 8 "Other fires" refer to fires other than building fires, forest fires, vehicle fires, ship fires and aircraft fires (fires involving vacant land, fields, roads, flood plains, waste collection sites, outdoor item collection sites, train tracks, utility poles, etc.). The same holds true in this section hereafter unless otherwise noted.
  - 9 Fatalities includes those people who were injured by fires and passed away within 48 hours. The same holds true in this section hereafter unless otherwise noted.
  - 10 The fire outbreak rate refers to the number of fires per 10,000 people. The same holds true in this section hereafter unless otherwise noted.
  - 11 Amount of damages and so forth include cases that are still under investigation, and so this may change. The same holds true in this section hereafter unless otherwise noted.
  - 12 The symbol "-" indicates negative numbers. The same holds true in this section hereafter unless otherwise noted.
  - 13 Rate of change was found by rounding up less than whole numbers with the displayed units. The same holds true in this section hereafter unless otherwise noted.
  - 14 The population for 2006 was found from the Basic Resident Register as of March 31, the population for 2015 was found from a Survey on the Current Status of Fire and Disaster Prevention and Earthquake Countermeasures as of March 31 for each year, and the population for 2016 was found from the Basic Resident Register as of January 1.
  - 15 If a fire is spread across more than two types of fires, it is aggregated into the number of fires based on which type had the larger amount of damages. For the amount of damages, this is aggregated for each type of fire by the objects damaged in the fire (building, vehicle, forest, ship, aircraft, or other). The same holds true in this section hereafter unless otherwise noted.
  - 16 The amount of damages from "Explosions" is posted to "Explosions" within "Amount of damages" without regard to the type of fire.
  - 17 The figures in the total column may not align with the totals for each figure due to rounding. The same holds true in this section hereafter unless otherwise noted.

## Current Status of Fire Prevention Administration

### 1. Current Status of Residential Fire Prevention Measures

The number of residential fires in 2016 (10,523, excluding those from arson) accounted for roughly 50% of the number of building fires (19,410, excluding those from arson). What is more, the number of fatalities from residential fires (885, excluding suicides by arson), accounts for roughly 90% of the number of fatalities from building fires (985, excluding suicides by arson). In addition, elderly people age 65 or older account for approximately 70% of the fatalities from residential fires.

The revision of the Fire Services Act in 2004 mandated that residential fire alarms be installed in newly-built residences starting from June 2006. As for existing residences, it mandated that said alarms be installed in them within all municipalities nationwide based on the ordinances in each municipality by June 2011. The Fire and Disaster Management Agency (FDMA) held the Committee on Measures to Install Residential Fire Alarms. Based on the Basic Policy on Measures to Install Residential Fire Alarms established at this committee,

various initiatives have been deployed to ensure that residential fire alarms are thoroughly installed and maintained. This is done by the fire defense headquarters throughout Japan in cooperation with volunteer fire corps, women's (female) firefighting clubs, voluntary disaster prevention organizations, and others. As of June 1, 2017, the nationwide installation rate\*<sup>1</sup> was 81.7% and the ordinance compliance rate\*<sup>2</sup> was 66.4%. When viewed by prefecture, Fukui Prefecture had the highest installation rate, and Ishikawa Prefecture had the highest ordinance compliance rate. (Table 1-1-15, Attachment 1-1-25)

### 2. Fire Prevention Properties

The Fire Services Act defines the primary properties that are eligible for fire prevention administration, such as architectural structures, as "fire prevention properties." It also mandates that personnel structures for fire prevention be established, fire defence equipment etc.\*<sup>3</sup> be installed, and flame retardant goods be used at those fire prevention properties listed in Appended Table I of the Ordinance of Enforcement for the Fire Services Act according to their purpose, size, and so forth.

**Table 1-1-15 Installation rate of home fire alarms and rate of compliance with regulations by prefecture (June 1, 2017)**  
(Since this is a sampling study, each of the figures contains a certain degree of measurement error.)

Prefecture	Installation rate	Regulation compliance rate	Prefecture	Installation rate	Regulation compliance rate
All of Japan	81.7%	66.4%	Mie	77.4% (34)	67.4% (17)
Hokkaido	84.6% (11)	71.0% (10)	Shiga	83.6% (13)	65.2% (20)
Aomori	76.9% (37)	59.3% (39)	Kyoto	87.8% (6)	73.5% (7)
Iwate	85.8% (9)	63.2% (27)	Osaka	82.9% (15)	76.0% (5)
Miyagi	88.9% (3)	60.3% (36)	Hyogo	86.7% (7)	68.6% (14)
Akita	81.3% (19)	68.6% (14)	Nara	79.8% (27)	74.6% (6)
Yamagata	80.4% (26)	56.0% (44)	Wakayama	79.5% (28)	62.4% (31)
Fukushima	74.7% (41)	58.3% (41)	Tottori	82.8% (17)	62.3% (32)
Ibaraki	74.0% (43)	61.9% (33)	Shimane	82.5% (18)	62.7% (30)
Tochigi	73.2% (44)	61.4% (35)	Okayama	75.8% (40)	60.1% (38)
Gunma	71.8% (45)	57.8% (43)	Hiroshima	85.9% (8)	76.8% (4)
Saitama	77.8% (31)	61.5% (34)	Yamaguchi	83.3% (14)	72.6% (8)
Chiba	77.6% (32)	60.3% (36)	Tokushima	77.4% (34)	63.4% (26)
Tokyo	88.6% (4)	71.8% (9)	Kagawa	77.0% (36)	63.5% (25)
Kanagawa	82.9% (15)	69.9% (12)	Ehime	81.2% (21)	70.4% (11)
Niigata	83.7% (12)	66.1% (18)	Kochi	76.8% (38)	57.9% (42)
Toyama	84.7% (10)	67.5% (16)	Fukuoka	79.0% (30)	63.7% (24)
Ishikawa	87.9% (5)	84.7% (1)	Saga	71.1% (46)	52.5% (46)
Fukui	94.6% (1)	83.4% (2)	Nagasaki	77.5% (33)	58.7% (40)
Yamanashi	74.5% (42)	64.7% (23)	Kumamoto	80.5% (24)	65.3% (19)
Nagano	81.1% (22)	62.9% (29)	Oita	79.5% (28)	63.2% (27)
Gifu	81.3% (19)	64.9% (22)	Miyazaki	80.5% (24)	68.9% (13)
Shizuoka	76.5% (39)	65.2% (20)	Kagoshima	89.1% (2)	77.4% (3)
Aichi	80.6% (23)	52.9% (45)	Okinawa	57.5% (47)	42.4% (47)

(Notes) ( ) The numbers in parenthesis show the rank in order starting with the prefectures with the highest installation rates and so forth.

\*<sup>1</sup> The "installation rate" refers to the share of households that have installed fire defense equipment in at least one location of the sections of their home in which they are obligated to do so due to municipal fire prevention ordinances (including households that are exempt from installing home fire alarms on account of having installed fire alarm systems, etc.) out of the total number of households.

\*<sup>2</sup> The "ordinance compliance rate" refers to the share of households that have installed fire defense equipment in every section of their home in which they are obligated to do so due to municipal fire prevention ordinances (including households that are exempt from installing home fire alarms on account of having installed fire alarm systems, etc.) out of the total number of households.

\*<sup>3</sup> Fire defence equipment etc.: Equipment for extinguishing fires, evacuation, and other fire protection activities (fire extinguishers, sprinkler systems, automatic fire alarms, fire escape equipment, guide lights, etc.)

As of March 31, 2017, the number of fire prevention properties throughout Japan came to 4,089,941 (this is the number obtained from the Survey on the Actual Conditions of Fire Prevention Properties (targeting those fire prevention properties listed in Appended Table I of the Ordinance of Enforcement for the Fire Services Act that are listed in (1) through (16-3) and have a total area of 150m<sup>2</sup> or larger, and those listed in (17) through (19)); the same hereafter).

Moreover, the number of fire prevention properties in the 21 major cities (special wards of Tokyo and ordinance-designated cities) came to 1,129,944, accounting for 27.6% of the total fire prevention properties throughout Japan. Those properties that are particularly concentrated in urban areas include underground malls (85.7% of the national total), semi-underground malls<sup>\*4</sup> (85.7% of the national total),

stores engaged in sex-related businesses, etc. (54.9% of the national total) (Table 1-1-16).

### 3. Fire Prevention Management System

#### (1) Fire Protection Managers

The Fire Services Act mandates that people with authority when it comes to managing fire prevention properties that contain large numbers of people (hereafter referred to as “management officials”) undertake the operations necessary for fire protection management. These include appointing the fire protection managers<sup>\*5</sup> that form the core of voluntary fire protection management structures, as well as preparing firefighting plans for fire protection management<sup>\*6</sup> that include stipulations on firefighting, reporting, and holding disaster drills.

**Table 1-1-16 Number of fire prevention properties**

(As of March 31, 2017)

Classification of fire prevention properties				Nationwide	21 major cities	Percentage (%)	Classification of fire prevention properties				Nationwide	21 major cities	Percentage (%)	
(1)	a	Theaters, etc.		4,392	657	15.0	(6)	c	(3) Nursery schools, etc.		32,344	6,456	20.0	
	b	Public halls, etc.		66,093	6,232	9.4			(4) Child development support centers, etc.		2,457	499	20.3	
(2)	a	Cabarets, etc.		902	122	13.5	(7)	d	(5) Welfare centers for disabled persons, etc.		18,051	2,733	15.1	
	b	Game centers, etc.		10,464	1,988	19.0			Subtotal		76,975	14,017	18.2	
	c	Stores engaged in sex-related businesses, etc.		206	113	54.9			(7) Kindergartens, etc.		17,618	4,119	23.4	
	d	Karaoke box and stores, etc.		2,728	650	23.8			(8) Schools		127,977	28,311	22.1	
(3)	a	Restaurants, etc.		3,089	530	17.2	(8) Libraries, etc.		7,605	856	11.3			
	b	Eating and drinking houses		83,140	16,829	20.2	(9)	a	Special bathhouses		1,527	671	43.9	
(4)	Department stores, etc.		160,744	27,984	17.4	b		General bathhouses		4,686	1,181	25.2		
(5)	a	Hotels, etc.		58,668	6,034	10.3	(10)	Railroad depots		3,943	1,406	35.7		
	b	Apartment houses, etc.		1,311,632	486,994	37.1	(11)	Temples and shrines, etc.		57,547	11,882	20.6		
(6)	a	(1) Hospitals requiring nursing care for patients in order to evacuate		12,128	1,845	15.2	(12)	a	Factories, etc.		491,547	68,738	14.0	
		(2) Medical clinics with beds requiring aid for patients in order to evacuate		3,895	879	22.6		b	Studios		429	131	30.5	
		(3) Hospitals (not including those listed in (1)), medical clinics with beds (not including those listed in (2)), and birth centers with beds		8,904	2,296	25.8		(13)	a	Parking lots, etc.		51,914	14,944	28.8
		(4) Medical clinics without beds and birth centers without beds		38,560	7,096	18.4			b	Aircraft hangars		810	110	13.6
Subtotal		63,487	12,116	19.1	(14)	Warehouses		328,311	52,085	15.9				
(6)	b	(1) Short-term welfare facilities for the elderly		40,019	7,277	18.2	(15)	Offices, etc.		471,499	106,753	22.6		
		(2) Shelters		217	37	17.1	(16)	a	Specified multipurpose fire prevention properties		365,954	135,565	37.0	
		(3) Nurseries		128	27	21.1		b	Unspecified multipurpose fire prevention properties		259,541	118,658	45.7	
		(4) Welfare facilities for disabled children		509	71	13.9	(16-2)	Underground malls		63	54	85.7		
		(5) Support facilities for the disabled		5,533	737	13.3	(16-3)	Semi-underground malls		7	6	85.7		
Subtotal		46,406	8,149	17.6	(17)	Cultural properties		8,721	1,581	18.1				
(6)	c	(1) Elderly daycare centers, etc.		23,829	4,268	17.9	(18)	Arcades		1,316	478	36.3		
		(2) Rehabilitation facilities		294	61	20.7	(19)	Mountain forests		0	0	-		
<b>Total</b>				<b>4,089,941</b>	<b>1,129,944</b>	<b>27.6</b>								

- (Notes) 1 Prepared based on the Survey on the Actual Conditions of Fire Prevention Properties (targeting those fire prevention properties listed in Appended Table I of the Ordinance of Enforcement for the Fire Services Act that are listed in (1) through (16-3) and have a total area of 150m<sup>2</sup> or larger, and those listed in (17) through (19); the same hereafter).
- 2 The 21 major cities refer to the 23 wards of Tokyo and 20 ordinance-designated cities (Sapporo City, Sendai City, Saitama City, Chiba City, Yokohama City, Kawasaki City, Sagami-hara City, Niigata City, Shizuoka City, Hamamatsu City, Nagoya City, Kyoto City, Osaka City, Sakai City, Kobe City, Okayama City, Hiroshima City, Kitakyushu City, Fukuoka City, and Kumamoto City).

<sup>\*4</sup> Semi-underground mall: A combination of an underground passage and shops established in the basement of a building that stand in a row facing this underground passage.

<sup>\*5</sup> Fire protection managers: People who have been appointed from among those management officials who have certain qualifications, such as having completed a training course on fire protection management for fire prevention properties, and who are in a managerial or supervisory position where they can appropriately carry out the operations necessary for fire protection management at said properties.

<sup>\*6</sup> Firefighting plans for fire protection management: These are plans that establish matters which are necessary for fire protection management. Said plans are prepared by fire protection managers, with fire protection management operations carried out on the basis of said plans.



As of March 31, 2017, the number of fire prevention properties that were legally required to establish fire protection management structures and appoint fire protection managers came to 1,069,966 nationwide. Of these, 869,471 properties, which corresponds to 81.3%, have appointed fire protection managers and have notified firefighting agencies to this effect. Additionally, the number of fire prevention properties where the fire protection manager has prepared firefighting plans for fire protection management in order to carry out the proper fire protection management operations for their own offices and so forth and notified firefighting agencies to this effect came to 807,742, for 75.5% of the total (Table 1-1-40).

## **(2) Supervisors of Fire Protection Management**

For properties like high-rise buildings (buildings that are taller than 31 m high), underground malls, semi-underground malls, and other specified properties under fire prevention at or above a certain size<sup>\*7</sup> where management authority has been divided up, the Fire Services Act stipulates that fire protection managers are to be appointed and carry out fire protection management for each of the various areas which they have management authority over. Conversely, it also states that supervisors of fire protection management are to be appointed in consultation with them in order to carry out fire protection management for the building as a whole in an integrated manner. It mandates that the management officials strive to prevent fires and maintain the safety of the fire prevention properties as a whole by preparing firefighting plans for fire protection management for said properties on the whole, as well as extinguishing fires, issuing reports, and holding evacuation drills (Supervisory Fire protection management System: enacted April 1, 2014).

As of March 31, 2017, the number of fire prevention properties that were required to appoint supervisors of fire protection management came to 86,273 nationwide. Of these, 46,701, which corresponds to 54.1%, have appointed supervisors of fire protection management and notified firefighting agencies to this effect. What is more, the number of fire prevention properties that have prepared overall fire prevention plans for the sake of carrying out fire protection management for the building as a whole in an integrated manner and that have notified firefighting agencies to this effect came to 45,804, which is 53.1% of the total (Attachment 1-1-41).

## **(3) Periodic Inspection and Reporting System for Fire Prevention Properties**

To prevent fires from occurring and mitigate the damage they do, it is important for not only firefighting agencies but also personnel from the fire prevention properties, to perform maintenance for fire prevention with said properties and strive to comply with fire prevention laws and ordinances.

Therefore, the Fire Services Act mandates that management officials at fire prevention properties with certain purposes or structures or the like have people with expert knowledge when it comes to fire prevention (hereafter referred to as “qualified inspectors of fire prevention properties”) perform inspections and report the results of these to firefighting agencies once a year.

These qualified inspectors of fire prevention properties consist of people with a certain level of knowledge of fire

prevention, such as fire protection engineers<sup>\*8</sup> with three or more years of practical experience with construction work for fire defence equipment etc., or people with three or more years of practical experience as fire protection managers. They must also complete a training course offered by a corporation that has been registered by the Minister of Internal Affairs and Communications, and have been issued a certificate attesting that they have acquired the necessary knowledge and skills when it comes to inspections for fire prevention properties.

What is more, these inspectors are obligated to undergo re-training every five years for new knowledge and skills that they must learn.

As of March 31, 2017, the number of such inspectors came to 29,964.

Those fire prevention properties for which periodic inspection reports have been mandated and which have been carrying out management for three or more years continuously are exempt from the duty to perform three-year inspections and reports if they meet a certain criteria. This criteria is that they have been acknowledged as having excellent compliance with the standards from fire prevention laws and ordinances as a result of inspections carried out by a firefighting agency on the basis of an application from the management officials from said property under fire prevention measures.

Fire prevention properties that have been acknowledged as being in compliance with the inspection standards by the inspectors for these properties may display a “Fire Prevention Standard Inspection Certificate of Completion.” Those that have been acknowledged as having excellent compliance with the standards in fire prevention laws and ordinances by firefighting agencies may display a “Fire Prevention Certificate of Excellence.”

## **4. Disaster Prevention Management System**

### **(1) Disaster Protection Managers**

In order to handle imminent threats such as major earthquakes, the Fire Services Act mandates that those people with authority for the management of large-scale and high-rise buildings and the like (hereafter referred to as “management officials”) are to establish fire defense organizations for self protection.<sup>\*9</sup> Such organizations prepare firefighting plans for disaster protection management<sup>\*10</sup> suited to earthquake and other disasters, and appoint disaster protection managers<sup>\*11</sup> responsible for emergency response structures concerning significant damage when earthquakes strike and for holding evacuation drills. In addition, they carry out the necessary operations in order to mitigate the damage from fires and other disasters (Disaster Prevention Management System: enacted June 1, 2009).

As of March 31, 2017, the number of properties under disaster prevention measures that were legally required to establish disaster protection management systems and appoint disaster protection managers came to 9,452 throughout Japan. Of these, 7,884, which corresponds to 83.4%, have appointed disaster protection managers and notified firefighting agencies to this effect.

What is more, the number of properties under disaster prevention measures at which the disaster protection manager has prepared firefighting plans for disaster

protection management, in order to carry out the appropriate disaster protection management operations at their own offices and other establishments, and notified firefighting agencies to this effect came to 7,316, or 77.4% of the total. The number of said properties that have established fire defense organizations for self-protection came to 8,336, or 88.2% of the total (Table 1-1-42).

## (2) Supervisors of Disaster Protection Management

For those buildings that require disaster protection management where management authority has been divided up, the Fire Services Act stipulates that disaster protection managers are to be appointed and carry out disaster protection management for each of the various areas which they have management authority over. Conversely, it also stipulates that supervisors of disaster protection management are to be appointed in consultation with them in order to carry out disaster protection management for the building as a whole in an integrated manner. It mandates that the management officials establish fire and disaster safety for the disaster prevention properties as a whole (supervisory disaster protection management system: enacted April 1, 2014).

As of March 31, 2017, the number of fire prevention properties that were required to appoint supervisors of disaster protection management came to 3,025 nationwide. Of these, 2,662, which corresponds to 88.0%, have appointed supervisors of disaster protection management and notified firefighting agencies to this effect. What is more, the number of disaster prevention properties that have prepared firefighting plans for the sake of carrying out disaster protection management for the building as a whole in an integrated manner and that have notified firefighting agencies to this effect, came to 2,556, which is 84.5% of the total (Attachment 1-1-43).

## 5. Onsite Inspections and Corrections of Violations

### (1) Current Status for Onsite Inspections and Corrections of Violations

Firefighting agencies enter fire prevention properties to perform onsite inspections pursuant to the regulations of Article 4 of the Fire Services Act when it is necessary to do so for the sake of fire prevention.

The number of times onsite inspections were carried out by firefighting agencies throughout Japan in FY2016 came to 882,190 (Attachment 1-1-44).

Fire chiefs or fire station chiefs may order measures that must be taken with respect to deficiencies in fire protection management at the fire prevention properties, fire defence equipment etc. that has not been installed at such properties, or other problems brought to light through the onsite inspections. Such measures include appointing

fire protection managers and installing fire defence equipment etc. or special fire defence equipment etc., pursuant to the regulations in Article 8, Article 8-2, or Article 17-4 of the Fire Services Act. In cases where this is recognized as posing a hazard for fire prevention, they can order that the necessary measures be taken, such as repairing or relocating the fire prevention properties in question or removing the hazards from them, or else question or removing the hazards from them, or else prohibiting or restricting their use, pursuant to the regulations in Article 5, Article 5-2, or Article 5-3 of the Fire Services Act. The act states that they must publicly announce when they issue orders such as these.

In cases where violations of fire prevention laws or ordinances are discovered as a result of these onsite inspections, the fire chief or fire station chief works to redress these violations to bring them back into legal compliance, such as by issuing warnings or other remedial instructions, orders, and so on (Attachments 1-1-45, 1-1-46, 1-1-47, and 1-1-48).

Particularly for specified violating properties (this refers to specified fire prevention properties with a floor area of 1,500m<sup>2</sup> or more or unspecified fire prevention properties with 11 or more floors, excluding the basement, where sprinkler systems, indoor fire hydrants, or fire alarm systems have not been installed in a majority of the sections where such equipment must be installed), strict guidance is imposed based on the severity of the violation, such as those that pose a significant hazard to human life in the event that a fire should break out.

As of March 31, 2017, there were 392 specified violating properties, and so therefore it is necessary to continue working to thoroughly correct these violations in a focused manner (Table 1-1-17).

### (2) Fire Safety Certification Mark

This new labeling system, which fire defense headquarters throughout Japan were notified of in October 2013, provides users with information on a building's compliance with laws and ordinances related to fire prevention and construction. Applications began being tendered and received on April 1, 2014, and hotels, Japanese-style hotels, and other facilities began sequentially putting the silver display marks out on display starting from August 1, 2014.

In addition, those hotels and other facilities that have been issued silver display marks for three years in a row and which meet the standards related to laws and ordinances on fire protection and construction are allowed to display a gold display mark.

Visitors to the FDMA's homepage can check to confirm hotels that have been issued the Fire Safety Certification Mark throughout Japan (reference URL: [http://www.fdma.go.jp/kasai\\_yobo/hyoujiseido/index.html](http://www.fdma.go.jp/kasai_yobo/hyoujiseido/index.html)).

<sup>77</sup> Specified properties under fire prevention measures: Certain properties under fire prevention measures that include department stores, restaurants, and other properties that can accommodate large numbers of people, as well as hospitals, nursing homes for the elderly, kindergartens, and other properties used by people who would require assistance during a disaster.

<sup>78</sup> Fire protection engineer: A person with expert knowledge of fire defence equipment etc. who has been issued a fire protection engineer certification

<sup>79</sup> Fire defense organizations for self protection: These are personal organizations comprised of people like employees at properties under fire prevention measures. They carry out the operations necessary in order to mitigate the damage from fires and other disasters when they occur based on the roles established in the firefighting plan.

<sup>100</sup> Firefighting plans for disaster protection management: These are plans that establish matters which are necessary for disaster protection management. Said plans are prepared by disaster protection managers, with disaster protection management operations carried out on the basis of said plans.

<sup>111</sup> Disaster protection managers: People who have been appointed from among those management officials who have certain qualifications, such as having completed a training course on disaster protection management, and who are in a managerial or supervisory position where they can appropriately carry out the operations necessary for disaster protection management at disaster prevention properties.

### (3) Initiation of a System for Publicly Announcing Violating Properties

The System for Publicly Announcing Violating Properties, which came about through a notification from December 2013, is a system for announcing the details of legal violations on the homepages of municipal governments based on the ordinances of said municipalities. This is aimed at specified properties under fire prevention measures that have not yet installed sprinkler systems, indoor fire hydrants, or fire alarm system, despite being obligated to do so. This announcement system was initiated in all ordinance-designated cities starting from April 2015.

What is more, fire departments overseeing populations of 200,000 people or more are slated to begin utilizing this public announcement system starting from April 2018.

Information on things like the implementation status of the public announcement system and its scheduled implementation period for municipalities throughout Japan can be confirmed via the FDMA's website (reference URL: <http://www.fdma.go.jp/publication/index.html>).

**Table 1-1-17 Trends in the improvement status of specified violating properties**

Category	No. of violating properties at the start of the FY	No. of properties that corrected their violations during the FY	Correction rate (%) (c=b/ax100)
By FY	(a)	(b)	
FY2009	301	63	20.9%
FY2010	299	69	23.1%
FY2011	389	37	9.5%
FY2012	179	46	25.7%
FY2013	230	54	23.5%
FY2014	249	56	22.5%
FY2015	331	100	30.2%
FY2016	359	125	34.8%
FY2017	392	—	—

- (Notes)
- 1 Prepared based on the Survey on the Actual Conditions of Fire Prevention Properties.
  - 2 "No. of violating properties at the start of the FY" is the sum of properties that remained in violation from two fiscal years before and violating properties that newly became aware they were in violation during the previous fiscal year at the end of the previous fiscal year for each fiscal year (as of March 31).
  - 3 "No. of properties that corrected their violations during the FY" is the number of properties that corrected their violation during the fiscal year (it does not include those that newly became aware of their violation or that were abandoned).

**Table 1-1-18 Process status for fire prevention approval**

(Cases)

Breakdown Gist of application	Approved		Unapproved		Total	
	FY2015	FY2016	FY2015	FY2016	FY2015	FY2016
New construction	207,240	214,001	26	16	207,266	214,017
Enlargement	20,170	19,426	2	4	20,172	19,430
Reconstruction	843	757	1	1	844	758
Relocation	146	123	0	0	146	123
Repair	134	124	0	0	134	124
Remodeling	100	112	0	0	100	112
Change of purpose	3,926	4,021	1	0	3,927	4,021
Other	3,161	3,238	0	1	3,161	3,239
Total	235,720	241,802	30	22	235,750	241,824

(Notes) Prepared based on the Survey on the Actual Conditions of Fire Prevention Properties

## 6. Fire Defence Equipment etc.

### (1) Current Status of Fire Prevention Approval

Fire prevention approval is a system that was established with the goal of boosting the safety of buildings by having personnel from firefighting agencies get involved in fire prevention for buildings starting from the design stage in their capacity as experts on fire prevention.

When it comes to the operation of this system, the firefighting agencies offer finely-detailed examinations and instructions based on legal regulations related to building fire prevention from the perspective of fire prevention safety and firefighting activities. They also work to enhance structures and strengthen cooperation for ensuring that this work is handled promptly.

The number of cases processed regarding fire prevention approval work throughout Japan in FY2016 came to 241,824, with only 22 of these failing to receive approval (Table 1-1-18).

### (2) Current Status for the Installation of Fire Defence Equipment etc.

The Fire Services Act states that the relevant personnel from fire prevention properties must install and properly maintain the necessary fire defence equipment etc. according to the purpose, size, structure, and capacity of the property in question.

A look at the installation status for primary fire defence equipment etc. in specified fire prevention properties throughout Japan reveals that, as of March 31, 2017, the installation rate for sprinkler systems (number installed/number that needs to be installed) was 99.7%, while that for automatic fire alarms was 98.7% (Table 1-1-19).

With respect to the technical standards pertaining to fire defence equipment etc., regulations are being successively set in place in accordance with technological progress and societal demands. In recent years, a fire occurred at a group home for elderly people with dementia in Nagasaki City, Nagasaki Prefecture in February 2013 (that left five people dead and seven injured). In light of this, it was

mandated that social welfare facilities that mainly house people who would have difficulty evacuating on their own must install sprinkler systems as a general rule, regardless of their floor area. The installation of these sprinkler systems has been carried out since April 1, 2017 as a result of the Partial Revision of the Order for Enforcement of the Fire Service Act (promulgated on December 27, 2013) and other legislation. To carry this out, transitional measures were established, which state that these are to be installed on existing facilities by March 31, 2018.

Moreover, a fire occurred at a medical clinic with beds in Fukuoka City, Fukuoka Prefecture in October 2013 (which left ten people dead and five injured). In light of this, it was mandated that medical clinics with beds and hospitals with patients that require assistance in order to evacuate must also install sprinkler systems as a general rule, regardless of their floor area.

### (3) Fire Protection Engineers and Fire Protection Inspectors

Efforts are made to ensure the performance of fire defence equipment etc. via inspection system for fire protection machinery and tools. However, if there are

deficiencies or defects at the installation stage, then such equipment will be rendered incapable of performing properly when a fire does occur. To prevent such circumstances, the installation and maintenance of certain fire defence equipment etc. can only be performed by fire protection engineers.

What is more, fire defence equipment etc. must be properly maintained on a daily basis to ensure that it is capable of performing at any and all times. As a result, it has been mandated that periodic inspections be performed and the results of these be reported. These inspections premised on maintaining the equipment require knowledge and skills with regards to the fire defence equipment etc.. Therefore, the relevant personnel from the fire prevention properties must have fire protection engineers or fire protection inspectors (people who have completed certain training courses offered by corporations that have been registered by the Commissioner of the FDMA and been issued a fire protection inspector certificate) perform the inspections on the fire defence equipment etc..

**Table 1-1-19 Installation status for sprinkler systems and fire alarm systems at specified properties under fire prevention measures throughout Japan**

(As of March 31, 2017)

Classification of properties under fire prevention measures		Equipment type Equipment condition	Sprinkler systems				Automatic fire alarms			
			No. that needs to be installed	No. installed	No. of violations	Installation rate (%)	No. that needs to be installed	No. installed	No. of violations	Installation rate (%)
(1)	a	Theaters, etc.	777	775	2	99.7	3,769	3,757	12	99.7
	b	Public halls, etc.	545	542	3	99.4	31,287	31,204	83	99.7
(2)	a	Cabarets, etc.	5	5	0	100.0	463	451	12	97.4
	b	Game centers, etc.	706	701	5	99.3	9,529	9,498	31	99.7
	c	Stores engaged in sex-related businesses, etc.	0	0	0	0.0	192	187	5	97.4
	d	Karaoke box and stores, etc.	9	9	0	100.0	2,743	2,698	45	98.4
(3)	a	Restaurants, etc.	1	1	0	100.0	2,164	2,114	50	97.7
	b	Eating and drinking houses	120	120	0	100.0	35,282	34,632	650	98.2
(4)		Department stores, etc.	7,561	7,520	41	99.5	87,487	86,526	961	98.9
(5)	a	Hotels, etc.	2,007	2,001	6	99.7	48,813	48,307	506	99.0
(6)	a	(1) Hospitals requiring nursing care for patients in order to evacuate	3,903	3,894	9	99.8	9,196	9,172	24	99.7
		(2) Medical clinics with beds requiring aid for patients in order to evacuate	899	896	3	99.7	3,322	3,317	5	99.8
		(3) Hospitals (not including those listed in (1)), medical clinics with beds (not including those listed in (2)), and birth centers with beds	3,058	3,056	2	99.9	8,418	8,415	3	100.0*
		(4) Medical clinics without beds and birth centers without beds	183	183	0	100.0	19,133	19,062	71	99.6
		Subtotal	8,043	8,029	14	99.8	40,069	39,966	103	99.7
	b	(1) Short-term welfare facilities for the elderly	36,263	36,182	81	99.8	40,015	39,956	59	99.9
		(2) Shelters	220	220	0	100.0	254	254	0	100.0
		(3) Nurseries	122	122	0	100.0	124	123	1	99.2
		(4) Welfare facilities for disabled children	413	413	0	100.0	537	535	2	99.6
		(5) Support facilities for the disabled	4,478	4,467	11	99.8	5,829	5,813	16	99.7
	Subtotal	41,496	41,404	92	99.8	46,759	46,681	78	99.8	
	c	(1) Elderly daycare centers, etc.	1,391	1,390	1	99.9	15,034	15,004	30	99.8
		(2) Rehabilitation facilities	21	21	0	100.0	266	266	0	100.0
		(3) Nursery schools, etc.	91	91	0	100.0	27,208	27,190	18	99.9
		(4) Child development support centers, etc.	41	41	0	100.0	1,251	1,239	12	99.0
		(5) Welfare centers for disabled persons, etc.	551	549	2	99.6	11,650	11,561	89	99.2
Subtotal	2,095	2,092	3	99.9	55,409	55,260	149	99.7		
d	Kindergartens, etc.	199	198	1	99.5	14,991	14,976	15	99.9	
(9)	a	Special bathhouses	19	19	0	100.0	1,420	1,413	7	99.5
(16)	a	Specified multipurpose fire prevention properties	18,457	18,388	69	99.6	196,280	191,384	4,896	97.5
(16-2)		Underground malls	57	57	0	100.0	63	63	0	100.0
(16-3)		Semi-underground malls	3	3	0	100.0	5	5	0	100.0
Total			82,100	81,864	236	99.7	576,725	569,122	7,603	98.7

(Notes) 1 Prepared based on the Survey on the Actual Conditions of Fire Prevention Properties.

2 For the installation rate, the digits in the second decimal place were rounded off. (The \* symbol indicate that the results of the rounding came to 100%.)

Efforts are made to improve the quality of these fire protection engineers and fire protection inspectors by mandating that they undergo re-training at certain fixed intervals after they have received their license in order for them to acquire new knowledge and skills concerning the fire defence equipment etc.. Moreover, these people will be ordered to return their license or face a similar punishment in the event that they violate any of the fire prevention laws or ordinances. As of March 31, 2017, the total number of fire protection engineers came to 1,144,899 (Attachment 1-1-49). In addition, the number of special fire protection inspectors came to 687 special inspectors (for special fire defense equipment etc.), 152,322 Class 1 inspectors (for mechanical systems) and 143,811 Class 2 inspectors (for electrical systems).

Programs for displaying that inspections have been performed, in which inspection certificates of completion verifying that inspections of fire defence equipment etc. have been properly carried out are posted, have been independently instituted at the prefectural level. This is done in an effort to clarify the responsibilities for performing inspections and have the relevant personnel from fire prevention properties perform the proper inspections.

The installation of these sprinkler systems has been carried out since April 1, 2016 as a result of the Partial Revision of the Order for Enforcement of the Fire Service Act (promulgated on October 16, 2014) and other legislation. To carry this out, transitional measures were established which state that these are to be installed on existing facilities by June 30, 2025.

For properties in violation of fire prevention laws and ordinances, such as those in violation of the obligation to install fire defence equipment etc., orders for them to take measures pursuant to the Fire Services Act are proactively issued and the prompt and effective remediation of the violation is further promoted.

#### **(4) Flame Retardancy Regulations**

##### **A. Usage Status for Flame Retardant Goods**

Using goods that resist catching fire for various objects that tend to be easily flammable within buildings prevents fires from breaking out and simultaneously checks the spread of fires during their initial stages when they do occur. As such, this is extremely effective when it comes to preventing fires. Therefore, fire prevention properties that must give forethought to fire prevention due to their structural features or configuration, such as high-rise buildings and underground malls, as well as fire prevention properties like theaters, hotels, and hospitals that are used by large unspecified numbers of people and people requiring special consideration have been designated as “flame retardancy and fire prevention properties.” The Fire Services Act mandates that these properties use goods with the prescribed flame retardant performance (hereafter referred to as “flame retardant goods”) for the curtains, stage curtains, plywood display boards, carpets, and other goods used (hereafter referred to as “goods under the flame retardancy requirement”).

As of March 31, 2017, the number of flame retardancy and fire prevention properties came to 971,176. The

conformance rate (share of the flame retardancy and fire prevention properties where flame retardant goods are used for all of the goods under the flame retardancy requirements at said properties) at flame retardancy and fire prevention properties using curtains and stage curtains came to 86.2%, while it was 85.7% at those using carpets, and 83.2% at those using plywood display boards (Table 1-1-20).

##### **B. Public Awareness of Flame Retardant Goods for Bedding and Other Goods**

Aside from those goods under the flame retardancy requirement stipulated in the Fire Services Act such as curtains and carpets, using fireproof goods for futons, pajamas, the body covers for automobiles and motorcycles, and more is also extremely effective for preventing fires. Therefore, the FDMA spreads public awareness of these by uploading videos detailing the effects from these flame retardant goods to its homepage (reference URL: [http://www.fdma.go.jp/html/life/yobou\\_contents/materials/](http://www.fdma.go.jp/html/life/yobou_contents/materials/)).

#### **(5) Regulations for Equipment and Tools that Use Fire**

From the perspective of fire prevention, the location, construction, management, and handling of equipment and tools that use fire, including home gas burners, stoves, hot-water heaters, fireplaces, kitchen equipment, and sauna equipment, are regulated via the fire prevention ordinances established by each municipality. These are established pursuant to the Ministerial Ordinance Establishing Standards for Enacting Ordinances on the Location, Construction, and Management of Eligible Equipment that Uses Fire and the Handling of Eligible Tools that Use Fire (2002 Ministry of Internal Affairs and Communications Ministerial Ordinance No. 24; hereafter referred to as the “Ministerial Ordinance on Eligible Equipment and Tools that Use Fire”).

## **7. Inspection System for Fire Protection Machinery and Tools etc.**

### **(1) Inspections**

Fire protection machinery or tools that are subject to inspection (hereafter referred to as “machinery and tools subject to inspection”) are prohibited from being sold, displayed for commercial purposes, and so forth unless they pass inspections and include a label indicating this pursuant to the regulations of Article 21-2 of the Fire Services Act.

The machinery and tools subject to inspection include the 12 items stipulated in Article 37 of the Order for Enforcement of the Fire Services Act, including fire extinguishers and enclosed sprinkler heads.

These inspections consist of “model approval” (approval indicating that the shape and other factors of the machinery and tools conform with the technical specifications established in ministerial ordinances) and “model compliance inspections” (inspections conducted to confirm that the shape and other factors of the individual machinery and tools subject to inspection are identical to the shape and so forth for models of said equipment that have received model approval) (Table 1-1-50).

**Table 1-1-20 Number of flame retardancy and fire prevention properties and usage status of flame retardant goods**

(As of March 31, 2017)

Categories of flame retardancy and fire prevention properties	No. of flame retardancy and fire prevention properties	Use of curtains, stage curtains, etc.	Properties on the left using all of the goods under the flame retardancy requirement		Use of carpets	Properties on the left using all of the goods under the flame retardancy requirement		Use of plywood display boards	Properties on the left using all of the goods under the flame retardancy requirement	
				Compliance rate (%)			Compliance rate (%)			Compliance rate (%)
(1) a Theaters, etc.	4,259	2,505	2,389	95.4%	1,876	1,780	94.9%	459	437	95.2%
b Public halls, etc.	63,535	38,270	34,397	89.9%	22,491	19,812	88.1%	3,985	3,476	87.2%
(2) a Cabarets, etc.	870	333	231	69.4%	360	275	76.4%	48	46	95.8%
b Game centers, etc.	10,101	4,331	3,843	88.7%	4,103	3,729	90.9%	649	586	90.3%
c Stores engaged in sex-related businesses, etc.	199	113	91	80.5%	83	65	78.3%	6	4	66.7%
d Karaoke box and stores, etc.	2,664	1,243	1,091	87.8%	1,071	975	91.0%	171	155	90.6%
(3) a Restaurants, etc.	3,052	1,570	1,288	82.0%	1,496	1,238	82.8%	188	166	88.3%
b Eating and drinking houses	80,206	32,662	26,095	79.9%	20,737	16,678	80.4%	3,781	3,129	82.8%
(4) Department stores, etc.	152,601	56,446	50,704	89.8%	30,579	26,878	87.9%	7,470	6,368	85.2%
(5) a Hotels, etc.	57,109	42,123	38,155	90.6%	35,604	32,474	91.2%	2,727	2,367	86.8%
a Hospitals, etc.	61,046	42,421	39,808	93.8%	24,120	22,314	92.5%	3,803	3,510	92.3%
(6) b Special elderly nursing homes, etc.	44,917	35,048	33,166	94.6%	20,447	19,235	94.1%	3,407	3,092	90.8%
c Elderly daycare centers, etc.	73,675	50,991	47,154	92.5%	29,204	26,412	90.4%	4,864	4,332	89.1%
d Kindergartens, etc.	16,756	11,986	11,044	92.1%	6,317	5,730	90.7%	1,044	924	88.5%
(9) a Special bathhouses	1,791	1,031	888	86.1%	1,008	902	89.5%	62	48	77.4%
(12) b Studios	646	176	160	90.9%	157	147	93.6%	129	112	86.8%
(16) a Specified multipurpose fire prevention properties	322,173	113,666	85,327	75.1%	78,789	60,213	76.4%	14,442	10,649	73.7%
b Unspecified multipurpose fire prevention properties	23,505	2,978	2,308	77.5%	2,097	1,623	77.4%	728	549	75.4%
(16-2) Underground malls	62	39	29	74.4%	34	27	79.4%	13	13	100.0%
(16-3) Semi-underground malls	7	3	1	33.3%	2	1	50.0%	1	1	100.0%
High-rise buildings	52,002	19,096	15,598	81.7%	17,712	15,148	85.5%	3,401	2,786	81.9%
<b>Total</b>	<b>971,176</b>	<b>457,031</b>	<b>393,767</b>	<b>86.20%</b>	<b>298,287</b>	<b>255,656</b>	<b>85.70%</b>	<b>51,378</b>	<b>42,750</b>	<b>83.20%</b>

(Notes) 1 Prepared based on the Survey on the Actual Conditions of Fire Prevention Properties.  
 2 High-rise buildings (buildings that are taller than 31m) are not classified within Appended Table I of the Ordinance of Enforcement for the Fire Services Act. Moreover, fire prevention properties that correspond to high-rise buildings were counted in the "High-rise buildings" field within the "Classification of fire prevention properties" column.

Moreover, for machinery and tools subject to inspection with regard to the development of new technologies, inspections can be carried out via the technical specifications established by the Minister of Internal Affairs and Communications for those items that conform to the technical standards established by said ministerial ordinance in terms of their shape or the like, or those acknowledged as having performance that meets or exceeds this level. Through this, the aim is to enhance the inspection system so as to promote technological innovation with these machinery and tools subject to inspection.

Regarding the inspection system, it came to light that cases of misconduct occurred in October 2008, including test samples being secretly switched out during model compliance inspections for fire hoses. Moreover, in March 2010 it was discovered that fire-extinguishing foam used in the compressed air foam apparatuses on fire trucks that had not been inspected was being sold.

As part of the public service corporation program review carried out in May 2010, evaluation results were issued to the effect that reassessments were to be made with a view towards expanding both voluntary screenings and the increased involvement of the private sector when it comes to inspections. Based on this, the Act for Partial Revision of the Fire Services Act was promulgated on June 27, 2012. This established collection orders via the Minister of Internal Affairs and Communications and strengthened penal provisions in cases where machinery and tools subject to inspection not in compliance with the standards or which lacked labels indicating their compliance were circulating on the market.

It also relaxed requirements in order to promote the entry of private companies into the registered inspection body market, among its other stipulations. Moreover, the Partial Revision of the Order for the Enforcement of the Fire Services Act (promulgated on March 27, 2013) made machinery and tools subject to inspections, mainly the fire hoses and couplers used by firefighting agencies and the electric leak alarms, for which there has been declining need due to changes in the configurations of buildings, items that are subject to self-labeling. At the same time, it also newly added residential fire alarms, which are required to be installed in all homes, to the machinery and tools subject to inspection (entered into force on April 1, 2014).

### (2) Self-labeling

With the self-labeling system, it is the responsibility of the manufacturers to confirm their compliance with specifications on their own according to the regulations in Article 21-16 (3) of the Fire Services Act. The system also gives approval for labeling models that have been reported to the Minister of Internal Affairs and Communications in advance. The number of reports from manufacturers in FY2016 came to 16 for power fire pumps, 16 for fire hoses, 1 for fire suction hose, 15 for couplers, zero for disposable aerosol fire extinguishers, and 9 for electric leak alarms.

Machinery and tools that are subject to self-labeling (hereafter referred to as "machinery and tools subject to self-labeling") are prohibited from being sold, displayed for commercial purposes, and so forth unless they include a label pursuant to the regulations of Article 21-16 (2) of the Fire Services Act.

Similar to machinery and tools subject to inspection, the Act for Partial Revision of the Fire Services Act (promulgated on June 27, 2012) established collection orders via the Minister of Internal Affairs and Communications and strengthened penal provisions for machinery and tools subject to self-labeling not in compliance with the standards or which lacked labels indicating their compliance.

Items that fall under the category of machinery and tools subject to self-labeling include power fire pumps and fire suction hoses. Furthermore, as a result of the Partial Revision of the Order for Enforcement of the Fire Services Act (promulgated on March 27, 2013) and other legislation, the fire hoses, couplers, and electric leak alarms that had previously been counted as machinery and tools subject to inspection, as well as the disposable aerosol fire extinguishers that are generally in widespread circulation but which frequently suffer from rupture accidents and the like, were newly added to this category (entered into force on April 1, 2014).

## 8. Performance Inspections of Technical Standard for Fire Defence Equipment etc.

When it comes to the technical standards for fire defence equipment etc., oftentimes details like materials or dimensions are prescribed in specification documents or the like. This makes it difficult for new technologies to gain acceptance, even when they offer satisfactory performance. Therefore, technical development for the fields of fire and other disaster prevention is promoted and performance regulations are adopted to ensure that even more effective fire prevention and safety measures can be established.

The basic philosophy behind this is to judge whether equipment offers performance that is at or above the level of performance of the installed fire defence equipment etc. based on the conventional technical standards. Equipment that has been confirmed to be at or above the conventional performance level is approved for installation in place of the existing fire defence equipment etc..

The performance demanded of fire defence equipment etc. is divided up into three categories. These are “initial spread inhibition performance,” which is performance for inhibiting the spread of fires during the initial stages, “evacuation safety support performance,” which is performance that supports safely evacuating during fires, and “firefighting activity support performance,” which is performance that supports the activities of firefighting teams.

A certain body of knowledge has been gained regarding these, on which their equivalence is evaluated via objective verification methods (methods of objectively and impartially verifying newly developed technologies and technical innovations) and so forth.

At the same time, a certification system via the Minister of Internal Affairs and Communications has been established aimed at equipment for which evaluations of its equivalence cannot be performed solely through the existing objective verification methods (such as special fire defence equipment etc.). Under this system, applications are made for each property under fire prevention measures regarding special fire defence equipment etc. for which general inspection standards

have not have established. The Minister of Internal Affairs and Communications will then perform an examination based on the evaluation results from a performance evaluation agency (the Japan Fire Equipment Inspection Institute or a registered inspection body), and equipment that has been acknowledged as having the necessary level of performance can be installed. As of March 31, 2017, 64 cases have received certification thus far as special fire defence equipment etc. (Attachment 1-1-51).

The expectation is that, by applying these regulations, new equipment that uses new technologies will be proactively developed and disseminated.

## 9. Current Status of Investigations into the Causes of Fires

Advances in science and technology have brought about increasing sophistication for industry and changes in social conditions. This has resulted in a tendency for fires that are large in scale and which assume aspects of complexity to occur with great frequency, and so investigating the causes behind these requires sophisticated expertise. What is more, investigating the causes of fires and illuminating the extent of the damage caused by both fires and firefighting are crucial when it comes to examining modalities for subsequent fire prevention administration.

Investigating the causes of fires is unequivocally the role of local governments, but it is the duty of the national government to complement them in this. In cases where there has been a request from a firefighting agency, or the Commissioner of the FDMA has deemed that there is a particular necessity in doing so, an investigation into the causes of a fire can be carried out by the Commissioner of the FDMA (see White Paper P287). Investigation teams formed from personnel from the FDMA according to the type of fire carry out the investigations into the causes of the fire through this system in coordination with firefighting agencies. Reviews are conducted based on the knowledge and data obtained from the investigations, and this is reflected in policies for fire defense administration. Cases where responses such as revising fire prevention laws and ordinances were carried out based on the results of investigations into the causes of fires by the Commissioner of the FDMA that were carried out recently are shown in Table 1-1-21.

In an effort to improve the effectiveness of investigations into the causes of fires regarding product fires, the Act for Partial Revision of the Fire Services Act (Law No. 38 from 2012) granted firefighting agencies the right to issue an order to submit materials to manufacturers and importers and the right to collect information from them (entered into force on April 1, 2013).

## 10. Promoting Countermeasures to Product Fires

In recent years, as the causes of fires has grown extremely diverse, the products close to the general public in their daily lives have begun causing fires as well, including automobiles and other vehicles, electronic appliances, and burning appliances. Given the strong demands to ensure consumer safety and peace of mind, the FDMA has been strengthening its initiatives to combat these product fires.

For such fires, the FDMA has established a structure whereby it collects fire information from firefighting agencies in a comprehensive manner and aggregates the number of fires for each type of product which serve as

the ignition source. It then provides the public with warnings and alerts quickly and effectively by announcing information like the names of faulty products and their manufacturers every quarter.

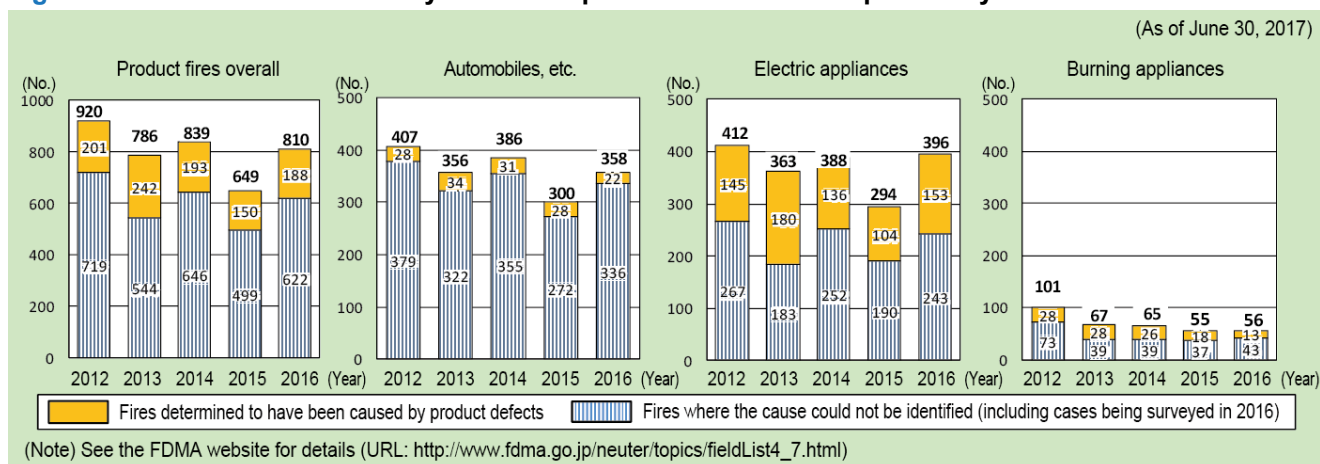
**Table 1-1-21 Investigations into the causes of fires by the Commissioner of the FDMA that were recently conducted and responses based on the results of these**

No.	Date of fire	Location	Building purpose, etc.	Responses by FDMA
1	May 13, 2012	Fukuyama City, Hiroshima Prefecture	Hotel (10 casualties)	Revised the Order for Enforcement of the Fire Services Act and other legislation, and strengthened installation standards for automatic fire alarms. Also restructured and began applying a labeling system that provides users with information on buildings that conform to the fire prevention standards in fire prevention laws and ordinances.
2	February 8, 2013	Nagasaki City, Nagasaki Prefecture	Group home (12 casualties)	Revised the Order for Enforcement of the Fire Services Act and other legislation. Strengthened installation standards for sprinkler systems and mandated that automatic fire alarms and fire notification alarms be interlinked.
3	August 15, 2013	Fukuchiyama City, Kyoto Prefecture	Fireworks festival (59 casualties)	Revised the Order for Enforcement of the Fire Services Act and the Fire Prevention Ordinance (Example). Mandated the submission of plans related to operations necessary for fire prevention at outdoor event venues at or above a certain size, and mandated that fire extinguishers be prepared.
4	October 11, 2013	Fukuoka City, Fukuoka Prefecture	Medical clinic (15 casualties)	Revised the Order for Enforcement of the Fire Services Act and other legislation. Reassessed the installation standards for fire extinguishing equipment, indoor fire hydrants, sprinkler systems, power fire pump equipment, and fire alarms that notify firefighting agencies.

Fires that firefighting agencies deemed to have been caused by defects in automobiles and other vehicles, as well as electronic appliances and burning appliances, that occurred in 2016 (January - December 2016) were aggregated. From this, it was discovered that of the total of 810 product fires, 188 were fires deemed to have been

caused by product defects, 424 were fires that could not be determined to have occurred from a defect in a specified product as the direct cause although the cause was identified, and fires where the cause could not be identified, and 198 were fires that are still currently under investigation (Fig. 1-1-19).

**Fig. 1-1-19 Trends in the survey results on product fires over the past five years**



The results of these investigations are reported to firefighting agencies throughout Japan. Furthermore, the collected fire information is shared between the Consumer Affairs Agency, the Ministry of Economy, Trade and Industry, the Ministry of Land, Infrastructure, Transport and Tourism, and the National Institute of Technology and Evaluation (NITE), which work together to promote countermeasures to product fires.

What is more, with respect to investigations into the causes of fires carried out by firefighting agencies throughout Japan, efforts are also being made to improve the investigation skills of the firefighting agencies. Examples of this include providing them with technical support such as scientific investigation based on the expert knowledge and equipment and materials of the National Research Institute of Fire and Disaster and so forth. In addition to working to enhance investigations into the causes of fires and the structures for this, the FDMA also strives to proactively collect information on product fires and strengthen collaborations with the relevant agencies. Through this, it is moving forward with ensuring

consumer safety and peace of mind, while also preventing fire accidents caused by products.

## 11. Promoting Fire Prevention Measures at Outdoor Event Venues

In August 15, 2013, a fire broke out at the venue for a fireworks show in Fukuchiyama City, Kyoto, that involved enormous human suffering in the sense that 3 people died and 56 were injured. Following this, the Order for Enforcement of the Fire Services Act was revised in December 2013 and the Fire Prevention Ordinance (Example) was revised in January 2014 in order to promote fire prevention measures at outdoor event venues. These mandated initiatives like preparing fire extinguishers when handling equipment that use fire at outdoor event venues and the like, and appointing managers for fire prevention at those large-scale outdoor and similar events that have been specially designated by fire chiefs. It also mandated that plans for the operations necessary for fire prevention be prepared and submitted.



## Section 2

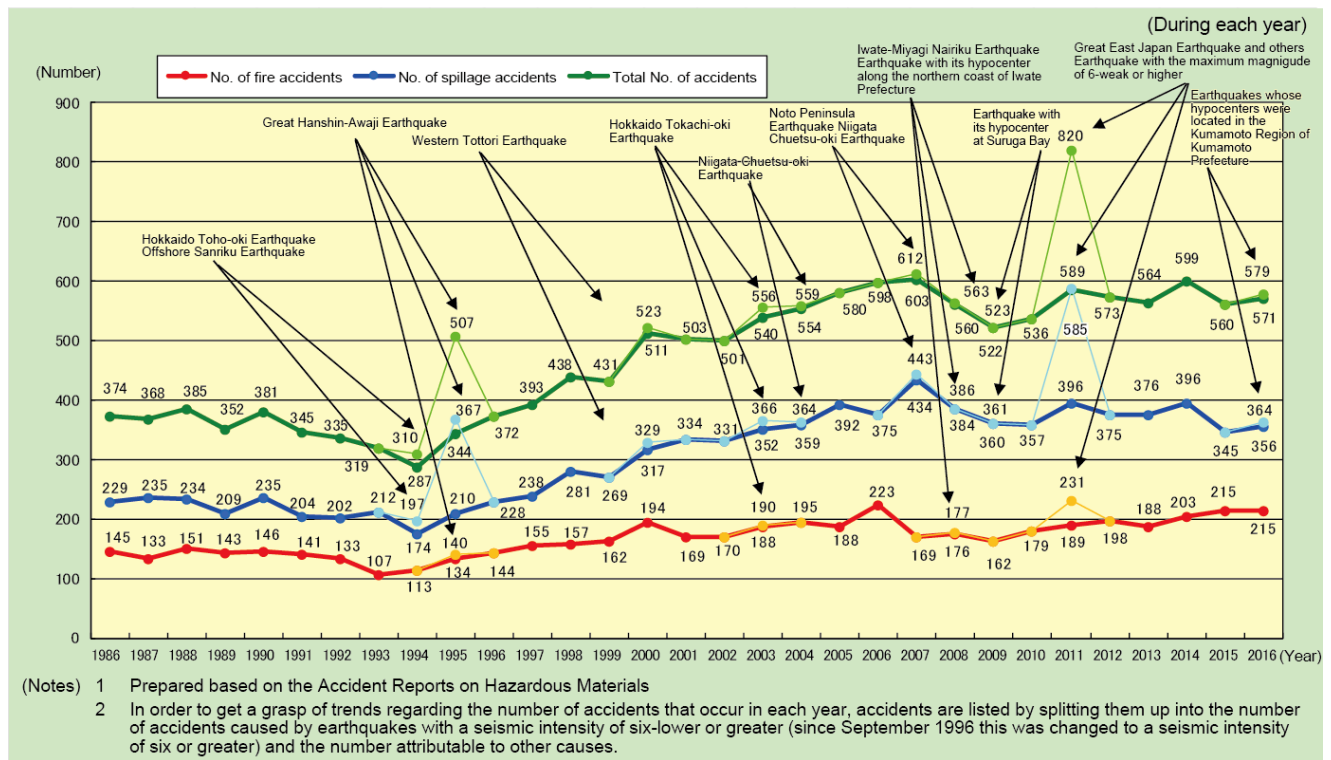
## Countermeasures to Disasters at Facilities for Hazardous Materials

### Current Status and Recent Trends in Disasters at Facilities for Hazardous Materials

Accidents at facilities for hazardous materials (see P17 <sup>\*2</sup>) are broadly classified into fires (including explosions) and spills of hazardous materials (see P17 <sup>\*1</sup>). The number of fire

and spillage accidents at facilities for hazardous materials have been trending upward since 1994. In 2016 (January 1 - December 31, 2016), there were 215 fires and 356 spills for a total of 571 accidents. This represents an increase of 11 accidents compared with the previous year, and accidents are still holding steady at a high level (Fig. 1-2-1).

Fig. 1-2-1 Trends in the number of fire and spillage accidents at facilities for hazardous materials



## 1. Fire Accidents

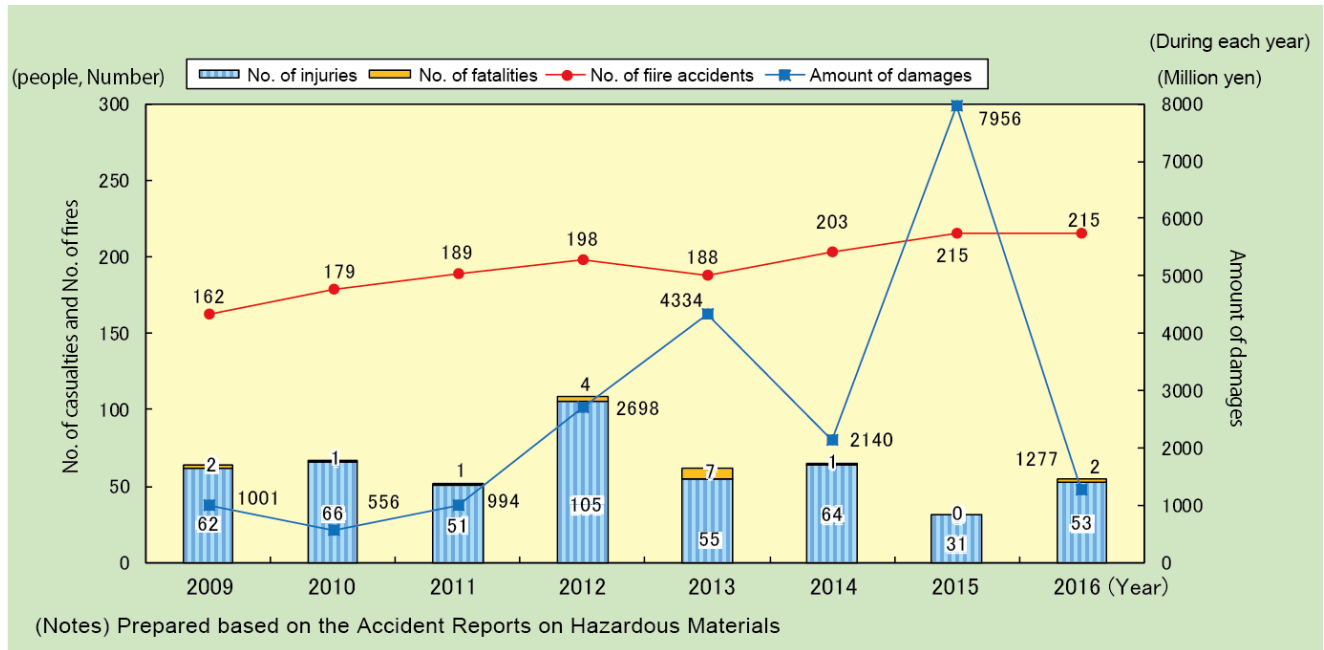
The number of fire accidents that occurred at facilities for hazardous materials in 2016 rose by roughly 2.0-times compared with the 107 such accidents in 1993, which had the lowest number of fire accidents since 1989, despite the fact that the number of facilities for hazardous materials has decreased. Accidents attributable to human factors such as inadequate maintenance and inadequate operating checks account for the majority of the primary causes for these. However, accidents caused by physical factors such as deterioration such as corrosion fatigue are also on an upswing.

### (1) Number of Fire Accidents at Facilities for Hazardous Materials and the Damage Done

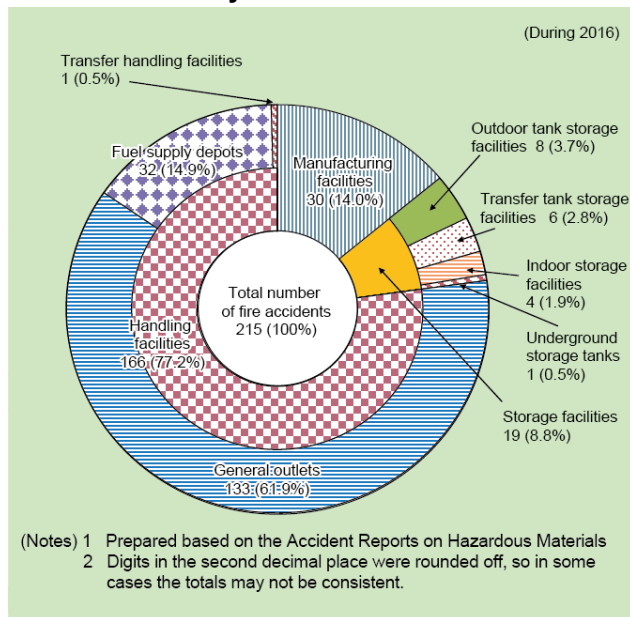
The number of fire accidents that occurred at facilities for hazardous materials in 2016 came to 215 (the same as the number from the previous year), the amount of damages came to 1,277 million yen (a decrease of 6,679 million yen year-on-year), and they resulted in 2 deaths (an increase of 2 people year-on-year) and 53 people injured (an increase of 22 people year-on-year) (Fig. 1-2-2).

Moreover, looking at the number of fire accidents that occurred by type of facility for hazardous materials reveals that the majority occurred at general outlets, followed by manufacturing facilities and fuel supply depots in that order. The total for these 3 facility classifications account for 90.7% of the total accidents (Fig. 1-2-3).

**Fig. 1-2-2** Number of fire accidents at facilities for hazardous materials and the extent of the damage done



**Fig. 1-2-3** Number of fire accidents by type of facility for hazardous materials

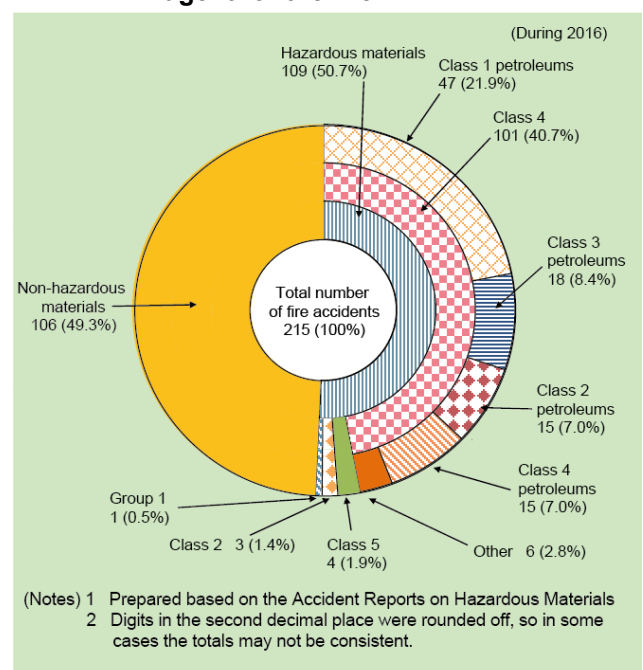


Conversely, of the 215 fire accidents 109 (or 50.7% of the total) were cases where a hazardous material served as the causative agent for the fire (Fig. 1-2-4).

**(2) Causative Factors behind the Fire Accidents at Facilities for Hazardous Materials**

A look at the causative factors behind the fire accidents at facilities for hazardous materials that occurred in 2016 reveals that human factors accounted for 48.8%; physical factors accounted for 34.9%; and the total for other causes, unknown, and under investigation came to 16.3% (Fig. 1-2-5). When viewed by ignition source, those ignited by high-temperature surface heat were most common at 30 (a decrease of 10 year-on-year), followed by 28 from static

**Fig. 1-2-4** Number of fire accidents by causative agent for the fire

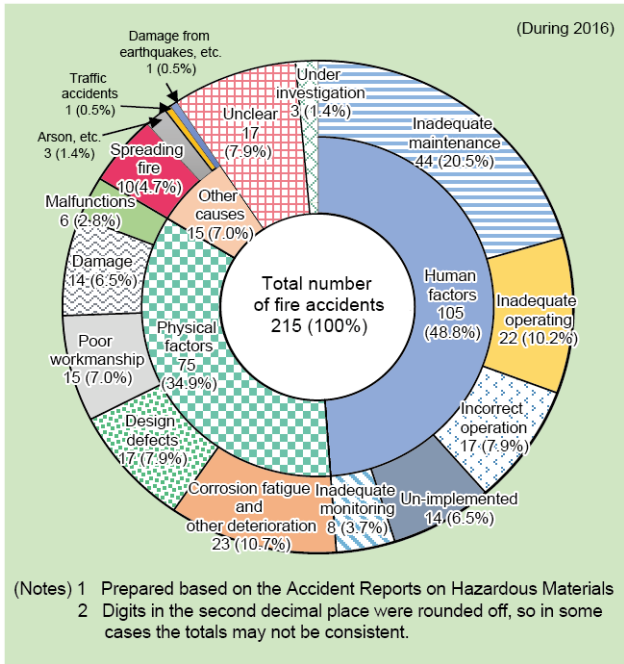


electricity sparks (an increase of 5 year-on-year) and 27 from ignition due to overheating (an increase of 5 year-on-year) (Fig. 1-2-6).

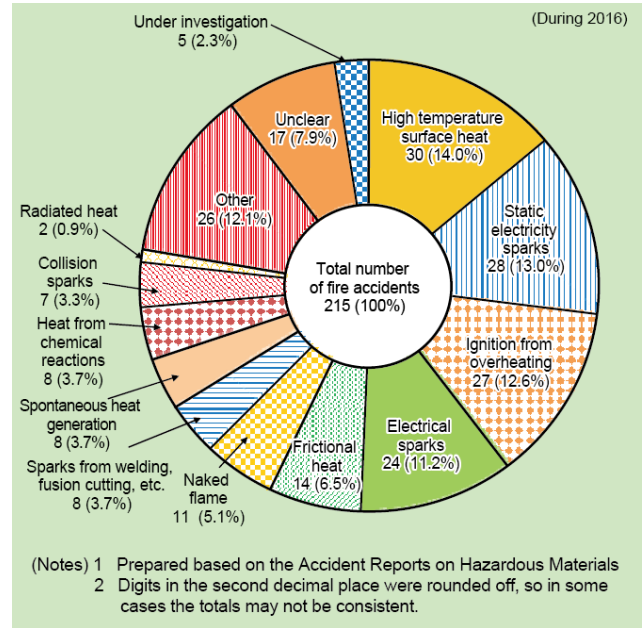
**(3) Fire Accidents at Unauthorized Facilities**

The number of fire accidents that occurred at facilities which were supposed to receive authorization as facilities for hazardous materials yet which failed to do so (hereafter referred to as “unauthorized facilities”) in 2016 came to eight (a decrease of one year-on-year), and they left zero people dead (a decrease of two year-on-year) and four injured (a decrease of ten year-on-year).

**Fig. 1-2-5 Number of fire accidents by causative factor**



**Fig. 1-2-6 Number of fire accidents by ignition source**



**(4) Fire Accidents during the Transportation of Hazardous Materials**

In 2016, two fire accidents during the transportation of hazardous materials occurred (the same as the number from the previous year).

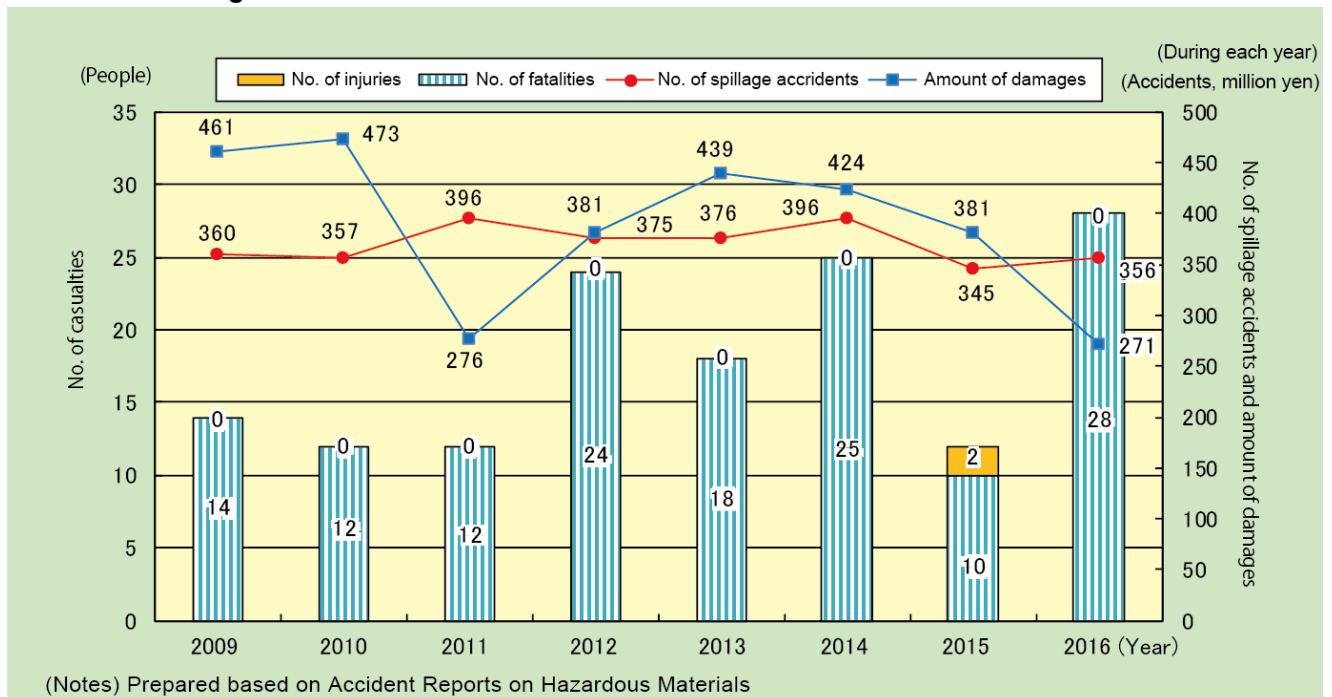
**(5) Fire Accidents during Temporary Storage or Handling**

Continuing on from 2015, no fire accidents during the temporary storage or handling of hazardous materials occurred in 2016.

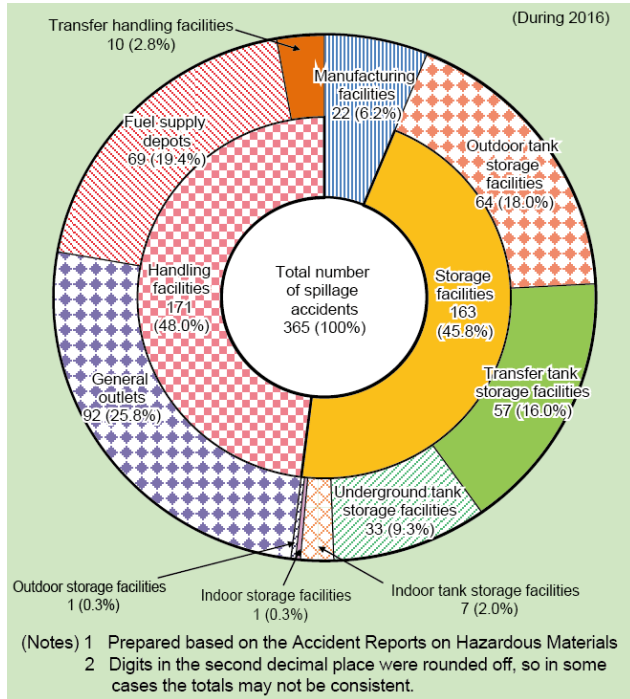
**2. Spillage Accidents**

The number of spillage accidents involving hazardous materials that occurred at facilities for hazardous materials in 2016 rose by roughly 2.0-times compared with the 174 such accidents in 1994, which had the lowest number of spillage accidents since 1989, despite the fact that the number of facilities for hazardous materials has decreased. As for the primary causative factors, accidents attributable to human factors and those caused by physical factors both occur in large numbers. However, of those accidents caused by physical factors, the number caused by age-related deterioration, such as corrosion fatigue, are on the rise.

**Fig. 1-2-7 Number of spillage accidents at facilities for hazardous materials and the extent of the damage done**



**Fig. 1-2-8 Number of spillage accidents by type of facility for hazardous materials**



**(1) Number of Spillage Accidents at Facilities for Hazardous Materials and the Damage Done**

The number of spillage accidents involving hazardous materials that occurred at facilities for hazardous materials (which did not turn into fires) in 2016 came to 356 (an increase of 11 year-on-year), the amount of damages came to 271 million yen (a decrease of 110 million yen year-on-year), and they zero people dead (a decrease of two year-on-year) but left 28 people injured (an increase of 18 people year-on-year) (Fig. 1-2-7).

Moreover, looking at the number of spillage accidents that occurred by type of facility for hazardous materials reveals that the majority occurred at general outlets, followed by outdoor storage tank facilities and transfer tank storage facilities in that order (Fig. 1-2-8).

Conversely, 98.6% of the number of spillage accidents at facilities for hazardous materials involved spills of Class 4 hazardous materials, which consist primarily of petroleum products. Viewing this item type reveals that Class 1 petroleum (gasoline, etc.) accounts for most of these, followed by Class 2 petroleum (light oil, etc.), Class 3 petroleum (heavy oil, etc.), and Class 4 petroleum (gear oil, etc.) in that order (Fig. 1-2-9).

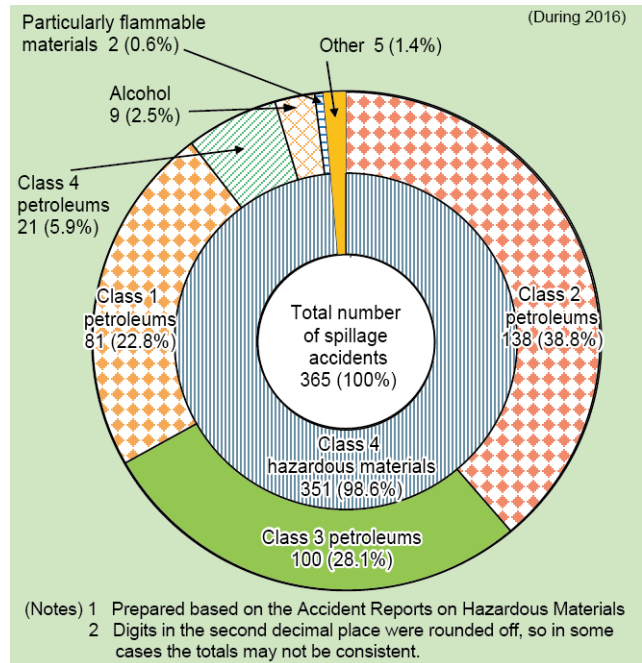
**(2) Causative Factors behind the Spillage Accidents at Facilities for Hazardous Materials**

A look at the causative factors behind the spillage accidents at facilities for hazardous materials that occurred in 2016 reveals that human factors accounted for 32.9%; physical factors accounted for 56.7%; and the total for other causes, unknown, and under investigation came to 10.4% (Fig. 1-2-10). When viewed by causative factor, those caused by deterioration such as corrosion fatigue were most common at 135 (an increase of 11 year-on-year), followed by 41 from inadequate operating checks (a decrease of one year-on-year) and 28 from operator error (an increase of two year-on-year) (Fig. 1-2-10).

**(3) Spillage Accidents at Unauthorized Facilities**

The number of spillage accidents that occurred at unauthorized facilities in 2016 came to six (an increase of one year-on-year), with no casualties occurring as a continuation from the lack of casualties in 2015.

**Fig. 1-2-9 Number of spillage accidents by material spilled**



**(4) Spillage Accidents during the Transportation of Hazardous Materials**

The number of spillage accidents that occurred during the transportation of hazardous materials in 2016 came to 11 (a decrease of one year-on-year), and while there were no deaths as a continuation from 2015, two people were injured (an increase of one year-on-year).

**[ Current Status of Hazardous Materials Administration ]**

**1. Regulations on Hazardous Materials**

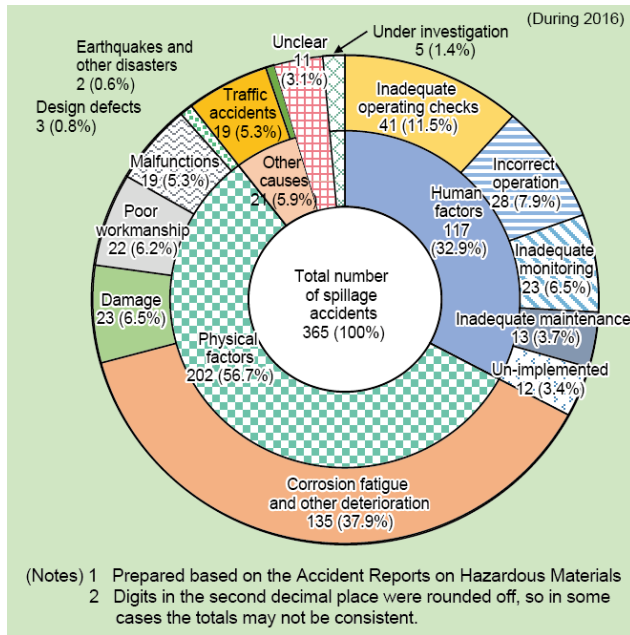
**(1) Regulatory Structure for Hazardous Materials**

The Fire Services Act designates substances with properties such as: (1) Carrying a significant risk of causing a fire, (2) Carrying a significant risk of spreading a fire once one starts, and (3) Being difficult to extinguish when a fire does break out, as "hazardous materials."<sup>1</sup> Enacting safety regulations for the storage, handling and transportation of these hazardous materials has been posited as a move that will prevent fires; protect the lives, health, and property of the public from fires; and mitigate the damage from fires.

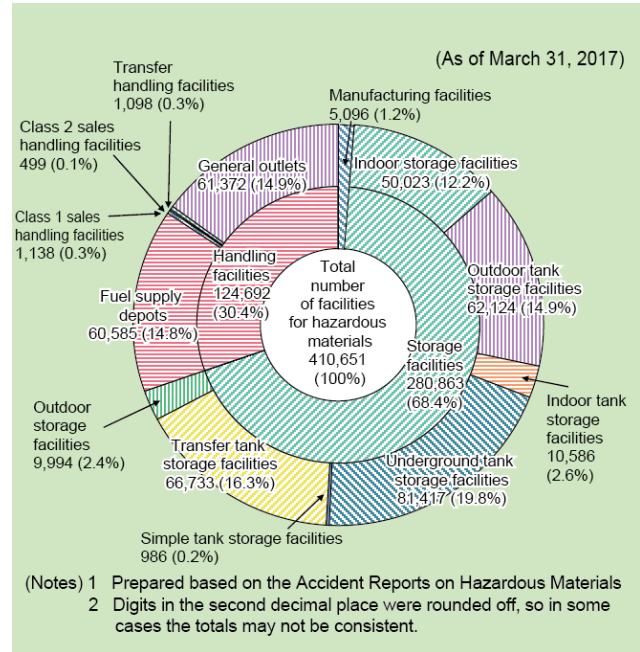
Regulations concerning hazardous materials have been instituted in a uniform manner throughout Japan through the partial revisions to the Fire Services Act of 1959 and by enacting cabinet orders on regulations for hazardous materials. Since then, efforts like revising the relevant legislation to ensure that it contains content like establishing necessary and sufficient technical standards that are safer for facilities for hazardous materials<sup>2</sup> have sequentially

been carried out in striving to thoroughly ensure safety at such facilities. An overview of the regulations on hazardous materials is shown below (Fig. 1-2-11).

**Fig. 1-2-10 Number of spillage accidents by causative factor**



**Fig. 1-2-12 Number of facilities for hazardous materials by classification**



<sup>1</sup>. Hazardous materials: The Fire Services Act (Article 2-7) defines them as such: "The term 'hazardous materials' means the materials listed in the Names of Items column of Appended Table 1, which have the properties listed in the Nature column of said table according to the Categories specified in said table." Moreover, the properties of each hazardous material are defined for each type in the "Remarks" to Appended Table I of the Fire Services Act.

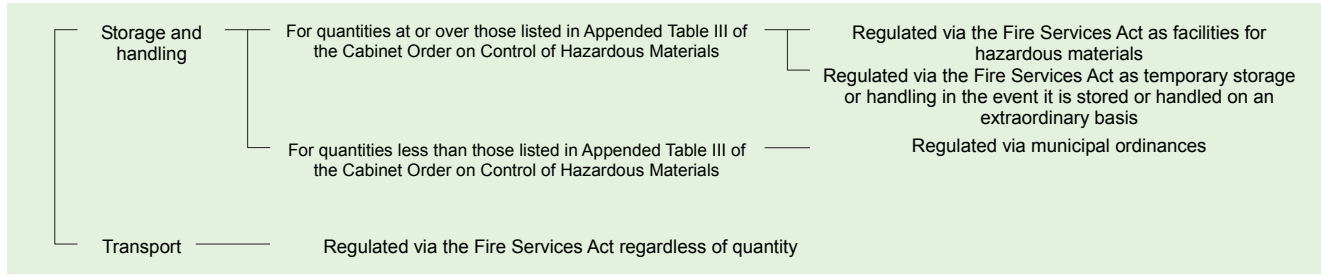
[Hazardous materials listed in Appended Table I and their characteristics]

Category	Nature	Properties	Representative substances
Category 1	Oxidizing solids	These are solids that do not burn themselves, but which have the property of causing other substances to oxidize powerfully. When mixed with inflammable materials, they degrade as a result of heat, impacts, or friction, and give rise to extremely intense combustion.	Sodium chlorate, potassium nitrate, ammonium nitrate
Category 2	Combustible solids	These are solids that easily ignite from fire or solids that easily catch fire at relatively low temperatures (less than 40°C). They easily catch fire, are quick to combust, and are difficult to extinguish.	Red phosphorous, sulfur, iron powder, solid alcohol, lacquer putty
Category 3	Spontaneously combustible substances and water-reactive substances	These substances spontaneously combust when exposed to air, or either combust or generate combustible gasses when they come into contact with water.	Sodium, alkyl aluminum, yellow phosphorous
Category 4	Inflammable liquids	These are liquids that are inflammable.	Gasoline, kerosene, light oil, heavy oil, acetone, methanol
Category 5	Self-reactive substances	These are solids or liquids that generate large quantities of heat at relatively low temperatures or promote explosive reactions as a result of thermolysis and other reactions.	Nitroglycerin, trinitrotoluen, hydroxylamine
Category 6	Oxidizing liquids	These are liquids that do not burn themselves, but which have the property of promoting the combustion of other flammable substances they are mixed with.	Perchloric acid, hydrogen peroxide, nitric acid

<sup>2</sup>. Facilities for hazardous materials: These are facilities that have received authorization from municipal mayors and similar officials as facilities that store or handle hazardous materials at or above the quantities specified in the Fire Services Act. As described below, they are classified into three types: manufacturing facilities, storage facilities, and handling facilities.

Classification	Details	
Manufacturing facilities	Facilities that manufacture hazardous materials (Ex.: Chemical plants, oil refineries)	
Storage facilities	Indoor storage facilities	Store hazardous materials inside buildings
	Outdoor storage tanks	Store hazardous materials in tanks located outdoors (Ex.: oil tanks)
	Indoor storage tanks	Store hazardous materials in tanks located indoors
	Underground storage tanks	Store hazardous materials in tanks located below the ground's surface
	Simple storage tanks	Stores hazardous materials in small tanks less than 600 L
	Transfer storage tanks	Store hazardous materials in tanks that have been affixed to vehicles (Ex.: Tanker trucks)
	Outdoor storage facilities	Store certain hazardous materials in containers in outdoor locations
Handling facilities	Fuel supply depots	Handling facilities that fuel vehicles and the like (Ex.: Gas stations)
	Sales handling facilities	Stores that sell containers full of hazardous materials
	Transfer handling facilities	Handling facilities that transfer hazardous materials through pipes (Ex.: Pipelines)
	General outlets	Handling facilities other than the three types of handling facilities above (Ex.: Boilers, private power generators)

**Fig.1-2-11 Regulatory structure**



**Table 1-2-1 Trends in the number of facilities for hazardous material**

(As of March 31 of each year)

Facility	Year	2013 (A)	2014	2015	2016 (B)	2017 (C)	Rate of change (%)	
							(C/A-1)×100	(C/B-1)×100
Manufacturing facilities		5,160	5,154	5,106	5,106	5,088	-1.2	0.2
Storage facilities	Indoor storage facilities	551,245	50,888	50,553	50,201	50,023	-2.4	-0.4
	Outdoor storage tanks	65,330	64,206	63,093	62,120	61,124	-6.4	-1.6
	Indoor storage tanks	11,502	11,296	11,021	10,802	10,586	-8.0	-2.0
	Underground storage tanks	91,255	87,831	85,499	83,341	81,417	-10.8	-2.3
	Simple storage tanks	1,101	1,060	1,019	1,002	986	-10.4	-1.6
	Transfer storage tanks	67,916	67,665	67,498	67,170	66,733	-1.7	-0.7
	Outdoor storage facilities	10,793	10,598	10,351	10,213	9,994	-7.4	-2.1
	Subtotal	299,142	293,544	289,034	284,849	280,863	-6.1	-1.4
Handling facilities	Fuel supply depots	64,593	63,222	62,269	61,401	60,585	-6.2	-1.3
	Class 1 sales handling facilities	1,293	1,245	1,209	1,178	1,138	-6.0	-3.4
	Class II sales handling facilities	538	529	518	510	499	-7.2	-2.2
	Transfer handling facilities	1,151	1,142	1,127	1,111	1,098	-4.6	-1.2
	General outlets	65,041	63,705	62,766	62,097	61,372	-5.6	-1.2
	Subtotal	132,616	129,843	127,889	126,297	124,692	-6.0	-1.3
Total		436,918	428,541	422,029	416,234	410,651	-6.0	-1.3

Hazardous materials of volumes at or above the designated quantities (the quantity at which authorization is necessary to store or handle a material as designated by the Fire Services Act) cannot be stored or handled at locations other than facilities for hazardous materials. Persons attempting to establish a facility for hazardous materials must ensure it is in compliance with the standards regarding its location, structure, and equipment specified by law, and receive authorization from the municipal mayor for this.

The transportation of hazardous materials must be carried out in accordance with the standards for ensuring safety specified in law, regardless of how large or small the quantity is.

Standards for the storage and handling of hazardous materials in volumes less than the designated quantities are to be established via municipal ordinances.

**(2) Current Status of Facilities for Hazardous Materials**

**A. Number of Facilities for Hazardous Materials**

The total number of facilities for hazardous materials (number of facilities for construction permits) as of March 31, 2017 came to 410,651 (Table 1-2-1).

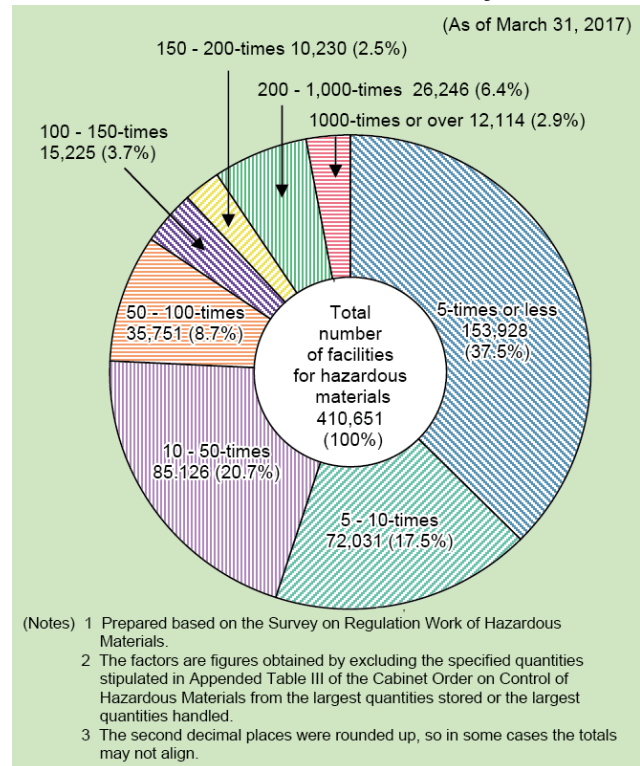
A look at the share of facilities by their classification reveals that storage facilities account for the majority at 68.4%, followed by handling facilities at 30.4% and then manufacturing facilities at 1.2% (Fig. 1-2-12).

**B. Composition of Facilities for Hazardous Materials by Size**

As for the number of facilities by size (according to the maximum storage quantity or the maximum handling quantity) of the total number of facilities for hazardous materials as of March 31, 2017, those facilities for hazardous materials that hold 50-times the designated

quantities or less account for 75.8% of the total (Fig. 1-2-13).

**Fig. 1-2-13 Composition rate of facilities for hazardous materials by size**



### (3) Hazardous Material Engineers

Hazardous material engineers are classified into three types. Class A engineers can handle all hazardous materials, Class B engineers can handle types of hazardous materials for which they have obtained approval, and Class C engineers can handle designated hazardous materials from among the type 4. When hazardous material engineers or someone else handles hazardous materials at facilities for hazardous materials, a Class A or Class B hazardous material engineer must be present to ensure safety.

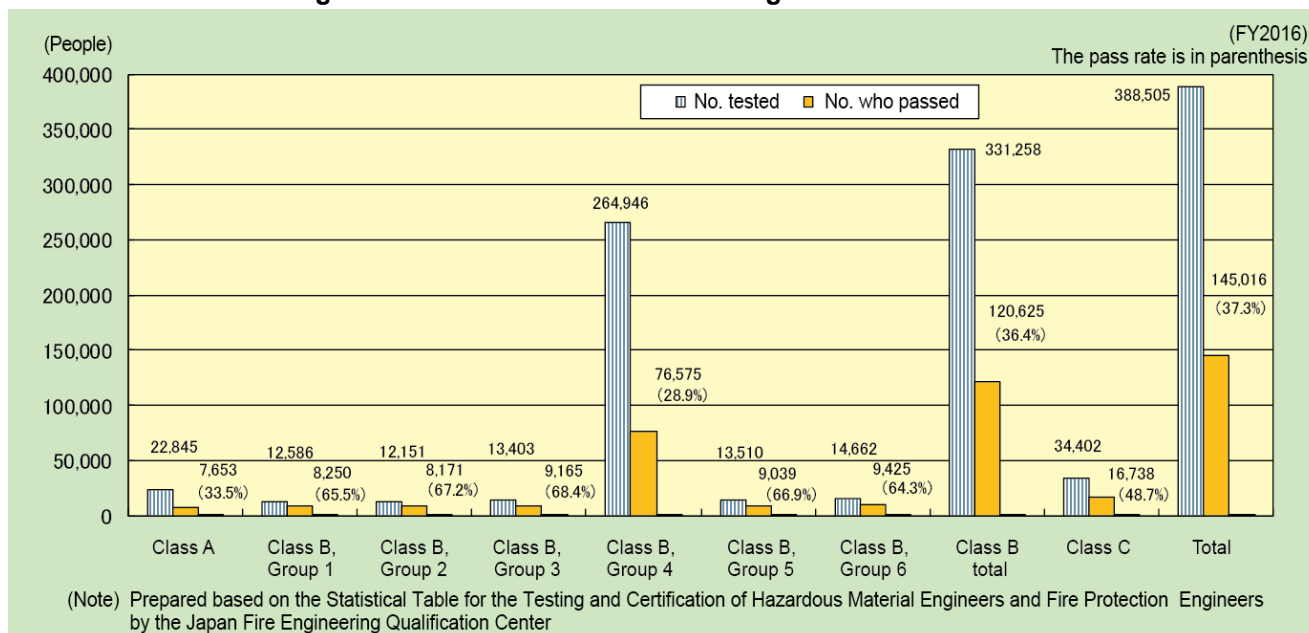
As of March 31, 2017 the (cumulative) total number of people who have passed the hazardous material engineer test since the hazardous material engineer system was launched came to 9,282,038 people. They play a significant role in ensuring safety at facilities for hazardous materials.

### A. Hazardous Material Engineer Tests

Hazardous material engineer tests were held 607 times throughout Japan in FY2016 (an increase of 29 year-on-year). They were taken by 388,505 people (a decrease of 12,591 people year-on-year), with 145,016 people passing (a decrease of 7,095 people year-on-year) for an average pass rate of roughly 37.3% (a decrease of 0.6 points year-on-year) (Table 1-2-14).

Viewing the situation by test type and category reveals that 68.2% of the people took the test for Class B, Type 4, followed by Class C at 8.9% of the total. These two test types accounted for 77.1% of the total. The number of people who passed these two test types accounted for 64.3% of the total.

**Table 1-2-14 Holding of tests for hazardous material engineers**



### B. Safety Training Courses

As a general rule, the hazardous material engineers engaged in handling hazardous materials at facilities for hazardous materials must take a training course on safety for handling hazardous materials offered by prefectural governors (safety training courses) within each three year period (starting from April 1, 2012, within three years from the first April 1 since the date on which the hazardous material engineer license was issued or the date they took the safety training course).

In FY2016, safety training courses were held a total of 1,467 times throughout Japan (an increase of 60 times year-on-year), and were attended by 178,002 people (a decrease of 841 people year-on-year) (Table 1-2-2).

### (4) Safety Systems at Offices

As of March 31, 2017, the total number of business establishments that owned facilities for hazardous materials came to 188,185 throughout Japan. In an effort to establish safety systems at business establishments, it has been mandated that the owners of facilities for hazardous materials that store or handle hazardous materials at or above certain quantities must carry out certain obligations. These include appointing hazardous materials security superintendents, appointing safety

officers for facilities for hazardous materials (1,640 business establishments), and preparing fire and disaster prevention rules (44,379 business establishments). Moreover, it has been mandated that said business establishments that own certain facilities for hazardous materials and that store or handle hazardous materials at or above certain quantities must establish fire defense organizations for self protection (69 business establishments) and appoint hazardous material safety supervising managers (209 business establishments).

### (5) Safety Inspections

It has been mandated that the owners of outdoor storage tanks and transfer handling facilities at or over a certain size must undergo inspections on the safety of facilities for hazardous materials performed by municipal mayors and similar officials (safety inspections) at regular fixed intervals according to factors like the facilities' size.

In FY2016, 265 safety inspections were performed, of which 259 involved outdoor storage tanks and 6 involved transfer handling facilities.

### (6) Onsite Inspections and Orders

Municipal mayors and similar officials can perform onsite inspections on facilities for hazardous materials and other such facilities to ensure that their installation,

construction, and establishment of equipment, as well as storage or handling of hazardous materials, are in compliance with the standards established in the Fire

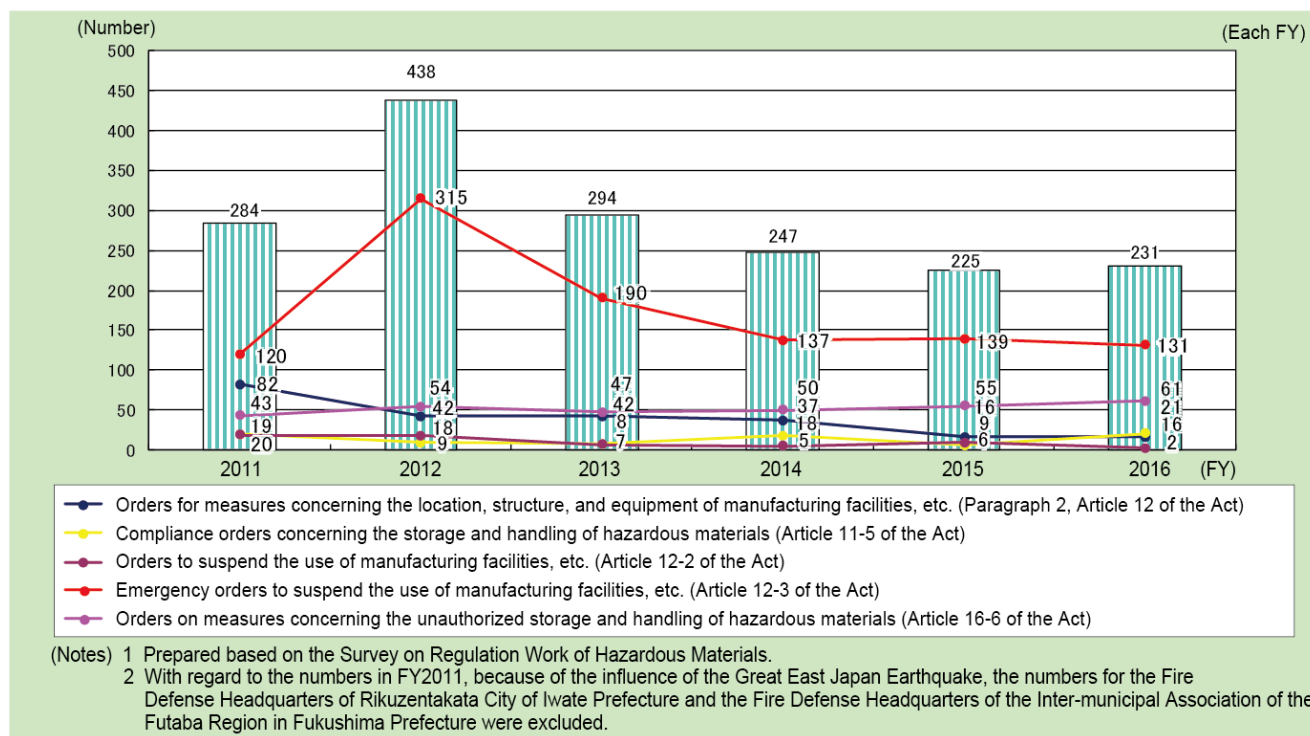
Services Act. These can be carried out when said official deems it necessary to prevent fires that arise consequent upon the storage or handling of hazardous materials.

**Table 1-2-2 Number of attendees at safety training courses for hazardous material engineers and a breakdown of this by type of hazardous material engineer certifications**

(As of March 31 of each FY)

Category FY	No. of attendees	Class A	Class B							Class C	Total by type	No. of training courses
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Subtotal			
2012	156,597	12,040	7,720	8,196	6,906	142,599	7,866	9,088	182,375	23,887	218,302	1,326
2013	164,296	13,703	8,969	9,655	7,948	148,714	9,367	10,278	194,931	24,910	233,544	1,374
2014	162,977	14,002	9,032	10,046	8,294	146,800	9,476	10,388	194,036	27,502	235,540	1,363
2015	178,843	14,280	9,507	10,554	9,008	152,324	10,362	11,248	203,003	25,473	242,756	1,407
2016	178,002	14,182	10,702	11,581	10,129	153,091	11,452	11,991	208,946	24,660	247,788	1,467

**Fig.1-2-15 Trends in orders for measures related to facilities for hazardous materials**



In FY2016, onsite inspections were carried out a total of 201,667 times at 183,783 facilities for hazardous materials. In cases where violations of the Fire Services Act were discovered as a result of the onsite inspections, these municipal mayors and other officials can issue a variety of different orders to the owners of said facilities for hazardous materials. These include orders to comply with regulations on storage and handling, orders to take measures related to standards for installing, constructing, or establishing equipment, and more.

In FY2016 municipal mayors or similar officials issued such orders to take measures in 231 cases. (Fig. 1-2-15)

## 2. Securing Petroleum Pipelines

### (1) Safety Regulations for the Petroleum Pipeline Business

Regarding those petroleum pipelines which are used to transport petroleum in response to general demand, the competent minister must formulate basic plans and listen to the opinions of the Minister of Internal Affairs and

Communications regarding business licenses in order to ensure safety pursuant to the Petroleum Pipeline Business Act enacted in 1972. What is more, the Minister of Internal Affairs and Communications provides licenses for construction plans, performs completion inspections, provides licenses for safety regulations, performs safety inspections, and more.

The facilities to which the Petroleum Pipeline Business Act apply currently only include the pipelines transporting airplane fuel to Narita International Airport, with other pipelines regulated as transfer handling facilities under the Fire Services Act.

### (2) Ensuring the Safety of Petroleum Pipelines

Safety inspections are carried out periodically on the pipelines transporting airplane fuel to Narita International Airport pursuant to the Petroleum Pipeline Business Act. In addition, the business operators must do everything they possibly can to ensure safety, such as having maintenance and inspections carried out in accordance with the technical standards established by law.



## Section 3

## Countermeasures to Disasters at Petroleum Industrial Complexes

## Current Status and Recent Trends in Disasters at Petroleum Industrial Complexes

### 1. Number of Accidents and Damage

The total number of accidents that occurred at specified business establishments<sup>\*1</sup> in petroleum industrial complexes and other special disaster prevention areas (see White Paper P102;

hereafter referred to as “special disaster prevention areas”) in 2016 came to 252. A breakdown of this reveals that there were two accidents from earthquakes and tsunamis (hereafter referred to as “earthquake-induced accidents”) and 250 accidents that were not earthquake-induced (hereafter referred to as “general accidents”). The number of earthquake-induced accidents increased by one over those from the previous year (one), while general accidents increased by 16 from the previous year (234) (Fig. 1-3-1).

Looking at this by type of accident reveals there were 120 fires (an increase of 13 year-on-year), 6 explosions (a decrease of 1 year-on-year), 121 leaks (an increase of 3 year-on-year), and 5 other accidents (an increase of 2 year-on-year) (Table 1-3-1).

Looking at trends in the number of general accidents that have occurred reveals that these had been on a downswing since the enactment of the Act on the Prevention of Disaster in Petroleum Industrial Complexes and Other Petroleum Facilities. However, since 2016 they have been trending at a high level of more than 200 such accidents a year.

The number of casualties from general accidents that occurred in 2016 came to 0 deaths and 32 injuries.

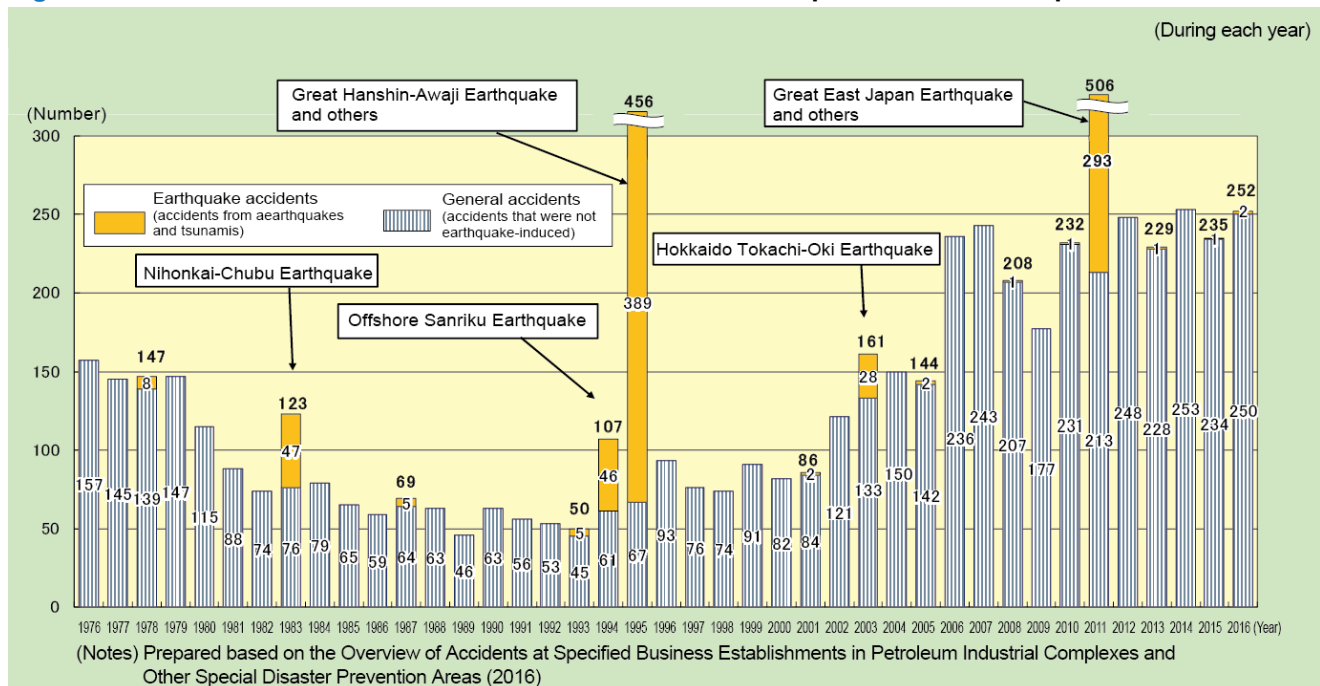
What is more, looking at the causes behind general accidents reveals that physical factors such as corrosion and other types of deterioration accounted for 137 of the accidents (54.8%), while human factors such as inadequate operation and maintenance accounted for 102 (40.8%).

### 2. Characteristics of Accidents

#### (1) Number of General Accidents by Type of Specified Business Establishment

Looking at the number of general accidents by type of specified business establishments reveals that Class 1 business establishments accounted for 201 (176 of which were at layout business establishments<sup>\*2</sup>), which account for 80.4% of the total (Table 1-3-2).

Fig. 1-3-1 Trends in the number of accidents that occurred at petrochemical complexes



<sup>\*1</sup>. Specified business establishments: These refer to Class 1 business establishments (business establishments where 10,000 kiloliters of petroleum or more are stored or handled, or where 2 million cubic meters of high-pressure gas or more are processed) and Class 2 business establishments (business establishments where 1,000 kiloliters of petroleum or more are stored or handled, or where 200,000 cubic meters of high-pressure gas or more are processed).

<sup>\*2</sup>. Layout business establishments: Business establishments from among Class 1 business establishments that handle both petroleum and high-pressure gases. Said business establishments are subject to layout regulations stipulating that their sites must be segmented off into six types of sections according to their purpose, with these including manufacturing facility sections and storage facility sections (see P105).

**Table 1-3-1 Occurrence of Accidents at Petrochemical Complexes**

(During each year)

Type	Accidents in 2016			Accidents in 2015		
		General accidents	Earthquake-induced accidents		General accidents	Earthquake-induced accidents
Fires	120 (47.6%)	120 (48.0%)	— (—%)	107 (45.5%)	107 (45.7%)	— (—%)
Explosions	6 (2.4%)	6 (2.4%)	— (—%)	7 (3.0%)	7 (3.0%)	— (—%)
Leaks	121 (48.0%)	119 (47.6%)	2 (100%)	118 (50.2%)	117 (50.0%)	1 (100%)
Other	Damage	5 (2.0%)	5 (2.0%)	3 (1.3%)	3 (1.3%)	— (—%)
	Accidents not corresponding to the above	— (—%)	— (—%)	— (—%)	— (—%)	— (—%)
<b>Total</b>	<b>252</b>	<b>250</b>	<b>2</b>	<b>235</b>	<b>234</b>	<b>1</b>

- (Notes) 1 Prepared based on the Overview of Accidents at Specified Business Establishments in Petroleum Industrial Complexes and Other Special Disaster Prevention Areas in 2016  
 2 Of the accidents that occurred in 2016, two were earthquake-induced accidents.

**Table 1-3-2 Number of General Accidents by Type of Specified Business Establishment**

(During 2016)

Type of business establishment	No. of specified business establishments (A)	No. of accidents (B)	Share of the total No. of accidents (%)	No. of accidents per business establishments (B/A)
Class 1 business establishments	363	201	80.4	0.55
Layout business establishments	174	176	70.4	1.01
Other business establishments	189	25	10.0	0.13
Class 2 business establishments	323	49	19.6	0.15
<b>Total</b>	<b>686</b>	<b>250</b>	<b>100.0</b>	<b>0.36</b>

- (Notes) 1 Prepared based on the Overview of Accidents at Specified Business Establishments in Petroleum Industrial Complexes and Other Special Disaster Prevention Areas in 2016  
 2 The number of business establishments is current as of April 1, 2016

## (2) Number of General Accidents at Specified Business Establishments by Business Category

As for the number of general accidents at specified business establishments by business category, there were 77 chemical industry-related accidents (30.8%), 76 petroleum and coal products manufacturing industry-related accidents (30.4%), 45 steel industry-related accidents (18.0%), 24 electrical industry-related accidents (9.6%), and 28 accidents in other business categories (11.2%).

## Current Status of Damage Countermeasures at Petroleum Industrial Complexes

In order to prevent disasters from occurring and spreading at special disaster prevention areas, where large quantities of petroleum and high pressure gasses are concentrated, efforts are made to establish comprehensive disaster prevention structures for these. This includes by applying the various regulations from the Fire Services Act, the High Pressure Gas Safety Act, the Industrial Safety and Health Act, the Act on Prevention of Marine Pollution and Maritime Disasters, and others, as well as by applying the regulations from the Act on the Prevention of Disaster in Petroleum Industrial Complexes and Other Petroleum Facilities regarding issues like the arrangements of the various facility sections and disaster prevention equipment.

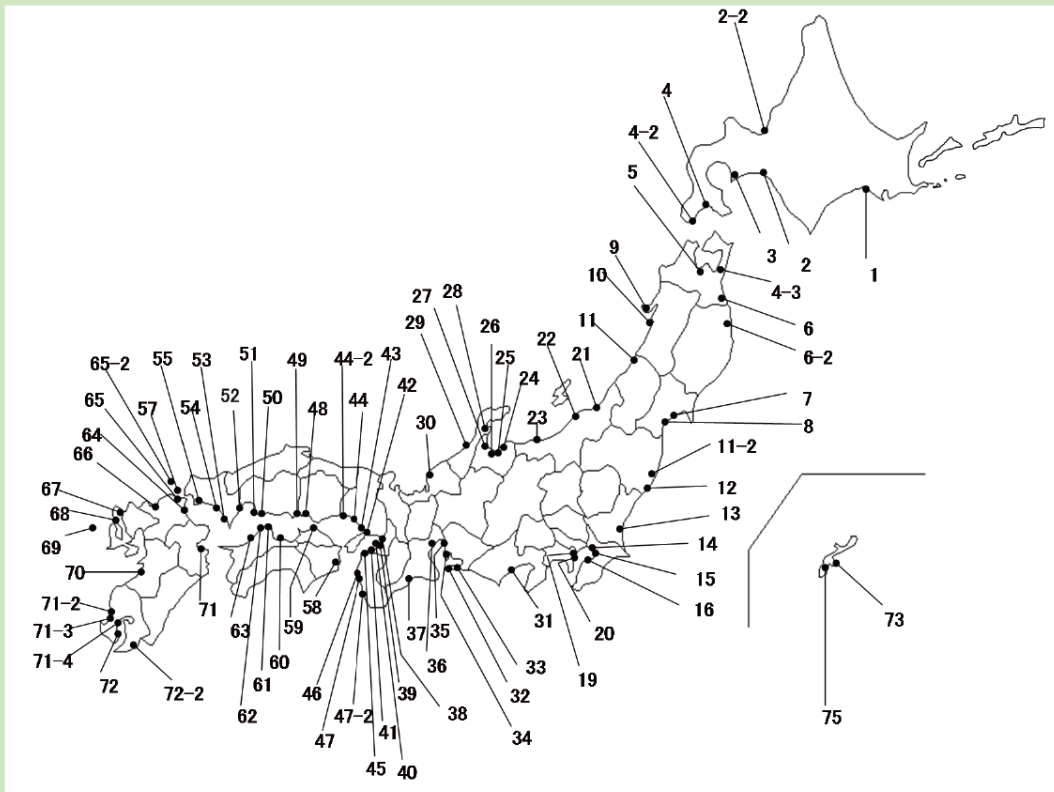
## 1. Current Status of Petroleum Industrial Complexes and Other Special Disaster Prevention Areas

As of April 1, 2017, 83 areas in which large quantities of petroleum or high pressure gas at or above certain quantities have been designated as special disaster prevention areas in 102 municipalities in 32 prefectures based on the Act on the Prevention of Disaster in Petroleum Industrial Complexes and Other Petroleum Facilities (Fig. 1-3-2). These special disaster prevention areas are under the jurisdiction of 90 fire defense headquarters.

What is more, 679 business establishments serve as specified business establishments subject to the regulations of the Act on the Prevention of Disaster in Petroleum Industrial Complexes and Other Petroleum Facilities. Of these, 353 are Class 1 business establishments (including 168 layout business establishments) and 326 are Class 2 business establishments.

**Fig.1-3-2 Designation Status for Petroleum Industrial Complexes and Other Special Disaster Prevention Areas**

(As of April, 2016)



No.	Special disaster prevention areas	No.	Special disaster prevention areas	No.	Special disaster prevention areas	No.	Special disaster prevention areas	No.	Special disaster prevention areas
1	Kushiro	14	North Keiyo coast	34	Kinuura	50	Etajima	68	Ainoura
2	Tomakomai	15	Central Keiyo coast	35	Port of Nagoya coast	51	Nomi	69	Kamigoto
2-2	Ishikari	16	South Keiyo coast	36	Yokkaichi coast	52	Iwakuni/Otake	70	Yatsushiro
3	Muroran	19	Keihin coast	37	Owase	53	Kudamatsu	71	Oita
4	Hokuto	20	Negishi coast	38	Osaka North Port	54	Shunan	71-2	Sendai
4-2	Shiriuchi	21	Port of Niigata (East)	39	Sakai Senboku coast	55	Ube/Onoda	71-3	Kushikino
4-3	Mutsuogawara	22	Port of Niigata (West)	40	Kansai International Airport	57	Mutsurejima	71-4	Kagoshima
5	Aomori	23	Naoetsu	41	Misaki	58	Anan	72	Kiire
6	Hachinohe	24	Toyama	42	Kobe	59	Bannosu	72-2	Shibushi
6-2	Kuji	25	Fuchiyu	43	Higashiharima	60	Niihama	73	Henza
7	Shiogama	26	Shinminato	44	Himeji coast	61	Namikata	75	Onaha
8	Sendai	27	Fushiki	44-2	Ako	62	Kikuma		
9	Oga	28	Port of Nanao, Mimuro	45	Northern coast in north Wakayama	63	Matsuyama		
10	Akita	29	Kanazawa Port north	46	Central coast in north Wakayama	64	Buzen		
11	Sakata	30	Fukui coast	47	Southern coast in north Wakayama	65	Kitakyushu		
11-2	Hirono	31	Shimizu	47-2	Kobo	65-2	Shirashima		
12	Iwaki	32	Atsumi	48	Mizushima coast	66	Fukuoka		
13	Kashima coast	33	Tahara	49	Fukuyama/Sasaoka	67	Fukushima		

\*83 areas

## 2. Disaster Prevention Structures at Prefectures and Firefighting Agencies

### (1) Establishing Disaster Prevention Schemes

The prefectures that contain special disaster prevention areas are establishing disaster prevention structures in a comprehensive and systematic manner based on the Act on the Prevention of Disaster in Petroleum Industrial Complexes and Other Petroleum Facilities. This is being done through concerted efforts together with relevant agencies centering primarily on disaster prevention headquarters at petroleum industrial complexes and other locations (hereafter referred to as “disaster prevention headquarters”).

The disaster prevention headquarters carry out operations such as preparing disaster prevention plans for petroleum industrial complexes and other locations (hereafter referred to as “disaster prevention plans”), liaising and coordinating with relevant agencies when disasters strike, and promoting research studies on disaster prevention.

### (2) Emergency Responses when Disasters Occur

When disasters occur in special disaster prevention areas, emergency responses consist of initiatives carried out in a concerted manner by the prefecture, municipality, related agencies, specified business operators and others under the leadership of the disaster prevention headquarters, as stipulated by the disaster prevention plan.

When disasters occur, firefighting agencies carry out defense activities, give instructions regarding the activities of disaster prevention organizations for self-defense, and carry out other important roles.

### (3) Maintaining the Firefighting Capabilities of Municipalities Containing Special Disaster Prevention Areas

There is the concern that disasters that occur within special disaster prevention areas will be large in scale and of a specialized type. Therefore, it is important to maintain firefighting capabilities in order to respond to said disasters.

Through the Firefighting Maintenance Policies, which are based on municipal firefighting agencies, the FDMA denotes those firefighting capabilities that must be retained in order to handle disasters involving special disaster prevention areas, and strives to maintain these. In addition, the FDMA has instituted the Emergency Response Unit for Disasters with Energy and Industrial Infrastructure (Dragon Hyper Command Unit) structure under the Emergency Fire Response Teams, and carries out research and development on sophisticated firefighting robots.

As of April 1, 2017, 73 large chemical firetrucks, 57 large elevated water trucks, 88 foam solution transport vehicles, 24 large elevated chemical water trucks, 2,975kl of 3% fire-extinguishing foam, 653kl of 6% fire-extinguishing foam, 23 fireboats, and other such equipment had been allocated to firefighting agencies in municipalities containing special disaster prevention areas. Likewise, 28 foam solution storage facilities, 5 portable foam cannons, and other such equipment has been allocated to prefectures containing special disaster prevention areas in order to supplement their municipal firefighting capabilities, as well as enhance and strengthen the disaster prevention structures of said special disaster prevention areas.

## 3. Disaster Prevention Structures at Specified Business Establishments

### (1) Establishing Disaster Prevention Organizations for Self-defense

The Act on the Prevention of Disaster in Petroleum Industrial Complexes and Other Petroleum Facilities mandates that those operators that establish specified business establishments that contain special disaster prevention areas (specified business operators) must set up disaster prevention organizations for self-defense, equip fire defense equipment, appoint disaster protection managers, formulate disaster prevention regulations, and so forth. It also stipulates that they are to establish joint disaster prevention associations,<sup>\*3</sup> wide-area joint disaster prevention associations,<sup>\*4</sup> and special disaster prevention area councils for petroleum industrial complexes and the like (hereafter referred to as “area councils”)<sup>\*5</sup> in order to establish disaster prevention structures through the combined efforts of the specified business establishments.

As of April 1, 2017, disaster prevention organizations for self-defense had been established at every specified business establishment (679 business establishments), and 73 joint disaster prevention associations, 11 wide-area joint disaster prevention associations, and 55 area councils had also been established. These disaster prevention organizations for self-defense, joint disaster prevention associations, and wide-area joint disaster prevention associations are constantly equipped with 5,527 disaster prevention personnel, 88 large chemical fire trucks, 51 large, elevated water trucks, 133 foam solution transport vehicles, 111 large, elevated chemical water trucks, 24 high capacity foam cannons, 25 oil recovery vessels, and more.

What is more, the law states that these specified business establishments must establish embankments to prevent oil spills, outdoor water supply equipment for firefighting, and emergency notification systems according

<sup>\*3</sup> Joint disaster prevention associations: Disaster prevention associations jointly established by the specified business operators involved with specified business establishments containing a single special disaster prevention area in order to carry out some of the tasks of the disaster prevention organization for self-defense.

<sup>\*4</sup> Wide-area joint disaster prevention associations: Joint disaster prevention associations covering a wide area jointly established by specified business operators involved with specified business establishments containing areas in which there are two or more special disaster prevention areas to carry out tasks related to disaster prevention activities by using large volume foam cannons and other equipment.

<sup>\*5</sup> Special disaster prevention area councils for petroleum industrial complexes and the like: These are councils established with the objective of having specified business operators related to specified business establishments located in a single special disaster prevention area come together to jointly draft independent standards related to preventing disasters from occurring and carrying out joint disaster prevention drills.

<sup>\*6</sup> Ring fires: Fires that occur at floating roof outdoor storage tanks all the way around the tank in the gap between the floating roof and the tank's side panel before spreading out in a ring pattern.

to their size. As of April 1, 2017, 142 business establishments had installed embankments to prevent oil spills, 500 had installed outdoor water supply equipment for firefighting, and 481 had installed emergency notification systems, respectively.

## (2) Equipping High Capacity Foam Systems

During the Tokachi-Oki Earthquake that occurred in September 2003, damage that included damage to and oil leaks from numerous outdoor storage tanks occurred at an oil refining business establishment in Tomakomai City. In addition, approximately 54 hours after the earthquake struck all of the floating roof outdoor storage tanks caught fire when the floating roof sank.

Before this disaster struck, it had been assumed that the fires that would occur at floating roof outdoor storage tanks would be ring fires.\*<sup>6</sup> But out of consideration for the risk of earthquakes occurring in Japan, the assumption for a disaster had to be that a fire would spread to all of the tanks.

In light of this, the Act on the Prevention of Disaster in Petroleum Industrial Complexes and Other Petroleum Facilities was revised in June 2004 and the order for the enforcement of this law was revised in November 2005 to strengthen and enhance disaster prevention structures. Furthermore, it was mandated that specified business establishments must equip themselves with high capacity foam systems, which were a new type of firefighting equipment then, by November 2008 in order to respond to fires that fully envelop floating roof outdoor storage tanks.

High capacity foam systems are a type of firefighting equipment that consist of high capacity foam cannons, feed pumps, foam mixers, and hoses. They have the capacity to spray more than 10,000 liters of foam per minute. A single high capacity foam cannon is capable of spraying anywhere from three to ten times as much foam as a conventional three-part set (consisting of a large chemical firetruck, large, elevated water truck, and a foam solution transport vehicle).

At present, high capacity foam systems with the capacity to spray anywhere from 10,000 to 40,000 liters per minute are stationed at 12 wide-area joint disaster prevention associations throughout Japan.



Spraying drills through the use of the high capacity foam system

## (3) Enhancing Disaster Prevention Structures for Self-defense

The fact that petroleum industrial complexes handle large quantities of hazardous materials and the like and have equipment that is complexly interconnected makes disaster prevention activities difficult, and as such carries the risk that this will result in enormous damage. Therefore, when such disasters occur, disaster prevention organizations for self-defense and joint disaster prevention associations must carry out precise disaster prevention activities. In addition, the disaster prevention personnel responsible for said activities require extensive knowledge and skills.

The FDMA details the disaster prevention activities of disaster prevention organizations for self-defense and others in reports like the Introduction to Disaster Prevention Activities for Disaster Prevention Organizations for Self-defense, Guidelines for Education and Drills for Disaster Prevention Personnel, Disaster Prevention Activities Using High Capacity Foam Systems, and more. In FY2016 and FY2017 the FDMA held the Research and Review Committee on Modalities for Education and Training for Disaster Prevention Organizations for Self-defense and Others with the aim of preparing standardized educational texts and enhancing both human resource development for disaster prevention personnel and disaster prevention structures.

## 4. Layout Regulations for Business Establishments

### (1) Layout Regulations

Just regulating each individual facility at the business establishments that form petroleum industrial complexes as discrete units is not enough to prevent the spread of damage at such complexes. Rather, measures must be taken by business establishments on the whole from the perspective of mitigating damage.

Therefore, the Act on the Prevention of Disaster in Petroleum Industrial Complexes and Other Petroleum Facilities mandates that layout business establishments must establish certain standards related to establishing facility areas on their sites and ensuring passageways. It also mandates that in cases like where business establishments are newly established or change their facility area layouts, they must provide notification of the plans for this. It also stipulates that they must undergo confirmation after these have been completed to determine whether or not they are consistent with the relevant plans.

The quantities of oil stored and handled and the quantities of high pressure gas processed at layout business establishments came to roughly 60% and 98%, respectively, of that for the specified business establishments as a whole (as of April 1, 2017).

### (2) Status for New Establishment and Other Notifications

The number of notifications for new establishments or changes to layout business establishments in FY2016 came to 8, while the number of confirmations in the same year came to 9 (Fig. 1-3-3).

\*<sup>7</sup> Abnormal phenomena: Fires, explosions, spills of oil and other substances, and other such abnormal phenomena at specified business establishments

## 5. Other Disaster Countermeasures

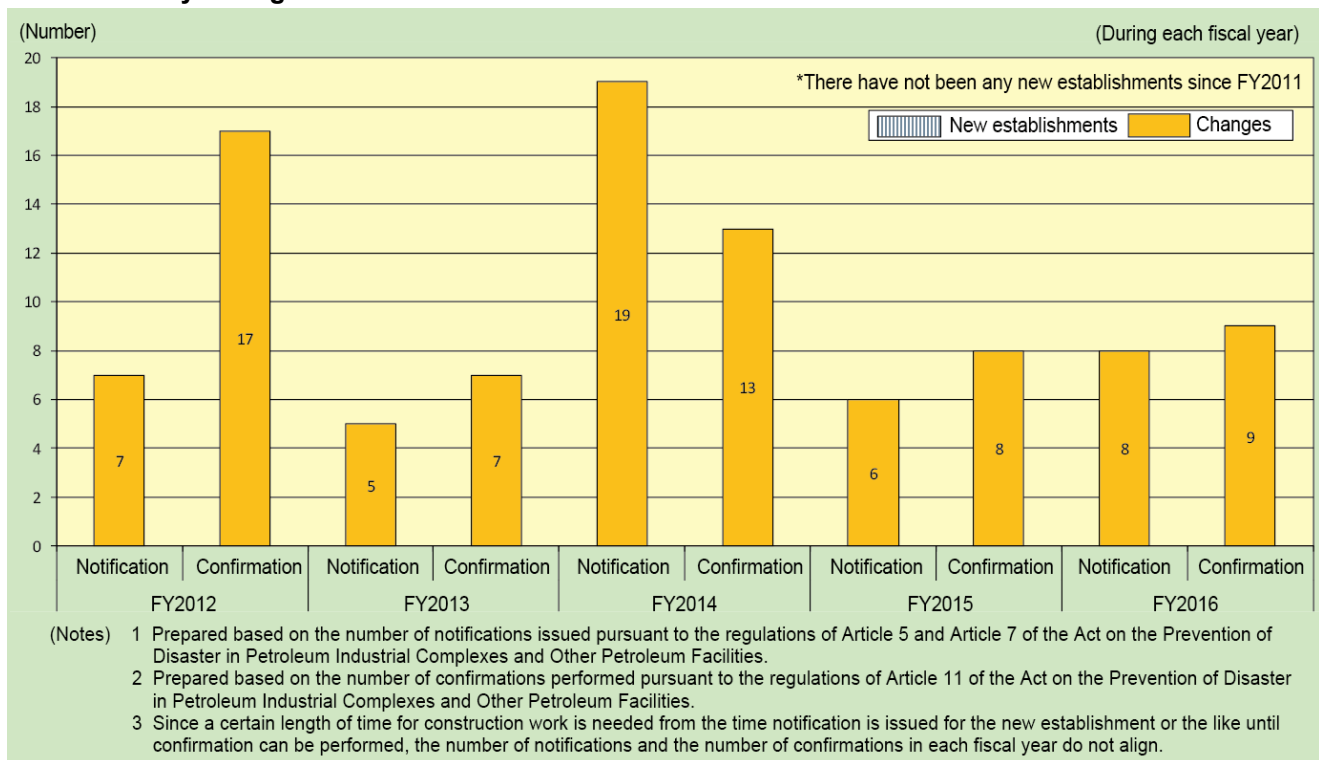
### (1) Establishing Disaster Response Structures

The Act on the Prevention of Disaster in Petroleum Industrial Complexes and Other Petroleum Facilities states that specified business operators must report to firefighting agencies or locations specified by municipal mayors immediately when any abnormal phenomena occurs.\*7 It also mandates that disaster prevention organizations for self-defense, joint disaster prevention associations, and wide-area joint disaster prevention associations must take the necessary measures in order to prevent disasters from occurring and spreading.

### (2) Establishing Green Buffer Zones for Disaster Prevention

Regulations were established in the Act on the Prevention of Disaster in Petroleum Industrial Complexes and Other Petroleum Facilities in relation to matters like drafting installation plans, the share of costs to be borne by business operators, and special financial measures for green buffer zones for disaster prevention established by local governments in the vicinities around special disaster prevention areas in order to prevent damage in said areas from spreading to the surrounding regions.

**Table 1-3-3 Status for the notification and confirmation of new business establishments subject to layout regulations**



## Section

## 1

# Firefighting Structures

## 1. Fire Defense Organizations

### (1) Standing Firefighting Agencies

Standing firefighting agencies refer to the fire defense headquarters and fire stations established in municipalities that are staffed by full-time personnel. As of April 1, 2017, there were 732 fire defense headquarters and 1,718 fire stations established throughout Japan (Table 2-1-1). There are 163,814 firefighters, of which 4,802 are women (Table 2-1-1, Fig. 2-1-1).

The current firefighting structures found in municipalities can largely be categorized into: [1] Municipalities with both fire defense headquarters and fire stations (so-called standing fire defense) as well as volunteer fire corps (so-called non-standing fire defense), and [2] Towns and villages with only volunteer fire corps.

As of April 1, 2017, 1,690 municipalities had switched over to a standing fire defense structure, whereas 29 towns and villages had failed to do so. This brings the percentage of municipalities that have switched over to a standing fire defense structure (standing ratio) to 98.3% (100% for cities and 96.9% for towns/villages). This conversion has taken place virtually nationwide, barring some towns and villages in mountainous regions or on remote islands, with 99.9% of the population now covered by standing fire defense structures.

Of these, there have been 290 fire defense headquarters established by special district authorities or extended associations (22 of which were established by extended associations). The 1,108 municipalities that have organized these (367 cities, 601 towns, and 140 villages) correspond to 65.6% of the total number of municipalities that have switched to a standing fire defense structure.

What is more, the number of municipalities outsourcing this work comes to 140 (35 cities, 85 towns, and 20 villages), which corresponds to 8.3% of the total number of municipalities that have switched to a standing fire defense structure (Fig. 2-1-2).

### (2) Volunteer Fire Corps

Volunteer fire corps are municipal, non-standing firefighting agencies. The volunteer firefighters that comprise their members have other main occupations, and engage in fire and disaster defense activities based on their love for their hometown and a desire to protect it under the thinking that they should be the ones to protect their own communities themselves. They do this as local government employees in special part-time positions vested with authority and responsibility.

As of April 1, 2017, the number of volunteer fire corps throughout Japan came to 2,209, while their volunteer members numbered 850,331. They have been established in every municipality (Table 2-1-1, Fig. 2-1-1).

Volunteer fire corps have the unique qualities of being:

- Rooted in local communities (volunteers live or work within the jurisdiction)
- Able to mobilize personnel (there are roughly 5.2-times the number of volunteers as there are regular firefighters)
- Able to respond at a moment's notice (volunteers acquire the skills and knowledge to respond to disasters through routine education and training)

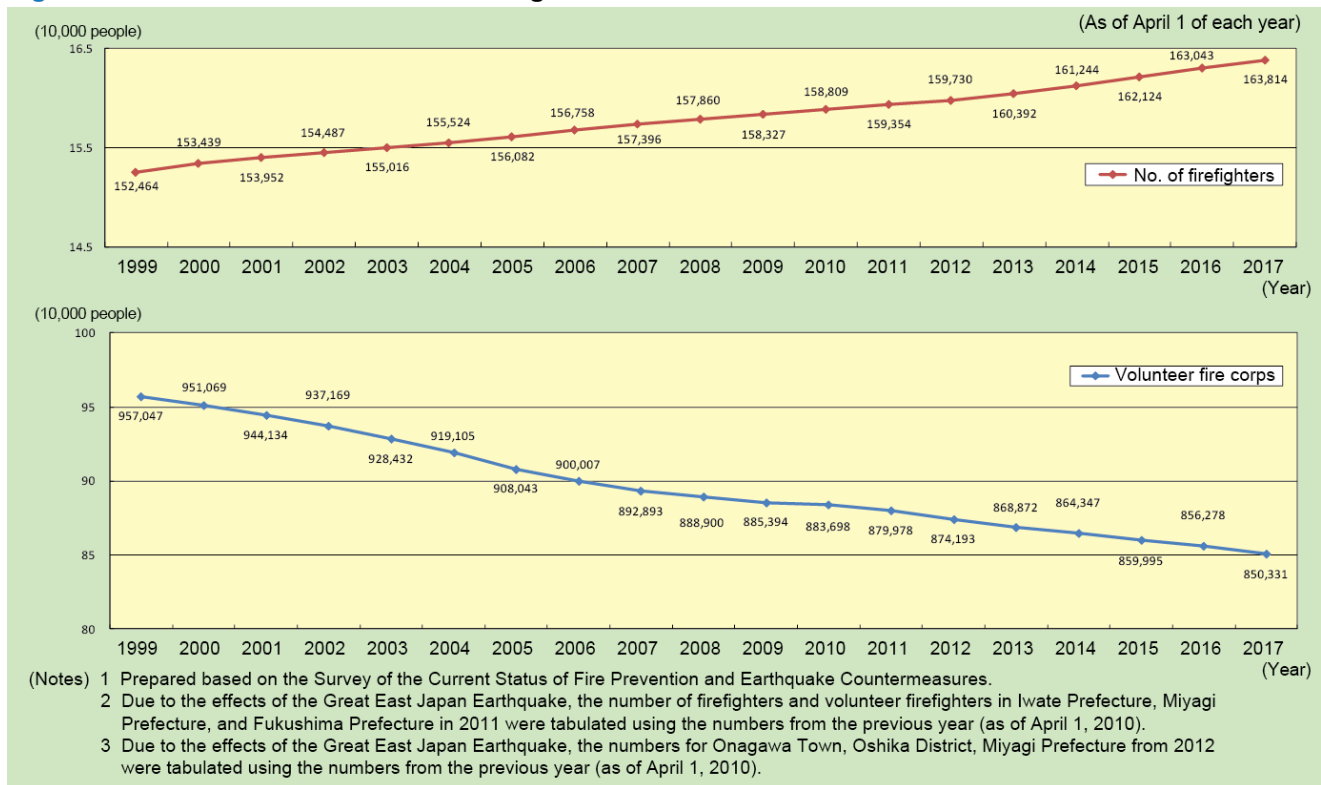
**Table 2-1-1 Current status of municipal fire defense organizations**

(As of April 1 of each year)

Classification		2016	2017	Comparison		
				Change	Rate of change (%)	
Fire defense headquarters	Fire defense headquarters	733	732	△ 1	△ 0.1	
	Breakdown	Individual	390	390	0	0.0
		Cities	52	52	0	0.0
		Towns/villages	291	290	△ 1	△ 0.3
		Special district authorities, etc.				
	Fire stations	1,714	1,718	4	0.2	
	Branch offices	3,130	3,111	△ 19	△ 0.6	
	No. of firefighters	163,043	163,814	771	0.5	
Of which, No. of female firefighters	4,597	4,802	205	4.5		
Volunteer fire corps	Volunteer fire corps	2,211	2,209	△ 2	△ 0.1	
	Divisions	22,484	22,458	△ 26	△ 0.1	
	No. of volunteers	856,278	850,331	△ 5,947	△ 0.7	
	Of which, No. of female volunteers	23,899	24,947	1,048	4.4	

(Note) Prepared based on the Survey of the Current Status of Fire Prevention and Earthquake Countermeasures and the Report on Personnel Changes concerning Fire Defense Headquarters and Volunteer Fire Corps.

**Fig. 2-1-1 Trends in the number of firefighters**



**Fig. 2-1-2 Breakdown of the establishment method for fire defense headquarters**

(As of April 1, 2017)

No. of fire defense headquarters	Municipalities	Municipalities			Standing/non-standing	Establishment method
		Cities	Towns	Villages		
732	1,690 municipalities	1,690	792	737	161	Municipalities with standing structures
Individual 442	442 municipalities	442	390	51	1	Individual
Special district authorities, etc. 290	140 municipalities	1,108	367	601	140	Comprised of special district authorities, etc.
	140 municipalities	140	35	85	20	Outsourced
		29	—	7	22	Municipalities with non-standing structures
		1,719	792	744	183	Total

(Notes) 1 Prepared based on the Report on Personnel Changes concerning Fire Defense Headquarters and Volunteer Fire Corps.  
 2 The 23 wards of Tokyo were tabulated as a single city for individual fire defense departments.  
 3 Extended associations are included under "Special district authorities."

By harnessing these qualities, they are able to engage in the initial firefighting when fires break out and deal with any residual fires, as well as sound warnings and carry out rescue activities when storm and flood disasters occur. In addition, when large-scale disasters occur, they engage in activities like assisting with resident evacuations and safeguarding against disasters, as well as giving instructions to evacuated residents in cases where they safeguard civilians. Volunteer fire corps play a major role in ensuring the safety and security of their communities, such as by overseeing fire defense activities in an across-the-board manner.

This is particularly true in towns and villages without a standing fire defense structure, where fire defense headquarters and fire stations have not been established. What is more, the volunteer fire corps engage in activities that are rooted in local communities during times of normalcy, such as raising awareness of fire prevention and disseminating first-aid treatment. They also play a major role in improving local fire prevention capabilities and revitalizing local communities.

## 2. Fire and Disaster Defense Facilities

### (1) Maintenance of Fire Trucks and Other Equipment

Fire defense headquarters and fire stations are equipped with the fire pump vehicles, ladder-equipped vehicles (including vehicles with folding ladders), chemical fire trucks, ambulances, rescue vehicles, fire protection helicopters, and other equipment that they need for their firefighting activities.

In addition, volunteer fire corps are equipped with vehicles such as fire pump vehicles, small power pump transport vehicles, and transport vehicles for rescue supplies (Table 2-1-2).



**Table 2-1-2 Number of firefighting vehicles owned**

(As of April 1, 2017) (Units: vehicles, ships, machines)

Category	Fire defense headquarters	Volunteer fire corps	Total	
Fire pump vehicles	7,757	14,097	21,854	
Ladder-equipped vehicles	1,176	0	1,176	
Chemical fire trucks	965	4	969	
Ambulances	6,271	0	6,271	
Command vehicles	1,792	892	2,684	
Rescue vehicles	1,248	0	1,248	
Other firefighting vehicles	8,609	1,847	10,456	
Small power pumps	3,779	50,064	53,843	
Breakdown	Equipped on vehicles	585	35,380	35,965
	Equipped on wheeled platforms	1,890	2,551	4,441
	Other than those above	1,304	12,133	13,437
Firefighting boats	44	18	62	
Fire protection helicopters	33	0	33	

(Note) Prepared based on the Survey of the Current Status of Fire Prevention and Earthquake Countermeasures, the Survey on the Implementation Status of Emergency Services, and the Survey on the Implementation Status of Rescue Work.

## (2) Fire Defense Communication Equipment

In order to minimize the damage from fires and other disasters, it is important to quickly become aware of said fires and disasters and have firefighting agencies rapidly arrive at the scene. In addition, it is also important to collect information and quickly and clearly issue instructions and orders at the scene of the incident. Fire defense communication equipment plays an enormous role in such contexts. Such equipment includes dedicated phone lines for reporting fires, fire defense communication networks, and more.

### A. Calls to 119

Dedicated phone lines for reporting fires refer to dedicated phone lines whereby firefighting agencies can receive emergency reports related to fires and medical emergencies from people providing notification.

The telecommunication number related to emergency reports to firefighting agencies has been set as “119” as per regulations on telecommunication numbers (see“Fig. 2-10-2. Overview of the fire and disaster defense communication network” on P230).

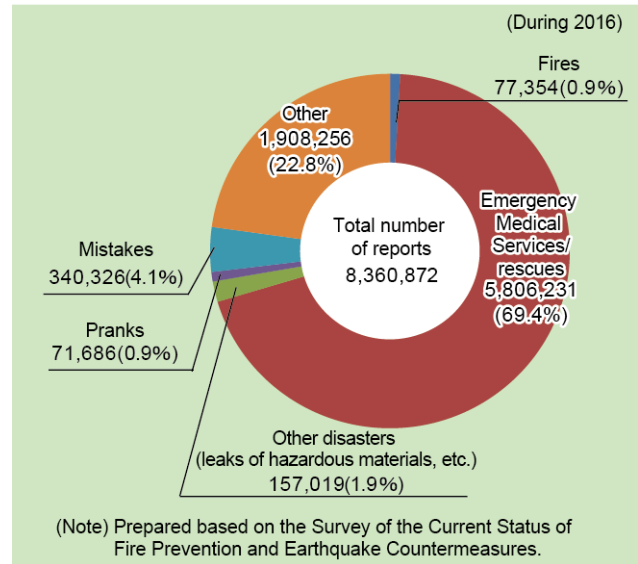
The number of incidents reported to 119 throughout 2016 came to 8,360,872. A breakdown of the reported details shows that the number of reported cases related to medical emergencies and rescues accounted for 69.4% of the total (Fig. 2-1-3).

Following the recent popularization of cell phones and IP phones\*<sup>1</sup> (hereafter referred to as “cell and other types of phones”), the number of reports to 119 from cell and other types of phones have risen, with their share versus the total number of reports coming to 41.6% and 23.8%, respectively (Fig. 2-1-4).

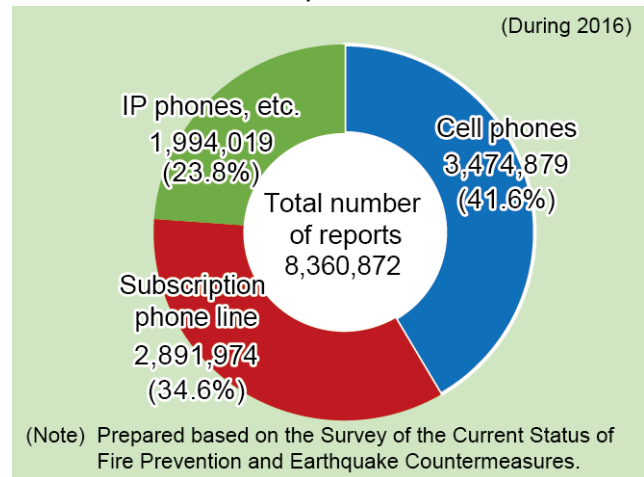
(A) Location Information Notifications for Emergency Reports to 119

The firefighting agencies that receive reports from 119 hear out the status at the scene of the disaster and information on the disaster through their back-and-forth with the person providing notification. Firefighting agencies that have adopted advanced fire defense command centers can display location information such as the reported location on a map over a monitor when they receive reports to 119.

**Fig. 2-1-3 Number of reports to 119 (by the reported details)**



**Fig. 2-1-4 Number of reports to 119 (by type of connection)**



The Location Information Notification System, which notifies firefighting agencies of the location information from the scenes where calls to 119 originate from cell phones and other sources, began operating in April 2007. The Integrated Location Information Notification System, which integrates this Location Information Notification System with the New Origin Location Display System\*<sup>2</sup> that had been operating since before to provide notifications from landline phones, began operating in October 2009.

\*<sup>1</sup> IP (Internet Protocol) phones: A voice call service offered through the use of IP technology at the contact point between the telephone network and the phone terminals

\*<sup>2</sup> New Origin Location Display System: This is a system that notifies fire defense headquarters of the location information (address information) of the person making a report with regards to 119 reports from Nippon Telegraph and Telephone East Corporation and Nippon Telegraph and Telephone West Corporation landline phones.

As of April 1, 2017, the number of fire defense headquarters that are now able to determine the location information when they receive 119 reports from cell and other types of phones is now 708 (of which 592 headquarters use the Integrated Location Information Notification System) as a result of the Location Information Notification System and Integrated Location Information Notification System.

#### (B) Nonverbal Reports

Reports to 119 are predicated on being communicated verbally. As such, when persons with hearing or speech impairments report emergencies, they are accommodated via alternative, nonverbal means through the use of FAX or email.

However, there are a number of problems with these sorts of alternative means, such as the fact that in some cases reports can only be provided from locations equipped with FAX machines, and that it takes time to convey the address and status of the person providing the report. Therefore, the FDMA held meetings of the Committee on the Diversification of 119 Reports between FY2015 and FY2016. This committee considered modalities for a new system (Net 119 Emergency Report System) whereby persons with hearing or speech impairments can easily provide reports nonverbally at anytime and from anywhere through the use of smartphones or similar devices. In March 2017, the committee compiled together standard specifications for a system that should be adopted by fire departments throughout Japan in the future.

### B. Fire Defense Communications Networks

Fire and emergency radios are an important piece of equipment. They are considered necessary for situations where a fire defense headquarters needs to provide instructions to fire brigades, rescue crews, and others who are active at the scenes of disasters, or for situations where orders are to be given and information collected at the scenes of fires. What is more, fire defense phone lines are dedicated phone lines that are used for communications such as simultaneously relaying information and orders when reports are received between fire defense headquarters, fire stations, and branch offices.

On the other hand, the image information recorded by the cameras equipped on fire protection helicopters are used nationwide and in local regions through the use of satellite communication networks.

### (3) Water Sources for Firefighting

Water sources for firefighting are an absolutely crucial component, together with fire trucks and other equipment, when it comes to carrying out firefighting activities. Generally speaking, these are categorized into artificial sources like fire hydrants and fire cisterns, as well as natural sources like rivers, ponds, oceans, and lakes.

With artificial sources, a certain amount of water can be drawn up at any time from near the location where the fire breaks out, and so they are frequently used as water sources for firefighting during such activities. Ever since the Great Hanshin-Awaji Earthquake in particular, the installation of fire cisterns and other equipment that has been seismically-reinforced against earthquakes has been actively promoted as a countermeasure for water sources for firefighting to combat large-scale earthquakes. In 2014 the Standards for Water Sources for Firefighting (FDMA Bulletin No. 7 from 1964) were revised to allow for their installation in a systematic manner (Table 2-1-3).

What is more, with natural water sources it is often the case that water can be taken in over a long period of time without any restrictions on the amount that can be taken. As such, these sources play an important role as a water source for firefighting together with artificial water sources. The other side of the coin is that there are sometimes cases where these water sources cannot be used due to the season, or where restrictions are placed on where the water can be drawn from or the like. Therefore, an appropriate combination of both artificial and natural water sources must be established when it comes to setting in place water sources for firefighting.

**Table 2-1-3 Number of water sources for firefighting installed (mainly artificial water sources)**

(As of April 1 of each year)

Category	2016	2017	Comparison	
			Difference	Percent change (%)
No. installed nationwide	2,469,427 ( 100.0 )	2,453,451 ( 100.0 )	△ 15,976	△ 0.6
Fire hydrants	1,916,386 ( 77.6 )	1,903,782 ( 77.6 )	△ 12,604	△ 0.7
Fire cisterns	532,379 ( 21.6 )	529,109 ( 21.6 )	△ 3,270	△ 0.6
20 m <sup>3</sup> -less than 40 m <sup>3</sup>	104,743	103,873	△ 870	△ 0.8
40 m <sup>3</sup> -less than 60 m <sup>3</sup>	382,410	379,961	△ 2,449	△ 0.6
60 m <sup>3</sup> or more	45,226	45,275	49	0.1
Wells	20,662 ( 0.8 )	20,560 ( 0.8 )	△ 102	△ 0.5

- (Notes) 1 Prepared based on the Survey of the Current Status of Fire Prevention and Earthquake Countermeasures.  
2 The numbers in parentheses show the proportion, and their unit is %.

## Section 4

# Education and Training Structures

## 1. Education and Training for Firefighters

It is essential to improve the knowledge and skills of firefighters to enable them to appropriately handle the increasingly diverse disaster and emergency services and increasing sophistication of fire prevention services. As such, education and training for firefighters is incredibly important.

Education and training for firefighters is offered by each fire defense headquarters, fire stations, and volunteer fire corps, as well as by the national government through the Fire and Disaster Management College and the fire academies in the various prefectures. In addition to these, there are also emergency medical technician (EMT) training institutes that offer education designed to have rescue workers from around the country acquire national qualifications as EMTs.

As this indicates, the national government, prefectures, municipalities, and others each undertake their own respective functions as they work together in a cooperative manner to provide education and training for firefighters.

## 2. On-the-job Training

Every firefighting agency carries out systematic education and training (on-the-job training) based on their respective regional characteristics on a routine basis. In particular, those firefighters who are required to perform rigorous team activities based on instructions and orders at the scenes of dangerous disasters require a sense of duty and abundance of energy and vigor in order to carry out their professional duties. Therefore, fire defense headquarters work to improve their knowledge and skills and lift their morale through various types of education and training.

The firefighting agencies work to promote training activities that are safe and effective. This is done through efforts like the establishment of standards for on-the-job training at the FDMA in the form of the Standards for Fire Development Training Etiquette, Standards for Firefighting Techniques, and Standards for Fire and Rescue Techniques, as well as safety management manuals both for during drills and during security activities.

## 3. Education and Training at Fire Academies

### (1) Establishment of Fire Academies

The provisions of Article 51 of the Fire Organization Act mandate that prefectures must establish fire academies independently or jointly, except in cases where financial circumstances or other special circumstances prevent them from doing so. In addition, the provisions stipulate that ordinance-designated cities can also establish fire academies independently or jointly together with the prefectures.

As of April 1, 2017, fire academies had been established in all 47 prefectures, seven ordinance-designated cities (Sapporo, Chiba, Yokohama, Nagoya, Kyoto, Kobe, and Fukuoka), and in the Tokyo Fire Department for a total of 55 such academies throughout Japan (in the Tokyo Metropolitan Region, there are two schools that have been jointly established: The Tokyo Metropolitan Fire Defense Training Center and the Tokyo Fire Department's Fire Academy).

The FDMA has established the Standards for the Establishment, Personnel, and Operation of Fire Academies with the objective being to work to establish and run fire academies. It also makes progress in ensuring and improving the level of education and training at the fire academies.

### (2) Types of Education and Training

The Education and Training Standards for Fire Academies have been established to serve as standards for the education and training offered at fire academies. The fire academies formulate specific curricula out of respect for the "Attainment objectives" stipulated in the standards and by using the "Standard subjects and class hours" found therein as reference guidelines. The types of education and training offered include initial education, specialized education, management education, and special education for firefighters, as well as basic education, specialized education, management education, and special education for volunteer firefighters.

- Initial education refers to foundational education and training offered to all newly-hired firefighters. The standards designate that 800 hours of class time is required for this.
- Basic education refers to basic education and training offered to those people who must acquire knowledge and skills as volunteer firefighters after joining a volunteer fire corps due to their limited experience. The standards designate that 24 hours of class time is required for this.
- Specialized education refers to expert education and training related to specific fields offered to active duty firefighters and mainly those volunteer firefighters who have completed their basic education.
- Management education refers to the education and training that is generally required for fire defense management, and is offered to management personnel and prospective candidates expected to advance onto management.
- Special education refers to education offered for special objectives that fall outside the bounds of the education and training mentioned above.

### (3) Enhancing and Strengthening the Education and Training at Fire Academies

Sophisticated firefighting activities are required due to the increasing size and complexity of disasters. In addition, prevention work also continues to grow increasingly

sophisticated and specialized as a result of revisions to fire defense laws and ordinances.

Against this background, the knowledge and skills that firefighters need in order to properly carry out their professional duties must be further improved upon. Therefore, partial revisions were made to both the Standards for the Establishment, Personnel, and Operation of Fire Academies and the Education and Training Standards for Fire Academies in March 2015 with the goal of working to enhance and strengthen the education and training offered at fire academies.

As part of the revisions, facilities capable of holding practical training by simulating actual disasters (simulated firefighting training equipment, earthquake training facilities, etc.) were added as facilities that should be set in place as standard practice. In addition, the method for calculating the number of teaching personnel at fire academies was revised out of consideration for safety management aspects, and revisions were also carried out regarding the proper allocation of class subjects and class hours based on the challenges of and need for fire defense.

#### (4) Holding of Education and Training

In FY2016 a total of 33,224 firefighters attended education and training at fire academies (Table 2-4-1). As for volunteer firefighters, in FY2016 a total of 41,698 attended education and training either at fire academies or through the dispatch of teachers from said academies (Table 2-4-2).

Since volunteer firefighters each have their own main occupations, in cases where it is determined that it will be difficult to adequately provide them with education and training at a fire academy, it has been stipulated that teachers from said academies can be dispatched locally to provide education and training. Many of the fire academies have adopted this approach.

What is more, education and training is also provided by fire academies to people other than volunteer fire corps members to the extent that doing so does not interfere with the education and training of said members. In FY2016, education and training was provided to a total of 10,369 people, including personnel from local public bodies, local voluntary disaster prevention organizations, women's (female) firefighting clubs, and voluntary firefighting organizations at companies.

## 4. Education and Training and Technical Assistance at the Fire and Disaster Management College

The Fire and Disaster Management College provides the advanced education and training needed for management to the personnel engaged in firefighting operations at the national and prefectural level, as well as to municipal volunteer fire corps members. In addition, it also provides the necessary technical assistance related to education and training for fire academies at the prefectural level.

**Table 2-4-1 Holding of education and training aimed at firefighters**

	(People)	
	FY2015	FY2016
Initial education	6,411	6,094
Specialized education	10,343	10,269
Fire Suppression Class	979	969
Special Disaster Class	683	608
Preventive Inspection Class	921	954
Hazardous Materials Class	446	388
Fire Inspection Class	1,005	1,054
Emergency Class	4,617	4,454
Rescue Class	1,692	1,842
Management education	3,150	3,736
Introductory Management Class	1,903	2,415
Intermediate Management Class	898	905
Advanced Management Class	349	416
Special education	13,515	13,125
<b>Total</b>	<b>33,419</b>	<b>33,224</b>

(Notes) Prepared based on the Survey on Education and Training at Fire Academies.

**Table 2-4-2 Holding of education and training aimed at volunteer firefighters**

	(People)					
Category	FY2015			FY2016		
	School education	Teacher dispatch	Total	School education	Teacher dispatch	Total
Basic education	3,859	7,682	11,541	4,672	4,753	9,425
Specialized education	2,264	0	2,264	2,150	13	2,163
Fire Suppression Class	1,033	0	1,033	769	13	782
Machinery Operation Class	1,231	0	1,231	1,381	0	1,381
Management education	8,172	438	8,610	6,973	567	7,540
Introductory Management Class	2,507	438	2,945	1,821	322	2,143
Graduates of the Supervisory Management Class	193	0	193	601	2	603
Branch Supervisor Course	2,631	0	2,631	2,486	13	2,499
Local Command Course	3,034	0	3,034	2,666	232	2,898
Special education	6,672	18,819	25,491	8,527	14,043	22,570
<b>Total</b>	<b>20,967</b>	<b>26,939</b>	<b>47,906</b>	<b>22,322</b>	<b>19,376</b>	<b>41,698</b>

(Notes) Prepared based on the Survey on Education and Training at Fire Academies.

\* Graduates of both the Local Command Course and the Branch Supervisor Course were counted as having completed the Supervisory Management Class.

\* The Intermediate Management Class was replaced with the Supervisory Management Class through the partial revisions to the education and training standards for fire academies from March 2014.

### (1) Facilities and Equipment

The Fire and Disaster Management College's education and training facilities consist of a main building, a secondary building, training facilities, and a dormitory.

The main building contains a large classroom that can accommodate 250 people, three regular classrooms, an audiovisual classroom, a scientific combustion laboratory, and a library. In addition, it also contains disaster response training rooms and other facilities for fostering trainees with the ability to assess situations and give commands as leaders by experiencing a variety of simulated disaster scenarios.

The secondary building contains an auditorium that can accommodate 300 people, as well as rescue training rooms, special classrooms, an indoor training ground, and more.

The training facilities consist of an indoor fire defense training building and an 11-story aboveground, multi-story training tower where trainees can run drills in an

environment where there is thick smoke and hot air through the combined use of steam and smoke machines. In addition, these also include a training facility where trainees can experience a real fire in which they experience the same changes in the environment that occur at the scene of an actual fire in which wood is burning inside a container.

The dormitory has a south wing that can accommodate 172 people and a north wing that can accommodate 52. In addition, it has been equipped with dedicated facilities for women, including the bathrooms, restrooms, changing rooms, and lounges women need for dormitory life.

As for education and training vehicles, the college is equipped with command vehicles, ordinary pump vehicles, pump vehicles equipped with water tanks, rescue work vehicles, special disaster response chemical vehicles, disaster support vehicles, and high-grade emergency vehicles.

## (2) Holding of Education and Training

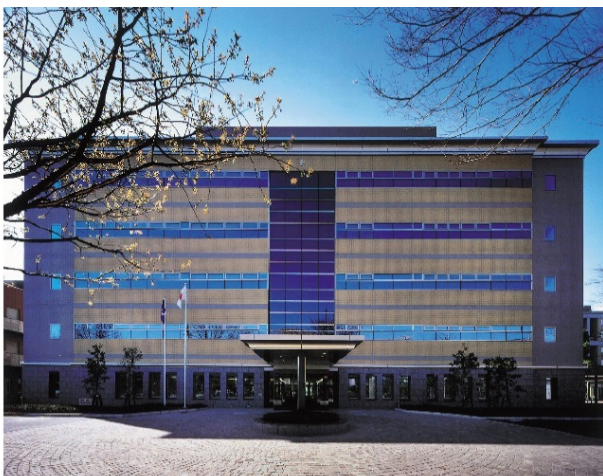
The Fire and Disaster Management College turned out 1,087 graduates from its comprehensive classes and specialized classes, and 595 graduates from its practical courses in 2016. This brings the total number of its graduates from the time it was founded up through FY2016 to 59,183.

What is more, its employees numbered 2,006 people in FY2017 (Table 2-4-3).

The college's classes were substantially reorganized in FY2006, following which reviews have been carried out where appropriate based on the needs of the attendees. As a result, in FY2016, 20 classes and 11 practical courses were held throughout the year.

Regarding the contents of the education and training for each course (lesson subjects), mental health, coping with critical incident stress, crisis management, public relations, and handling litigation have been incorporated as subjects designed to cope with the new challenges that have arisen as a result of changes in social conditions according to the objectives of each class. What is more, efforts are being made to round-out the contents of the curriculum, such as by adding in training that simulates receiving commands during a fire, simulation training for receiving assistance during a large-scale earthquake, and other such drills that make use of information systems. Other examples of this include drills on firefighting activities in environments that are similar to those of an actual fire through the use of training facilities that simulate the experience of being in an actual fire (hot training).

Moreover, some of the classes incorporate advance learning over the internet (e-learning) in an effort to provide efficient education and training within a limited period of time.



The Fire and Disaster Management College's main building



Drill on responding to a large number of sick or injured persons carried out by several classes



NBC disaster response drill



Training that simulates the experience of being in an actual fire (hazardous material fire)

In FY2016, a five-day, women-only practical course was held with the main objective of supporting the career development of female firefighting officials in an effort to expand training opportunities for women.

What is more, this has been established as part of a framework for giving priority to female firefighting officials by reserving 5% of the enrollment slots for each class for women to encourage their matriculation.

Furthermore, for the holding of large-scale international events (such as the 2020 Tokyo Olympic and Paralympic Games), the FDMA has increased the number of days of education for its NBC Course from 10 to 15 up through FY2020, when the Olympics are to be held, to contribute to enhancing NBC disaster response capabilities.

At the Committee on the Education and Training at the Fire and Disaster Management College held in FY2015, it was acknowledged that in-service fire academy teachers must acquire advanced knowledge and expert skills commensurate with their positions, and that their capabilities must also be enhanced so as to enable them to continue reassessing modalities for how the education and training at fire academies should be structured. Based on this, for FY2017 classes were newly established with the objective of improving their capabilities to enable them to provide comprehensive instruction on operational management planning, and preventative operations or security operations.

In addition, as a means of expanding training opportunities for female firefighting officials, the decision was made to increase enrollment for women-only courses and the number of days of education, while also enhancing their contents. It was also decided that the Fire and Disaster Management College Forum that is offered as an on-demand course would be offered with content based around the theme of promoting the active involvement of women.

In addition, a practical course was established for those people who are involved in preventative operations at fire departments with the objective being to instill in them the knowledge and skills needed in order to perform management for inspection operations as a whole.

### **(3) Technical Assistance for Fire Academies**

The education and training provided at prefectural fire academies must be enhanced and strengthened owing to the increasing diversity and growing scale of the situations resulting from natural disasters, fires, and accidents. The Fire and Disaster Management College provides the following sorts of technical assistance in order to achieve this.

#### **A. Education and Training for Fire Academy Principals and Teachers**

Education and training for newly-appointed fire academy principals and teachers is provided via classes for newly-appointed fire chiefs and school principals, as well as classes for newly-appointed teachers, respectively.

What is more, the classes for newly-appointed teachers and in-service teachers provide education centered mainly around learning teaching techniques. In addition, they also incorporate practices in which the teachers actually give lectures, and provide training for educational leaders at the fire academies.

The classes for people other than newly-appointed teachers and in-service teachers also strive to foster educational leaders as one of their objectives, and offer learning on teaching techniques and practice with giving lectures as part of this.

#### **B. Dispatch of Lecturers**

Lecturers on fire suppression duty, prevention, emergency medical service, rescue, and other forms of fire service administration and firefighting techniques are dispatched in response to requests from fire academies in order to enhance the educational content at said academies. Lecturers were dispatched a total of 113 times in FY2016.

#### **C. Editing Firefighting Textbooks**

The FDMA edits the textbooks for beginners that are used at the fire academies. As of April 2017, it had issued 21 types of textbooks.

#### **D. Providing Information on Lecturers, etc.**

The FDMA provides a roster of the names of graduates from the Fire and Disaster Management College, information on lecturers, and more. This is designed to secure lecturers who have acquired a certain level of knowledge and skills in specialized areas, as well as to contribute to further improving the quality of the education and training offered by the fire academies.

**Table 2-4-3 Education and training implementation status**

Category		FY2016 (actual performance)		FY2017 (planned)				
		No. of times held (times)	Graduates (people)	No. of times held (times)	Capacity (people)	Time	Educational goals	
Classes	Comprehensive education	Management Class	4	284	4	294	2 months	To foster human resources suitable for becoming senior firefighting management by having them learn advanced knowledge and skills related to firefighting in a comprehensive manner.
		Advanced Management Class	1	50	1	54	2 weeks	To improve the qualifications of people currently serving as senior firefighting management by having them learn advanced knowledge and skills related to firefighting in a comprehensive manner.
		New Fire Chief/Principal Orientation Class	2	55	2	120	2 weeks	To have newly-appointed fire chiefs and fire academy principles learn the knowledge and skills they will need for their positions in a comprehensive manner.
		Volunteer Fire Corps Management Class	2	61	2	72	1 week	To have senior management at volunteer fire corps learn the knowledge and skills they will need for their positions in a comprehensive manner.
	Specialized education	Guard Class	2	120	2	120	2 months	To improve the qualifications of educational instructors on guard duty by having them learn advanced knowledge and skills related to guard duty in a specialized manner.
		Rescue Class	2	120	2	120	2 months	To improve the qualifications of educational instructors on rescue duty by having them learn advanced knowledge and skills related to rescue duty in a specialized manner.
		Emergency Medical Service Class	1	48	1	48	1 month	To improve the qualifications of rescue work instructors by having emergency rescue team leaders and others acquire advanced knowledge and skills in a comprehensive manner (including education for fostering EMTs to offer instruction).
		Prevention Class	2	96	2	96	2 months	To improve the qualifications of educational instructors on prevention by having them learn advanced knowledge and skills related to prevention in a specialized manner.
		Hazardous Substances Class	1	42	1	42	1 month	To improve the qualifications of educational instructors on hazardous material safety by having them learn advanced knowledge and skills related to hazardous material safety in a specialized manner.
		Fire Survey Class	2	96	2	96	2 months	To improve the qualifications of educational instructors on fire survey work by having them learn advanced knowledge and skills related to fire survey work in a specialized manner.
	New Teacher Orientation Class	1	115	1	60	2 weeks	To have newly-appointed personnel in charge of education and training at fire academies learn the knowledge and skills they will need for their positions in a comprehensive manner.	
	In-service teachers	-	-	2	72	1 week	This improves the skills of the in-service teaching personnel in charge of providing education and training at fire academies and the like to enable them to provide comprehensive instruction on operational management planning, preventative operations, and security operations.	
	<b>Subtotal</b>	<b>20</b>	<b>1,087</b>	<b>22</b>	<b>1,194</b>			
Practical courses	Emergency Fire Response Team classes	Commanding Officer Course	2	76	2	96	2 weeks	To have the command support leaders of Emergency Fire Response Teams learn the knowledge and skills they will need for their work.
		Advanced Rescue/Special Advanced Rescue Course	1	67	1	66	2 weeks	To have the leaders of advanced rescue teams and special advanced rescue teams learn the knowledge and skills they will need for their work.
		NBC Course	1	66	1	66	3 weeks	To have NBC disaster personnel on Emergency Fire Response Teams learn the knowledge and skills they will need for NBC disaster response duties.
		Air Corps Officer Course	1	56	1	84	2 weeks	To have firefighting and fire defense air patrol commanders learn the knowledge and skills they will need for their work.
	Crisis management/firefighting education classes	Crisis Management/Public Protection Course	1	69	1	96	1 week	To have crisis managers, fire defense managers, and those in charge of protecting the public at local public bodies learn the knowledge and skills they will need for their work.
		Voluntary Disaster Prevention Organization Training Course	1	64	1	72	1 week	To have those in charge of training at voluntary disaster prevention organizations learn the knowledge and skills they will need for their work.
		Short-term Voluntary Disaster Prevention Organization Training Course	2	90	2	128	2 days	To have the personnel in charge of the task of training voluntary disaster prevention organizations learn the basic knowledge and skills they will need for their work.
		Volunteer Fire Corps Revitalization Course	1	47	1	96	1 week	To have those involved in volunteer fire corps duties and education/training learn the knowledge and skills they will need for their work.
		Courses encouraging the active involvement of women	1	60	1	60	2 weeks	To support the career development of female firefighting officials who are candidates for management positions and have them learn knowledge and skills with the goal of expanding their career opportunities.
		Inspection operations management course	-	-	1	48	1 week	This instills persons at or above the section head-level who supervise preventive operations at fire departments with the knowledge and skills needed in order to perform management for inspection operations as a whole, such as handling violations.
	<b>Subtotal</b>	<b>11</b>	<b>595</b>	<b>12</b>	<b>812</b>			
	<b>Total</b>	<b>31</b>	<b>1,682</b>	<b>34</b>	<b>2,006</b>			

**(4) Special Lectures**

The FDMA is planning special lectures in anticipation for the Rugby World Cup 2019 and the 2020 Tokyo Olympic and Paralympic Games to be held for four years in the prefectures where the venues for these events are located at 16 sites. In FY2017, lectures on topics like

safety management, responding to mass casualties, and NBC responses were held at four locations in Hokkaido Prefecture, Hyogo Prefecture, Saitama Prefecture, and Fukuoka Prefecture.

Section **5**

# Ambulance Service System

## 1. Implementation of Emergency Medical Services

### (1) Emergency Medical Service Mobilization

The number of times emergency medical service mobilizations were sent out via ambulances nationwide in 2016 came to 6,209,964 (an increase of 155,149, or 2.6%, from the previous year). This has consistently continued to trend upward since the year 2004, when the number of cases exceeded 5 million for the first time. The number of times emergency medical service mobilizations were sent out taken as a daily average is approximately 16,967 (this was 16,589 in the previous year), meaning that emergency medical service teams were mobilized at a rate of once every 5.1 seconds or so (this was 5.2 seconds the previous year). What is more, the number of people transported by ambulance has also consistently continued its upward swing, coming to 5,621,218 people (an increase of 142,848 people, or 2.6%, from the previous year). This means that one out of every 23 members of the public has been transported by an emergency medical service team (this was one out of every 23 people in the previous year). Looking at this by the type of accident that led people to be transported by an ambulance reveals that 3,607,942 people (64.2%) suddenly took ill, 847,871 people (15.1%) suffered an ordinary injury, 476,689 people (8.5%) suffered a car accident, and so on (Table 2-5-1, Table 2-5-2, and Attachments 2-5-1 and 2-5-2).

The number of times fire protection helicopters were mobilized came to 3,664 (this was 3,375 the previous year), and 2,816 people were transported by them (2,882 the previous year).

### (2) People Transported by the Severity of Their Injury or Illness

Of the 5,621,218 people transported by ambulances in 2016, the majority were people with minor injuries or illnesses that did not require hospitalization (outpatient care) or other cases (cases where a doctor did not provide a diagnosis, etc.) (Table 2-5-3).

### (3) People Transported by Ambulance by Age Group and Type of Accident

Viewing a breakdown of the 5,621,218 people transported by ambulance in 2016 by age group reveals that 13,239 of them were newborn infants (0.2%), 270,515 were young children (4.8%), 202,189 were youths (3.6%), 1,918,454 were adults (34.1%), and 3,216,821 were elderly people (57.2%). As the aging of society advances, the share accounted for by elderly people will continue to trend upwards year by year (this was 56.7% the previous year).

What is more, elderly people accounted for the largest percentage of the people transported by ambulance for sudden illnesses (2,174,469 people, or 60.3%), while the largest percentage transported for traffic accidents consisted of adults (297,051 people, or 62.3%) and the largest percentage for ordinary injuries consisted of elderly people (559,037 people, or 65.9%) (Table 2-5-1, Attachment 2-5-3).

**Table 2-5-1 Trends in the number of ambulance services and number of people transported**

(During each year)

Category	No. of emergency medical service mobilizations				People transported				Of (A), No. of mobilizations due to sudden illnesses (B)	Ratio of (B) to (A) (%)
	Total No. of emergency medical service mobilizations	Of which, No. via ambulance (A)	Of which, No. via fire protection helicopter	Difference/rate of change (%) from previous year	Total No. of people transported	Of which, No. via ambulance	Of which, No. via fire protection helicopter	Difference/rate of change (%) from previous year		
Year										
2002	4,557,949	4,555,881	2,068	158,754 ( 3.6 )	4,331,917	4,329,935	1,982	139,447 ( 3.3 )	2,610,812	57.3
2003	4,832,900	4,830,813	2,087	274,951 ( 6.0 )	4,577,403	4,575,325	2,078	245,486 ( 5.7 )	2,819,620	58.4
2004	5,031,464	5,029,108	2,356	198,564 ( 4.1 )	4,745,872	4,743,469	2,403	168,469 ( 3.7 )	2,953,471	58.7
2005	5,280,428	5,277,936	2,492	248,964 ( 4.9 )	4,958,363	4,955,976	2,387	212,491 ( 4.5 )	3,167,046	60.0
2006	5,240,478	5,237,716	2,762	▲39,950 (▲0.8)	4,895,328	4,892,593	2,735	▲63,035 (▲1.3)	3,163,822	60.4
2007	5,293,403	5,290,236	3,167	52,925 ( 1.0 )	4,905,585	4,902,753	2,832	10,257 ( 0.2 )	3,223,990	60.9
2008	5,100,370	5,097,094	3,276	▲193,033 (▲3.6)	4,681,447	4,678,636	2,811	▲224,138 (▲4.6)	3,102,423	60.9
2009	5,125,936	5,122,226	3,710	25,566 ( 0.5 )	4,686,045	4,682,991	3,054	4,598 ( 0.1 )	3,141,882	61.3
2010	5,467,620	5,463,682	3,938	341,684 ( 6.7 )	4,982,512	4,979,537	2,975	296,467 ( 6.3 )	3,389,044	62.0
2011	5,711,102	5,707,655	3,447	243,482 ( 4.5 )	5,185,313	5,182,729	2,584	202,801 ( 4.1 )	3,562,208	62.4
2012	5,805,701	5,802,455	3,246	94,599 ( 1.7 )	5,252,827	5,250,302	2,525	67,514 ( 1.3 )	3,648,074	62.9
2013	5,918,939	5,915,683	3,256	113,238 ( 2.0 )	5,348,623	5,346,087	2,536	95,796 ( 1.8 )	3,732,953	63.1
2014	5,988,377	5,984,921	3,456	69,438 ( 1.2 )	5,408,635	5,405,917	2,718	60,012 ( 1.1 )	3,781,249	63.2
2015	6,058,190	6,054,815	3,375	69,813 ( 1.2 )	5,481,252	5,478,370	2,882	72,617 ( 1.3 )	3,851,978	63.6
2016	6,213,628	6,209,964	3,664	155,438 ( 2.6 )	5,624,034	5,621,218	2,816	142,782 ( 2.6 )	3,975,380	64.0

(Note) Prepared based on the Annual Report on Ambulance Service and the Survey on the Current Status of Fire and Disaster Prevention and Earthquake Countermeasures.



**Table 2-5-2 Trends in the number of ambulance mobilizations by type of accident and the number of people transported**

(During each year)

By type of accident	During 2015		During 2016		YoY	
	No. of mobilizations (People transported)	Composition rate (%)	No. of mobilizations (People transported)	Composition rate (%)	Difference	Rate of change (%)
Sudden illness	3,851,978 ( 3,491,374)	63.6 ( 63.7)	3,975,380 ( 3,607,942)	64.0 ( 64.2)	123,402 ( 116,568)	3.2 ( 3.3)
Traffic accident	501,321 ( 490,797)	8.3 ( 9.0)	488,861 ( 476,689)	7.9 ( 8.5)	-12,460 ( -14,108)	-2.5 ( -2.9)
Ordinary injury	894,742 ( 817,931)	14.8 ( 14.9)	926,356 ( 847,871)	14.9 ( 15.1)	31,614 ( 29,940)	3.5 ( 3.7)
Self-inflicted injury	56,891 ( 38,425)	0.9 ( 0.7)	54,302 ( 37,054)	0.9 ( -0.7)	-2,589 ( -1,371)	-4.6 ( -3.6)
Work-related injury	50,788 ( 49,589)	0.8 ( 0.9)	52,168 ( 50,791)	0.8 ( 0.9)	1,380 ( 1,202)	2.7 ( 2.4)
Assault	35,879 ( 28,116)	0.6 ( 0.5)	35,217 ( 27,445)	0.6 ( 0.5)	-662 ( -671)	-1.8 ( -2.4)
Sports/athletics	40,588 ( 40,307)	0.7 ( 0.7)	41,031 ( 40,692)	0.7 ( 0.7)	443 ( 385)	1.1 ( 1.0)
Fire	22,318 ( 5,600)	0.4 ( 0.1)	22,132 ( 5,337)	0.4 ( 0.1)	-186 ( -263)	-0.8 ( -4.7)
Flood	5,329 ( 2,327)	0.1 ( 0.1)	5,184 ( 2,341)	0.1 ( 0.0)	-145 ( 14)	-2.7 ( 0.6)
Natural disaster	493 ( 336)	0.0 ( 0.0)	827 ( 655)	0.0 ( 0.0)	334 ( 319)	67.7 ( 94.9)
Other	594,488 ( 513,568)	9.8 ( 9.4)	608,506 ( 524,401)	9.8 ( 9.3)	14,018 ( 10,833)	2.4 ( 2.1)
<b>Total</b>	<b>6,054,815</b> <b>( 5,478,370)</b>	<b>100</b> <b>( 100)</b>	<b>6,209,964</b> <b>( 5,621,218)</b>	<b>100</b> <b>( 100)</b>	<b>155,149</b> <b>( 142,848)</b>	<b>2.6</b> <b>( 2.6)</b>

- (Notes) 1 Prepared based on the Annual Report on Ambulance Service  
2 Digits in the second decimal place were rounded off, so in some cases the totals may not be consistent.

**Table 2-5-3 Number of people transported by ambulance by type of accident and severity of their injury / illness**

(During 2016)

Category	Death	Serious (Lengthy hospitalization)	Moderate (Hospitalization)	Minor (Outpatient care)	Other	Total
Type of incident						
Sudden illness	60,634 (1.7)	277,334 (7.7)	1,508,146 (41.8)	1,760,470 (48.8)	1,358 (0.0)	3,607,942 (100)
Traffic accident	2,136 (0.4)	18,414 (3.9)	91,249 (19.1)	364,588 (76.5)	302 (0.1)	476,689 (100)
Ordinary injury	5,591 (0.7)	55,158 (6.5)	282,462 (33.3)	504,225 (59.5)	435 (0.1)	847,871 (100)
Other	7,618 (1.1)	119,251 (17.3)	420,692 (61.1)	139,918 (20.3)	1,237 (0.2)	688,716 (100)
<b>Total</b>	<b>75,979</b> <b>(1.4)</b>	<b>470,157</b> <b>(8.4)</b>	<b>2,302,549</b> <b>(41.0)</b>	<b>2,769,201</b> <b>(49.3)</b>	<b>3,332</b> <b>(0.1)</b>	<b>5,621,218</b> <b>(100)</b>

- (Notes) 1 Prepared based on the Annual Report on Ambulance Service  
2 The severity of injuries or illnesses at the time of the initial medical examination are classified as follows.  
(1) Dead: Persons confirmed to be dead at the time of the initial medical examination  
(2) Severe condition (lengthy hospitalization): Persons whose injury or illness is so severe that they require hospitalization lasting three weeks or longer  
(3) Moderate condition (hospitalization): Persons whose injury or illness are neither severe nor mild  
(4) Mild condition (outpatient care): Persons whose injury or illness does not require hospitalization  
(5) Other: Persons who have not been diagnosed by a physician, persons for whom the extent of their injury or illness is not clear, or persons who were transported to another location  
\* Since the extent of injuries or illnesses are categorized by using the amount of hospitalization required as the criteria, mild condition includes persons who required treatment at a hospital in the early stages and persons who required treatment at a hospital on a regular basis.  
3 The numbers in parentheses show the proportion, and their unit is %.  
4 Digits in the second decimal place were rounded off, so in some cases the totals may not be consistent.

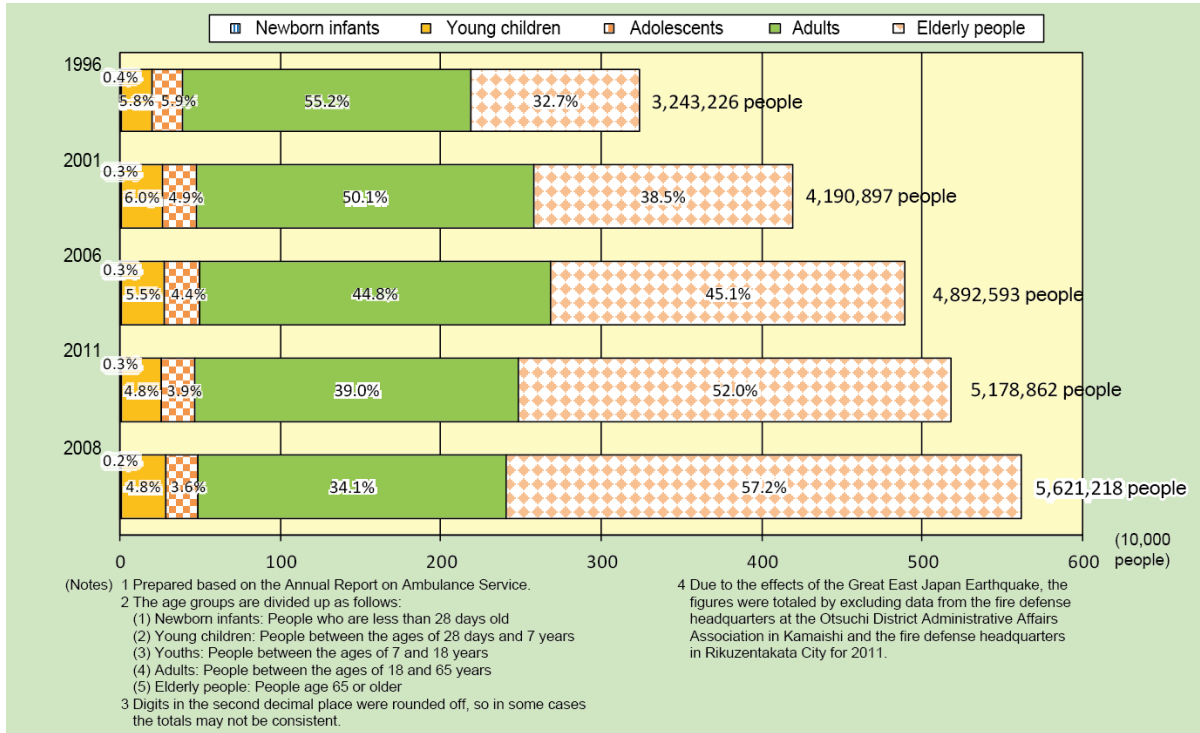
#### (4) Time Required to Arrive at the Scene

Looking at a breakdown of the 6,209,964 cases in which ambulances were mobilized in 2016 by the time required to arrive at the scene (time it took to arrive at the scene after the 119 report was received) reveals that in the majority of cases it took between five and ten minutes

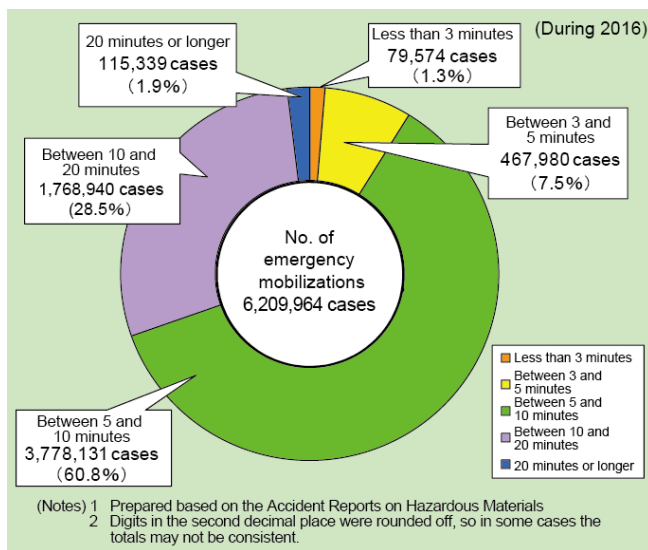
(3,778,131 cases, or 60.8% of the total) (Fig. 2-5-2).

Moreover, the average time required to arrive at the scene came to 8.5 minutes (8.6 minutes, the previous year), which is 1.9 minutes longer than it was ten years ago (2006) (Fig. 2-5-4).

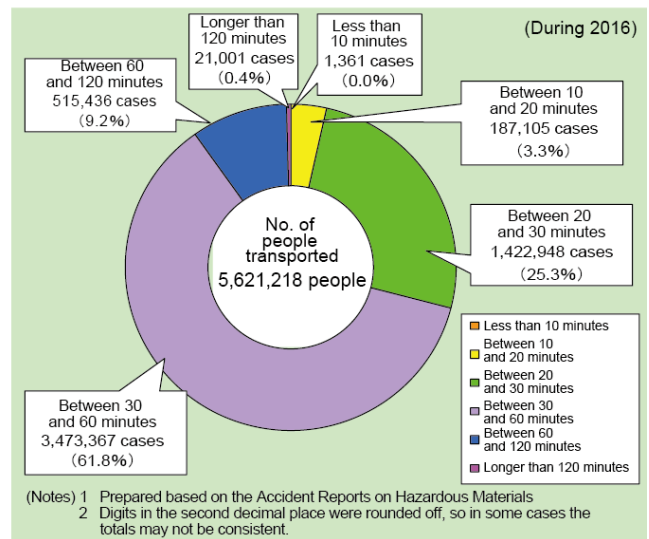
**Fig. 2-5-1 Trends in the composition rate for people transported by age group**



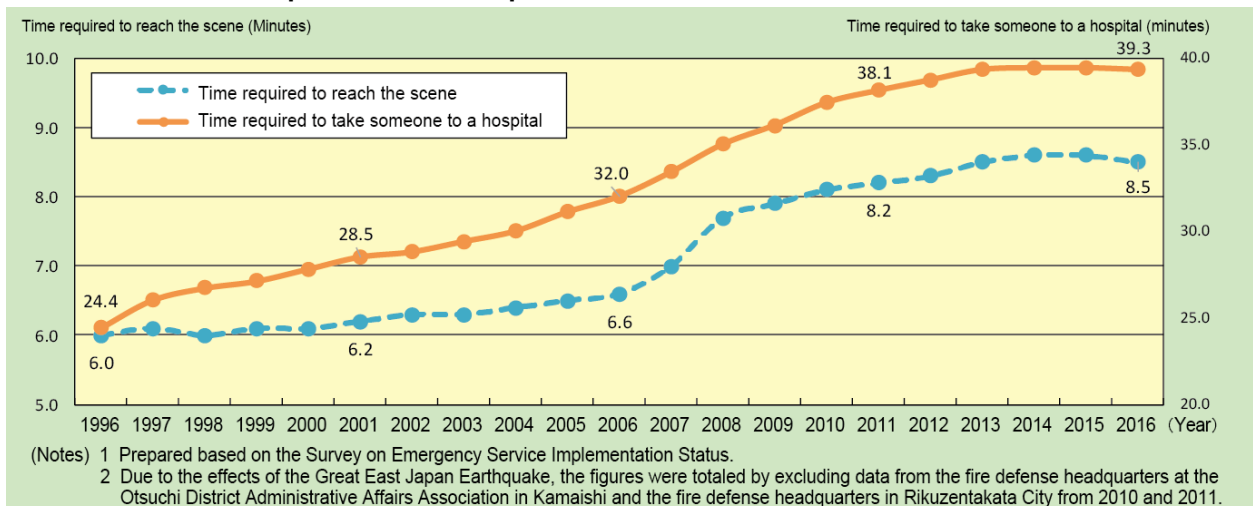
**Fig. 2-5-2 No. of mobilizations by time required for the ambulance to arrive at the scene**



**Fig. 2-5-3 No. of people transported by ambulance by time it took to check them into a hospital**



**Fig. 2-5-4 Trends in the amount of time it takes ambulances to arrive at the scene and the time it takes to check the patient into a hospital**



**Table 2-5-4 First-aid Treatment Administered by Ambulance Crew Members**

Type of incident	Sudden illness	Traffic accident	Ordinary injury	Other	Total	
No. of people transported who were given first-aid treatment	3,448,333	456,584	809,714	658,737	5,373,368	
Items for which first-aid treatment were administered	Stanching bleeding (0.2)	23,162 (1.3)	77,151 (2.6)	17,128 (0.7)	139,682 (0.7)	
	Covering (0.2)	85,333 (4.8)	187,021 (6.2)	38,099 (1.5)	336,202 (1.6)	
	Immobilization (0.3)	220,826 (12.3)	164,892 (5.5)	48,780 (2.0)	477,027 (2.3)	
	Keeping warm (7.1)	84,380 (4.7)	200,038 (6.6)	167,606 (6.7)	1,421,120 (6.8)	
	Oxygen inhalation (5.7)	39,568 (2.2)	57,349 (1.9)	190,673 (7.6)	1,060,955 (5.1)	
	Artificial respiration (0.2)	849 (0.0)	3,090 (0.1)	4,763 (0.2)	38,659 (0.2)	
	Pressure on sternum (0.1)	285 (0.0)	1,093 (0.0)	1,109 (0.0)	11,832 (0.1)	
	*Of which, cases involving automatic heart massagers	2,457	43	287	282	3,069
	Cardiopulmonary resuscitation (0.7)	94,736 (0.2)	3,129 (0.2)	11,100 (0.4)	11,222 (0.4)	120,187 (0.6)
	*Of which, cases involving automatic heart massagers	9,454	249	1,248	1,130	12,081
	*Continuation of home medical treatment (0.2)	30,156 (0.0)	277 (0.0)	2,608 (0.1)	2,825 (0.1)	35,866 (0.2)
	*Antishock garments (0.0)	113 (0.0)	14 (0.0)	35 (0.0)	28 (0.0)	190 (0.0)
	*Measuring blood pressure (23.8)	3,241,300 (24.6)	441,220 (24.6)	756,207 (25.1)	612,477 (24.5)	5,051,204 (24.2)
	*Listening for heartbeat/sounds of breathing (7.8)	1,067,078 (7.8)	134,967 (7.5)	153,727 (5.1)	140,085 (5.6)	1,495,857 (7.2)
	*Measuring blood oxygenation levels (24.6)	3,345,495 (24.6)	448,192 (25.0)	787,546 (26.2)	640,081 (25.6)	5,221,314 (25.0)
	*ECG measurements (14.9)	2,032,546 (14.9)	115,152 (6.4)	233,234 (7.7)	306,181 (12.3)	2,687,113 (12.8)
	Ensuring respiratory tracts (1.2)	157,560 (1.2)	5,006 (0.3)	16,662 (0.6)	19,544 (0.8)	198,772 (1.0)
	*Of which, nasal airways	8,421	172	828	1,084	10,505
	*Of which, laryngoscope, forceps, etc.	4,920	126	3,082	396	8,524
	*Of which, laryngeal mask, etc.	32,771	826	2,990	2,681	39,268
	*Of which, tracheal intubation	6,865	128	2,300	828	10,121
	*Defibrillation (0.1)	11,505 (0.1)	207 (0.0)	535 (0.0)	749 (0.0)	12,996 (0.1)
	*Ensuring intravenous lines (0.3)	47,154 (0.3)	1,730 (0.1)	4,887 (0.2)	4,037 (0.2)	57,808 (0.3)
	*Of which, cases before CPA	12,556	855	726	752	14,889
	*Of which, cases after CPA	31,586	746	3,800	2,963	39,095
	*Drug administration (0.1)	19,207 (0.1)	516 (0.0)	2,360 (0.1)	1,649 (0.1)	23,732 (0.1)
	*Measuring blood sugar (0.3)	36,309 (0.3)	381 (0.0)	993 (0.0)	789 (0.0)	38,472 (0.2)
	*Administration of grape sugar (0.0)	5,742 (0.0)	22 (0.0)	32 (0.0)	54 (0.0)	5,850 (0.0)
	*EpiPen administration (0.0)	212 (0.0)	13 (0.0)	39 (0.0)	22 (0.0)	286 (0.0)
	Other treatments (12.1)	1,649,960 (12.1)	189,227 (10.5)	350,327 (11.6)	288,963 (11.6)	2,478,477 (11.9)
	<b>Total</b>	<b>13,611,355</b> (100)	<b>1,794,456</b> (100)	<b>3,010,926</b> (100)	<b>2,496,864</b> (100)	<b>20,913,601</b> (100)
	Expanded first-aid treatments, etc.	9,901,705	1,144,235	1,952,938	1,715,378	14,714,256

- (Notes)
- 1 Prepared based on the Annual Report on Ambulance Service
  - 2 Since there are cases in which several types of first-aid treatment were administered to one person, the totals for the number of people transported who received first-aid treatment and the items on first-aid treatment by type of incident do not align.
  - 3 The numbers in parentheses show the proportion, and their unit is %.
  - 4 The \* symbol indicates first-aid treatment items that were expanded in 1991.
  - 5 Shows the first-aid treatments administered to sick and injured patients transported by ambulance.
  - 6 Digits in the second decimal place were rounded off, so in some cases the totals may not be consistent.

**(5) Time Required to Check the Patient into a Hospital**

Looking at a breakdown of the 5,621,218 people transported by ambulance in 2016 by the time required to check the patient into a hospital (time required to check

the patient into a hospital after the 119 report was received) reveals that the majority of people were checked in between 30 and 60 minutes at 3,473,367 people (61.8%) (Fig. 2-5-3).

In addition, the average time required to check the

patient into a hospital came to 39.3 minutes (39.4 minutes, the previous year), which is 7.3 minutes longer than it was ten years ago (2006) (Fig. 2-5-4).

### (6) First-aid Treatment Administered by Ambulance Crew Members

Of the 5,621,218 people transported by ambulances in 2016, ambulance crew members administered first-aid treatment to 5,373,368 patients (95.6%). This brings the total number of cases in which ambulance crew members administered first-aid treatment to 20,913,601.

What is more, the total number of cases in which first-aid treatment was administered by ambulance crew members since their expansion in 1991 (items with \* symbol in Table 2-5-4) came to 14,714,256 (a 4.0% increase year-on-year (YoY)). Of these, the number of cases in which EMTs administered first-aid treatment in order to resuscitate a patient (defibrillation\*<sup>1</sup> (including cases administered by non-EMT ambulance crews), ensuring respiratory tracts using laryngeal masks, etc.,\*<sup>2</sup> tracheal intubation, ensuring intravenous channels,\*<sup>3</sup> drug administration,\*<sup>4</sup> EpiPen use,\*<sup>5</sup> measuring blood sugar,\*<sup>6</sup> and administration of grape sugar\*<sup>7</sup>) came to 188,533 (161,381 the previous year), which is a roughly 16.8% increase year on year.

## 2. Implementation Structure for Emergency Medical Services

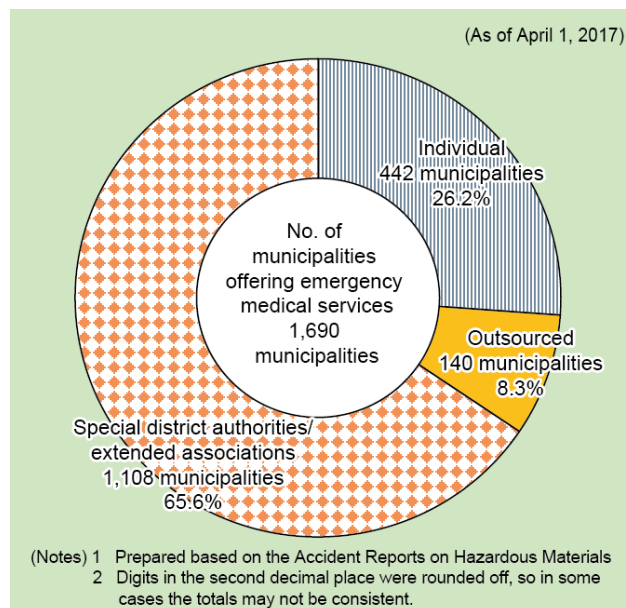
### (1) Number of Municipalities Offering Emergency Medical Services

The number of municipalities offering emergency medical services as of April 1, 2017 came to 1,690 municipalities (792 cities, 737 towns, and 161 villages) (the special wards of Tokyo were counted as one city; the same hereafter).

Emergency medical services are offered in 98.3% of municipalities (same as last year), and cover 99.9% of the total population (same as last year; the population used is from the 2015 national census; the same hereafter), which means that emergency medical services can be received in virtually every region (Table 2-5-5, Attachment 2-5-4).

When viewed by the configuration through which said emergency medical services were offered, 442 municipalities offered them independently, 140 did so by outsourcing them, and 1,108 did so through special district authorities and extended associations (Fig. 2-5-5).

**Fig. 2-5-5 Breakdown of the configurations by which emergency medical services are offered**



**Table 2-5-5 Trends in the number of municipalities offering emergency medical services**

(As of April 1 of each year)

Category	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
No. of municipalities	3,162	3,136	3,048	2,352	1,784	1,769	1,753	1,742	1,692	1,689	1,685	1,685	1,686	1,689	1,690	1,690
Municipal implementation rate (%)	98.2	98.3	98.3	98.2	98.0	98.0	98.0	98.0	97.9	97.9	98.0	98.0	98.0	98.3	98.3	98.3
Population coverage rate (%)	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9

(Notes) Prepared based on the Annual Report on Ambulance Service

### (2) Number of Emergency Medical Crews and Emergency Medical Crew Members

As of April 1, 2017, 5,140 emergency medical crews (an increase of 50 YoY) had been established (Fig. 2-5-6).

Since emergency medical crew members are engaged in the important duty of saving people's lives, they must complete at least 135 hours' worth of training courses on emergency medical services (the former Emergency Medical I Course). As of April 1, 2017, the number of firefighters who fulfilled this eligibility requirement came

to 121,854 (an increase of 277 YoY). Of these, 62,489 were engaged in emergency medical services as emergency medical crew members (including not only full-time emergency medical crew members, but also emergency medical crew members who have been appointed as such and who concurrently serve on firefighting vehicles such as pump vehicles by riding along with them) (Fig. 2-5-7).

<sup>1</sup> Defibrillation: This refers to the application of electrical shock to lethal arrhythmia (ventricular fibrillation) whereby minor tremors in the heart, such as heart spasms, make it impossible for blood to flow, as a means of dispelling said tremors.

<sup>2</sup> Laryngeal mask: This is a type of ventilation tube used to ensure the openness of the respiratory tract. It is fastened in place so as to cover the larynx to ensure open breathing channels.

<sup>3</sup> Ensuring intravenous channels: A process of securing transfusion channels by inserting needles or tubes intravenously. Ensuring intravenous channels makes it possible to administer medications intravenously right away when they are needed.

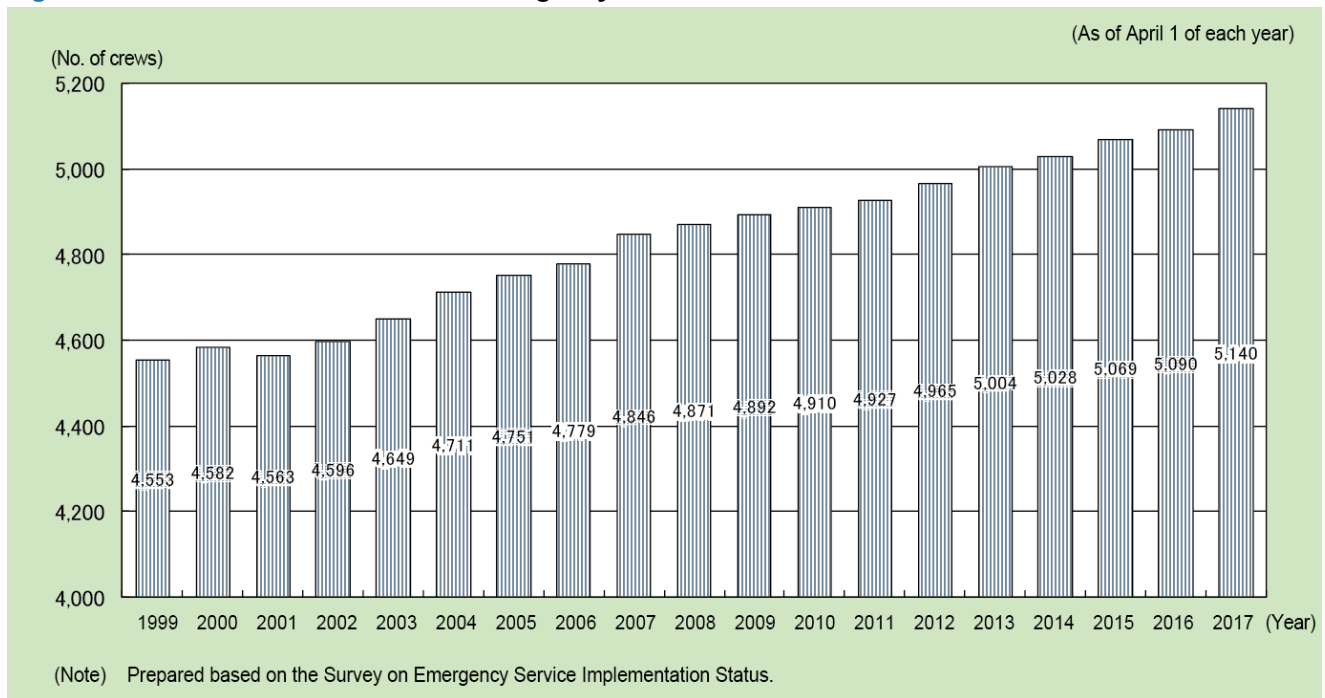
<sup>4</sup> Drug administration: This refers to administering epinephrine (also called adrenaline; simply called "epinephrine" hereafter) under the specific instructions of a doctor.

<sup>5</sup> EpiPen use: In cases where sick or injured patients whose lives are at risk from anaphylactic shock have been prescribed self-injectable epinephrine formulations (EpiPen) in advance, EMTs will administer said epinephrine via an EpiPen.

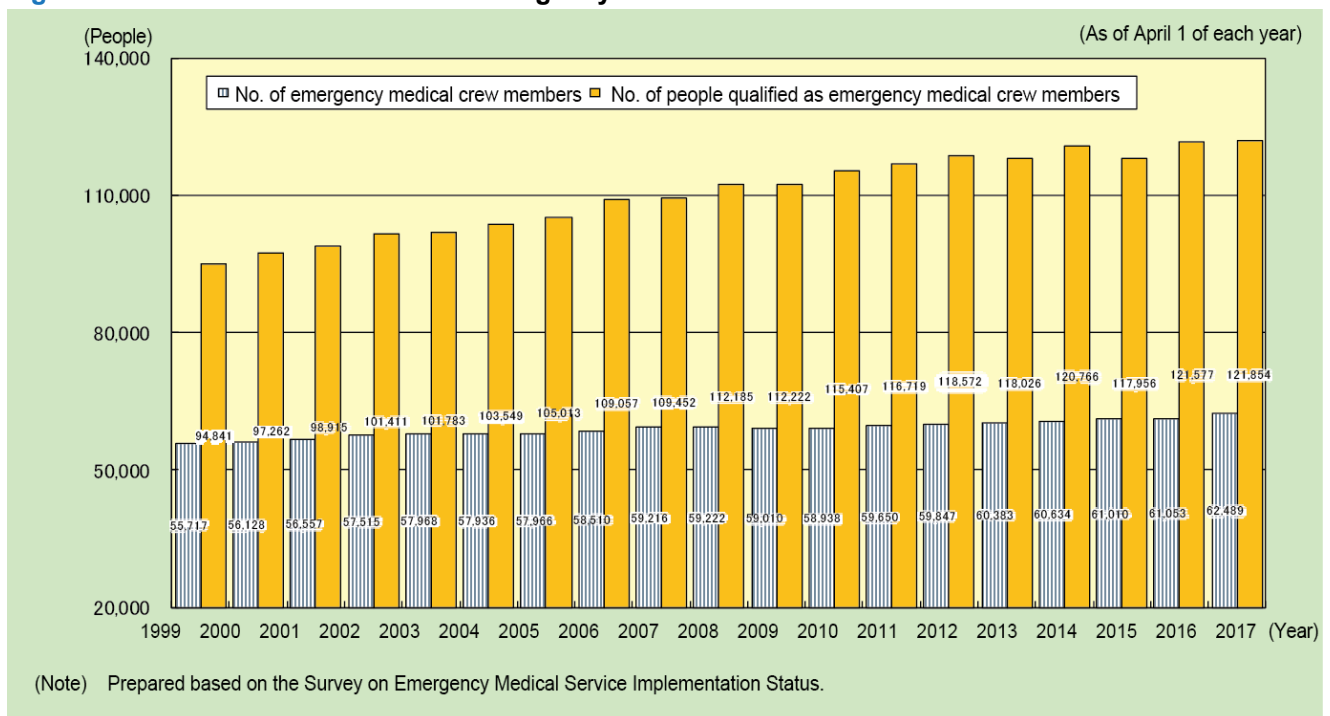
<sup>6</sup> Measuring blood sugar: The measurement of blood sugar levels in sick or injured patients with impaired consciousness.

<sup>7</sup> Administration of grape sugar: This refers to the act of administering grape sugar under the specific instructions of a doctor.

**Fig. 2-5-6 Trends in the number of emergency medical crews**



**Fig. 2-5-7 Trends in the number of emergency medical crew members**



What is more, of the firefighters who fulfilled the eligibility requirements to be emergency medical crew members, the number who had completed 250 hours' worth of emergency medical courses to enable them to provide even more advanced first-aid treatment (including the former Emergency Medical Standard Course and former Emergency Medical II Course) came to 81,960 people (a decrease of 31 YoY) nationwide as of April 1, 2017. Of these, 34,557 are engaged in emergency medical services as emergency medical crew members.

### (3) Trends in the Number of EMTs and Medical Crews with EMTs

As a result of the increasing sophistication of emergency

services, the FDMA promotes the fostering of EMTs and the setting in place of structures for making use of them. The objective is a structure where at least one EMT is stationed with every emergency medical crew.

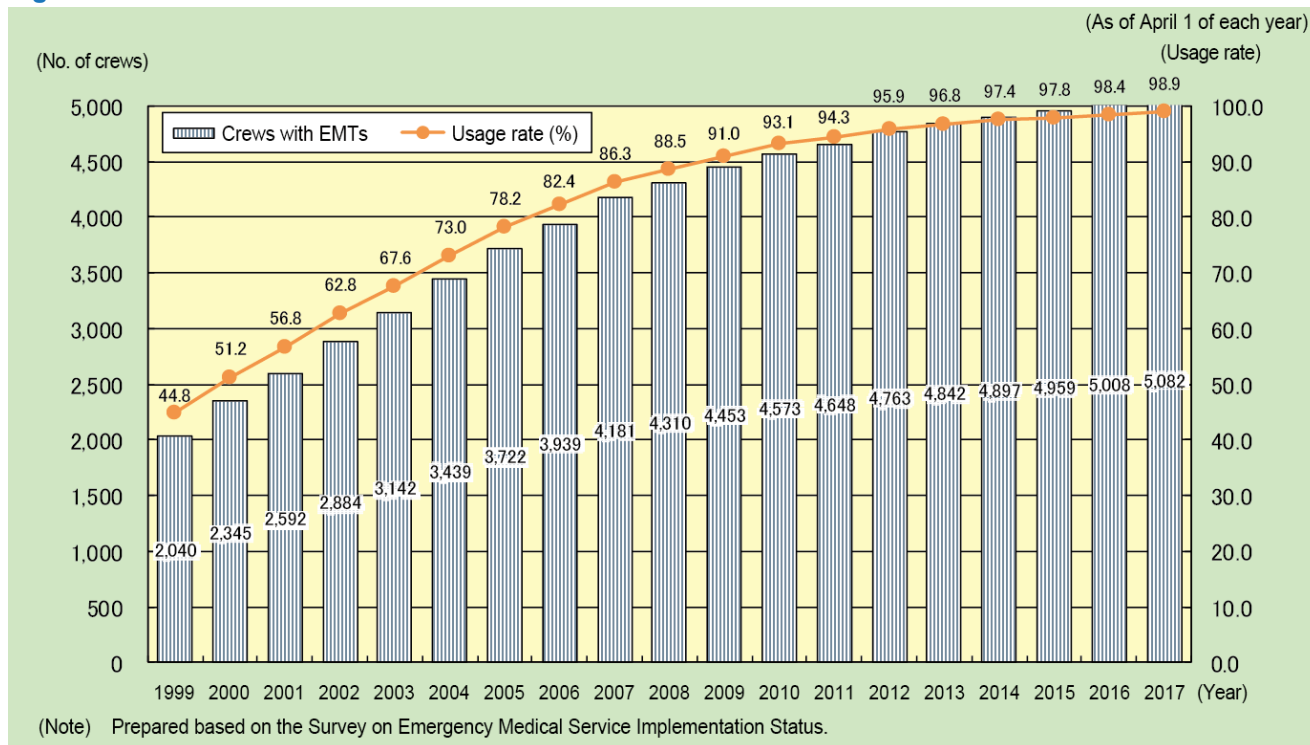
The number of fire defense headquarters making use of EMTs as of April 1, 2017 came to 731 of the total of 732 fire defense headquarters throughout Japan, for a usage rate of 99.9% (same as the previous year).

The number of emergency medical crews with EMTs came to 5,082 (an increase of 74 YoY), which corresponds to 98.9% of the 5,140 emergency medical crews throughout Japan (98.4% the previous year), with this rising year by year.

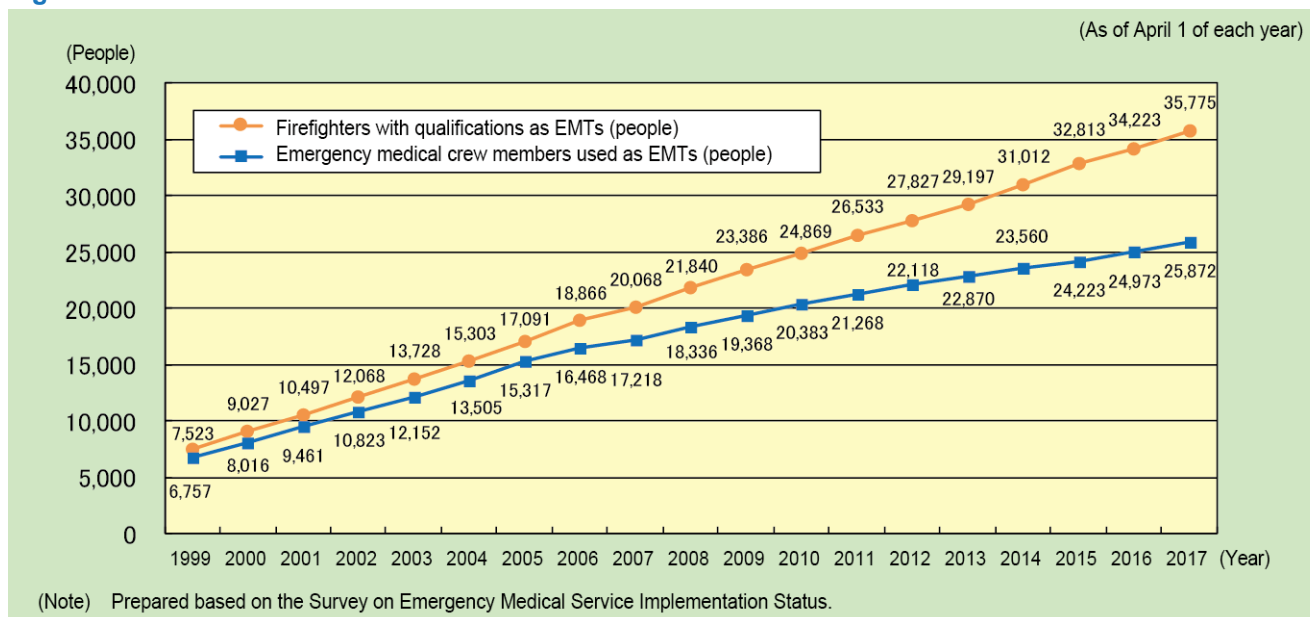
What is more, there were 35,775 firefighters with EMT qualifications (an increase of 1,552 people YoY). Of these, 25,872 had been put to use as EMTs (an increase of 899

people YoY), with this number steadily increasing year by year (Fig. 2-5-8, Fig. 2-5-9).

**Fig. 2-5-8 Trends in the number of medical crews with EMTs**



**Fig. 2-5-9 Trends in the number of EMTs**



**(4) Number of Ambulances**

The number of ambulances owned by fire defense headquarters throughout Japan as of April 1, 2017 came to 6,271 (an increase of 61 YoY), including those for emergency use. Of these, the number of high-standard ambulances came to 5,977 (an increase of 100 YoY), which corresponds to 95.3% of the total.

**(5) Emergency Medical Services along National and Other Expressways**

When it comes to emergency medical services along national expressways, the Seto-Chuo Expressway, and the Kobe-Awaji-Naruto Expressway (hereafter referred to as

“national and other expressways”), the East Nippon Expressway Company, Central Nippon Expressway Company, West Nippon Expressway Company, and Honshu-Shikoku Bridge Expressway Company (hereafter referred to as “expressway companies”) are responsible for road management operations and offering centralized, independent emergency medical services. Moreover, the municipalities along said expressways are responsible for handling emergency medical services as per the provisions of the Fire Service Law. So it has been stipulated that both parties are to work together to properly and efficiently safeguard human life. As of March 31, 2017, emergency medical services along national and other expressways

were provided by municipal firefighting agencies over every section of the 8,782 km of the length of expressway currently in use. The expressway companies bear a certain extent of the financial burden that is placed on the municipalities providing emergency medical services.

### 3. Promoting Coordination between Firefighting and Medical Care

#### (1) Acceptance of People Receiving Emergency Transport at Medical Institutions

Reports were received on cases in which problems arose in choosing medical institutions to receive patients during emergency transport in regions all over Japan. Based on these, in October 2007 the FDMA performed the first survey on the actual state of acceptance for pregnant or perinatal patients transported from 2004 to 2006. Moreover, for the survey on the actual acceptance status regarding emergency transport in 2007, the survey was carried out not only on pregnant and perinatal patients, but also focused on patients with severe conditions or worse, young patients, and patients transported to critical care centers.

For the Survey on the Actual Acceptance Status at Medical Institutions for Emergency Transport in 2016, reductions were seen for every category regarding both the number and percentage of cases in which four or more

acceptance inquiries were made compared with the same survey in 2015 (Table 2-5-6). The number of cases where the time spent at the scene was 30 minutes or longer rose for cases in which young patients were transported. Yet conversely, this fell for cases where patients with severe conditions or worse and pregnant or perinatal patients were transported, as well as cases where patients were transported to critical care centers. The percentages fell for every category (Table 2-5-7).

#### (2) Standards on Patient Transport and Their Acceptance

In light of the occurrence of cases in which it is difficult to select an accepting medical institution during emergency transport, in 2009 the FDMA worked together with the Ministry of Health, Labour and Welfare to enact the Standards on Patient Transport and Their Acceptance (hereafter referred to as the “acceptance standards”) for the prefectures. It also revised the Fire Service Law to include content mandating the establishment of committees concerning the acceptance standards (hereafter referred to as “legally-mandated committees”). The revised Fire Service Law was enacted on October 30, 2009. At present, committees have been established in every prefecture, and acceptance standards have been formulated as well.

**Table 2-5-6 Trends in the number of cases in which four or more acceptance inquiries were made to medical institutions**

	2012		2013		2014		2015		2016	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
Cases in which patients with severe conditions or worse are transported	16,736	3.8%	15,132	3.4%	14,114	3.2%	11,754	2.7%	10,039	2.3%
Cases in which pregnant or perinatal patients are transported	530	3.6%	678	4.3%	617	3.8%	549	3.7%	540	3.5%
Cases in which young patients are transported	10,759	3.0%	9,528	2.7%	8,708	2.4%	8,570	2.4%	7,527	2.0%
Cases in which patients are transported to critical care centers	25,324	3.9%	27,528	3.9%	26,740	3.6%	25,411	3.3%	20,248	2.6%

- (Notes) 1 Prepared based on the Survey on the Actual Acceptance Status at Medical Institutions for Emergency Transport in 2016  
 2 There is some overlap  
 3 The percentage is the percentage versus the total number of people transported from each respective category  
 4 Digits in the second decimal place were rounded off, so in some cases the totals may not be consistent.

**Table 2-5-7 Trends in the number of cases where the time spent at the scene was 30 minutes or longer**

	2012		2013		2014		2015		2016	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
Cases in which patients with severe conditions or worse are transported	23,033	5.2%	23,950	5.4%	23,500	5.3%	22,379	5.2%	22,104	5.0%
Cases in which pregnant or perinatal patients are transported	1,019	6.9%	1,333	8.4%	1,267	7.8%	1,194	7.9%	1,161	7.5%
Cases in which young patients are transported	10,431	2.9%	11,986	3.5%	11,423	3.2%	12,039	3.4%	12,237	3.2%
Cases in which patients are transported to critical care centers	35,445	5.4%	41,777	5.9%	45,208	6.1%	47,030	6.1%	40,213	5.1%

- (Notes) 1 Prepared based on the Survey on the Actual Acceptance Status at Medical Institutions for Emergency Transport in 2016  
 2 There is some overlap  
 3 The percentage is the percentage versus the total number of people transported from each respective category  
 4 Digits in the second decimal place were rounded off, so in some cases the totals may not be consistent.

The hope is that through the legally-mandated committees, the prefectures will survey and verify the transport of patients and their acceptance status based on the acceptance standards. Then, based on this, it is hoped that they will tie the results of this in with making

improvements to the acceptance standards and so forth.

For its part, the FDMA works to get a grasp of the status of initiatives by and challenges for each of the prefectures. It also makes efforts to follow-up, such as by broadly getting a grasp of and introducing case examples of

initiatives by local regions that are striving to operate this effectively.

Each prefecture and local region brings together firefighting agencies and medical organizations (including hospital departments other than those offering ambulance service) and sometimes just medical organizations, as well as healthcare centers, welfare, police, and other related organizations according to the local circumstances in order to thoroughly discuss and share their awareness of problems through ex-post inspections of transport and acceptance conditions. In addition, through the creation of “relationships with a visible face” on an everyday basis, it is important that they continue to draft more specific and effective rules (revisions to acceptance standards, etc.) geared towards smooth transport and acceptance. Each group is being called upon to make greater efforts regarding such initiatives. For its part, the FDMA has resolved to continue carrying out the necessary surveys and providing information to contribute to improving the application of the acceptance standards at the prefectural committees and to discussions over revisions to them.

In light of the revisions to the Fire Service Law and the fact that emergency transport is carried out based upon the acceptance standards, local governmental financial measures are being taken through special tax grants with respect to the costs entailed by the assistance rendered to private secondary emergency medical institutions<sup>\*8</sup> by local public bodies in an effort to enhance emergency medical care structures in local regions.

### **(3) Emergency Medical Care Structure**

With regards to the notification status of emergency hospitals and emergency clinics, which constitute the

primary destinations to which patients are taken, as of April 1, 2017 there were 4,267 such locations throughout Japan (White Paper Attached Document 2-5-5).

There are 563 weekend and nighttime emergency care centers (as of March 31, 2017) that ensure that initial medical care can be received on weekends and at nights, which serve as the initial emergency medical care structure. By way of the secondary medical care structure, 2,896 hospitals on a hospital-group rotating system and joint-use hospitals have been established (as of March 31, 2017), and so have 288 critical care centers (as of August 31, 2017) by way of the tertiary medical care structure. Moreover, among the critical care centers are advanced critical care centers capable of handling patients with specific illnesses or injuries, such as extensive burns, severed digits and limbs, and acute poisoning, of which 39 locations have been set in place (as of August 31, 2017).

Approval for emergency hospitals and emergency clinics is provided through emergency reporting structures, while the installation of initial, secondary, and tertiary emergency medical care structures is performed in an integrated manner under the medical care plans established by prefectural governors.

Under these emergency medical care structures and through the acceptance standards enacted by the prefectures through the provisions of the Fire Service Law, a list of medical institutions that can provide medical care according to patients’ conditions has been compiled. Firefighting agencies use this list when carrying out emergency transport operations.

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<sup>\*8</sup> Among secondary medical institutions, emergency medical service notice institutions (excluding national and public medical institutions and public institutions).



## Section 6

## Rescue Activity System

## 1. Implementation Status for Rescue Activities

## (1) Number of Rescue Activities and Number of People Rescued

The life-saving rescues performed by firefighting agencies refer to activities whereby human or machine-power is used to extricate people from dangerous situations and transport the victims to safe locations. Examples of such dangerous situations include fires, traffic accidents, water accidents, natural disasters, and accidents due to machines.

As for the implementation status for rescue activities throughout Japan in 2016, 57,148 rescue activities were carried out (an increase of 1,182, or 2.1% increase, YoY) and 57,955 people were rescued (this refers to the number of people rescued through rescue activities; a decrease of 1,235, or 2.1% decrease, YoY) (Table 2-6-1, Attachment 2-6-1).

As part of this, the primary reason for the increase in the number of rescue activities is due to the increase in the number of rescue activities for accidents caused by buildings (an increase of 1,151, or 5.1%, YoY).

In addition, the primary reason for the drop in the number of people rescued is due to the decrease in accidents from natural disasters like storms and floods (a decrease of 1,940 people, or 67.1%, YoY).

## (2) Implementation Status of Rescue Activities by Type of Incident

During the 2016 Kumamoto earthquakes that occurred in April 2016, enormous damage arose in the form of human casualties, damage to homes, the destruction of roads, and more. Given this, local fire departments, volunteer fire corps, and prefectural firefighting support teams worked together with Emergency Fire Response Teams, the police, the Japan Self-Defense Forces (JSDF), and others to carry out diligent rescue activities.

Looking at the status of rescue activities by type of incident reveals that the numbers for accidents caused by buildings and traffic accidents remain high in terms of both the number of rescue activities and the number of people rescued.

Accidents caused by buildings has been the type of incident with the greatest number of rescue activities since

2008. In terms of the number of people rescued, starting in 2013 it surpassed traffic accidents, which had been the type of incident with the most people rescued since 1978, to become the type with the most people rescued.

The number of rescue workers mobilized (which refers to the total number of people mobilized in order to carry out rescue activities) came to 1,383,457 in total.

Of these, the number of firefighters mobilized came to 1,310,368 in total, of which 28.3% were mobilized due to traffic accidents, while 26.9% were mobilized due to accidents due to buildings. At the same time, the number of volunteer fire corps members mobilized came to 73,089 in total, of which 70.7% were mobilized on account of fires.

Next, the number of people who engaged in rescue activities (this refers to the number of people who actually engaged in rescue activities out of the number mobilized) came to 564,641 in total. This means that 9.9 people on average took part in each individual rescue activity. What is more, in terms of the number of people engaged in each individual rescue activity by type of incident, fires had the greatest number at 16.9 people on average, followed by water-related accidents at 14.5 people (Fig. 2-6-1, Fig. 2-6-2, Table 2-6-2).

## 2. Implementation Structure for Rescue Activities

## (1) Number of Rescue Crews and Number of Rescue Crew Members

Rescue crews are established in municipalities that have fire defense headquarters and fire stations pursuant to the Ministerial Ordinance Establishing Standards for the Organization, Outfitting, and Establishment of Rescue Crews (Ministerial Ordinance No. 22 of the Ministry of Home Affairs from 1986; hereafter referred to as the "Rescue Ordinance"). They consist of members who have received specialized education related to lifesaving (140 hours' worth), as well as rescue and relief supplies and the rescue vehicles equipped with these needed for rescue activities. They are categorized into four classifications: rescue crews, special rescue crews, advanced rescue crews, and special advanced rescue crews.\*1

Table 2-6-1 Trends in the number of rescue activities and number of people rescued

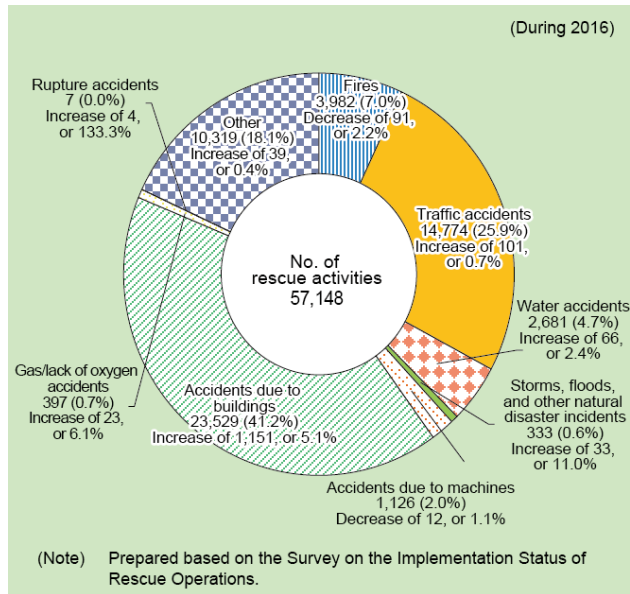
Year	Category	No. of rescue activities		No. of people rescued	
		No.	Change YoY (%)	No. of people	Change YoY (%)
	During 2012	56,103	△ 2.7	59,338	△ 6.7
	During 2013	56,915	1.4	57,659	△ 2.8
	During 2014	56,695	△ 0.4	57,809	0.3
	During 2015	55,966	△ 1.3	59,190	2.4
	During 2016	57,148	2.1	57,955	△ 2.1

(Notes) 1 Prepared based on the Survey on the Implementation Status of Rescue Activities

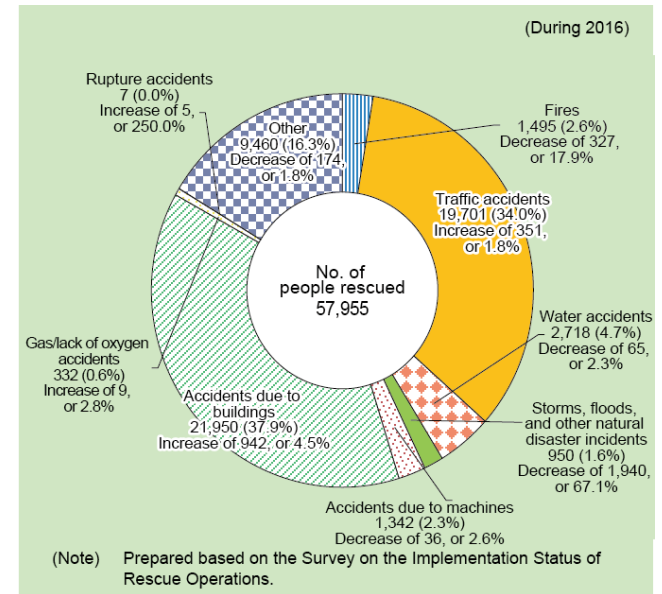
2 This includes the number of activities by volunteer fire corps in municipalities where fire defense headquarters/fire departments have not been established. The same holds true for the following data in this section.

\*1. The Rescue Ordinance stipulates that municipalities with a population of 100,000 people or more and a standing fire defense structure must establish a special rescue crew. Core cities and the like must have one or more special rescue crews that serve as advanced rescue crews, and the Tokyo Fire Department and ordinance-designated cities must have one or more advanced fire crews that serve as special advanced rescue crews.

**Fig.2-6-1 Number of rescue activities by type of incident**



**Fig.2-6-2 Number of people rescued by type of incident**



**Table 2-6-2 Number of mobilizations and status of activities by type of incident**

Type of incident		(During 2016)									
		Fires	Traffic accidents	Water accidents	Storms, floods, and other natural disaster incidents	Accidents due to machines	Accidents due to buildings	Gas/lack of oxygen accidents	Rupture accidents	Other	Total
Category											
No. of rescue activities		3,982 (7.0)	14,774 (25.9)	2,681 (4.7)	333 (0.6)	1,126 (2.0)	23,529 (41.2)	397 (0.7)	7 (0.0)	10,319 (18.1)	57,148 (100.0)
No. of people rescued		1,495 (2.6)	19,701 (34.0)	2,718 (4.7)	950 (1.6)	1,342 (2.3)	21,950 (37.9)	332 (0.6)	7 (0.0)	9,460 (16.3)	57,955 (100.0)
Firefighters	No. of rescue workers mobilized	136,114 (10.4)	352,440 (26.9)	80,360 (6.1)	5,779 (0.4)	25,304 (1.9)	370,232 (28.3)	11,546 (0.9)	220 (0.0)	328,373 (25.1)	1,310,368 (100.0)
	No. of people who engaged in rescue activities	57,442 (10.4)	150,622 (27.4)	37,981 (6.9)	3,984 (0.7)	11,327 (2.1)	191,542 (34.8)	4,209 (0.8)	88 (0.0)	93,300 (16.9)	550,495 (100.0)
Volunteer firefighters	No. of rescue workers mobilized	51,702 (70.7)	1,812 (2.5)	2,476 (3.4)	472 (0.6)	125 (0.2)	2,426 (3.3)	133 (0.2)	0 (0.0)	13,943 (19.1)	73,089 (100.0)
	No. of people who engaged in rescue activities	9,917 (70.1)	153 (1.1)	1,021 (7.2)	310 (2.2)	22 (0.2)	21 (0.1)	2 (0.0)	0 (0.0)	2,700 (19.1)	14,146 (100.0)
No. of people who engaged in rescue activities per incident		16.9	10.2	14.5	12.9	10.1	8.1	10.6	12.6	9.3	9.9

- (Notes)
- 1 Prepared based on the Survey on the Implementation Status of Rescue Activities
  - 2 The numbers in parenthesis show the proportion (%). Less than whole units were rounded up, so in some cases the totals may not be consistent.
  - 3 "No. of rescue workers mobilized" refers to the total number of people mobilized in order to carry out rescue activities.
  - 4 "No. of people who engaged in rescue activities" refers to the number of people who actually engaged in rescue activities out of the number mobilized.
  - 5 "Accidents due to buildings" refer to accidents caused by the collapse of buildings, gates, fences, walls, and other facilities ancillary to buildings or equivalent structures; accidents in which people were trapped within buildings; and accidents from people being caught between buildings.
  - 6 "Other" refers to accidents other than the types listed above that necessitated rescue by firefighting agencies.

As of April 2017, 1,420 crews had been established within 715 fire defense headquarters, and the number of rescue crew members came to 24,449 people.

This means that on average, roughly 2.0 rescue crews have been established at each fire defense headquarters, with an average of 17.3 rescue crew members stationed on each crew. The number of fire defense headquarters and rescue crews have been dropping as they spread out to cover broader areas, but the number of rescue crews per fire defense headquarters and the number of crew members per rescue crew have been trending upward.

## (2) Ownership Status of Rescue Equipment for Rescue Activities

Rescue equipment for rescue activities includes equipment for removing heavy objects such as hydraulic spreaders, cutting equipment like hydraulic cutters, detection and measurement equipment such as inflammable gas measuring instruments, and more. Advanced, specialized equipment has been deemed necessary for them to guard against the large-scale earthquake disasters and terrorist disasters that could potentially occur. As such, the FDMA makes efforts to promote the establishment and maintenance of rescue work vehicles and rescue equipment by taking advantage of grants for equipping Emergency Fire Response Teams, as well as tax measures allocated to local governments and more (Table 2-6-3).

**Table 2-6-3 Ownership status of rescue equipment for rescue activities and board vehicles for carrying rescue crews**

(As of April 1, 2017)

Major rescue equipment	Ministerial ordinance annex 1	Three-part ladders	Lifeline throwing guns	Hydraulic spreader	Hydraulic cutters	Portable winches	Engine cutters	Chainsaws	Gas cutters	Inflammable gas measuring instruments	Breathing apparatus	Simple image search machines
		7,435	1,891	2,146	1,993	4,400	6,262	6,686	1,339	5,672	49,489	915
	Ministerial ordinance annex 2	Mat air jacks	Large hydraulic spreaders	Large hydraulic cutters	Rock drills	Air saws	Rope climbing machines	Hammers/drills	Ventilators	Oxygen masks		
		2,699	2,192	2,218	1,687	1,942	3,042	1,617	2,176	3,400		
Ministerial ordinance annex 3	Image search equipment	Underground noise detectors	Thermal imaging devices	Night vision equipment	Earthquake alarms	Electromagnetic wave detectors	Carbon dioxide detectors	Underwater probes				
	607	320	1,301	347	199	115	60	77				
Boarding vehicles	Rescue work vehicles	Ladder-equipped vehicles	Folding ladder-equipped vehicles	Fire pump vehicles	Fire cistern-equipped vehicles	Chemical vehicles	Special disaster vehicles	Other	Total			
		1,248	421	90	262	376	121	14	475	3,007		

### 3. Holding National Firefighting and Rescue Skills Meets

The National Firefighting and Rescue Skills Meet has been held every year since 1972 (sponsored by the Japan Firefighters Association, with the backing of the FDMA and others). Its goal is to foster the physical strength, mental toughness, and technical capabilities needed for rescue activities, as well as to gather rescue crew members from throughout Japan together to cultivate crew members who can serve as examples to others through competition and learning.

The National Firefighting and Rescue Skills Meet is divided up into a land division and a water division. For

each division, a number of types of training are carried out. There is basic training where individual crew members practice basic skills, coordinated training where crew members practice their individual skills together with cooperation with other crew members, as well as skills training where participating crew members demonstrate everything from training assumptions to rescue methods using creativity and ingenuity without stipulations as to the equipment or training skills that will be used.

The 46th meet was held on August 23, 2017 in Rifu Town, Miyagi Prefecture. Here, 704 crew members took part in the land division and 230 took part in the water division. The 47th meet will be held in the city of Kyoto.

## Section 8

## Wide-area Joint Firefighting Support and Emergency Fire Response Teams

## 1. Wide-area Joint Support for Firefighting -Omitted-

## 2. Emergency Fire Response Teams

## (1) Creation of the Emergency Fire Response Teams and Their Enshrinement in Law via Revisions to the Fire Organization Act

## A. Creation of the Emergency Fire Response Teams

The Emergency Fire Response Teams were created in June 1995 through the cooperation of fire defense headquarters from throughout Japan in order to create an assistance structure through the mutual cooperation of firefighting agencies from around the country. This was based on the lessons from the Great Hanshin-Awaji

Earthquake from January 17, 1995, and designed to make it possible to carry out lifesaving rescue activities when large-scale disasters such as earthquakes occur within Japan in a faster, more effective manner.

The system is structured so that during times of normalcy, the Emergency Fire Response Teams focus all of their energies on carrying out firefighting duties in their respective local regions. But once a large-scale disaster occurs somewhere in Japan, firefighting teams mobilize in a concentrated manner to the afflicted region from throughout the country to respond to said disaster at the request or instructions of the Commissioner of the FDMA. There they engage in firefighting activities, including lifesaving and rescue activities.

**Table 2-8-1 Actual track record regarding mobilizations of wide-area aerial medical support teams based on the Implementation Guidelines for Wide-area Aerial Firefighting Support Teams during Large-scale and Special Disasters (past 20 years)**

(As of November 1, 2017; Unit: Record)

Year	Track record for mobilizations	By type of mobilization							
		Fires in forests and fields	Fires in locations other than forests and fields	Storms and floods	Explosion disasters	Earthquake disasters	Volcano disasters	Accidents involving aircraft	Other disasters
1998	17	12		1		1			3
1999	18	15	1	2					
2000	23	21				1	1		
2001	32	31						1	
2002	38	38							
2003	24	18	2	1		2			1
2004	27	21		5		1			
2005	20	18				1			1
2006	8	6	2						
2007	13	12		1					
2008	10	10							
2009	21	18		2					1
2010	16	12		2				1	1
2011	28	23		5					
2012	7	5		2					
2013	20	17		2		1			
2014	36	19							17
2015	10	10							
2016	5	3		1		1			
2017	6	4		1				1	
<b>Total</b>	<b>379</b>	<b>313</b>	<b>5</b>	<b>25</b>	<b>0</b>	<b>8</b>	<b>1</b>	<b>3</b>	<b>24</b>

When they were first launched, the Emergency Fire Response Teams consisted of 376 teams registered with the FDMA to provide domestic assistance for firefighting. They were comprised of rescue crews, emergency medical crews, and more (these numbered roughly 4,000 people if you include standby and replacement members). There were also 891 out-of-prefecture assistance teams that engaged in activities between neighboring prefectures, which consisted of firefighting teams and others (these numbered roughly 13,000 people if you include standby

and replacement members). This brought the total to 1,267 teams (with roughly 17,000 people if you include standby and replacement members). In January 2011, a registration system for fire teams was introduced in order to enhance the mobilization structure for the Emergency Fire Response Teams and response capabilities for various disasters.

What is more, a number of new types of teams were established in order to handle increasingly complicated and diverse disasters. These included special disaster

teams with the capacity to respond to special disasters such as oil and chemical disasters, as well as those involving toxic or hazardous substances, or radioactive materials, as well as air teams that use fire protection helicopters and water teams that use firefighting boats. This brought the types of teams to eight, and the number of teams to 1,785 (with roughly 26,000 people if you include standby and replacement members).

## **B. Enshrinement in Law through the 2003 Revisions to the Fire Organization Act**

It has been pointed out that potential earthquakes like a Tokai Earthquake, Tonankai/Nankai Earthquake, or an earthquake directly below the Tokyo Metropolitan Region are imminent, as have the dangers of NBC terrorism disasters. As such, scenarios can be envisioned where it would be difficult to respond to such disasters promptly and precisely solely through the firefighting capabilities of the municipalities in the afflicted region or those found in the afflicted prefecture. Therefore, the Commissioner of the FDMA has been vested with the necessary authority to work to enhance and strengthen emergency response structures from a national perspective. In conjunction with this, the Act for the Partial Revision of the Fire Organization Act was drafted in 2003 and entered into force in 2004. This act includes content that includes prescribing financial measures for the national government.

### **(a) Main content of the revised law**

The main content of the revised law consists of staking out a clear legal position for the Emergency Fire Response Teams, establishing the authority of the Commissioner of the FDMA to order mobilizations, formulating basic plans relating to the Emergency Fire Response Teams, and the financial measures of the national government.

### **(b) Legal position and mobilization orders by the Commissioner of the FDMA**

The Emergency Fire Response Teams, which have been put to use based on certain guiding principles since they were established, were given a clear legal position within the Fire Organization Act through the revisions to this law. In addition, in the event that a Tokai Earthquake or other large-scale disaster extends over two or more prefectures or an NBC disaster were to occur, the Commissioner of the FDMA shall be able to issue the orders to take the necessary measures to mobilize the Emergency Fire Response Teams. This authority to order mobilizations was established based on the thinking that the national government bears responsibility for deploying firefighting capabilities to afflicted regions in the form of ordering the mobilization of the Emergency Fire Response Teams for large-scale disasters that should be handled from a truly nationwide perspective. The unprecedented, enormous disaster of the Great East Japan Earthquake was the first time this authority was exercised since it was established.

### **(c) Enactment of the Basic Plan pertaining to the Emergency Fire Response Teams**

It has been legally mandated that the Minister for Internal Affairs and Communications is to enact the Plan on Basic Items concerning the Organization and Outfitting of Facilities for the Emergency Fire Response Teams (hereafter referred to as the “Basic Plan”).

This Basic Plan was enacted in February 2004, and established matters such as standards for equipping and organizing the crews that comprise the Emergency Fire

Response Teams, mobilization plans, and targets for setting in place the necessary facilities. When it was initially enacted, it set the target of registering 3,000 Emergency Fire Response Teams by FY2008.

### **(d) Financial measures by the national government for the Emergency Fire Response Teams**

The mobilization of the Emergency Fire Response Teams has been legally mandated in cases where they have been ordered to mobilize by the Commissioner of the FDMA. Therefore, the expenses that are newly required as a result of said mobilizations are to be borne by the national government as treasury expenses as per Article 10 of the Local Government Finance Act.

What is more, the establishment of facilities pursuant to the Basic Plan were clarified in a legal sense as constituting “expenses to be subsidized by the national government.” In addition, the eligible facilities and the subsidy rate (one-half) have been established through government ordinance (Table 2-8-2).

### **(e) Use of equipment for Emergency Fire Response Teams free of charge**

With regard to those pieces of equipment from among the equipment needed for the organization of the Emergency Fire Response Teams that it would be inefficient for local public bodies to outfit and own from a cost-effectiveness perspective, it is hard to imagine that progress will be made in outfitting this even if government subsidies are provided for it. There is some equipment that needs to be provided quickly in order to fulfill the national government’s responsibilities when it comes to large-scale and specialized disasters. As such, it was stipulated that this equipment is to be set in place by the national government, but provided for use free of charge to the prefectures or municipalities to which the personnel who are active as Emergency Fire Response Team members belong.

## **C. Enhancing mobility through the 2008 revisions to the Fire Organization Act**

In 2008 the Act for the Partial Revision of the Fire Organization Act was drafted and entered into force. This included content such as enhancing the mobility of the Emergency Fire Response Teams in an effort to further strengthen fire and disaster defense structures for large-scale earthquakes such as a Tokai Earthquake, Tonankai/Nankai Earthquake, or an earthquake directly below the Tokyo Metropolitan Region.

### **(a) Main content of the revised law**

The main content of the revised law consists of establishing the authority for prefectural governors to order the mobilization of Emergency Fire Response Teams that are already active in municipalities where disasters have occurred, the establishment of coordination headquarters for firefighting support activities, and revisions to the requirements for the orders to mobilize the Emergency Fire Response Teams by the Commissioner of the FDMA (Fig. 2-8-1).

### **(b) Establishment of the authority for prefectural governors to order mobilizations**

This stipulated that prefectural governors can order the mobilization of Emergency Fire Response Teams active in municipalities where they normally operate. This can be done in cases where a disaster has occurred in two or more municipalities within a prefecture, and where it is deemed necessary for the sake of urgently providing firefighting

support for municipalities where a disaster has occurred that lie outside of the municipalities in which said Emergency Fire Response Teams normally operate. This structure was set in place based on the fact that teams spanning across municipal borders within the same prefecture were mobilized for the 2004 heavy rainfall disasters in Niigata and Fukushima, as well as the Mid Niigata Prefecture Earthquake in 2004. In cases spanning across prefectural borders, it has been stipulated that the Commissioner of the FDMA shall coordinate this, since said coordination will span across two or more prefectures (Fig. 2-8-2).

(c) Establishment of coordination headquarters for firefighting support activities

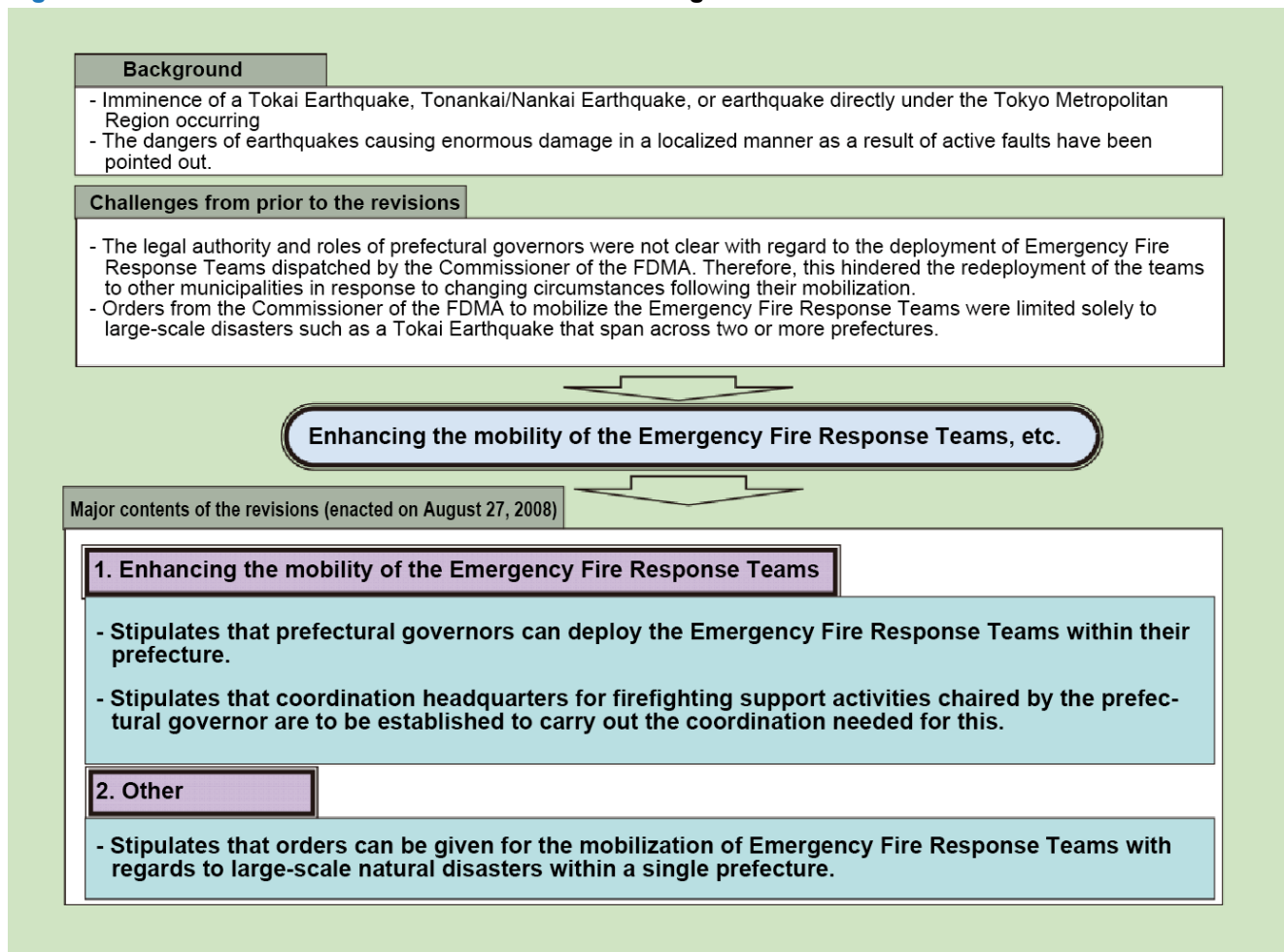
To ensure that the prefectural governor's orders from (b) are carried out smoothly, the prefectural governors are to

establish coordination headquarters for firefighting support activities (hereafter referred to as "coordination headquarters") in order to carry out the general coordination for measures like lending support for firefighting when the Emergency Fire Response Teams are mobilized for this purpose. The coordination headquarters are tasked with handling tasks related to coordinating with the Japan Self-Defense Forces, police, and other relevant organizations. This is done in an effort to ensure that tasks related to general coordination over measures designed to support the firefighting activities carried out by the prefecture and municipalities within the prefecture in question are carried out smoothly (Fig. 2-8-3).

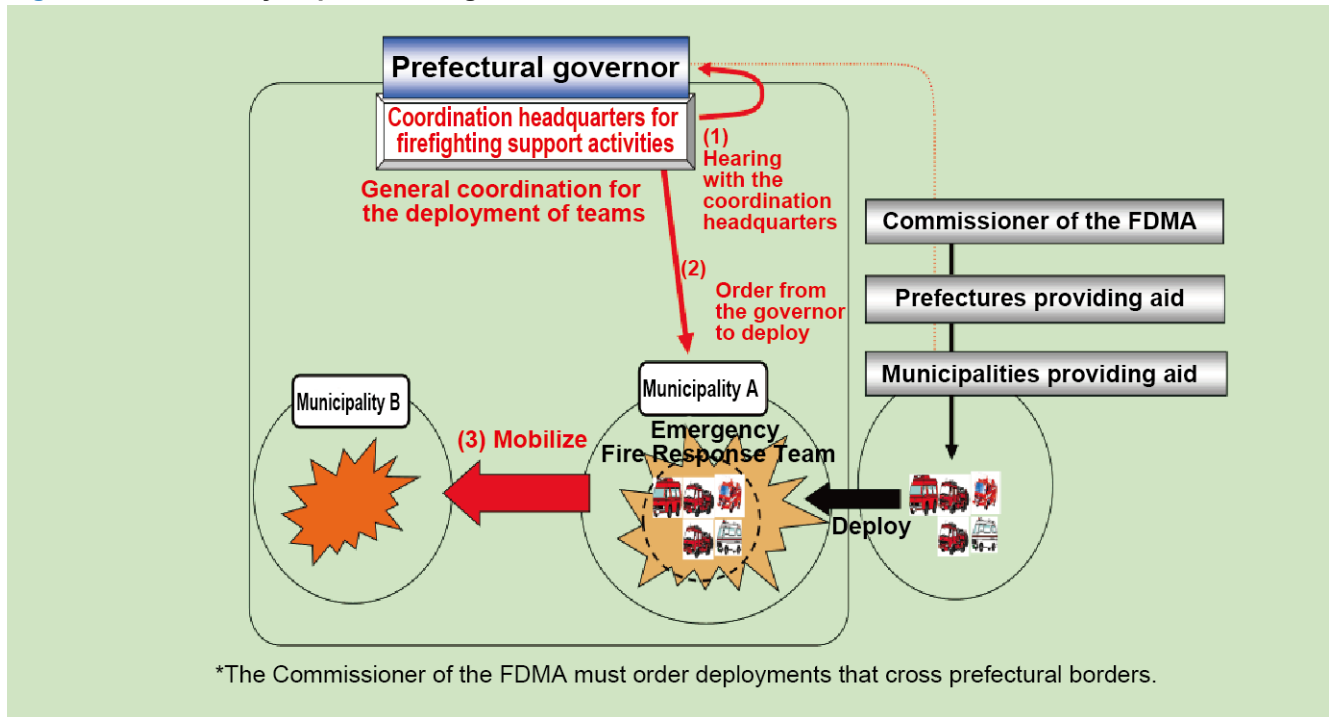
**Table 2-8-2 Enshrining the Emergency Fire Response Teams into law through the 2003 revisions to the Fire Organization Act**

		Prior to the revisions	After the revisions
Position of the Emergency Fire Response Teams		Guidelines for the Emergency Fire Response Teams	Fire Organization Act
Standards for organization and equipping the teams, basic plans for their mobilization		Guidelines for the Emergency Fire Response Teams	Basic Plan established by the Minister for Internal Affairs and Communications
Involvement of the Commissioner of the FDMA		Requests for measures	(1) Requests for measures (2) Orders (Tokai Earthquake and other large-scale earthquakes, NBC disasters)
Financial measures, etc.	Activity expenses	Special tax grants, etc.	Treasury expenses (The national government will bear any increased expenses and new expenses as a result of activities when said activities were ordered)
	Facilities and equipment	Encouragement subsidies (general subsidy rate of 1/3)	Mandatory subsidies (subsidy rate of 1/2)
	Use of government-owned assets and goods	Paid loans, etc.	Permission to use free of charge

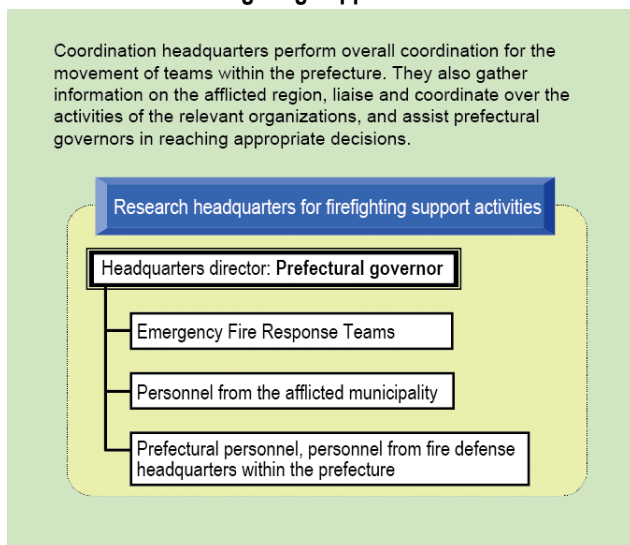
**Fig.2-8-1 Overview of the 2008 revision to the Fire Organization Act**



**Fig.2-8-2 Authority of prefectural governors to order mobilizations**



**Fig 2-8-3 Organization of coordination headquarters for firefighting support activities**



**(d) Revisions to the requirements for the Commissioner of the FDMA to order the mobilization of the Emergency Fire Response Teams**

The dangers of earthquakes causing enormous damage in a localized manner as a result of active faults have been pointed out. It was stipulated that the Commissioner of the FDMA can order the governors of prefectures aside from the prefecture where the municipality in which the disaster occurred is located or the mayors of municipalities within the prefecture in question to take the necessary measures to mobilize their Emergency Fire Response Teams. Where this was previously limited to cases where the disaster was regarded as a large-scale disaster spanning two or more prefectures, now it can be done when it has been acknowledged that there is a special need to respond to the disaster in question, even when it is a large-scale disaster that has occurred solely within a single prefecture.

**(2) Organization of and Mobilization Plans for Emergency Fire Response Teams**

Issues like the organization of and mobilization plans for the Emergency Fire Response Teams are established within the Basic Plan set by the Minister of Internal Affairs and Communications. An overview of these issues is provided below.

**A. Organization of the Emergency Fire Response Teams**

**(A) Command Support Group**

The Command Support Group is tasked with the duty of urgently heading to afflicted regions via helicopter or the like when large-scale disasters or special disasters occur to gather information related to the disaster and convey this to the Commissioner of the FDMA, the governors of the relevant prefectures, and others. In addition, it has also been tasked with the duty of carrying out support activities to ensure that commands pertaining to the Emergency Fire Response Teams are carried out smoothly within the afflicted region.

**(B) Municipal Teams**

Municipal Teams are comprised of the teams required to aid with firefighting undertaken in afflicted regions from among a number of different teams. These include the Municipal Team Commanding Team, firefighting teams, rescue teams, emergency services teams, logistical support teams, communication support teams, air teams, water teams, special disaster teams, and special equipment teams established within the prefecture in question or municipalities within said prefecture (including the special district authorities and extended associations for firefighting in the special wards of Tokyo or municipalities; the same hereafter). **Table 2-8-4**

**(c) Joint Task Force**

The Joint Task Force is tasked with the duty of promptly dispatching advance mobilizations upon the orders of the head of the Municipal Team Commanding Team after a large-scale disaster or special disaster occurs. It is also

tasked with collecting and providing information conducive to ensuring smooth activities on the part of the Municipal Teams that follow, as well as carrying out urgent firefighting activities in the afflicted regions.

(d) Emergency Response Unit for Disasters with Energy and Industrial Infrastructure (Dragon Hyper Command Unit)

The Emergency Response Unit for Disasters with Energy and Industrial Infrastructure is tasked with the duty of undertaking sophisticated and specialized firefighting activities promptly and in the correct manner in response to special disasters in regions containing petrochemical complexes, chemical plants, and other energy and industrial infrastructure.

**B. Mobilization Plans**

**(A) Basic Mobilization Plans**

When large-scale disasters occur, the Commissioner of the FDMA makes efforts to gather information and closely coordinate with the prefectural governor of the afflicted prefecture and other officials. They also decide on whether or not it is necessary to mobilize the Emergency Fire Response Teams, and take the measures to request or order their mobilization based on Article 44 of the Fire Organization Act. Mobilization plans are to be established ahead of time to enable their prompt and precise mobilization in such cases.

Specifically, for each prefecture in which a disaster occurs, they designate prefectural squads that mobilize to provide support with a primary focus on neighboring

prefectures as “first response prefectural squads” and prefectural squads that provide additional support according to the scale of the disaster as “reserve response prefectural squads.”

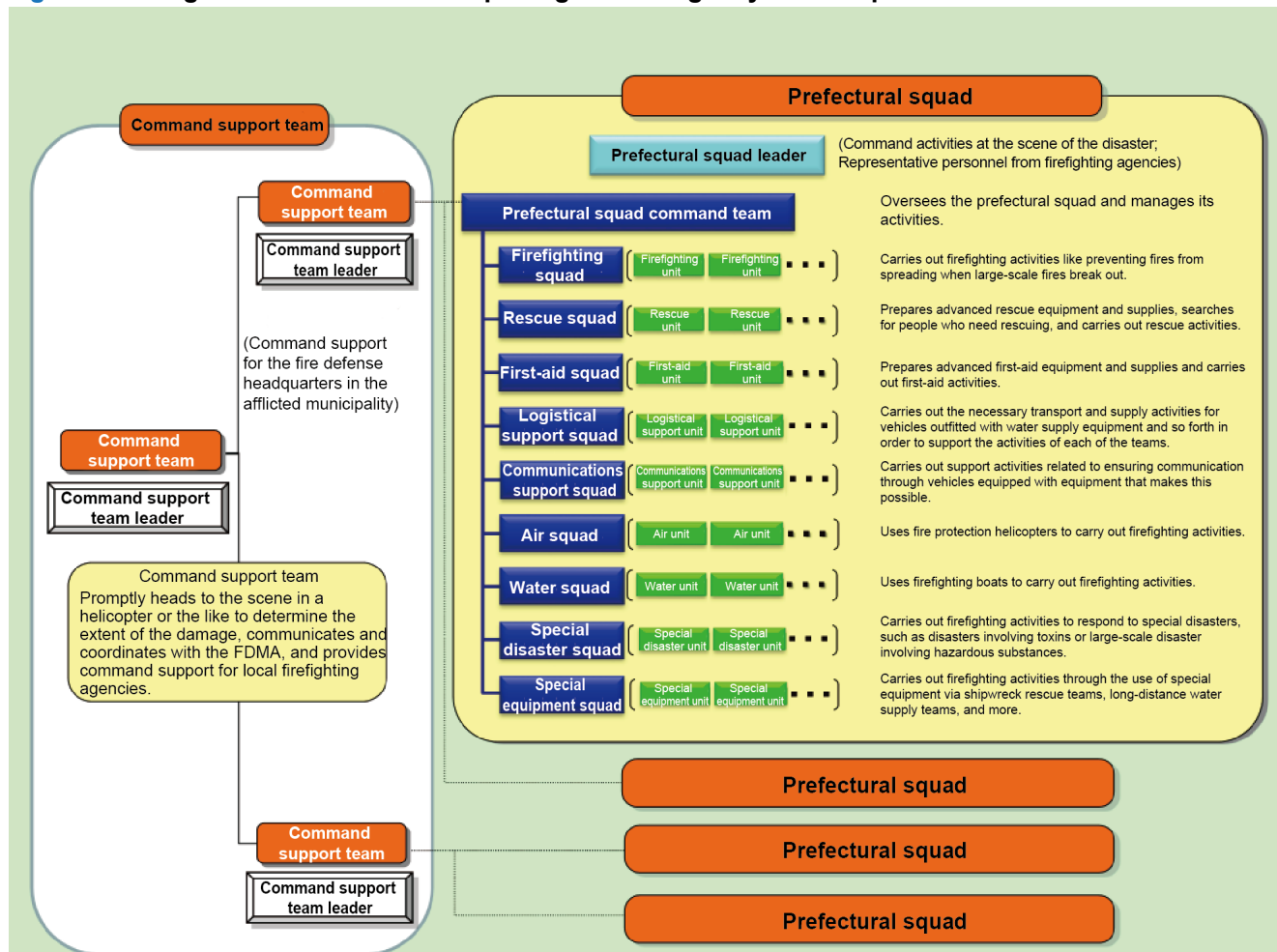
**(B) Rapid Mobilization Standards for when Large-scale Earthquakes Occur**

When large-scale earthquakes occur, communications infrastructure is disrupted and a considerable length of time is needed in order to determine the overall extent of the damage. In light of this, Emergency Fire Response Teams must be ready to be quickly mobilized to the afflicted region so that they can effectively save lives through firefighting, rescue, first-aid, and other such activities.

For this reason, the Commissioner of the FDMA has prefectural governors and municipal mayors from around the country prepare Requests for the Mobilization of Emergency Fire Response Teams Pursuant to Article 44 of the Fire Organization Act in advance. The Implementation Guidelines on Rapid Mobilizations of the Emergency Fire Response Teams for Large-scale Earthquakes were enacted in July 2008, which contained content on matters like mobilizing them the instant a large-scale earthquake occurs.

Then, in March 2015, these implementation guidelines were prescribed in the Guidelines on Requests for Assistance from Emergency Fire Response Teams.

**Fig 2-8-4 Organization of teams comprising the Emergency Fire Response Teams**





(C) Mobilization Plans for a Tokai Earthquake and Other Potential Earthquakes

It is envisioned that a Tokai Earthquake, Tonankai/Nankai Earthquake, Nankai Trough Earthquake, or earthquake directly below the Tokyo Metropolitan Region would produce considerable damage that would extend over multiple prefectures. The thinking is that the firefighting capabilities of just the first response prefectural squads and reserve response prefectural squads alone would be insufficient for this. Therefore, it has been decided that Emergency Fire Response Teams would be mobilized at a national scale for these.

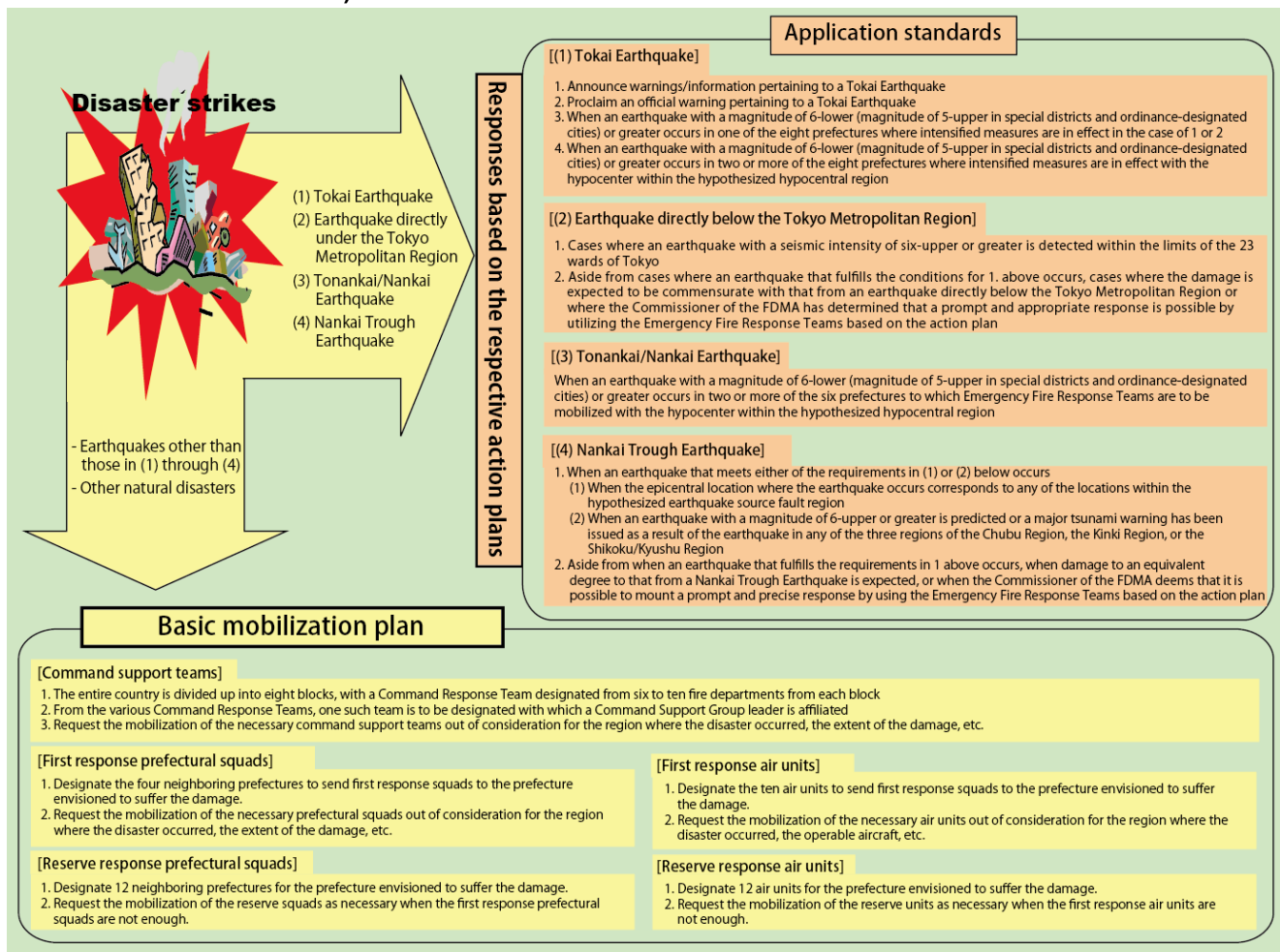
Therefore, the FDMA has formulated guidelines and action plans for using the Emergency Fire Response Teams for each of these disasters should they occur. This was done by envisioning a Tokai Earthquake, Tonankai/Nankai Earthquake, Nankai Trough Earthquake, and earthquake directly below the Tokyo Metropolitan Region, and is based on the response guidelines, estimates of the damage from such disasters, and other data from the Central Disaster Prevention Council.

For example, there is an Emergency Fire Response Team action plan for a Nankai Trough Earthquake that was formulated in March 2016. This plan determines sites to receive assistance in 37 other prefectures aside from the

ten prefectures designated to receive priority assistance, to which every Emergency Fire Response Team capable of providing assistance would be simultaneously and promptly deployed (Fig. 2-8-5). What is more, the action plan for an earthquake directly below the Tokyo Metropolitan Region that was enacted in March 2017 decides on assistance providers from the 43 prefectures (excluding four prefectures designated as the prefectures receiving support), and states that every Emergency Fire Response Teams that can provide support is to promptly devote personnel to this all at once.

For an earthquake along the Nankai Trough, the report by the Working Group to Review Disaster Responses based on Seismic Observations and Evaluations for a Nankai Trough Earthquake from September 2017 indicated the course for a disaster response in the event that abnormal phenomena were observed along the Nankai Trough. Therefore, in the future the policy for deploying Emergency Fire Response Teams and the action plan are slated to be revised as needed based on the new disaster responses of the national government, regional public organizations, and others.

**Fig 2-8-8 Basic mobilization and action plans for the Emergency Fire Response Teams (as of December 2017)**



#### (D) Assistance Plans by the Prefectures

Each prefecture formulates its own Implementation Plans for Assistance from Emergency Fire Response Teams based on the registration status of Emergency Fire Response Teams within the prefecture in question. These plans are based on consultations with the firefighting agencies of each prefecture in question with regard to the organization of prefectural squads and other teams, meeting locations, information communication structures, and other necessary items concerning the prompt mobilization of Emergency Fire Response Teams to afflicted regions.

What is more, the fire defense headquarters must likewise formulate assistance plans while striving for consistency with the contents of the assistance plans formulated by the prefectures for the sake of promptly mobilizing the Emergency Fire Response Teams to afflicted regions.

#### C. Requests for Assistance

Based on the lessons from the disasters that occurred in 2014, in March 2015 the Guidelines on the Use of the Emergency Fire Response Teams were revised, and the following content was prescribed through the Guidelines on Requests for Assistance from Emergency Fire Response Teams and the Guidelines on the Use of the Emergency Fire Response Teams.

##### (a) Requests for immediate assistance

The guidelines stated that in the event that a large-scale disaster occurs, prefectural governors are to request assistance when the damage is expected to expand to a considerable degree and they deem the assistance of the Emergency Fire Response Teams to be necessary. This is to be done even in situations where the extent of the damage cannot be immediately determined in detail so as to ensure that requests for immediate assistance can be made.

What is more, it had been common practice from before for requests for assistance from the prefectural governors to be made in writing based on the official forms. But the guidelines now state that the need for assistance can be conveyed over the phone. What is more, when prefectural governors request the dispatch of the Japan Self-Defense Forces (JSDF) in response to disasters, they are to consider the need for assistance from the Emergency Fire Response Teams at the same time.

##### (b) Coordination with relevant organizations

The guidelines stipulate that coordination headquarters for firefighting support activities are to be set up in locations where they can closely coordinate with not only prefectural disaster response headquarters, but also the government's local response headquarters and relevant organizations. This is designed to strengthen coordination with the relevant organizations (JSDF, police, Japan Coast Guard, DMAT, etc.) at the prefectural level.

Moreover, at the municipal level the command support headquarters is to be set up at a location that would allow for close coordination with the municipal disaster response headquarters and the command headquarters (established within the fire defense headquarters of the afflicted region). The guidelines also stipulated that the team members are to be dispatched to the municipal disaster response headquarters or the command headquarters based on the judgment of the head of the command support headquarters as needed. Both of these measures are

designed to enhance coordination with the relevant organizations.

#### D. Plans for Receiving Assistance

Each prefecture formulates Plans for Receiving Assistance from the Emergency Fire Response Teams by hypothesizing situations in which said prefecture itself falls victim to a disaster. This is done through consultations with the firefighting agencies within the prefecture over necessary matters regarding the acceptance of the Emergency Fire Response Teams. Examples of these include how to operate the coordination headquarters and air support coordination teams in times of normalcy, as well as points of ingress, billeting locations, and refueling bases. It is envisioned that a large number of aircraft from organizations such as firefighting agencies, the police, the Japan Coast Guard, the JSDF, and helicopter ambulances will amass in order to provide assistance to the afflicted region, particularly when large-scale disasters occur. As such, the guidelines state that air support coordination teams are to be established within the prefectural disaster response headquarters in an effort to provide safe and smooth air support coordination.

What is more, the fire defense headquarters must likewise formulate plans for receiving assistance while striving for consistency with the contents of the plans for receiving assistance formulated by the prefectures and the prefecture's regional firefighting plans for the sake of receiving the Emergency Fire Response Teams in their region.

### (3) Number of Emergency Fire Response Teams Registered and Their Equipment

#### a. Number of teams registered

The stipulations of Paragraph 4, Article 45 of the Fire Organization Act states that the Commissioner of the FDMA must register the Emergency Fire Response Teams based on applications to do so from the prefectural governors or municipal mayors.

Since the launch of the 1,267 Emergency Fire Response Teams in September 1995, there has been a growing recognition of the importance of their activities during disasters. As a result, the number of teams registered has been on the rise, and as of April 1, 2017, 5,658 teams have been registered from 727 fire defense headquarters nationwide (roughly 99% of the fire defense headquarters nationwide). This is an increase of 357 teams over and above the number registered in April 1, 2016 (of 5,301 teams).

In March 2014, the basic plan was revised and a target for the number of teams registered was set for the end of FY2018 that would substantially increase the number of teams from its current level of roughly about 4,500 to roughly 6,000 teams. This is to be done because it is crucial to set in place a structure for deploying teams quickly and at a large scale in preparation for large-scale disasters such as a Nankai Trough Earthquake or an earthquake directly below the Tokyo Metropolitan Region, for which damage that is worse than that from the Great East Japan Earthquake is envisioned.

#### B. Equipment

Since they were first launched, the FDMA has formulated standards for the equipment for the Emergency Fire Response Teams. Moreover, since their enshrinement into law in 2003, it has included provisions for this in its

basic plan as it has worked to round-out their line-up of equipment. Starting from 2006, government subsidy measures have been taken through a subsidy for outfitting the Emergency Fire Response Teams with facilities and equipment. Through this, progress has been made in equipping them with special disaster-response fire pump vehicles, rescue work vehicles, special disaster-response ambulances, as well as the support vehicles active teams need to act in a self-contained manner in afflicted regions, and also fiberscopes and other sophisticated rescue equipment and supplies.

What is more, the stipulations in Article 50 of the Fire Organization Act provide for a system for using equipment free of charge. Under this system, some of the equipment needed by the Emergency Fire Response Teams for their team activities and logistical activities is allocated to fire defense headquarters and other sites throughout Japan. Such equipment includes systems for water sources for firefighting capable of handling disasters at energy and industrial infrastructure, response vehicles for handling tsunamis and large-scale storm and flood damage, vehicles that can function as mobile bases, and more (Table 2-8-3).



Response vehicle for handling tsunamis and large-scale storm and flood damage



Vehicle that can function as a mobile base

**Table 2-8-3 Main allocation of vehicles and other equipment via the system for using equipment free of charge stipulated in Article 50 of the Fire Organization Act**

FY of allocation	Allocated vehicles, etc.	No. allocated	
2005	Helicopters	1 helicopter	
2006	Vehicles equipped with large blowers	5 vehicles	
	Vehicles equipped with water cutters	5 vehicles	
2007	Vehicles equipped with large decontamination systems	5 vehicles	
2008	Special elevated work vehicles	5 vehicles	
	Fuel supply vehicles	6 vehicles	
2009	Helicopter movement management system	8 systems	
	Special disaster response vehicles	10 vehicles	
	Special elevated work vehicles	9 vehicles	
	Vehicles equipped with large decontamination systems	8 vehicles	
	Fuel supply vehicles	2 vehicles	
2010	Firefighting systems that use ocean water	2 systems	
	Helicopter movement management system	2 systems	
	Infrared cameras	1 helicopter	
	Type 1 support vehicles	47 vehicles	
2011	Firefighting systems that use ocean water	3 systems	
	Helicopters	2 helicopters	
	Personnel transport vehicles	47 vehicles	
	Equipment transport vehicles	46 vehicles	
	All-terrain response vehicles	1 pair	
	Radio relay vehicles	21 vehicles	
	Elevated rescue vehicles for large-scale earthquake disasters	3 pairs	
	Heavy machinery and heavy machinery transport vehicles	19 pairs	
	Prefectural command team vehicles	45 vehicles	
	2012	Fuel supply vehicles	30 vehicles
		Type 1 support vehicles	17 vehicles
		Firefighting systems that use ocean water	1 system
		Special disaster response vehicles	1 vehicle
		Special disaster work vehicles	2 vehicles
		Vehicles equipped with large decontamination systems	4 vehicles
		Helicopter movement management system	11 systems
		Heli-Sat system	1 system
Vehicle that can function as a mobile base		6 vehicles	
2013		Response vehicle for handling tsunamis and large-scale storm and flood damage	15 vehicles
		Mobile communication vehicles	33 vehicles
	Helicopters	2 helicopters	
	Helicopter movement management system	4 systems	
	Heli-Sat system	4 systems	
	Heli-Sat cameras	3 systems	
2014	Vehicle that can function as a mobile base	4 vehicles	
	Response vehicle for handling tsunamis and large-scale storm and flood damage	2 vehicles	
	Water systems for firefighting capable of handling disasters at energy and industrial infrastructure	2 systems	
2015	Helicopter movement management system	4 systems	
	Vehicle that can function as a mobile base	2 vehicles	
	Response vehicle for handling tsunamis and large-scale storm and flood damage	2 vehicles	
	Systems for firefighting capable of handling disasters at energy and industrial infrastructure	2 systems	
	Drones for firefighting activities	2 systems	
	Heavy machinery and heavy machinery transport vehicles	3 pairs	
2016	Vehicles equipped with large decontamination systems	1 vehicle	
	Helicopter movement management system	6 systems	
	Vehicle that can function as a mobile base	2 vehicles	
	Response vehicle for handling tsunamis and large-scale storm and flood damage	3 vehicles	
	Water systems for firefighting capable of handling disasters at energy and industrial infrastructure	2 systems	
2017 *	Vehicles equipped with large decontamination systems	1 vehicle	
	Helicopter movement management system	5 systems	
	Vehicle that can function as a mobile base	2 vehicles	
	Response vehicle for handling tsunamis and large-scale storm and flood damage	2 vehicles	
	Water systems for firefighting capable of handling disasters at energy and industrial infrastructure	2 systems	
	Radio relay vehicles	3 vehicles	
*	Vehicles equipped with large decontamination systems	1 vehicle	
	Fuel supply vehicles	9 vehicles	
	Helicopter video transmission receivers	23 systems	

(Notes) \* indicates equipment scheduled to be allocated in FY2017

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Moreover, the emergency and disaster prevention and reduction business debentures (100% allocations, 70% tax grant rate) that were established in FY2011 were expanded in FY2013 to newly encompass “Equipment for vehicles for the functional enhancement of the Emergency Fire Response Teams” and “Facilities to serve as bases for wide-area activities for the Emergency Fire Response Teams.”

In FY2014, base facilities for rescue activities and the like were added to the list of facilities eligible for aid via subsidies for the costs of outfitting fire and disaster prevention equipment. Such facilities consist of helicopter landing pads, facilities for storing equipment and supplies,

and private refueling facilities. Through this, progress has been made with setting in place base facilities that will allow Emergency Fire Response Teams to carry out rescue and other activities in a self-reliant manner.

The FDMA will continue working to round-out and enhance the equipment of the Emergency Fire Response Teams in a systematic manner to ensure that they can effectively carry out their activities.

## Attachment 1-1-2 Extent of fire damage by prefecture

(During 2016)

Classification Prefecture	No. of fires							No. of buildings burned				
	Total	Buildings	Forests	Vehicles	Ships	Aircraft	Other	Total	Totally destroyed	Half destroyed	Partially destroyed	Minor fire
Hokkaido	1,859	1,137	33	360	3	0	326	1,459	334	124	445	556
Aomori	472	262	31	46	2	0	131	510	183	47	152	128
Iwate	438	219	58	46	1	0	114	412	170	24	121	97
Miyagi	734	387	28	102	3	0	214	598	172	33	158	235
Akita	311	191	32	32	1	0	55	380	165	28	112	75
Yamagata	311	163	25	27	0	0	96	264	81	11	83	89
Fukushima	640	338	38	83	1	0	180	587	207	42	163	175
Ibaraki	1,062	510	45	137	0	0	370	935	340	52	221	322
Tochigi	669	332	28	100	0	0	209	554	189	43	151	171
Gunma	755	377	16	84	0	0	278	596	160	30	179	227
Saitama	1,835	1,052	15	189	0	0	579	1,567	305	91	460	711
Chiba	1,742	927	40	164	3	0	608	1,313	288	69	310	646
Tokyo	4,007	2,780	1	280	3	1	942	3,129	107	102	530	2,390
Kanagawa	1,927	1,176	9	189	8	0	545	1,483	169	70	358	886
Niigata	573	394	20	61	0	0	98	849	344	50	231	224
Tomiyama	195	139	3	32	0	0	21	182	47	19	50	66
Ishikawa	244	144	8	34	0	0	58	217	48	15	66	88
Fukui	196	127	1	24	0	0	44	176	45	12	47	72
Yamanashi	338	138	12	33	0	0	155	212	67	17	70	58
Nagano	786	362	33	68	0	0	323	498	152	46	166	134
Gifu	686	333	21	78	0	0	254	486	123	19	158	186
Shizuoka	967	551	12	102	0	0	302	802	172	49	227	354
Aichi	2,042	1,086	28	240	4	0	684	1,455	258	81	376	740
Mie	654	306	19	89	1	0	239	476	143	33	135	165
Shiga	448	218	11	64	1	0	154	340	73	21	86	160
Kyoto	545	355	9	63	0	0	118	507	102	32	133	240
Osaka	2,129	1,436	9	206	0	1	477	1,826	140	105	482	1,099
Hyogo	1,569	827	47	159	3	1	532	1,086	186	42	312	546
Nara	448	205	9	48	0	0	186	294	75	16	81	122
Wakayama	353	186	7	48	2	0	110	279	80	18	69	112
Tottori	219	120	9	18	0	0	72	188	50	15	71	52
Shimane	256	127	28	24	1	0	76	198	77	7	47	67
Okayama	601	331	41	55	1	0	173	560	169	33	171	187
Hiroshima	781	448	40	82	3	0	208	704	163	42	188	311
Yamaguchi	434	226	17	46	2	0	143	390	105	37	113	135
Tokushima	239	131	14	32	1	0	61	214	80	14	60	60
Kagawa	298	158	13	34	1	0	92	221	66	12	74	69
Ehime	389	252	5	25	3	0	104	390	113	24	114	139
Kochi	266	146	14	22	0	0	84	232	89	14	69	60
Fukuoka	1,274	785	10	146	5	0	328	1,026	181	65	290	490
Saga	258	131	7	33	2	0	85	181	42	15	62	62
Nagano	482	232	20	54	8	0	168	343	95	25	84	139
Kumamoto	592	305	42	75	2	0	168	482	136	16	122	208
Oita	383	199	24	55	2	0	103	284	73	12	78	121
Miyazaki	399	213	34	46	1	0	105	357	113	19	111	114
Kagoshima	604	332	25	58	3	0	186	556	213	26	125	192
Okinawa	421	197	36	60	1	0	127	234	32	11	57	134
<b>Prefectural total</b>	<b>36,831</b>	<b>20,991</b>	<b>1,027</b>	<b>4,053</b>	<b>72</b>	<b>3</b>	<b>10,685</b>	<b>30,032</b>	<b>6,722</b>	<b>1,728</b>	<b>7,968</b>	<b>13,614</b>
Sapporo City	517	340	1	109	0	0	67	393	26	25	129	213
Sendai City	250	149	0	25	0	0	76	190	21	8	33	128
Saitama City	273	158	0	22	0	0	93	235	43	8	61	123
Chiba City	265	150	2	33	0	0	80	182	21	5	33	123
Special wards	3,010	2,156	0	185	3	1	665	2,396	49	71	413	1,863
Yokohama City	754	449	0	61	4	0	240	570	48	26	133	363
Kawasaki City	374	247	0	28	3	0	96	278	10	11	66	191
Sagamihara City	149	89	3	22	0	0	35	118	25	5	25	63
Niigata City	140	106	0	23	0	0	11	197	42	11	61	83
Shizuoka City	169	91	3	14	0	0	61	144	25	8	39	72
Hamamatsu City	166	92	5	19	0	0	50	127	22	11	41	53
Nagoya City	567	339	3	76	0	0	149	421	32	19	117	253
Kyoto City	256	193	2	23	0	0	38	266	33	20	86	127
Osaka City	850	615	0	66	0	0	169	739	31	26	217	465
Sakai City	178	112	0	14	0	0	52	142	7	8	22	105
Kobe City	457	259	6	52	0	0	140	313	32	11	89	181
Okayama City	159	92	3	17	0	0	47	154	32	6	50	66
Hiroshima City	275	176	5	31	0	0	63	216	18	5	45	148
Kitakyushu City	256	153	2	24	2	0	75	210	39	9	70	92
Fukuoka City	283	216	0	23	1	0	43	240	13	6	69	152
Kumamoto City	174	103	3	21	0	0	47	145	19	5	34	87
<b>21 city total</b>	<b>9,522</b>	<b>6,285</b>	<b>38</b>	<b>888</b>	<b>13</b>	<b>1</b>	<b>2,297</b>	<b>7,676</b>	<b>588</b>	<b>304</b>	<b>1,833</b>	<b>4,951</b>

(Note) The "21 city total" is found within the prefectural total.

Attachment 1-1-2 Extent of fire damage by prefecture (continued)

(During 2016)

Classification Prefecture	Area burned			No. of casualties		No. of households affected				No. of people affected
	Building floor area (m <sup>2</sup> )	Building surface area (m <sup>2</sup> )	Forests (a)	Fatalities	Injured	Total	Totally destroyed	Half destroyed	Minor destruction	
Hokkaido	56,224	6,557	6,026	69	290	811	188	76	547	1,659
Aomori	32,085	2,777	1,837	32	79	289	94	27	168	645
Iwate	23,991	1,780	1,053	15	52	195	64	8	123	504
Miyagi	26,010	1,102	358	30	118	358	99	14	245	872
AKita	52,739	2,009	2,614	22	54	188	79	11	98	512
Yamagata	8,787	928	340	14	53	119	30	6	83	314
Fukushima	36,125	2,222	7,953	42	95	293	93	23	177	686
Ibaraki	40,629	4,537	221	46	140	495	180	29	286	1,188
Tochigi	21,967	1,344	1,987	36	82	304	103	23	178	708
Gunma	20,936	2,943	140	35	119	346	75	39	232	806
Saitama	34,694	6,315	178	70	276	959	191	51	717	2,254
Chiba	32,982	2,997	204	66	274	773	172	47	554	1,742
Tokyo	18,262	6,980	131	83	853	2,077	140	147	1,790	4,035
Kanagawa	24,947	7,002	110	63	344	1,075	182	63	830	2,289
Niigata	67,356	5,002	627	49	138	482	190	29	263	1,244
Tomiyama	9,093	351	52	14	35	97	30	8	59	236
Ishikawa	12,825	1,599	31	12	41	121	33	9	79	322
Fukui	7,422	303	7	6	31	91	23	8	60	255
Yamanashi	10,087	761	170	11	45	122	37	11	74	263
Nagano	23,855	3,463	1,617	44	101	256	77	23	156	621
Gifu	18,328	1,975	174	29	96	310	72	26	212	749
Shizuoka	23,288	3,311	84	42	135	471	110	28	333	1,148
Aichi	34,828	5,003	156	57	286	893	155	66	672	2,108
Mie	16,995	1,554	297	25	81	242	95	21	126	509
Shiga	21,186	824	163	18	69	188	37	15	136	498
Kyoto	11,888	1,367	109	29	92	379	69	27	283	734
Osaka	33,788	7,068	63	74	430	1,542	201	132	1,209	3,167
Hyogo	34,128	3,220	434	54	221	703	109	39	555	1,503
Nara	10,764	1,853	2,336	14	58	189	36	11	142	498
Wakayama	11,138	573	186	15	57	139	34	10	95	304
Tottori	9,487	1,632	38	12	41	100	33	7	60	219
Shimane	9,426	830	281	14	39	95	36	3	56	230
Okayama	20,398	1,468	457	32	90	317	91	19	207	770
Hiroshima	22,964	2,041	826	30	132	372	80	24	268	829
Yamaguchi	14,005	947	75	26	51	216	69	10	137	480
Tokushima	10,862	2,638	202	16	35	108	38	13	57	267
Kagawa	8,352	631	27	13	36	121	42	9	70	248
Ehime	13,061	1,109	59	22	76	233	72	15	146	499
Kochi	8,588	1,219	181	11	37	135	45	7	83	283
Fukuoka	35,385	2,714	1,093	47	200	718	142	55	521	1,508
Saga	7,487	816	13	10	47	121	24	16	81	326
Nagano	12,102	2,714	66	17	72	220	71	13	136	536
Kumamoto	21,714	1,682	1,074	22	74	285	83	9	193	689
Oita	14,959	854	2,546	12	56	150	35	3	112	332
Miyazaki	14,207	1,676	1,010	14	55	176	67	6	103	369
Kagoshima	22,948	1,132	181	33	89	322	115	11	196	720
Okinawa	3,189	829	624	5	24	139	23	6	110	292
Prefectural total	1,026,481	112,652	38,411	1,452	5,899	18,335	4,064	1,253	13,018	40,970
Sapporo City	6,533	2,103	0	18	84	254	23	17	214	491
Sendai City	2,881	291	0	5	46	136	21	4	111	297
Saitama City	4,693	1,237	0	10	32	164	24	3	137	400
Chiba City	1,857	261	1	7	39	108	24	5	79	235
Special wards	11,901	5,001	30	52	660	1,569	98	105	1,366	2,994
Yokohama City	5,541	1,673	0	25	130	444	72	23	349	913
Kawasaki City	2,386	443	0	5	64	210	37	12	161	448
Sagamihara City	3,672	254	4	6	23	69	14	2	53	146
Niigata City	7,316	709	0	16	38	139	33	8	98	372
Shizuoka City	3,475	277	26	7	36	90	15	5	70	226
Hamamatsu City	3,687	695	4	5	30	77	18	4	55	202
Nagoya City	6,218	1,494	8	18	90	337	40	29	268	685
Kyoto City	4,282	751	26	15	52	236	39	18	179	392
Osaka City	5,429	3,280	0	32	183	679	53	63	563	1,242
Sakai City	1,315	192	0	4	31	107	15	5	87	232
Kobe City	3,493	763	36	20	74	220	24	16	180	423
Okayama City	5,601	576	3	8	27	101	18	4	79	247
Hiroshima City	2,929	562	45	5	53	149	19	8	122	339
Kitakyushu City	6,448	479	2	14	42	171	40	8	123	339
Fukuoka City	2,546	822	0	6	48	202	26	11	165	388
Kumamoto City	3,230	497	12	7	24	95	14	3	78	241
21 city total	95,433	22,360	197	285	1,806	5,557	667	353	4,537	11,252

(Note) The "21 city total" is found within the prefectural total.

Attachment 1-1-2 Extent of fire damage by prefecture (continued)

(During 2016) (Unit: 1,000 yen)

Classification Prefecture	Amount of damages									
	Total	Buildings			Forests	Vehicles	Ships	Aircraft	Other	Explosions
		Subtotal	Buildings	Contents						
Hokkaido	3,650,772	3,391,552	2,084,483	1,307,069	3,801	168,631	3,440	0	71,850	11,498
Aomori	1,056,244	990,324	719,775	270,549	17,194	32,902	1,400	0	13,584	840
Iwate	1,012,037	947,111	783,263	163,848	11,977	22,167	2,329	0	28,453	0
Miyagi	2,377,742	2,129,509	1,095,561	1,033,948	1,723	49,562	80,045	0	116,903	0
Akita	2,580,324	2,427,908	1,330,200	1,097,708	39,994	15,841	10,030	0	86,443	108
Yamagata	442,603	430,507	323,009	107,498	361	8,054	0	0	3,655	26
Fukushima	1,549,082	1,428,112	1,085,460	342,652	3,484	52,166	1,400	0	51,964	11,956
Ibaraki	2,743,141	2,575,725	1,847,852	727,873	2,157	122,495	100	0	42,641	23
Tochigi	1,623,830	1,509,291	882,602	626,689	32,582	36,683	0	0	35,537	9,737
Gunma	1,628,748	1,545,714	949,254	596,460	619	54,546	0	0	19,535	8,334
Saitama	3,833,498	3,580,412	2,497,531	1,082,881	1,539	106,927	0	0	142,960	1,660
Chiba	2,907,350	2,385,204	1,884,322	500,882	407	88,205	70,000	0	361,854	1,680
Tokyo	4,061,183	2,985,034	1,961,227	1,023,807	0	122,953	650	920,000	21,513	11,033
Kanagawa	2,580,496	2,431,474	1,981,045	450,429	8	98,296	6,302	0	42,213	2,203
Niigata	2,266,476	2,205,925	1,546,500	659,425	2,346	44,436	0	0	13,137	632
Tomiyama	433,810	411,683	313,004	98,679	1,848	17,036	0	0	2,249	994
Ishikawa	864,098	840,168	687,483	152,685	964	6,006	0	0	16,945	15
Fukui	412,033	404,224	313,409	90,815	0	6,263	0	0	1,546	0
Yamanashi	1,284,979	1,223,957	762,818	461,139	116	47,625	0	0	13,281	0
Nagano	3,589,133	3,517,214	967,846	2,549,368	12,160	44,410	0	0	15,281	68
Gifu	1,176,307	1,111,480	825,974	285,506	143	42,943	0	0	21,560	181
Shizuoka	1,852,119	1,723,722	1,264,659	459,063	195	65,327	0	0	56,607	6,268
Aichi	4,158,992	3,788,369	2,956,334	832,035	78	91,278	5,085	0	57,825	216,357
Mie	1,295,368	1,217,938	943,919	274,019	492	48,112	412	0	26,521	1,893
Shiga	2,053,346	1,987,133	1,016,668	970,465	549	50,437	250	0	14,977	0
Kyoto	998,865	978,126	660,467	317,659	84	14,178	0	0	4,335	2,142
Osaka	3,312,353	2,932,468	1,976,993	955,475	46	140,315	0	240	137,036	102,248
Hyogo	2,303,529	2,148,616	1,549,118	599,498	793	94,787	119	92	56,759	2,363
Nara	786,865	734,043	503,740	230,303	4,364	29,763	0	0	16,057	2,638
Wakayama	655,603	629,145	447,945	181,200	596	11,797	4,000	0	8,419	1,646
Tottori	352,795	337,155	280,327	56,828	312	3,434	0	0	11,894	0
Shimane	567,354	550,065	354,224	195,841	819	14,457	1	0	1,730	282
Okayama	1,215,438	1,144,120	773,729	370,391	1,382	38,495	633	0	30,301	507
Hiroshima	1,711,504	1,519,253	981,148	538,105	57	37,388	1,830	0	152,649	327
Yamaguchi	699,883	652,736	504,672	148,064	216	17,282	1,600	0	27,082	967
Tokushima	676,906	613,262	458,914	154,348	283	13,921	41,140	0	8,300	0
Kagawa	442,478	433,107	301,938	131,169	0	4,856	420	0	4,095	0
Ehime	530,773	424,482	327,177	97,305	13	88,623	901	0	15,143	1,611
Kochi	464,573	451,096	361,639	89,457	90	8,179	120	0	5,088	0
Fukuoka	2,278,847	2,111,101	1,499,735	611,366	63	74,919	7,007	0	85,610	147
Saga	615,232	494,505	426,287	68,218	229	18,511	98,341	0	3,646	0
Nagano	618,600	545,643	422,879	122,764	12	28,836	28,083	0	9,623	6,403
Kumamoto	2,485,993	2,420,126	1,180,559	1,239,567	2,750	45,675	764	0	16,181	497
Oita	840,515	657,087	410,438	246,649	4,281	40,413	1,628	0	133,416	3,690
Miyazaki	627,134	596,806	453,458	143,348	5,103	12,974	365	0	11,886	0
Kagoshima	1,399,425	1,179,367	779,387	399,980	467	89,672	119,993	0	9,241	685
Okinawa	215,020	172,305	142,526	29,779	486	21,308	30	0	20,891	0
Prefectural total	75,233,396	68,914,304	45,821,498	23,092,806	157,183	2,293,084	488,418	920,332	2,048,416	411,659
Sapporo City	450,240	426,777	278,052	148,725	0	14,198	0	0	6,544	2,721
Sendai City	171,627	148,959	123,378	25,581	0	20,189	0	0	2,479	0
Saitama City	485,445	456,427	307,392	149,035	18	15,808	0	0	13,192	0
Chiba City	225,781	196,997	162,163	34,834	0	25,059	0	0	3,725	0
Special wards	3,109,666	2,079,936	1,426,640	653,296	0	90,742	650	920,000	15,840	2,498
Yokohama City	637,577	586,253	499,100	87,153	0	23,056	6,292	0	21,731	245
Kawasaki City	235,437	202,098	126,369	75,729	0	27,772	10	0	5,557	0
Sagamihara City	369,888	352,038	303,104	48,934	0	9,447	0	0	7,373	1,030
Niigata City	437,481	423,879	349,575	74,304	0	11,725	0	0	1,877	0
Shizuoka City	201,996	187,521	150,678	36,843	0	10,681	0	0	3,794	0
Hamamatsu City	258,142	243,725	202,268	41,457	75	9,933	0	0	4,409	0
Nagoya City	439,499	414,057	305,754	108,303	15	15,388	0	0	10,009	30
Kyoto City	313,249	305,388	232,075	73,313	84	6,562	0	0	994	221
Osaka City	548,064	434,206	256,070	178,136	0	60,016	0	0	53,556	286
Sakai City	164,632	156,083	97,912	58,171	0	4,795	0	0	3,754	0
Kobe City	414,503	383,616	287,823	95,793	0	22,395	0	0	8,492	0
Okayama City	412,596	396,297	236,464	159,833	0	13,387	0	0	2,912	0
Hiroshima City	439,604	418,749	172,073	246,676	3	12,667	0	0	8,185	0
Kitakyushu City	286,766	237,994	170,877	67,117	0	12,945	4,600	0	31,224	3
Fukuoka City	163,859	147,085	111,827	35,258	0	9,203	0	0	7,430	141
Kumamoto City	121,826	112,530	78,928	33,602	0	5,186	0	0	3,613	497
21 city total	9,887,878	8,310,615	5,878,522	2,432,093	195	421,154	11,552	920,000	216,690	7,672

(Note) The "21 city total" is found within the prefectural total.

## Attachment 1-2-1 Trends in the number of facilities for hazardous material

(As of March 31 of each year)

Year	Types of manufacturing facilities, etc.	Net total	Manufacturing facilities	Storage facilities							Handling facilities						
				Subtotal	Indoor storage facilities	Outdoor tank storage facilities	Indoor tank storage facilities	Under ground storage facilities	Simple tank storage facilities	Transfer tank storage facilities	Outdoor storage facilities	Subtotal	Fuel supply depots	Class I sales handling facilities	Class II sales handling facilities	Transfer handling facilities	General outlets
1959		95,207	2,523	63,303	23,566	19,090	2,048	5,484	7,237	3,527	2,351	29,381	19,937	1,702			7,742
1967		213,526	3,008	140,842	34,163	48,975	8,863	23,891	4,648	15,190	5,112	69,676	42,347	2,059			25,270
1968		246,767	3,164	157,456	36,523	53,938	9,993	28,243	4,731	17,856	6,172	86,147	49,041	2,478			34,628
1969		279,012	3,309	175,150	38,880	59,504	11,172	33,142	4,793	20,556	7,103	100,553	54,060	2,907			43,586
1970		308,784	3,459	192,155	40,709	64,693	12,334	38,852	4,767	22,645	8,155	113,170	58,096	3,274			51,800
1971		346,113	3,684	213,883	43,254	71,320	13,611	45,880	4,849	25,396	9,573	128,546	62,749	3,553			62,244
1972		377,123	3,789	231,972	44,872	76,090	14,667	52,132	4,805	28,484	10,922	141,362	66,638	3,722	91		70,911
1973		410,158	3,929	251,372	46,769	81,388	15,575	58,913	4,748	32,139	11,840	154,857	71,049	3,697	163		79,948
1974		461,500	4,037	288,771	50,253	91,596	16,840	68,423	4,774	36,049	20,836	168,692	74,697	3,763	258		89,974
1975		495,161	3,961	312,009	53,239	97,846	17,534	75,642	4,578	39,364	23,806	179,191	76,879	3,727	319	1,148	97,118
1976		512,675	4,035	323,827	55,140	99,401	17,936	80,906	4,540	41,909	23,995	184,813	78,508	3,717	374	1,225	100,989
1977		527,118	4,104	333,440	56,772	99,626	18,236	85,874	4,496	44,266	24,170	189,574	79,998	3,675	464	1,229	104,208
1978		539,532	4,124	341,341	57,819	99,456	18,632	90,734	4,286	46,333	24,081	194,067	81,288	3,626	513	1,251	107,389
1979		552,597	4,184	349,777	58,528	98,984	18,929	95,823	4,194	49,427	23,892	198,636	82,900	3,538	541	1,316	110,341
1980		575,376	4,272	366,356	60,165	100,373	19,451	104,193	4,187	52,350	25,637	204,748	84,588	3,462	604	1,357	114,737
1981		587,052	4,346	373,465	61,554	97,509	19,923	109,755	4,076	54,986	25,662	209,241	86,056	3,416	647	1,366	117,756
1982		596,575	4,393	379,752	62,789	97,007	20,013	113,398	3,953	57,126	25,466	212,430	86,962	3,351	667	1,382	120,068
1983		601,905	4,435	382,914	63,440	96,341	19,955	115,724	3,871	58,662	24,921	214,556	87,678	3,284	705	1,380	121,509
1984		607,040	4,477	386,406	63,598	96,057	19,878	117,715	3,742	61,019	24,397	216,157	88,143	3,221	729	1,391	122,673
1985		613,364	4,560	390,825	63,878	95,685	19,831	119,749	3,638	64,393	23,651	217,979	88,582	3,124	744	1,400	124,129
1986		617,540	4,598	393,419	64,081	94,998	19,621	121,254	3,531	66,998	22,936	219,523	88,882	3,040	739	1,402	125,460
1987		620,783	4,657	395,877	63,980	94,334	19,465	122,509	3,435	69,976	22,178	220,249	88,890	2,939	758	1,397	126,265
1988		574,720	4,677	397,687	63,693	93,497	19,354	123,402	3,361	72,957	21,423	172,356	89,088	2,845	766	1,381	78,276
1989		578,881	4,722	400,597	63,562	93,105	19,150	124,374	3,288	76,451	20,667	173,562	89,506	2,768	765	1,372	79,151
1990		582,911	4,775	403,577	63,426	92,778	18,955	125,630	3,199	79,308	20,281	174,559	89,814	2,696	776	1,360	79,913
1991		561,184	4,774	385,975	61,350	87,950	17,999	125,874	2,354	71,596	18,852	170,435	89,388	2,630	657	1,373	76,387
1992		562,980	4,917	387,019	61,522	87,550	17,710	126,599	2,266	73,111	18,261	171,044	89,616	2,554	640	1,369	76,865
1993		562,250	4,975	386,022	61,285	87,038	17,459	126,706	2,212	73,699	17,623	171,253	89,996	2,464	652	1,377	76,764
1994		560,790	5,013	383,979	60,862	86,272	17,168	126,543	2,169	73,704	17,261	171,798	90,647	2,395	647	1,380	76,729
1995		561,295	5,046	383,683	60,304	85,764	16,880	126,533	2,089	75,307	16,806	172,566	91,418	2,321	647	1,382	76,798
1996		561,094	5,071	382,941	59,824	85,114	16,598	126,552	2,040	76,575	16,238	173,082	92,037	2,256	660	1,378	76,751
1997		560,108	5,126	382,409	59,221	84,553	16,315	126,617	1,965	77,881	15,857	172,573	91,583	2,196	652	1,365	76,777
1998		556,647	5,159	380,337	58,697	83,902	16,133	126,218	1,906	78,184	15,297	171,151	90,226	2,146	641	1,359	76,779
1999		551,371	5,156	377,229	58,073	82,877	15,848	125,481	1,828	78,404	14,718	168,986	88,382	2,075	645	1,350	76,534
2000		546,043	5,145	374,034	57,246	81,646	15,497	124,558	1,768	79,027	14,292	166,864	86,616	2,017	638	1,343	76,250
2001		542,068	5,160	371,351	56,722	80,260	15,311	123,964	1,703	79,802	13,589	165,557	85,182	1,963	631	1,331	76,450
2002		537,825	5,183	368,561	56,010	79,264	15,022	123,096	1,646	80,356	13,167	164,081	83,869	1,876	625	1,322	76,389
2003		530,484	5,085	363,829	55,178	77,631	14,709	121,795	1,586	80,194	12,736	161,570	82,371	1,807	618	1,288	75,486
2004		523,341	5,076	358,786	54,577	76,147	14,368	119,988	1,514	79,804	12,388	159,479	80,814	1,737	611	1,262	75,055
2005		514,990	5,050	352,872	54,337	74,724	14,086	117,491	1,446	78,683	12,105	157,068	79,104	1,681	600	1,250	74,433
2006		506,245	5,058	346,532	53,770	73,428	13,803	114,564	1,384	77,630	11,953	154,655	77,642	1,632	591	1,241	73,549
2007		496,789	5,107	339,728	53,720	72,213	13,363	111,204	1,307	76,262	11,659	151,954	76,310	1,584	583	1,226	72,251
2008		486,812	5,121	332,859	53,473	70,898	12,965	108,292	1,247	74,513	11,471	148,832	74,388	1,523	567	1,215	71,139
2009		475,989	5,154	325,590	53,182	69,756	12,574	105,206	1,204	72,387	11,281	145,245	72,121	1,480	554	1,208	69,882
2010		465,685	5,164	318,562	52,637	68,606	12,287	102,417	1,170	70,232	11,213	141,959	70,005	1,428	551	1,190	68,785
2011		455,829	5,152	311,996	52,219	67,470	11,923	99,383	1,141	68,746	11,114	138,681	67,990	1,381	542	1,179	67,589
2012		447,277	5,150	305,975	51,516	66,294	11,679	96,120	1,114	68,299	10,953	136,152	66,470	1,333	537	1,153	66,659
2013		436,918	5,160	299,142	51,245	65,330	11,502	91,255	1,101	67,916	10,793	132,616	64,593	1,293	538	1,151	65,041
2014		428,541	5,154	293,544	50,888	64,206	11,296	87,831	1,060	67,665	10,598	129,843	63,222	1,245	529	1,142	63,705
2015		422,029	5,106	289,034	50,553	63,093	11,021	85,499	1,019	67,498	10,351	127,889	62,269	1,209	518	1,127	62,766
2016		416,234	5,088	284,849	50,201	62,120	10,802	83,341	1,002	67,170	10,213	126,297	61,401	1,178	510	1,111	62,097
2017		410,651	5,096	280,863	50,023	61,124	10,586	81,417	986	66,733	9,994	124,692	60,585	1,138	499	1,098	61,372

- (Notes)
- 1 Prepared based on the Survey on Regulation Work of Hazardous Materials.
  - 2 1959 is as of September 30.
  - 3 With regard to the numbers in 2011 and 2012, because of the influence of the Great East Japan Earthquake, the numbers for the Fire Defense Headquarters of Rikuzentakata City of Iwate Prefecture and the Fire Defense Headquarters of the Inter-municipal Association of the Futaba Region in Fukushima Prefecture were calculated based on the numbers at the time of last fiscal year's survey (as of March 31, 2010).



## Attachment 2-1-2 Trends in the number of firefighting agencies and volunteer firefighter

(As of April 1 of each year)

Year	Category	Fire defense headquarters				Volunteer fire corps				
		Fire defense headquarters	Unions among these	Fire departments	Branch offices	Firefighters	Volunteer fire corps	Divisions	Standing volunteer fire corps	Volunteer firefighters
1956		383	6	465	713	31,864	5,332	-	101	1,830,222
1957		406	6	488	735	32,745	4,484	-	107	1,737,319
1958		429	6	507	778	33,729	4,304	-	104	1,677,555
1959		438	6	533	831	35,168	4,153	-	93	1,633,792
1960		445	3	562	833	36,627	4,016	-	102	1,591,053
1961		461	3	578	889	38,489	3,957	35,463	96	1,542,406
1962		484	3	597	919	40,948	3,909	35,377	100	1,488,495
1963		511	3	617	961	43,169	3,852	34,323	116	1,445,508
1964		544	4	641	996	45,357	3,835	33,825	117	1,413,285
1965		620	4	735	1,024	48,075	3,826	31,653	123	1,330,995
1966		640	4	755	1,072	50,806	3,818	30,940	125	1,301,702
1967		671	5	817	1,110	53,957	3,764	29,926	107	1,283,003
1968		700	9	851	1,155	56,681	3,748	29,451	94	1,258,277
1969		734	26	892	1,242	60,486	3,743	28,998	89	1,234,696
1970		756	58	937	1,308	64,230	3,699	28,482	71	1,210,839
1971		782	129	986	1,470	70,077	3,682	27,732	61	1,189,675
1972		805	221	1,094	1,769	79,092	3,659	27,638	23	1,166,625
1973		829	304	1,155	2,120	88,754	3,696	27,392	25	1,148,567
1974		848	359	1,230	2,407	98,329	3,682	27,081	22	1,131,723
1975		859	378	1,258	2,590	105,005	3,668	26,805	22	1,118,036
1976		869	387	1,286	2,665	107,632	3,673	26,650	22	1,105,299
1977		878	398	1,321	2,742	110,618	3,669	26,463	17	1,094,367
1978		887	408	1,336	2,771	114,249	3,669	26,324	18	1,087,269
1979		895	419	1,366	2,840	117,657	3,666	26,281	12	1,078,536
1980		906	427	1,425	2,883	120,460	3,641	26,084	11	1,069,140
1981		914	435	1,462	2,930	123,204	3,645	25,995	11	1,063,761
1982		923	441	1,470	3,001	125,335	3,656	26,115	9	1,057,404
1983		927	445	1,476	3,063	126,959	3,653	26,002	8	1,050,271
1984		932	451	1,483	3,111	128,087	3,658	25,858	8	1,042,463
1985		933	454	1,496	3,132	128,914	3,641	25,798	7	1,033,376
1986		933	454	1,501	3,151	129,610	3,650	25,701	7	1,026,224
1987		931	455	1,514	3,152	130,463	3,648	25,667	7	1,017,807
1988		930	456	1,526	3,170	131,407	3,649	25,606	6	1,008,998
1989		931	458	1,535	3,160	132,437	3,649	25,620	6	1,002,371
1990		933	464	1,554	3,166	133,610	3,654	25,639	6	996,743
1991		935	468	1,589	3,175	135,157	3,648	25,559	2	991,566
1992		935	467	1,602	3,181	137,388	3,642	25,574	1	986,996
1993		932	466	1,618	3,200	141,403	3,642	25,575	1	983,014
1994		931	465	1,615	3,207	144,885	3,641	25,561	1	979,737
1995		931	467	1,631	3,207	147,016	3,637	25,506	-	975,512
1996		925	470	1,636	3,219	148,989	3,636	25,480	-	972,078
1997		923	471	1,654	3,224	150,626	3,641	25,455	-	968,081
1998		920	473	1,662	3,232	151,703	3,643	25,393	-	962,625
1999		911	473	1,670	3,239	152,464	3,641	25,351	-	957,047
2000		907	472	1,682	3,230	153,439	3,639	25,322	-	951,069
2001		904	475	1,687	3,225	153,952	3,636	25,268	-	944,134
2002		900	475	1,690	3,226	154,487	3,627	25,238	-	937,169
2003		894	472	1,696	3,207	155,016	3,598	25,064	-	928,432
2004		886	459	1,699	3,207	155,524	3,524	24,852	-	919,105
2005		848	385	1,704	3,225	156,082	2,963	24,384	-	908,043
2006		811	329	1,706	3,221	156,758	2,584	23,946	-	900,007
2007		807	320	1,705	3,230	157,396	2,474	23,605	-	892,893
2008		807	316	1,706	3,218	157,860	2,380	23,180	-	888,900
2009		803	312	1,710	3,197	158,327	2,336	22,997	-	885,394
2010		802	305	1,716	3,180	158,809	2,275	22,926	-	883,698
2011		798	303	1,711	3,186	159,354	2,263	22,839	-	879,978
2012		791	305	1,706	3,184	159,730	2,234	22,753	-	874,193
2013		770	304	1,700	3,162	160,392	2,224	22,578	-	868,872
2014		752	296	1,703	3,153	161,244	2,221	22,560	-	864,347
2015		750	295	1,709	3,145	162,124	2,208	22,549	-	859,995
2016		733	291	1,714	3,130	163,043	2,211	22,484	-	856,278
2017		732	290	1,718	3,111	163,814	2,209	22,458	-	850,331

(Notes) Prepared based on the Survey of the Current Status of Fire Prevention and Earthquake Countermeasures and the Report on Personnel Changes concerning Fire Defense Headquarters and Volunteer Fire Corps.