東京の消防100年

東京の消防
百年記念

昭和五十五年

TOKYO FIRE DEPARTMENT

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TOKYO, 100 JAPAN

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January 20, 1982

Mr. Ralph Feldman
Fire Marshal
New York Fire Department
110 Church Street, New York
N.Y. 10007

Dear Mr. Feldman:

Thank for sending us your filled-in questionnaire, the Annual Report, your publications and Fire Department paraphernalia.

These information are a valuable addition to our library.

Since our personnel do not wear a patch, I am sending you by separate mail a medal made in commemoration of the 100th year of the fire service in Tokyo.

If we can be of any service to you please feel free to write to us.

Sincerely yours,

H. Ohno

Haruo Ohno
Chief, Liaison Branch

We appreciate your lecture course and slide presentation on cause and origin of fire, building construction, history of New York City buildings, and New York City economics.

TOKYO FIRE SERVICE

In Tokyo, the low fire rate is a testament to a well-trained fire department and its citizens. ■ **DENISE LAITINEN**

THE TOKYO FIRE DEPARTMENT (TFD) has come a long way from the Edo period (1603 to 1867), when fires were put out by demolishing the burning building. Back then, the samurai acted as firefighters, and their wives wore red coats to stand out in the crowd and help evacuate people. Today, the fire department is the largest in the world, with 17,993 employees and a budget of US$2 billion (244 billion yen for fiscal year 2001.) Some 1,839 pieces of apparatus, including 20 firefighting motorcycles, are housed in 80 fire stations throughout Tokyo, which is composed of 23 wards, called "ku," 24 surrounding cities, 3 towns, and a village.

For a city of 12 million residents, or 10 percent of the entire Japanese population, Tokyo has a remarkably low fire rate. There are roughly 19 fires of various types and origin every day, or approximately 6,933 a year. In 2001, 4,044 of these were structure fires.

Although buildings in Tokyo are typically five to seven stories high, there is tremendous interest in building Tokyo up instead of out. As a result, the city has become a hodgepodge of soaring skyscrapers, high-rises, and one- and two-story dwellings. And with land at a premium, it's increasingly common for high-rises to be multi-use buildings.

In the Shinjuku section of Tokyo, for instance, the lower floors of a 45-story high-rise contain restaurants, while several upper floors contain offices. On the 19th floor is a hotel lobby.

Among the companies investing millions in new multi-use buildings is Misawa Homes, which is spending $1.5 billion to develop twin 60-story towers containing offices and condominiums. Minori Mori, the biggest landlord in Tokyo with 88 buildings, plans to complete 17 new office buildings in central Tokyo in the next three years. The largest of the Mori Building Company projects is Roppongi Hills, a $2.1 billion office, cultural, and residential complex. Mori and other developers are betting that childless couples, the largest growing segment of Japan's population, will prefer to live in multi-use high-rises close to work and attractions than in the suburbs.

Keeping buildings safe

One of the major codes that govern buildings in Tokyo is the *Building Safety Law*, managed by the Land, Infrastructure and Transport Ministry and enforced in Tokyo by the Tokyo Metropolitan Government. The other is the *Fire Service Law*, which has applied nationwide since 1948.

According to the *Fire Service Law*, a high-rise is a building 101 feet (31 meters) high—the length to which a typical fire department ladder extends—or higher. A building 101 feet (31 meters) tall is about 11 stories, and the *Fire Service Law* stipulates that buildings 11 stories or higher must be sprinklered. Office buildings, factories, apartment houses, schools, and warehouses 11 stories or less need not be sprinklered. However, fire prevention ordinances in Tokyo require sprinklers in buildings not governed by the *Fire Service Law*, including those with

Tokyo is a hodgepodge of skyscrapers, high-rises, and one- and two-story dwellings.

TOKYO FIRE SERVICE

Personnel: 17,993

Budget: US$2 billion

Number of apparatus: 1,839

Includes:
20 motorcycles
6 helicopters
9 fireboats

Number of stations: 80

Number of ambulance runs in 2000: 575,690

Number of structure fires in 2000: 3,986

In 2000, the largest source of major fires were:
Arson, 38.3 percent

"Other," 31.5 percent

Smoking, 16.7 percent

Gas ranges and others, 9 percent

Playing with matches, 3 percent

Bonfires, 1.5 percent

TFD personnel assist employees during a fire drill (left) and at a building inspection.

basements, windowless floors, and others.

Buildings 11 stories or higher must have emergency public address systems and emergency power outlets for firefighter operations. Automatic detection systems are required for high-rises above 11 stories, as well as lower, smaller buildings.

Multi-use buildings in Tokyo use three types of automatic detection systems: heat detectors, smoke detectors, and flame detectors, which sound alarms to alert occupants and send a signal to a safety center control room in the building.

Workplace managers are required to form private fire brigades depending on the square footage and occupancy capacity. Movie theaters, for example, including those in high-rise shopping centers, must have fire brigades if they're 107,642 square feet (10,000 square meters) or larger, or if they can hold 2,000 or more people. Multi-use buildings that cover 1,858 square feet (20,000 square meters) or more must also have a private fire brigade, the size of which is determined by the building's size. Japanese building codes are strict when it comes to protecting multi-use structures from fire, since they house different types of occupancies and a large number of unspecified people.

VISIT THE TOKYO FIRE DEPARTMENT'S WEB SITE AT WWW.TFD.METRO.TOKYO.JP/ENG/INDEX.HTML.

DENISE LAITINEN
is managing editor of *NFPA Journal*.

According to the *Fire Service Law* and the *Building Standard Law*, the authority to approve or disapprove construction in Tokyo lies with the city building supervisor or designated inspection specialist who must get consent from the Tokyo Fire Chief or one of the local station chiefs before he or she gives the owner(s) permission to build. Houses, built in unzoned areas, such as the suburbs, are exempt from this rule.

Even flame-retardant products inside multi-use buildings are regulated. According to *Fire Service Law* Article 8-3, high-rises, including the offices and residential units within them, and buildings used by a large number of unspecified people are required to have flame retardant items, such as curtains and carpets above the level set by the Cabinet Order. Officially approved "flame retardant materials" are marked by a white label with red "flame retardant" letters.

On the other hand, upholstered furniture, bedding, and so forth isn't regulated by law, but is given approval by the Japan Fire Retardant Association, a private body. Items approved by the Japan Fire Retardant Association are designated as "flame retardant products." For example, officials encourage the use of such designated products for car covers, because arsonists often set fire to car covers in Japan.

Safety-conscious citizens

The Tokyo Metropolitan Government requires every workplace to have a disaster preparedness plan that includes safety drills, and building fire protection managers, who are often the building's owner, are trained in fire safety and disaster preparedness. Of the 780,000 workplaces in Tokyo, 330,000 must submit preparedness plans to the authorities. Though the others needn't submit their plans, they must be prepared, as fire department personnel visit workplaces regularly to make sure plans are in place and are being practiced. Safety drills are held every year, although the frequency differs according to the type of occupancy.

Public education and these repeated safety drills are key elements in maintaining Japan's low fire rate. The TFD relies heavily on educating its residents in fire safety and on changing behavioral patterns. This pertains not only to fire safety, but to disaster preparedness, as well. In fact, says Tokyo Fire Chief Tetsuya Sugimura, the department's "first priority is on earthquake preparedness, residential fire safety, and emergency medical services."

Fifty-two fire stations in the city have a seismic meter, and every year on September 1, Japanese fire, police, civil defense departments, municipal governments, and residents participate in a national, large-scale safety drill focusing on earthquake preparedness, as well as weapons of mass destruction. This is hardly surprising when you consider that Japan experiences a large-scale earthquake about once a decade and has withstood seven quakes that measured more than 7.0 on the Richter scale since 1945. One of these was the Great Hanshin Awaji earthquake of 1995, which killed 6,000 residents of Kobe. A similar-sized earthquake is feared to strike Tokyo in the future.

After the Great Hanshin Awaji earthquake, TFD officials reviewed and strengthened all its disaster measures. Their goal is to prepare the city for disasters by encouraging officials to redevelop urban areas, particularly those in which wooden houses proliferate; secure open spaces; widen roads; and support the construction of fire-resistive buildings. Large water cisterns have also been strategically placed in important areas, such as refuge areas, to aid fire crews.

Preventing the fires that often erupt after an earthquake is one of TFD's most important disaster preparedness policies. Fire

Volunteers participate in a drill.

department personnel work with representatives of facilities using hazardous materials: chemical, electrical, and gas facilities; high-rises; underground garages; and tunnels to improve safety and eliminate fire dangers. TFD staff also inspect such facilities regularly and teach company employees how to put out fires and otherwise prepare for disasters.

In April 2001, the Tokyo Metropolitan Government's Earthquake Countermeasures Ordinance was enacted, encouraging office workers, building owners, and neighbors to rely on themselves in the initial aftermath of a disaster, cooperating with and helping each other. There are 24,434 trained volunteer fire corps members in Tokyo, who play an important role as leaders in the community.

Like fire officials elsewhere in Japan, TFD officials believe strongly that those at the scene of disaster can help contain a fire shortly after it ignites, preventing a small fire from becoming larger, and that they can help those in need of care. To this end, everyone applying for a driver's license in Japan must show proof that they've passed a CPR class, and fire department personnel work with fire corps volunteers and with every family in every neighborhood and every company in Tokyo to teach them how to extinguish a fire in the early stages.

Tokyo fire officials also train about two million people a year at three Life Safety Centers around the city run by the Tokyo Fire Department. The Honjo Life Safety Center, one of the three centers, cost 2.8 billion yen to build and is a virtual wonderland of hands-on fire and life safety training, open to the public free of charge.

Visitors to the Life Safety Centers get experience putting out a kitchen fire in the firefighting training section, finding an exit while crawling through a smoke-filled hallway in the smoke maze section, taking appropriate action during an earthquake in the earthquake simulation section, and performing CPR in the first-aid training section. Daily training is provided to anyone interested, including schoolchildren.

All this is part of the TFD's seven-pronged Earthquake Countermeasure Promotion Plan, which also stresses the management of information to save lives and the deployment of specially skilled rescue crews. Technological innovations, such as pop-out electric outlets, have also been introduced to help reduce the threat of electrical fires after earthquakes, and a long-distance water supply system has been implemented to help control fire spread.

The future

As the global source of cutting-edge electronic equipment, it may seem surprising that the Japanese rely more on people than technology when it comes to fire safety, but training remains key to the Tokyo Fire Department.

"We continue to enhance volunteer fire corps capabilities, improve our citizens' ability to respond to disasters, and promote fire prevention," says Chief Sugimura.

Every year, the Tokyo Fire Department receives a million emergency calls, and fire service personnel perform about 570,000 ambulance runs, 60 percent of which are minor injuries. And department officials expect this number to climb dramatically in the next 5 to 10 years. The better prepared people are to prevent fires and to respond effectively to disasters on their own, officials feel, the more effective fire crews will be when deployed to an incident.

FIREFIGHTING

ROBOTS

While search and rescue robotics are new technology in the United States, they've been used in Japan since 1971, when the Tokyo Fire Department first developed a remote-control monitor nozzle vehicle. The department has been using robotics in search and rescue operations, haz-mat responses, and incidents of weapons of mass destruction for more than a decade.

Six types of robots are used in fires and disasters, depending on the circumstances. The unmanned monitor nozzle vehicle, which looks like a mini-tank with a long metal arm attached to the front, was created in response to the Katsushima warehouse fire in 1964. Designed to respond to disasters, the robot is equipped with an obstacle remover than can move haz-mat drums, fallen debris, and other heavy objects. It also has four cameras and two nozzles that can discharge 1,320 gallons (5,000 liters) of water per minute and 792 gallons (3,000 liters) of foam per minute.

At the other end of the robotic spectrum is the remote-control firefighting vehicle, or Jet Fighter (pictured). Only inches tall, the

Jet Fighter is used at tunnel and underground shopping mall fires. Propelled by high-pressure water discharge and a motor, it can enter small spaces firefighters can't reach and douse them with water.

A reconnaissance robot, called Fire Search, is an initial deployment device used to survey a fire or disaster scene and measure gas density. Able to ascend stairs, it has an eye-level camera to relay images in heavy smoke conditions and movable arms that can open doors and valves.

The submersible robot Water Search, which was used in underwater rescue operations during an earthquake off Okushiri Island, looks like the motorized scooters used by scuba divers. Equipped with a television camera, it can dive to a depth of 361 feet (110 meters) and has extendable arms that can pick up a person or an object.

PHOTOGRAPHS: TOKYO FIRE DEPARTMENT