

Fire-Fighting and Disaster Prevention in Edo

By Yamamoto Sumiyoshi



Photo: National Diet Library

Upon the instruction of the shogunate in 1718, the townsfolk of Edo organized 64 units of fire brigades. The number of firefighters went up to as many as 11,429 persons in total by 1738. In contrast, it was not until 1865 in Britain that the authorities provided for a proper firefighting force

homes. In a typical example, a warrior wrote from the battlefield to his wife back home. "Here's a quick letter: be vigilant about fires."

Under the Tokugawa shogunate, Japan enjoyed 270 years of peace, but danger remained in the guise of huge fires. In a country rich in timber, the houses were naturally made of

1. Great city of Edo

Tokyo, the capital of Japan, was known as Edo until the Meiji Restoration of 1868. The old name of the city was derived from a powerful clan of the same name, who lived there around the beginning of the 12th century.

Feudalism in Japan had come into being by the 12th century and lasted for about 800 years until the beginnings of the modern nation in 1868.

In the first half of the feudal era, the military power was centered on Kamakura (south of Tokyo) and Kyoto. But from the early 17th century, the warrior leader Tokugawa Ieyasu gained supremacy over the other regional lords and chose Edo as the seat of the military government. He received the title of shogun (generalissimo) from the Emperor, who continued to reside in Kyoto surrounded by the aristocracy. So began the Edo Bakufu or shogunate. As its headquarters, Ieyasu began the construction of Edo Castle.

In feudal times, powerful military leaders built their strongholds in the lowland plains near the mouths of large rivers. This proximity to waterways enabled them to keep their large armies well supplied. So Edo, situated on the coast of the Kanto plains (halfway along Honshu, the largest main island),

was a natural choice for Ieyasu to build his castle. The city of Edo grew around the castle, fanning out over a radius of 4 kilometers.

Under succeeding generations of the Tokugawa shogun, the running of government was centralized in Edo, a complete contrast to the disjointed rivalries of the earlier centuries of feudal history. The shogun entrusted the management of most of the country to regional lords, known as *daimyo*, of whom there were around 270. The families of the *daimyo* were made to live in Edo in large estates, virtually as hostages to guarantee the loyalty of the family head. After the great fire of 1657, the *daimyo* were encouraged to build second, third or even more mansions within Edo. They often ended up owning several large establishments in the city.

Protection of Edo Castle was entrusted to direct samurai retainers of the Tokugawa shogun. Known as *hatamoto* (literally, bannermen), they lived in mansions surrounding the castle. And so, Edo became a huge consumer city, burdened with the problems, such as fires, of any urban area. In times of conflict, samurai warriors did not give a second thought to setting fire to enemy strongholds, but they were fiercely protective about their own

wood rather than stone or clay and, consequently, prone to destruction by fire. The roofs of houses were usually thatched with straw, but in Edo the government ordered tiles to be used and even gave subsidies to ensure this was carried out.

The population of Edo grew rapidly. In the early 18th century, the shogunate began the practice of taking a census and found that there were over half a million commoners living in the city. There is no record of the numbers in samurai households, but it is estimated they, too, accounted for around half a million or more. So Edo was already a city of one million population.

A look at the ratio of occupancy to ground area reveals that the estates of the *daimyo* lords and the *hatamoto* retainers dominated for 60 percent of the land; temples and shrines, 20 percent, and the commoners, who accounted for half the total population, were crammed into just 20 percent of the land. So when fires broke out in a crowded city like this, houses lying directly in the path of the wind would be quickly swallowed up by the flames. In wintertime, the common method of heating was by charcoal braziers, and if these were knocked over and started a fire, a strong northerly wind would fan the flames at great speed to other houses.

The records show there were over 100 fires in Edo during the Tokugawa period, an average of one every three years, of which really big ones occurred once every ten years. Ninety-seven major blazes swept through the built-up areas, of which 87 occurred in January, February, March, April, May and December. We also know how the wind was blowing on those occasions: in 58 cases of winter fires, a northwesterly wind was blowing, while in 13 cases, it was a northerly wind.

2. Making Edo a disaster-proof city

Demolition was the prime method of fire fighting in the feudal days. If a fire broke out in one house, the surrounding houses were torn down quickly and the timber cleared away, leaving the fire to burn out naturally. This involved a lot of people working at top speed.

But more often than not, much of the firefighting effort was in vain because fragments of burning timber were often carried away by the wind to start a fire of an even greater dimension elsewhere. The shogunate realized it had to re-plan the city so that the danger of fire being spread by flying debris should be contained to the minimum.

The first measure was to read the likely movement of a fire and to make sure that sparks from a burning house fell to the ground rather than on another roof. So if a westerly or northwesterly wind was blowing, it meant there should be an open space on the down-side of the wind.

The obvious solution was to have wide roads. Many of them still survive to this day, including Ueno Hirokoji which was constructed to the north of Edo Castle. The ideal would have been to have wide boulevards encircle the castle, but space was limited and they had to adapt already existing roads. Consistently wide roads could not be built, so they had to make do with expanding the roads wherever they could. In the Edo period, broad, solid roads were needed to withstand the passage of heavy carts used for transporting goods, but the reason for creating the spacious boulevards was primarily fire-protection. In the course of



Photo : Fire Museum, Tokyo Fire Department

The fire brigade of the shogun's direct retainers, jobikeshi, was set up in 1650

expanding a road, there would often be houses standing in its path. Rather than simply ordering people to move out, the shogunate offered an alternate plot of land for the occupants and paid compensation. The first stage of the construction began in 1656 on the east side of the castle, near the area which is now Tokyo Station. The following year there was a big fire and the open space proved its effectiveness, prompting other areas in Edo to follow suit.

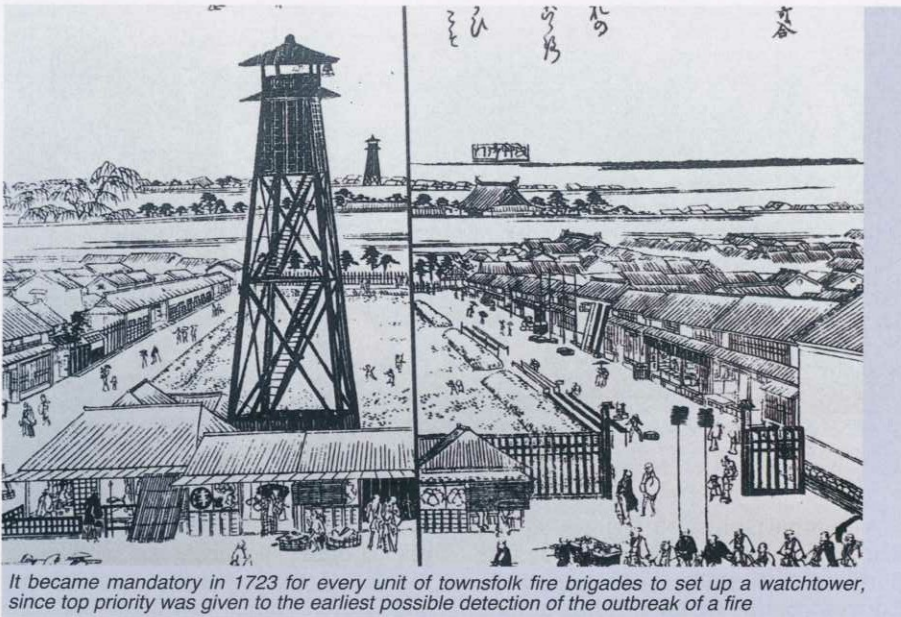
In 1658, as its next fire-protection strategy, the shogunate began the construction of high, soil embankments along the Nihombashi River. This river flowed along the north side of Edo Castle, so constructing a firewall to prevent flames from spreading was believed to be an effective plan. The same idea proved to be effective for protecting temples, which were enclosed by tall, tiled walls. These can still be seen at temples around Tokyo today. Further measures were taken involving the strategic use of roads and topographical features to protect the city from fire. Great importance was given to creating sizeable areas of empty space to act as fire breaks.

Temples themselves were a fire hazard because of their sheer size. If a big temple caught fire, burning debris could fly from its tall roof, carrying the flames to surrounding houses. So the shogunate made a point of forcing temples to move outside the immediate city. The space left empty by the departed temple would be converted

into a park, complete with a keeper, and so serve the purpose of a fire break.

On a more practical scale, the shogunate ordered the townsfolk to keep wooden pails filled with water outside their shops and homes. In an ordinance of 1661, huge pails filled with water had to be placed beside the large wooden gates that marked the entrance to each city block. As for the shops, if they faced the road and were less than 8 meters wide, they had to have 3 water pails outside the premises. If a shop was more than 8 meters, then the number of pails jumped to 10 or more. Besides these, each block had to have 60 pails filled with water at all times. By 1792, the city consisted of 1,668 blocks (setting aside the residential areas for the daimyo lords), each about 60 meters long, so it must have meant an astronomical number of water pails! Today, we can see remnants of this custom at temples in Tokyo, which have cast-iron decorations depicting these stacks of water pails.

Fire engines did not exist in the Edo period, so wooden pails were vital for putting out fires in the early stages. They did have hand-worked contraptions known as "dragon pumps," so named because they looked as though a dragon were spitting out water, but the mechanism did not include a hose. This meant that the people had to stand in a long line and relay buckets of water to the pump. But the pump was not very powerful, only sufficient to shoot water up as high as the second



It became mandatory in 1723 for every unit of townsfolk fire brigades to set up a watchtower, since top priority was given to the earliest possible detection of the outbreak of a fire

floor, just far enough to wet the back of the firefighter on the roof, who would be holding his banner to indicate the position of a fire. In 1764, the shogunate distributed 55 “dragon” pumps to townsfolk fire brigades around Edo. The water canon was another effective weapon. In 1830, the shogunate ordered every block to be equipped with such canons.

After fires had subsided, what often escaped destruction were the sturdy storehouses owned by rich merchants. These had thick clay walls and sturdy, tiled roofs. What’s more, the merchants were prepared for the likelihood of their shops being completely destroyed in a fire. They would store enough timber to rebuild their establishment, in a safe place on the other side of the Sumida River, which cut through Edo on the east side. The timber would be roped together like a raft and taken down the river to reservoirs where it would be sunk below the surface, held down by heavy stones, so that another load or two could be stacked on top. In this way, Edo was always ready with building materials, which could be transported swiftly along the many waterways to wherever they were needed after a fire.

3. Sounding the alarm

In Edo, the authorities and townspeople alike were conscious of the need to

raise the alarm quickly whenever a fire broke out.

Numerous watchtowers were set up around the city to keep a lookout for fires. *Ukiyoe* prints depicting city life in Edo would invariably have a watchtower somewhere in the picture – they were that common. These towers also indicated the social ranking of whoever erected them.

The homes of firefighters attached to shogunate samurai had watchtowers from quite early on. Daimyo lords also had towers on their estates. As for the common townsfolk, the shogunate ordered the establishment of fire brigades in each district, and five years later, in 1723, the construction of watchtowers became mandatory too. There were strict rules, however, about the way an alarm was to be sounded and in what order. The first alarm had to be sounded by a watchman from a shogunate tower. This was deemed necessary to maintain the government’s authority. By no means was the first alarm to come from a daimyo watchtower or a humble town watchtower. The alarm from the shogunate watchtower was sounded by a drum or, in some cases, by striking a large plank since the drum beat was often swallowed up by other sounds of the city. The way the alarm was sounded also notified people of the direction of the fire: two short beats repeated three times indicated that a fire had broken

out in the east of the city. Three short beats meant “west,” while four was “south” and five, “north.” Fires in close proximity were indicated by a combination of five and seven short beats, repeated three times.

Daimyo watchtowers also used drums and planks to sound the alarm. For example, the watchtower of the Mito Tokugawa family (closely related to the shogun) was situated to the northeast of the castle in an area known as Koishikawa Tomisaka. Here, if a fire was discovered within 800 meters, the alarm was sounded by three short beats on the drum, repeated three times. If the fire was even nearer, within 300 meters, then it was five short beats, repeated over and over.

The alarm from the townsfolk watchtowers was sounded by banging on a small iron bell.

4. Fire brigades in Edo

Edo had a firefighting policy in place from early on. But the biggest obstacle to a really effective system was the existence of class barriers, which prevented brigades of the different classes cooperating with each other.

In 1634, the Edo shogunate instigated a rotation for its daimyo fire brigade, to protect Edo Castle. They moved in response to the shogun’s firefighting order every time a fire broke out. But this was a time-consuming process: when the shogunate decided that the castle was in danger of being set alight by fiery debris from nearby fires, it would send a messenger on horseback to the duty-daimyo with orders to set the fire-fighting in motion. But often the fire would have spread out of control by this time.

In 1648, the shogunate ordered the townsfolk to organize nighttime fire patrols. This was because many fires were known to be started deliberately. Each block was made safe with a wooden gate at the entrance and a gatekeeper, employed at the expense of the block, who would be responsible for opening the gate in the morning and closing it again at night. This unique practice of dividing the city up into enclosed blocks was noted by a for-

eigner as early as 1609. A Spanish official, Viveroy Velasco Rodorigode, who had drifted to the coast of Japan on his way back from the Philippines to the Spanish colony of Mexico, reported that each block was secured with a wooden gate. This feature was also adopted in Kyoto and Sakai, in the Kansai region.

Then in 1650, the shogunate set up a fire brigade among the shogun's direct retainers, the hatamoto. Known as *jobikeshi*, they were entrusted with the protection of Edo castle. At their peak, there were as many as 15 units, who were housed in huge estates around Edo Castle. Each unit consisted of 6 senior samurai, 30 other samurai and 200 firefighters (who were not samurai). But these units became a big financial burden and the shogunate began to cut down their numbers. By the time the shogunate ended in 1868, the *jobikeshi* units had dwindled to just two, and the onus of fire fighting at the castle was passed on to the townspeople fire brigades.

The mainstay of the fire-fighting in Edo came to rest with the townspeople.

5. Townsfolk fire brigades

The constant danger of fire in Edo prompted the shogunate to have the townsfolk organize fire brigades in 1718. At this time, the Edo shogunate was suffering great financial straits and looking for ways to ease the burden. One solution was to get the townsfolk to shoulder some of the cost of fire-fighting.

With nearly 1,700 residential blocks in the city, each fire brigade was set up with 20-30 residential blocks as its own unit and was identified by a letter of the Japanese alphabet, *iroha*. There were 48 units in all, divided up into 8 brigades. There were a further 16 units on the eastern side of the Sumida River. By 1738, there were a total of 11,429 firefighters in Edo.

The largest unit, "Yo", was manned by 720 firefighters, and had responsibility for the Kanda area, at the northern side of the castle. The smallest unit, "Hon," was south of the castle and had a mere 25 members.

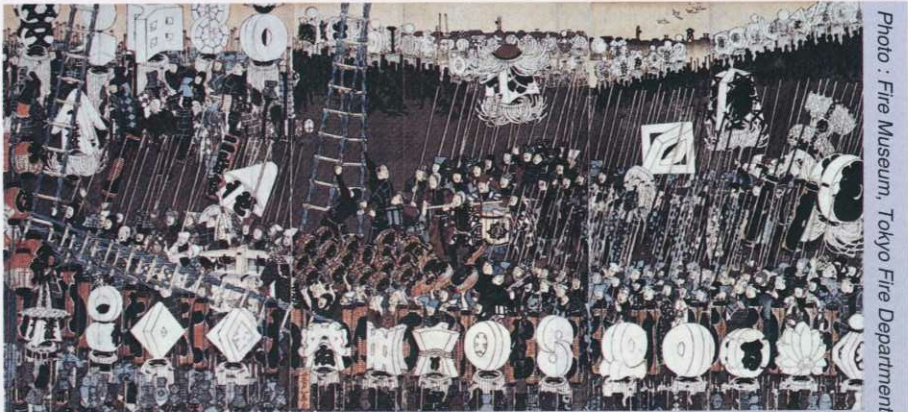


Photo : Fire Museum, Tokyo Fire Department

A leaflet of a townsfolk fire brigade's New Year parade - this kind of leaflet was very popular among children because of the high prestige of these fire brigades

A comparison with Britain shows that the fire fighting system in Edo was fairly sophisticated. According to the Encyclopaedia Britannica, insurance companies established fire brigades of their own (the first appeared around 1722) but their services were only available to buildings covered by fire insurance! The Houses of Parliament went up in flames in 1834, and there was a devastating fire in 1861 in London, but it was not until 1865 that the authorities provided for a proper fire fighting force.

When a fire broke out in Edo, the area was sealed off and only firefighters allowed near the scene. This was to prevent burglaries. Townspeople, especially shopkeepers and their assistants, were identified by their shop name stamped onto their uniforms, but anyone else acting suspiciously could expect to be cut down by a sword-wielding samurai.

Most town firefighters were building workers by trade, accustomed to climbing heights. But to make sure they were always available for fire duty, they were forbidden to accept work in far-off places. And when there was no work to be had nearby, the officials would find jobs for the firefighters, like cleaning drains, or even pay a stipend to make sure they stayed in town. In the event of a fire, the unit members would gather at the block office, change into their firefighting gear, pick up their equipment and rush to the designated meeting point. The orders were given by the head of the block, with a shogunate samurai taking the ultimate responsibility for the operation. The

block office was, in effect, the local branch of the shogunate and was where the people came with their grievances, and where criminal investigations were initiated. The office employed a secretary whose salary was paid out of the block's revenue from rents. We can still see remnants of this practice in some old parts of Tokyo, where you will find a police box, next to which would be a tiny park and public conveniences. These are not usually found in other cities.

A strict line of command existed in the townspeople fire unit. The leader was known as *todori* and his role carried great prestige. The second-in-command was known as the *kashira*. Then came the highly esteemed emblem bearer: his job entailed taking huge risks so he earned a bigger salary than the other firefighters. Next came the ladder carriers, followed by the *tobi*, the rank-and-file firefighters. At the New Year, it was customary for the fire unit to parade in all their glory through the district. Each unit was accompanied by the block head, who was half government official, half common citizen.

The duties of the firefighters involved great danger, but they were a closely knit group, fiercely loyal to their fellow members, more so than to their own families. They prided themselves on their role and were willing to put their lives on the line for their fellow members.

The townspeople put their faith in the firefighters and gave them their full backing. The cheerful, happy-go-lucky nature of the people of Edo (and now



Photo: Fire Museum, Tokyo Fire Department

Each of the 64 fire brigades of the townsfolk was run considerably in an autonomous manner with the funds solicited from among the commoners

Tokyo) was in many ways created by this environment, where it was considered useless to hoard savings because there were so many fires.

As a special force, the bridge firefighters were set up in 1721. The shogunate had built bridges over the Sumida River to make sure the people in the central part of the city could flee to safety in the event of a fire. Ryogoku Bridge was one such bridge, built after the great fire of 1657, which claimed many lives when people had nowhere to flee and were trapped by the flames at the river bank. There were now open spaces on both sides of each bridge for people to take refuge and to facilitate construction of a new bridge, should the old one be destroyed. The protection of bridges was entrusted to the guild of hairdressers, who got permission to set up shop at the foot of the bridge. And later, these people were also in charge of evacuating important government documents.

A look at the size of the Edo town firefighting brigades shows us that for a population of 500,000, there were 11,000 firefighters; that's one fireman for 50 citizens. Since demolition was the prime method of fire-fighting, the larger the force, the better, but in wintertime, with extra men needed on the watchtower and for doing the rounds, the expenses multiplied. Besides the salaries, there was the cost of uniforms, fire hooks, and watchtower construction. All these costs were shouldered by the townspeople. A contribution was deducted from household rents for

fire-fighting, keeping the block register up-to-date and for festivals. Blocks were also ordered to pay the salaries of the watchmen on the towers and those who did the rounds of the block at night, clapping loudly on wooden blocks to warn people to mind their fires. These regular rounds also had the effect of discouraging arson and getting people to take more care.

6. Firefighting spirit

There's an old Japanese saying: "*sonae areba, ureinashi*," meaning "providing is preventing." In times of disaster such as earthquakes or big fires, the shogunate would put up temporary shacks along the wide boulevards and provide free meals of cooked rice for those made homeless – the Japanese version of a soup kitchen. Doctors also gave their services free at these shelters.

In 1791, the shogunate gave orders for the townspeople to cut down on their spending for meetings and festivals. This came after a thorough investigation of expenditures at the residential block level. Spending on such items were financed from rents and the shogunate feared that rents would be raised to accommodate the extravagant spending, and thereby cause inflation. The following year, the shogunate went further and ordered the savings thus accrued to be centralized into the Emergency Fund which was newly set up with the additional injection of financial resources from the shogunate. The management of the Fund was

entrusted to the representatives of both the townsfolk and the shogunate in their mutual collaboration. The fund successfully augmented its financial availability to such a great extent as to set up warehouses and to build up therein the stock of rice for emergency in large quantity. A maximum use was actually made of the stock of rice thus built up in 1806 and 1834, among others, when big fires attacked the city. The Fund also provided allowances of money and rice to the needy, and to pay out sickness compensation for workers who were injured or became ill (they were required to have their need certified by the head of the block). Even after the end of the shogunate in 1868, the townspeople's savings accumulated in the Fund became useful sources for funding the construction of bridges and schools, and for putting up government offices. The Meiji Restoration signaled the end of 800 years of feudal rule. And Edo, after more than two and a half centuries as the seat of the Tokugawa shogunate, was re-named Tokyo, the eastern capital, and became the centre of modern Japan. This earth-shaking change of government and social upheaval was not, however, accompanied by food riots in the capital. The wisdom of 265 years meant that the people of Edo-Tokyo were well-provided for and could take pride in their city's history. **UJI**

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