Results of the Review Meeting on the Future Approach to Firefighting after Lessons Learned from the Large-scale Fire in Itoigawa City

Shinpei Taniguchi, Firefighting & Ambulance Division, FDMA

1. Basic approach after the lessons of the large-scale fire in Itoigawa City

The large-scale fire which broke out in Itoigawa City, Niigata Prefecture at about 10:20 on December 22 (Thu.), 2016 was the first large-scale fire in an urban area after the large fire in Sakata City in 1976, meaning the largest one in the past 40 years (excluding the ones caused by earthquake), with the fire causing 17 injuries and damaging 147 buildings. This paper described the basic approach after the “Review Meeting on the Future Approach to Firefighting after Lessons Learned from the Large-scale Fire in Itoigawa City” held by the FDMA.

A pillar of fire much higher than a 3 story building (photo provided by the Fire Department of Itoigawa City)

(1) The possibility of large-scale fires like this occurring

The district where the origin of the fire is situated is a dense zone of wooden buildings built in the early part of the Showa period (around 1930–1940) with structures which do not meet fire-proof standards (so-called bare-wooden structures), and is a district with comparatively poor performance for fires. On the other hand, when viewing the entire burnt area, although about 90% of the buildings were wooden buildings, roads allowing the entry of fire trucks were put in place with comparatively new buildings also having been built recently, and you could say that such districts are rather common, not just limited to Itoigawa City.

Moreover, on the day of the fire, strong winds continued from the morning (the maximum wind speed announced by the Japan Meteorological Agency was 13.9 m/s from the south (at 10:20) and the maximum instantaneous wind speed measured by the Fire Department of Itoigawa City was 27.2 m/s from the south-southeast (at 11:40)). This, together with the fact that the local meteorological observatory of Niigata Prefecture had issued a strong wind warning at 05:10 on the day of the fire (cancelled at 16:31 the next day) and also a fire weather report to Niigata Prefecture at 09:35, means that the weather conditions on the day required more attention than usual regarding fire. However, according to the AMEDAS observatory data, the number of days with a maximum wind speed of more than 10 m/s in a year at the observation point in Itoigawa City is 22.4 days/year, which ranks 221st of 871 observation points all over Japan (meaning about a quarter down from the top). This means that Itoigawa City is not a district with particularly strong winds.

Therefore, it is necessary to examine the necessary measures on the premise that this kind of large-scale fire can occur in any part of the country which has many wooden buildings, in strong winds once a fire breaks out.

(2) Future approach to firefighting

Considering the future of firefighting, it is first necessary to analyze the urban structure of one's own jurisdictional district and identify or specify those areas at high risk of a large-scale fire such as those areas with many wooden buildings. Based on such an understanding, it is further necessary to create a standard or other document beforehand which includes such information such as the number of fire trucks to be mobilized and the deployment of staff to watch for leaping flames, in order to enable quick and appropriate firefighting in the event of a fire. According to a questionnaire conducted in January 2017 with all fire departments in Japan, about 60% of the fire departments have not done such preparations.

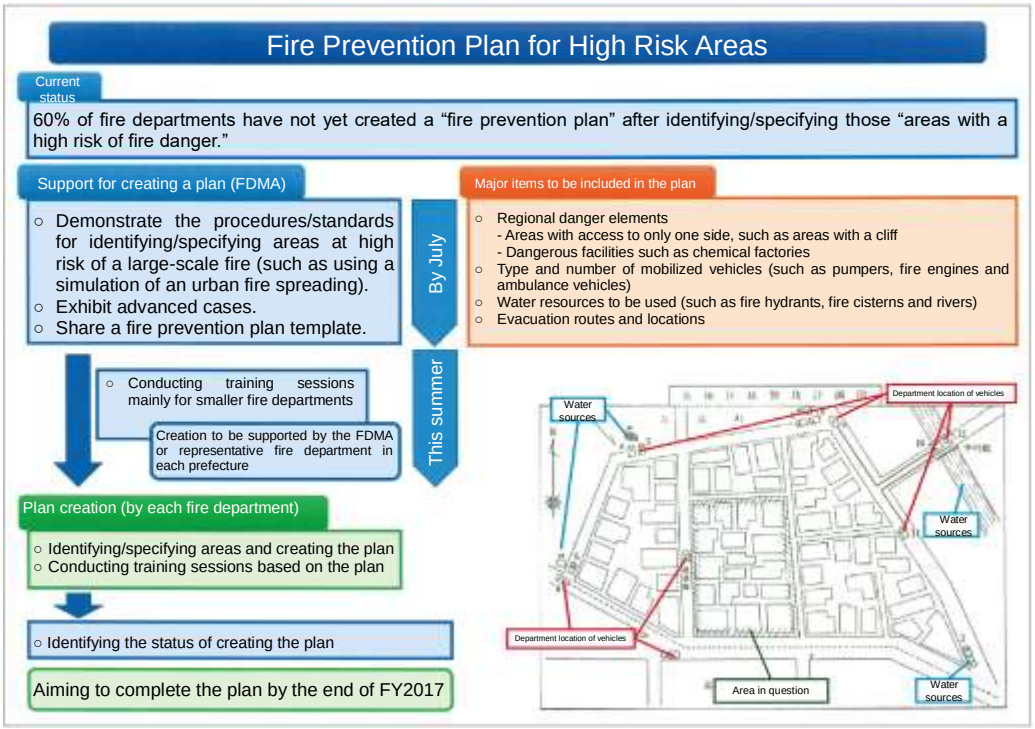
2. Items each fire department should be engaged with

This section describes the main items that the FDMA and each fire department should be engaged with, based on the basic approach stated in 1 above.

(1) Identifying and specifying those areas at high risk and creating fire prevention plans

Each fire department needs to analyze the urban structure of its own jurisdiction and identify/specify beforehand those areas with a high risk of large-scale fires such as those areas with dense concentrations of wooden buildings (hereinafter "large-scale fire danger areas"). Also, in order to cope with a large-scale fire actually occurring in the large-scale fire danger areas, it is necessary to create beforehand a fire prevention plan defining such items as the necessary number of pumpers, fire water sources to be used and the locations/departments of vehicles which meet the width of the roads and the status of the buildings.

To this end, the FDMA is planning to demonstrate the procedures and standards for identifying and specifying such areas by the middle of July, and we also plan to share a fire prevention plan template. We are further planning to exhibit advanced cases where such identification and specification have been conducted. We also plan to hold training sessions for each block for smaller fire departments in August. Each fire department is requested to start their necessary studies quickly and identify/specify the large-scale fire danger areas by using these FDMA engagements and then create their fire prevention plan by the end of FY2017.



(2) Reviewing the support organization

It is necessary for each fire department to not only deploy their maximum firefighting power including the volunteer fire corps by considering, based on mobilization standards, the number of firefighters which can be mobilized, the status of vehicles and the necessity of security watch in jurisdictional areas other than the origin of the fire, but also issue support requests at the same time.

All-out firefighting (photo provided by the Fire Department of Itoigawa City)

It is also necessary to create a standard for support requests beforehand to enable an objective decision on whether or not to issue such request depending on the location of the origin of the fire, weather conditions and other factors.

It is further necessary, for times when support requests need to be issued to multiple fire departments, to structure the arrangements beforehand with adjacent fire departments and other parties allowing, for example, a single request to be issued to one fire department which then distributes such request to the other departments on behalf of the original department.

For smaller fire departments, since they will have to concentrate their power on firefighting and will have no room to issue support requests, it is advised to agree and establish a structure of always sharing the status of the fire with the adjacent fire departments and to allow the nearby departments to go into action without waiting for a support request if major damage is expected.

In the adjacent fire departments which will provide the support, since the weather conditions are expected to be similar to the original fire department and support power may become restricted, it is recommended to create a plan beforehand to use reserve troops and call for additional firefighters in order to maintain the same level of firefighting power inside their own area.

The FDMA is planning to demonstrate measures to review these support schemes such as introducing cases of the advanced support schemes stated above by the end of July.

Flames breaking out at a location 200 m away from the original location of fire (photo provided by the Fire Department of Itoigawa City)

Shopping street turned into devastated land (photo provided by the Fire Department of Itoigawa City)

Each fire department is requested to start their studies quickly and to review the supporting organization by referring to the measures to be demonstrated by the FDMA.

(3) Assurance of fire water sources

When each department creates their fire prevention plan, it is necessary to define, in addition to deciding the fire water sources to be used in the large-scale fire danger areas as already stated in 2. (1) above, the water supply not only provided by large-scale water tank vehicles and water supply from volunteer fire corps but also such support as 10 t water tank cars from other fire departments, drainage pump cars from MLIT and concrete mixer cars from private companies should also be defined. Furthermore, it is also necessary to close contracts on such activities as water supply with local construction associations and individual local construction companies beforehand.

The FDMA is planning to introduce advanced cases of such contracts by the summer.

Each fire department is requested to start their studies as soon as possible and to review the support organization using the advanced cases introduced by the FDMA as reference.

Furthermore, since it will be necessary to transport bulk water from natural water sources such as from the sea and from rivers in events where the spread of fire takes a longer period of time to contain, it is necessary to install a super pumper or similar if appropriate for the actual situation of each region. Since the super pumper is applicable to emergency disaster prevention/disaster reduction industry bonds and facility introduction subsidies for Emergency Fire Response Teams, each fire department is requested to consider its introduction.

(4) Making the installation of fire extinguishers compulsory for small-scale restaurants

For restaurants with a gross area less than 150 m^2, the installation of fire extinguishers is obligated by fire prevention ordinance as part of local public authorities but is not obligated by nation-wide regulations.

Hence, in view of the danger of stove fires in restaurants, the FDMA is planning to revise the Ordinance of Enforcement for the Fire Services Act, making the installation of fire extinguishers in such smaller restaurants compulsory.

Countermeasures Based on the Experience of the Large-scale Fire in Itoigawa City

1. General

A large-scale fire can occur in any region with many wooden buildings in strong winds.

(Photo provided by the Fire Department of Itoigawa City)

(Photo provided by the Fire Department of Itoigawa City)

2. Countermeasures

(1) Outline of proposal	(2) Direction of countermeasures	(3) Goals to achieve
Identification/specification of high risk areas and the promotion of creating fire prevention plans Identifies and specifies those areas at high risk of a large-scale fire and promotes the creation of a fire prevention plan. ⇒ Defines such items as the number of necessary pumpers, the fire water sources to be used and the department location of the vehicles, and executes training according to the plan.	○ Shows the procedures/standards for identifying/specifying areas (using such methods as simulating an urban fire spreading). (by July) ○ Shares the plan templates. (by July) ○ Executes training sessions. (this summer)	○ Aim to create a plan and close contracts as soon as possible.
Support organization - Mobilizes the maximum firefighting power in the region and issues support requests at the same time. - The representative fire department, etc. issues support requests on the behalf of others. - The adjacent fire departments, etc. mobilize without waiting for a support request. - Uses reserved cars and volunteer fire corps for backup in the event of support activities to prevent the level of firefighting power declining.	○ Shows the methods for reviewing the support schemes. (by this summer)	
Fire water sources - Promotes the creation of a plan for assuring the fire water sources in identified/specified areas. - Closes contracts with local construction industry associations, etc. on such matters as water supply activities. - Introduces super pumpers* for remote and bulk water supply from natural water resources such as seas and rivers. * Introduction status: Already deployed at 21 fire departments, 50 teams Supply capacity: More than 3,000 L/min for 1 km ahead (a normal pumper can supply 1,500 L/min for 200 m ahead)	○ Assures fire water sources. Using financial support schemes ○ Introduces advanced cases of closing contracts. (by this summer)	○ Aim to assure the required fire water sources.
Making the installation of fire extinguishers compulsory in smaller restaurants Investigates regulations to make the installation of fire extinguishers in smaller restaurants with a gross area of less than 150 m² also compulsory.	○ Studies ordinance, etc. revisions. (by end of FY2017)	○ Strengthen initial fire extinguishing measures.
Interlocking type home fire alarm Studies and validates the effects and issues of new methods of transmitting a fire alarm using home fire alarms between adjacent buildings including restaurants.	○ Validation by executing model projects in FY2017 (by end of FY2017)	○ Examine expansion based on validation results.
Reassuring safety management for volunteer fire corps - Upgrades safety devices such as fire protective hats with shields and reassures safety management through measures such as thorough enforcement of the correct way to wear.	○ Makes the upgrade of safety devices known to all. (Notifications already issued in May)	○ Thorough execution of safety management by upgrading installations.

(5) Interlocking type home fire alarms

To enable the early perception of fire and for residents to collaborate in extinguishing the initial fire in the event of a fire at a restaurant, a new model project is to be conducted at the FDMA utilizing home fire alarms with such alarms transmitting one to the other between adjacent buildings including small restaurants. The effects and issues of these projects will be examined.

(6) Thorough execution of safety management for volunteer fire corps

When firefighting in strong winds in large-scale fire risk areas, since the risk of injury to the eyes by smoke and flying objects is high, each fire department needs to thoroughly execute safety management by such means as upgrading the necessary safety attire such as fire prevention hats with shields being supplied to the volunteer fire corps and education provided on how to correctly wear such equipment.

3. Others

This fire reminded us of our lack of care, the lack of which caused us to think that a large-scale fire would not occur in an urban area. We expect each fire department to put the points stated above and other measures into action quickly and appropriately so that a large-scale fire in an urban area will not occur again.