High-Level Firefighting Technics in Japan

- a case in Tokyo -

Today's topics

- 1. What the Fire Service in Tokyo faces at
- 2. Command System
- 3. Task of Fire Pump Unit
- 4. Latest Firefighting Method
- 5. New Initiatives

1. What the Fire Service in Tokyo faces at

- Mass retirement of veterans
- Decrease of fire scenes with significant features
- Increase of junior officers who have less experience on scene

Decrease of numbers of fires



Decrease of daily numbers of fires



Fire resistant construction is <u>the most frequent source</u> of the fire, and the inclination has toned up steadily.



Electrical equipment is <u>the most frequent</u> cause of fires last 5 years



STATISTICAL FEATURES

The BIGGER the size of construction as in capacity seats or total area is, the more FREQUENT electrical equipment can be the cause of fire.

Fire in warehouse



PRACTICAL FEATURES

- Large amount of combustibles
 Large and consecutive space
 Large number of people possibly left behind
 Inaccessibility to fire source
- Takes quite long time for fire extinguishment
- Heavy toll of human lives

The most priority issue is to build up fire control capacity





Dispatch plans

Plan Title	Dispatch level
General Fire	$1^{st} - 4^{th}$
Fire on Highway	1 st – 3 rd
Hazardous Material Fire	1 st – 3 rd
Large-scale Fire	$1^{st} - 4^{th}$
Ship Fire	1 st
Aircraft Fire	1 st – 4 th
Ambulance special task	$1^{st} - 4^{th}$
Rescue special task	1 st – 2 nd
Etc.	

Scale of corps according to each dispatch levels

e.g.)

General Fire 1st Level

Fire Pumper6 - 8Arial Ladder1 - 2Ambulance1Rescue Truck1Command car1

Large-scale Fire 4^{th Level}

Fire Pumper 50 Command car 4 Arial Ladder Recue truck Ambulance as needed

3. Task of Fire Pump Unit

- On Fire Scene -



Search and Rescue

✓ Not only Rescue Task Forces take charge of

Rescue Task Area

Every Fire pump units have it's own Rescue Task Areas while they have regular jurisdiction.

They are commanded to be a Rescue Task unit when fires occurred in the assigned area, in addition to Rescue Truck unit.

Also the first arriving unit plays a role as a Rescue Task unit in case of the assigned unit is delayed.



Back up deployment unit is dispatched to the Engagement jurisdiction area in preparation of another fire happens





Fire fighting formation

<u>and</u>

Effective fire control



Basic formation of 2 pumpers unit



Basic formation of solo pumper unit



Hose Car

- vital equipment for **RELAY**-

- Electric/Man Powered Mobility
- Quick and Easy to extend hoses
- Advantage in narrow area
- Carrier for equipment
- Pedestal for water cannon
- Equipped with "Sender" and "Solo unit"



(A firefighter is extending hoses towards "Leader" pumper from "Sender" pump by a hose car)

 \sim after reaching the fire \sim



GENERAL REGIDENCE (fireproof construction)

STRUCTURAL FEATURES

- Rapid fire progression
- High possibility of collapse
- Leaping frame
- Embers

- Encircle the fire building with spray guns
- Approach inside ASAP and spray the fire source
- Caution for expanding fire to other buildings
- High risk of flashover
- Use of wide diameter nozzle at strong force of fire



Encircle the fire building



Initial response by the first arriving unit



Formation of search and rescue



 \sim before approaching inside \sim

Confirm communication method in invisible situation

- Radio
- Buzzer Sign (attached with lighting equipment)
- Rope Sign
- Reconfirm the signs at every single scene –

Beep!

- 1. Detection of victims
- 2. Start rescuing victims out of fire
- 3. Emergency Escape



To make personal protection perfect

Confirm the condition of all members at every single approach into burning areas

- check <u>Alarm On</u>
- check <u>Remaining Air</u>
- check <u>PPE. Wore Perfect</u>
- check <u>Physical and Mental Fatigue</u>



Perceive Risk Factor

- Collapse
- Falling
- Electric shock
- Hazardous materials
- Flashover



Flashover

The flashover occurring during firefighting can cause injuries to firefighters and victims when combustible materials ignite instantaneously and the interior room temperature rises rapidly.





How to prepare against Flashover

- AFT training
- Research and experiments
 - Conducted for the purpose of improving the safety of fire personnel during water discharge, and the thermal environment in the fire compartment where flashover occurred and the compartment from which the water was being discharged was confirmed for each water discharge angle.

□<u>diffused spray at 30°</u>

□<u>diffused spray at 90°</u>

□<u>diffused spray at 60</u>

<u>□straight stream</u>





COMPLEX

STRUCTURAL FEATURES

- Possibility of lots of people left inside
- Acres of space to check
- Full of smoke due to sealed structure
- Emergency fire facilities

FEATURES on Firefigting operation

- Limited space and approach
- Loss of radio communication
- Ineffective spray due to internal compartment
- Spray techniques
- Water damage
- Smoke extraction
- Long time operation





Connection W Supply Pipe

Extension of water hoses

Fire operation space is quite limited at approaching the fire source in a complex

➡ Efficient use of space is required





(Floor)



Smoke extraction

Optimize operation area by adopting appropriate smoke extraction according to the situation

- need close communication among every active units
- utilizing entrance and windows
- set "intake air way" and "exhaust air way"
- allocate water nozzle as a caution for exhaust air way









"The First Aid Team" is the latest initiative to suit current situation of our society.



- A pair of 2 electric tricycles and crews
- Equipped with AED and fire suppression equipment



The most priority is to make "first touch on scene" much quicker and more efficient

- Disaster prevention and mitigation in narrow area
- First medical aid on the very early stage
- Give a hand to elderly in daily incidents

In disaster scenes

Quick access to the disaster scenes where fire pumper and ambulance hardly approach due to limited space of route.



case of sudden illness and injuries





On other requests

The first aid team corresponds in place of fire pumper

case of Automated 119 call due to fire alarm activated



Thank you for listening !