Dr Cziva Oszkár

Realization of the fire-training container in Budapest Fire Department

Ahogyan a környezetünk változik, úgy változik benne maga a tűz is. Ma már a zárt terekben keletkező tüzek esetében igen könnyen elérhetjük a közel 1000 Celsius fokos hőmérsékletet is. Ezek a körülmények pedig különleges veszélyeket rejtenek a tűzoltók számára. A különleges helyzetek különleges felkészültséget igényelnek. A teljes lángba borulás (flashover) és a szúróláng (backdraft) elleni harc csak is akkor lehet sikeres, ha a tűzoltókat már az alapképzés során felkészítjük a várható rémálomra.

National Emergency Training Center
U.S. Department of Homeland Security
16825 S. Seton Avenue
Emmitsburg, MD 21727-8998

Dr. habil. Cziva Oszkár

Emmitsburg
May 19-05-2006

Table of contents

1. Problem Statement

Do Budapest firefighter lack experience, knowledge and physical condition to be able to perform their job effectively.

2. Background

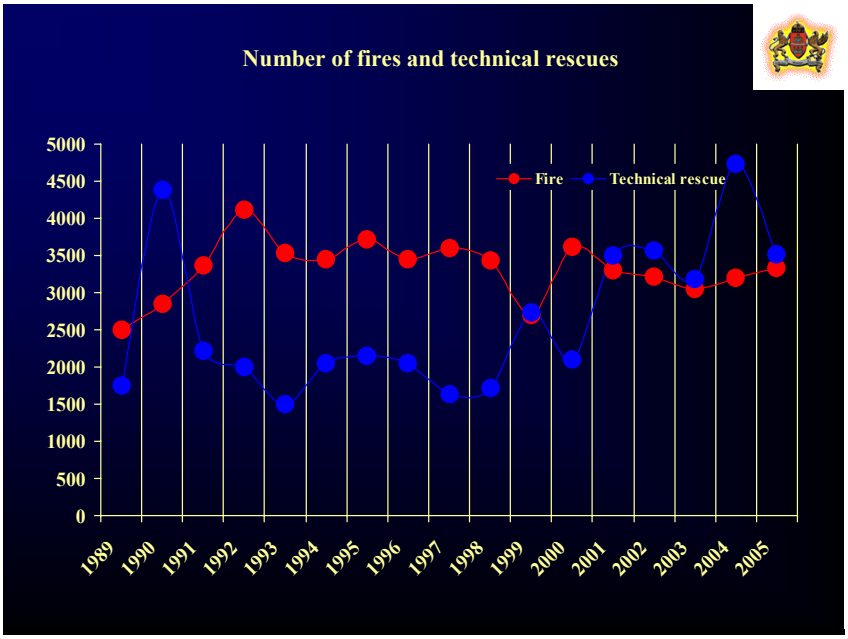
The mission of all the Fire Departments across the world is to serve and protect the public from loss of life and property from fire and other natural and manmade disasters as efficiently and effectively as possible. The firefighters can not solve this challenge if they lack of experience, knowledge and physical condition.

According to data of Budapest Fire Department, 25% of all the fire is springs up in the close territories. In addition almost 80% of these fires are in a flats. By the numbers it is mean that approximately 1000 fire is in the flats

every year which are have an incredible danger for inhabitants. It makes inestimable big worth.

The worth is consist of two elements. One of the is the worth which is caused by the fire and the second is caused by the firefighters. During the attack of fire suppression very important to make less secondary damage. It is depends on the preparedness of firefighters. How fast can they found the fire, how many water they will use and so on.

The flashover and the backdraft are the biggest challenge in the flat fires which can became the killer. The phenomenon of flashover in its generic sense, is a significant killer of firefighters. They are a result of a physical and chemical process. It could be cause the death for the firefighters if you are not prepared. The firefighters have to feel the circumstances of this process which is available just in a real situations.



The medical fact of the firefighters is very sad. Unfortunately the fire department don't have enough resources for the healthy control of firefighters. The firefighters must visit the doctor only once a year. This time the circumstances are very calm. The doctor not able to make any control under

the stress situation. 65% of all illness firefighter have blood pressure and circulation problem.

According to the rules of European Union, training burns are not allowed for the fire departments. It means that the firefighters don't have any opportunity to have even the minimal level of experience in the real circumstances. The lack of the knowledge can cause fatal result

2.1. A Firefighter's Worst Nightmare

In the USA, NFPA statistics recorded between 1985 and 1994 demonstrated that a total of 47 US firefighters lost their lives to "flashover". Of 87 firefighters killed since 1990 that reportedly died of smoke inhalation whilst operating inside structures, the major causes of injury were – became lost inside the structure and ran out of air (29 deaths); caught by the progress of the fire, backdraft or flashover (23 deaths); and caught in structural collapses (18 deaths, 10 of which were in floor collapses).

2.2. Backdraft

In 1996, a firefighter (female) was killed by a backdraft that occurred in Bristol. As four firefighters (including the victim) entered through the main entrance to tackle the fire, the heavy black smoke layer was seen to be in motion, continually rising and falling. Just five minutes after entry an intense "howling wind" was seen to enter the main entrance doorway causing flames to bend inwards.

The resulting ignition of the fire gases move across the wide expanse of the store both under and within the suspended fiberboard ceiling at an estimated five meters per second. The accompanying pressure wave knocked one firefighter of his feet.

The continuous rise and fall of the smoke layer is most likely a result of the pulsation cycle caused by brief ignitions in the fuel – rich gas layers. As these ignitions occur intermittently, the repeated thermal expansion of fire gases may cause the smoke interface to rise and lower and such a process must be viewed as a classic warning sign for backdraft.

2.3. Flashover

In December 2002, a company engine officer described to Fire & Rescue how is crew attended a one-room house fire that had vented itself out of a rear window. “heavy fire was seen issuing from the window – the fire was post-flashover. As the fire crew forced entry at the front they took out two windows either side of the entry door. As they advanced towards the fire they encountered moderate heat so they took out another window from the interior. At this stage the fire found them.

2.4. Environmental pollution during the fire suppression

Nowadays one of the biggest problem is the pollution of our life space. In case of a fire, the pollution of the environmental is mostly depends of the time and effectiveness of suppression. Provable, that the preparedness of firefighters is effect for the environmental. It means that a project which is improving the knowledge and physical condition of firefighters is advantage for the environmental too.

3. Source review

3.1. Development of fire protection in Hungary

According to researches and archaeological excavations, the fire department in Budapest has a 2000-year old history. In the Roman Empire the

center of Pannonia Province was Aquincum which is now a part of Budapest. At that time this significant area had two fire stations. One of them was protect the civilians and the other one was to set up for the soldiers. The relics which were found, prove that the Roman ancestors had a highly developed system of fire safety.

Afterwards, our rough history made it extremely difficult for the technical state and the system of fire safety make any rapid progress. In spite of the difficulties in Hungary, at the end of XIX. century the first professional fire brigade was organized. These time people had great respect for the firemen and they were incredibly popular.

After the II. Word War everything is changed. A new organization was developed for the fire protection by the new government. The fire departments were strongly centralized during the socialist transformation.

The fire technical equipments were in a very low level so the firefighter had to improve their theoretical and practical knowledge.

In 1996 the fire brigades again had been placed under local governments direction. This decision is open many opportunities for the developing.

Similarly to all of the citizens of Hungary the year 2004 also means for the fire department a new age. In this year Hungary was joined to the European Union. This joining has many advantages for us but also difficulties. The fire department must be conform with the rules of European Union.

3.2. Training system at the FD of Budapest

The basic level of firefighter education in the Budapest is provided two or three times a year. These training sessions are called fire Fighters Training Courses. The training courses were introduced in last year as a new form of basic education. The course is made up of a merged theoretical and practical preparation, during which the students get a competence of handling chain saws, hydraulic cutters and so on.

After this three mounts is coming the practical preparation in 24/48 hours shift. The students perform two mounts duties on a stand-by fire engine, during which they are able to gain experience but they can work just in the back side. For them not allowed to go inside during the fire suppression. After the successful exam they came back to their fire station.

All the firefighters must take a part in the trainings during his duty expect of the weekend. These trainings are consist of one hour theoretical education (for example- fire suppression in the subways, knowledge about PPE, most important rules of fire prevention and so on) and practical exercises (for example – PPV, using leather, special technical equipments).

BUT The firefighters do not have any opportunities to have experience in a real situations.

4. Recommendation

4.1. Classification of the goals

The goal of this project is to develop a training container in which the firefighters are able to practice in a real fire without the environmental pollution. Fuel of the container must be only gas which is not polluting the environmental and the extinguisher substances must be collected.

The container must be provided with emergency exits and different detectors for the safety of firefighters. Also the container must be available for the medicine check before the exercise and after that.

4.2. Construction of the container

Construction of the container must be similar with those elements which are very common in the fire. The most important modules are below.

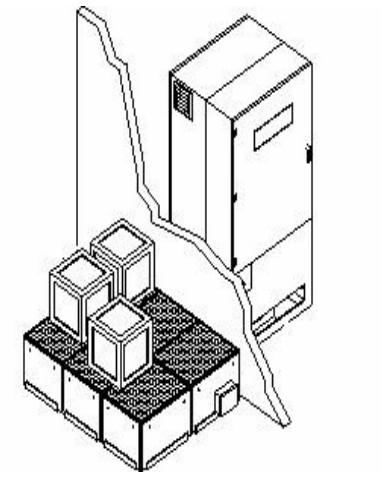
Flashover equipment

The equipment must be under the ceiling which is able to generate a flame minimum 6-8 meter.

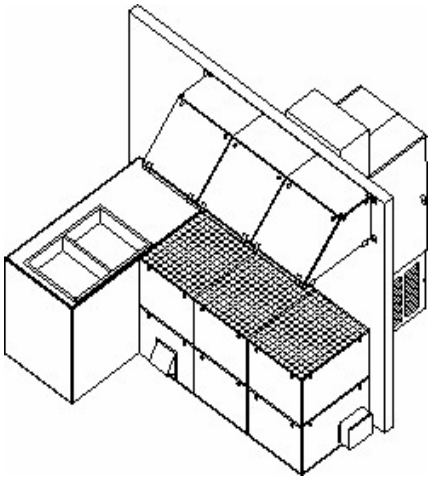
Backdraft equipment

This module is available to practice the method of the opening the door.

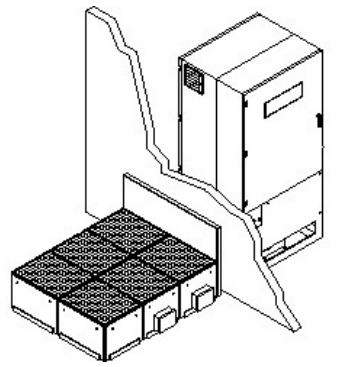
Fire in the corridor



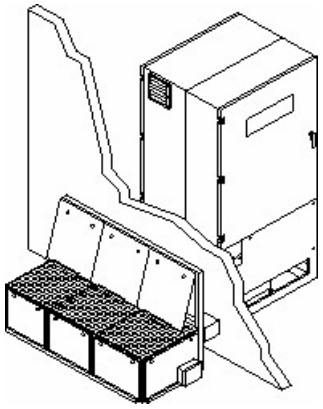
Fire in the kitchen



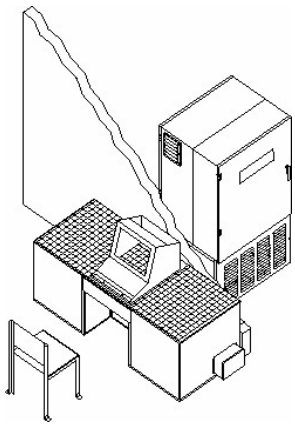
Fire in the badroom



Fire in the living-room



Fire in the study



5. References

Grimwood, Paul T. : *Flashover: a firefighter's worst nightmare.* Journal **"Fire&Rescue"** p. 21-23. April. 2003.

West, Gary : *Developing knowledge and understanding of flashover training.* Journal **"Asia pacific Fire Magazine"** p. 17-18. December 2004.

Knapp, Jerry: *Highrise firefighting – training elements .* Journal **"Fire&Rescue"** p. 39. January 2000.

Emery, Mark: *The three that kill* Journal **"Health and Safety"** p.8. June 2005

National Fire Academy. *Training Program Management*. Emmitsburg 2006

www.tuzoltosagbp.hu/statistic download 12/5/06

www.haagen.com download 12/5/06

www.kidde_firetechnik.de download 12/5/06