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у Новом Саду

  
TECHNICAL UNIVERSITY  
IN ZVOLEN

3. МЕЂУНАРОДНА НАУЧНА КОНФЕРЕНЦИЈА

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ПОЖАР, ЖИВОТНА СРЕДИНА,  
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13. МЕЂУНАРОДНА КОНФЕРЕНЦИЈА

## ЗАШТИТЕ ОД ПОЖАРА И ЕКСПЛОЗИЈЕ



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FIRE, ENVIRONMENT,  
WORK ENVIRONMENT, INTEGRATED RISK

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13<sup>th</sup> INTERNATIONAL CONFERENCE

## FIRE AND EXPLOSION PROTECTION



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## FOREST FIRES AND HELITACK

László Komjáthy<sup>1</sup>

komjathy.laszlo@uni-nke.hu

### ABSTRACT

Each forest fire requires different technique and tools. The extent of the catastrophe determines the size and type of units that take part in containing and extinguishing the fire. In many cases the involvement of volunteers and the army is necessary along with the regular Fire Department Response Units.

However it is very important to have knowledgeable and well-trained personnel in command. It is also imperative to provide the firefighters with carrier vehicles appropriate logistics and equipments. During extinguishing, the nature of the terrain determines whether or not the fire trucks can be deployed.

**Keywords:** forest fire, firefighter, danger, aerial firefighting, safety equipment, water, helicopter.

## ШУМСКИ ПОЖАРИ И ГАШЕЊЕ ХЕЛИКОПТЕРОМ

### РЕЗИМЕ

Сваки шумски пожар захтева другачију технику и опрему. Размере катастрофе одређују величину и врсту јединица које учествују у задржавању и гашењу пожара. У многим случајевима је неопходно професионалним ватрогасним јединицама прикључити добровољце и војску.

Међутим, веома је важно имати школован и добро обучен командни кадар. Такође је битно обезбедити ватрогасцима возила, одговарајућу логику и опрему. Природа терена је та која одређује да ли ће се или не током гашења користити и тешка ватрогасна возила.

**Кључне речи:** шумски пожар, ватрогасац, опасност, гашење пожара из ваздуха, опрема за заштиту, вода, хеликоптер

### 1. INTRODUCTION

We can clearly establish the fact that each fire - such as forest fire - has different characteristics. Depending on the nature of the fire, there has to be a broad range of method in place to battle the elements. It is the responsibility of the Fire Department - being the first unit to respond - to quickly decide on the extent of personnel and technical requirements to extinguish different type of fires. The local professional firefighter units with the help of volunteers can easily handle smaller forest fires. In the case of medium fires however, there might be a need for help from the neighboring communities or even from the general population.

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<sup>1</sup> Dr, Nemzeti Kozszolgálati Egyetem, Hungária Korut 9-11, Budapest, Hungary

The commanders of the Fire Department may request the help of the local residents, however in the event of more severe cases, the involvement of the Disaster Response Unit is absolutely necessary. At significant forest fires where it could take several days to extinguish the fire, the importance of thoughtful and careful organizing is obvious. There are major logistical issues to deal with while providing sufficient and effective environment such as financial and technical support, and well-rested units at any given time.

## **2. UNITS AND EQUIPMENTS**

An important aspect of receiving help from residents is the fact that they do not always have proper qualification and experience. To fully utilize their presence and willingness to help, they need guidance from well-trained firefighters. In case of devastating forest fires, residential areas are clearly in danger, therefore organizing and executing of the evacuation phase are the most important priorities.

Here is the summary of deployable groups and organizations in fighting enormous forest fires:

- volunteer firefighters;
- civic defense forces;
- members of professional regional firefighters;
- commanders of the Emergency Response Unit;
- volunteer helpers of residents;
- forestry engineers and workers.

### Technical Support:

The resources of the ground units are the hand tools, various vehicles, fire trucks, their team and individual equipments.

### Team Equipments:

- carrier vehicle;
- walkie-talkie radio;
- first aid package;
- various tools such as hacks, picks shovels, axes, motorized chain-saws, fuel.

### Individual Equipments:

- personal safety equipment;
- shovel;
- 2-3 liters of water.

These specifications contain the basic individual and team equipment only.

## **3. VEHICLES**

The fire trucks have multiple purposes. They are designed to carry the response units, their equipments, maintenance and service tools. It is quite difficult to get water into the forest from any kind of vehicle. During the deployment of fire trucks firefighters encounter challenging terrains therefore proper positioning of the vehicles is close to impossible.

Water cannons and special chemical powders that are being used from fire trucks to extinguish house fires are difficult to deploy on mountainous terrains. Flat terrain could also pose danger as the vehicles can easily sink into sandy soil, where even walking could be a challenge. To fight forest fires, water cannons can only be used at the very edge of the forest, or along roads where equipments can be safely operated [1].



It is obvious, that due to the special firefighting environment in the face of the modern requirements aerial support is necessary even in our country. Aerial firefighting is the use of aircraft and other aerial resources to combat wildfires. The types of aircraft used include fixed-wing aircraft and helicopters. Because of the present, integrated disaster management system and the rising probability of other environmental disasters besides fires, it is not logical and not possible to operate these aerial vehicles only for firefighting purposes.

Taking the characteristics and frequencies of domestic accidents into consideration helicopters have better features in exploitation and effectiveness in comparison with fixed-wing aircrafts due to their multi-purpose applicability [2]. A well-equipped helicopter in readiness with a well-trained crew besides the extinction of the vegetation can be capable for:

- aerial reconnaissance;
- fire extinction of hall-type buildings;
- relief in case of industrial and environmental disasters;
- SAR (search&rescue) missions;
- MEDEVAC (medical evacuation) missions;
- engineering rescue in distant or hardly accessible places;
- aerial rescue;
- supporting flood protection activities.

The term Helitack refers to "helicopter-delivered fire resources", and is the system of managing and using helicopters and their crews to perform aerial firefighting and other firefighting duties, primarily initial attack on wildfires. Helitack crews are used to attack a wildfire and gain early control of it, especially when inaccessibility would make it difficult or impossible for ground crews to respond in the same amount of time.

#### **4. HELITACK EXERCISE**

This August we carried out our first helicopter fire extinguishing exercise, using a helicopter servicing in agriculture (type: Kamov Ka-26) with a modified filling system of its outer tank (volume 600-800 liters). We fitted a pressure stud with a rapid connector to the tank and made the escape valve capable of hydraulic opening and closing.

We made four runs and made the following observations: To complete our mission four people were necessary. The first was the commander, who controls the filling-up, the second operates the compressor, and the other two connect the hoses between the compressor and the tank on the helicopter. The time needed for filling-up was approximately 15-20 seconds. Landing and refilling near the fire meant 5 minutes per run. So the main consequence is, that 10-12 turns an hour means capable support of the conventional (ground) firefighting [3].

#### **5. CONCLUSION**

Quite often water cannons can only be used from the edge of the forest or along the road. In such cases when vehicles are unable to approach the site due to inaccessible terrains, firefighters are forced to get to the fire on foot.

The difficult terrains pose dangerous and challenging conditions, especially when firefighters have to wear the same protective heavy gear as they do in conventional circumstances. For all these reasons it is clear that using helicopters in firefighting in Hungary could provide invaluable help for our men.

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## 6. REFERENCES

1. \*\*\*: [http://en.wikipedia.org/wiki/Aerial\\_firefighting](http://en.wikipedia.org/wiki/Aerial_firefighting)
2. Komjáthy László, Répásy Péter: *Az erdőtüzek kialakulásának körülményei és oltásának taktikai lehetőségei* (Repüléstudományi Konferencia, 2008) [http://www.szrfk.hu/rtk/kulonszamok/2008\\_cikkek/Repasy\\_Peter\\_Komjathy\\_Laszlo.pdf](http://www.szrfk.hu/rtk/kulonszamok/2008_cikkek/Repasy_Peter_Komjathy_Laszlo.pdf)
3. \*\*\*: *Új helikopteres légi tűzoltási módszert mutattak be (Tűzvonalban)*, 2006. [http://www.langlovagok.hu/tuzvonal/181\\_uj-helikopteres-legituzoltasi-modszert-mutattak-be](http://www.langlovagok.hu/tuzvonal/181_uj-helikopteres-legituzoltasi-modszert-mutattak-be)