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Deployment of pond system to firefighting in extreme terrain conditions

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Abstract

The article deals with the possibilities of overcoming forest fires in extreme terrain conditions. It is devoted an issue of using pond system for the water transport to the seat of fire during firefighting under what conditions it is advantageous to deploy this mode of water transport, how to proceed when it is required and its deployment. Transport of water in exposed terrain is governed by the basic hydraulic regularities that determine the ways of deployment pond system.

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Keywords: forest fire; firefighting tactics; pond system; firefighting equipment; inaccessible terrain.

1. Introduction

One of the most devastating type of a wildfire in our country is exactly a forest fire in mountains. Many of them from this kind of localities are for the most used fire appliance hardly available nor unavailable at all. The supply of seat of fire with water for extinguishing requires to create a firefighting tactics applied on mountainous terrains cover by wood vegetation. In this case one of the options is deployment of the pond system. Pond system is a method of long-distance ground transport of water to the seat of fire. This system is possible to use in extreme and inaccessible terrain conditions. Pond system is a system of transport link from hose lines and a low-capacity artificial tank. To make the transport of water into terrain with elevation possible, pumps have to be connected into the system which ensure the transport of water from the source to the seat of fire.

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1.1. Pond system

A pond is a smaller tank with capacity of thousands liters. It is possible to pack and put the tank into a bag what makes the transport to the required place easier. At the deployment of the pond system it is important to create a so called nest for the pond (figure 1). That is how the tank is secured against displacement, sliding or outpouring. The pump adds needed pressure for the water to overcome the height and length loss. Each kind of pump must reach such a power that the pumped water has the sufficient pressure to overcome the terrain differences, sufficient feed pressure before next pump and necessary pressure for extinguishing. Height loss is caused by elevation of the terrain. From the last pond one or more, if necessary, offensive hose lines are being stretched. The number of lines is determined by the number of seat of fire. Offensive hose line can be created from hoses type C or from hoses type D, according to the required pressure. Offensive line is finished with a branch with which the fire is extinguished. The branch can be full flow rate, water curtained or combined [1,2].

Fig. 1. The connecting of a pond with pump and hoses (photo: author)

2. Deployment of the pond system

Option of the deployment and advantages of the pond system:

- transport of water into extreme inaccessible terrain for fire appliance,
- transport of water in terrain with high elevation,
- securing big enough flow necessary for extinguishing,
- at optimal setup of the parameters required pressure is secured for extinguishing also a larger seat of fire,
- in case of larger seat of fire it is possible to move the ponds upwards if needed,
- transport of water by pond system is economically more convenient as air transport,
- the pond system is possible to deploy in bad weather [2, 3].

2.1. Deployment of the pond system

At making the pond system it is important to plan and execute each of the activities in a way that the time requirements should be as short as possible. Connecting a system of ponds into action consists of this single steps [4,5,6]: