

Original article

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Justification of the Rational Appearance of the Forest Fire Extinguishing Integrated Aviation System Using Aviation Fire Tankers

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Abstract. *New possibilities of using aviation to protect forests from fires are being considered. Variants of optimization of detection and extinguishing of forest fires arising on a given plot of forest fund lands are proposed within the framework of the methodology of integrated aviation systems, the total losses/costs of the state are selected as the target function of which. The target function is introduced taking into account the developed simplified model of spreading and extinguishing a forest fire. The comparison of various fleets of fire-fighting aircraft is carried out: existing Il-76, Be-200, Ka-32, as well as promising aircraft with hypothetical characteristics. It is shown that within the framework of the introduced models, the most rational appearance of an integrated aviation system for extinguishing forest fires using aviation fire tankers is the division of forest lands into areas of responsibility of individual units, which include an air fleet based on two types of unmanned aerial vehicles: small patrol and larger duty firefighters. Despite the fact that the conducted modeling is of a qualitative nature, the application of the integrated aviation systems approach for fire aviation tasks allows us to form reasonable conclusions about the promising directions of its development.*

Key words: *forest fire, forest fire detection means, forest fire extinguishing means, integrated aviation system*

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