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DRONE USE CASES

Rescue Missions with Drones in France

Thanks to their agility and ability to quickly cover large areas, drones play a crucial role in rescue and firefighting operations. They help to avoid exposing firefighters to certain risks and help maintain the safety and readiness of personnel during operations.
Drones are widely used in France in search and rescue operations. They are essential tools for locating victims using thermal and night vision, mapping the terrain, delivering supplies, and supporting ground teams. After COVID, the internal security law clarified the use of civil security drones, offering a great deal of freedom but imposing certain rules of discretion, including the use of images. Their autonomous capabilities and the regulations governing them are constantly evolving to strengthen their role in rescue operations. As part of civil protection missions in France, drone teams are called upon to intervene whenever the director of rescue operations requests it. French emergency services call on drone teams for all rescue missions.

What is it, where and how is it used?

The majority of rescue missions in France using drones are reconnaissance, identification of victims or sensitive areas, guidance of ground resources, sampling, transmission of messages and data in real time, calculation of propagation speed and delimitation of the intervention zone. The person in charge is the rescue operations commander (firefighter), with the approval of the rescue operations director (prefect), his or her superior. More than 100 drone teams are used in all civil protection missions: natural and technological risks, searching for missing persons, rescue in dangerous environments, and sea rescue. The teams are involved in the development of tools (cameras, buoys, ropes, sampling capsules, etc.).

Technical and organisational aspects

There is no uniformity in terms of technical components. All types of drones are used, with a predominance of multi-rotors. In terms of transmission, all kinds of data are collected according to the needs of the director or commander of rescue operations. They are transmitted via 4G, 5G or satellite networks. The data is processed by experts in the field. For example, chemical samples are processed by specialists, and aerial photographs by authorised personnel. The pilot transmits the data to the rescue operations commander, and, in the case of images, these are stored to protect the privacy of the people filmed, in accordance with the regulations in force. The link with the command post is physical or radio for the transmission of images. In the event of a failure of communication via the public network, the command posts have equipment to develop a dedicated network.

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With regard to cooperation between the various services (e.g., police, fire brigade and health services), the prefect (head of rescue operations) is responsible for coordinating rescue operations. He/she may use drones across the board, except for law enforcement missions. The police have and use their own drones. The health services do not have operational drones and use those of the fire brigade as needed.

Benefits and effectiveness

Drones have been used on several occasions in various types of rescue missions. During forest firefighting operations, the use of drones is subject to authorisation by the rescue operations director at the request of the operations commander. Drones have multiple uses: guidance, reconnaissance, calculation of propagation speed, fire boundaries, deployment of firefighting resources, etc.

Although drones have not reduced the workload of ground-based emergency services, the main advantages observed are accuracy, immediacy, manoeuvrability, versatility, and cost, which is one of the major factors in the success rate and effectiveness of the use of drones, as the cost of using drones is, of course, significantly lower than that of conventional aircraft.

Compared to traditional methods, drones can improve emergency management and response time, enabling rapid intervention, particularly in critical rescue operations. More specifically, drones can provide real-time information and visual data, reducing the time and number of searchers needed to locate and rescue a person. They can also carry various sensors, including thermal cameras which are widely used in search and rescue missions.

Key challenges

The main challenges identified are technical in nature. The limitations and constraints are imposed by the drones themselves: load capacity, radiation, autonomy, etc. When technical difficulties arose, other means were implemented.

Flights are subject to civil aviation authorisation, so there are no specific safety measures other than the European civil aviation regulations which must be followed at all times. If an aeroplane is in flight, the drones must land immediately. Regular reminders and checks are carried out. Emergency services declare their drone teams as the only ones authorised to intervene. Only drones declared simultaneously to civil aviation and emergency services may be deployed. There are no private drones for these missions.

Work is underway to make drone flights safer and allow their simultaneous use with other aircraft.

Future potential

At the national level, numerous concepts are currently being developed. The main concern is to improve response and rescue operations in the context of civil security missions.

The use of artificial intelligence is enabling the development of smarter, faster and more efficient drones. These technological advances are increasing flight time, allowing for advanced obstacle avoidance and sensor integration, improving data collection and transmission, and increasing intrinsic performance, including payload weight. Emergency services remain vigilant and are integrating these new tools. There is an ever-growing use of drones to search for victims, analyse the necessary resources, reduce response times, improve safety, etc.

At the international level, there is an urgent need to set up joint training programmes, to ensure the interoperability of resources and share new techniques and tools.