

FRONTEX - European Agency for Border Security



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The Potential of UAS for European Border Surveillance

Our lives in the globalised world depend increasingly on efficient, convenient and secure world-wide mobility of persons and goods. To this end, the European Union has abolished the internal borders in the Schengen area and started to develop a common policy on Integrated Border Management. The objectives of this policy are to keep the external borders of the EU open for trade and movement of persons, to facilitate regional cooperation with neighboring non-EU states, and to keep the borders closed for criminal activities such as smuggling, illegal migration, and terrorism.

The abolishment of the internal borders of the European Union has underlined the need for the Member States to collaborate to maintain security at the external border. As a part of the Integrated Border Management policy, Frontex has been created as a European agency tasked to coordinate such collaboration¹. Frontex (within the scope of its mandate) aims at ensuring more effective implementation of this Community' policy and is under constant development in terms of operational capacities and capabilities. The application of three elements: assessing threats and risks, managing joint operations at the external borders of Member States, and building intellectual, operational and physical capacity, makes it possible for the Agency to become the keystone of the European concept of Integrated Border Management.

The European Commission has recently issued a communication on the creation of a European Border Surveillance System (EUROSUR). EUROSUR is a long-term initiative to create a «system of systems» enhancing the situational awareness and the reaction capabilities to secure the EU's external border. While the areas to be covered by EUROSUR are very wide, the objects of interest can be very small, ranging from normal ships to small wooden or inflatable craft to improvised craft such as tires. Furthermore, EUROSUR will need to cover the wide areas with sufficient continuity and detection capability to ensure that action can be taken against suspicious vessels. To meet the requirements for surveillance in conditions ranging from the open Atlantic to the Greek archipelago, requires a multitude of systems using sensors mounted on space and airborne platforms, as well as on ships and on land. In this context, unmanned aircraft systems (UAS) offer an interesting potential and have already been employed for border surveillance by some countries, including the United States and Israel.

The EU has a coastline, which is 65,993 kilometers long². The sea presents a huge economic benefit for EU and affects all its Member States. However illegal activities such as transportation of illegal migrants, terrorism, organized crime, drug and contraband smuggling, theft and cargo fraud are an every day issue at EU ports, inland, territorial and international waters. Aerial capabilities are a very important factor to strengthen the surveillance of the EU's external "blue border" but also towards the areas where these illegal activities start. UAVs can contribute in improving capacities of detection at longer distances, providing real- and near real- time operational data, detection of smaller vessels, fast vessels (speedboats) and reconnaissance

missions to areas of preparation of illegal immigration. UAV should operate efficiently in all weather and day/night conditions with long endurance, speed and altitude adaptability. For efficient operations, UAS platforms will have to be integrated with other existing surveillance networks, such as: coastal radars, satellite coverage and other surveillance equipment (aircraft, ships...). Because of the huge size of the surveillance area, coastal MS could share/operate UAS in order to synthesise operational information, efficiency and costs of the systems. The sea surveillance mission that could be performed by UAVs include wide area surveillance under most weather conditions, which calls for radar sensors, as well as identification of suspicious targets, which calls for optical sensors or possibly imaging radar. As the mission has to be performed continuously over wide areas, UAVs are useful because they can patrol a far-off area for as much as 24 hours before returning to base.

The eastern land border also presents various challenges. With the enlargement of the European Union to 27 Member States, the structure of land borders of the EU have also changed. The border spans thousands of kilometers and ten European countries. Additionally the landscape of the borders varies from country to country; some are isolated/uninhabited and therefore difficult to access; others are more populated making it difficult to distinguish illegal activities from legitimate ones.

Aerial technologies for surveillance can also support land border services along the external border European Union. Currently border guards are using helicopters or smaller fixed-wing aircrafts for surveillance purposes. UAV technology could contribute to meeting the main challenges in "green border surveillance"³ via the efficient detection of human presence and cars at the borders which calls for optical sensors.

The Eastern EU border presents a variety of challenges; firstly Member States have very different lengths of the border to deal with. This would mean that different sizes of UAVs would need to be used, together with a different number of relays for the coverage of the operational area. The different topographical / climate characteristics will require UAVs to be operated at different altitudes and speeds. The extreme differences in weather condition will demand UAS to be very reliable and safe to prevent collateral damage in case of failure while providing all-weather detection capacity. At least to provide added value to current surveillance equipment, UAV should detect any threat in day/night condition.

In the context of the development of a common European border surveillance system (EUROSUR), Member States are expected to improve and harmonise their surveillance activities in order to ensure effective detection of illegal immigration and cross-border crime.

Frontex R&D Unit takes initiative to organise a series UAV workshops and real-flight demonstration events in 2010

¹ Council Regulation (EC) 2007/2004/ 26.10.2004 (OJ L 349/25.11.2004).

² <http://www.answers.com/topic/european-union>.

³ It refers to the border area between border crossing points at the Land border

covering both maritime domain and land border surveillance. The objective of the initiative is to allow end users and policy-makers to debate the main challenges related to UAV technology and its use for creating more efficient and effective border surveillance and to present industry with the chance to demonstrate the capabilities of currently available technical solutions. The interoperability and integration of sensors and reporting systems will also be a main focus of the events. To be of interest, the UAS will need to prove their value in purely economical terms. The life cycle costs for using UAS have to be lower than for alternative systems.

In the maritime domain, there is a wide spectrum of possible technical means that can be employed to provide effective surveillance including: coastal radar stations, surface ships, manned aircraft and satellites. However, it is clear that Unmanned Aerial Vehicles (UAVs) could also play an important role in further enhancing border surveillance in the future, though they face a number of technical and other challenges. The demonstration session in this domain aims to showcase in particular several of the latest developments in Medium Altitude Long Endurance (MALE) UAVs. These aircraft, generally propeller driven and often controlled from line-of-sight rather than through satellites, are adequate for most point-surveillance applications. They fly high enough to, for example, monitor most harbors, airports or other transportation nodes. They also fly low enough to closely inspect vehicles and boats. Land border surveillance demo session will be focus on mini - small UAVs. These drones may be carried in a pack and hand launched by one operator. They are useful for looking over the next hill or around the next turn in the road. They will stay in the air for about an hour and typically transmit video from a single camera to the operator. Significantly, a new class of electric fuel cell powered UAVs is just now being flown. They're essentially silent and can fly for many hours.

Although the development of UAVs certainly poses technological challenges, the critical issue is the question of operating unmanned vehicles in normal airspace. To resolve this issue, there are many activities going on, ranging from technologies to legal aspects. Just like satellites, although to a lesser extent, UAS offer an economy of scale. They can cover large areas far from base and the information can be readily distributed to multiple users. This indicates that it would make sense to operate UAS at a European level. To provide this added value, Frontex could very well have its mission expanded to include acquisition of information from satellites and UAS for use by cooperating MS.

In summary, the European Union is giving increased priority to security at the EU's external borders. UAS have the potential to play a major role in providing surveillance of European border areas. However, to realise their potential and in order for end-users to consider the use of unmanned vehicles, the critical issue of operating UAS in normal airspace urgently needs to be resolved. Overall, UAVs still need to prove both their safety and their cost-effectiveness in order to be considered a relevant surveillance asset.

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