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U.T.SEC 2019: "Strategies for air security are an essential condition for the safe and orderly commercial use of drones"

Interview with Daniela Hildenbrand, Business Development Manager ESG Elektroniksystem- und Logistik GmbH

Unmanned flight has achieved its own momentum. In addition to applications in the hobby area, commercial applications will grow substantially in the next few years. Forecasts assume that by 2030, there will be as many as 850,000 drones in private and commercial use in Germany[1]. Conflicts in the sky, and illegal entry into no-fly zones, will continue to increase. The latter, in particular, has gained public attention because of concerns about protection against terror and the number of flights that have been affected in the UK. We spoke with Daniela Hildenbrand, Business Development Manager at ESG Elektroniksystem- und Logistik GmbH, about air surveillance in no-fly zones.

NürnbergMesse (NM): Following the recent events at Gatwick, it seems everyone is talking about protection against drones. Could the events at Gatwick have been prevented using technology?

Daniela Hildenbrand (DH): Intrusions, or drone flights over airports, would be difficult to prevent completely. The area covered by an airport is often too large for it to be completely monitored. We also have to consider the high costs associated with the use of technology. But with a well thought-out strategy and a multi-sensor, multi-effector system like GUARDION for the secure detection of, and defence against, dangers caused by uncooperative drones, the chaos that was experienced could have been brought to an end much faster, which would have minimised the downtime costs and the negative impact on passengers.

[1] "Analyse des deutschen Drohnenmarktes" (Analysis of Germany's Drone Market), Verband der unbemannten Luftfahrt (Unmanned Aviation Association), published on 12.02.2019

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NM: How exactly does the GUARDION system that you mentioned operate?

DH: The system includes a broad portfolio of sensors that automatically detect and classify drones. The portfolio includes RF bearing estimation and analysis of remote control systems, radar systems and acoustic arrays, and also camera solutions to verify the drones that are detected.

NM: Could something similar to Gatwick happen in Germany, and how well are German airports prepared for such an incident?

DH: It goes without saying that the same threat scenarios also apply here. They could range from careless use of drones by private individuals to deliberate interference and even actions motivated by terrorism. Unfortunately, German airports are in a similar situation to those in the UK. Because of the division of responsibilities that continues to apply between airport operators, various police units, the Interior Ministry, the Ministry of Transport, and airport security, no German airport yet has sufficient precautions in place to be able to respond any better in a similar situation.

NM: In your view, what form should a system-based strategy to protect an airport take?

DH: The first thing to remember is that we cannot resort to trial-and-error in an environment where large numbers of human lives are potentially at stake. In other words, any system for air surveillance must be available on the market and have been tested for use. It must also be capable of being used both as a mobile and as a stationary solution, and should identify both the drone and its pilot. The false alarm rate must be kept to a minimum, to ensure that not every small aircraft that approaches triggers a response. The same goes for impacts on third parties, which must also be minimised. Ultimately, the system should be looked after by its supplier throughout its life cycle, to ensure that maintenance – and also training for future operators – is reliably assured for the long term.

NM: What added value can your air surveillance system offer airport operators, in addition to simply recognising a drone?

DH: Firstly, we have the edge in terms of information by being able to identify an intruding drone at an early stage. That means the control tower will alert the pilot of an incoming aircraft and not the other way around. This information edge also represents a time advantage, since an early alarm means that flights can be suspended in an orderly manner. This creates opportunities to respond appropriately to the situation rather than apply an externally controlled response. Actions appropriate to the situation also mean unnecessary expense can be avoided, since that is the only way flight operations can be resumed again swiftly. This coordinated approach also builds up a deterrent effect if it is communicated via the media in an emergency. The deterrent effect can play a critical part in preserving life and limb, since it reduces the potential risk of accidents, attacks, etc. Operators thus help to increase confidence in the safety of civilian air transport.

NH: Air security has also grown to be a very important aspect for events. How well can this be implemented in inner-city areas? Can you explain it using examples?

DH: Our GUARDION system has already been put to use, for example during the G20 summit in downtown Hamburg, and during the street party for German Unity Day in Berlin in 2018, on behalf of the Germany's Federal Office of Criminal Investigation, BKA. Urban scenarios and inner-city situations, in particular, are characterised by dense housing and therefore restricted visibility of potential drone targets for the sensors. Yet these are the very situations in which it is important to have access to a range of sensors. That's why we found that a distributed, multi-sensor approach in different locations was particularly effective.

NM: Normally, the data you gather has to be rapidly processed in an emergency, with a swift response time. What are the challenges that arise in this context?

DH: Time is a critical factor, since questions relating to complex situations must often be weighed up and decided under time pressure. Incident commanders therefore need a clear overview of the situation that is available in different locations for both stationary and mobile forces.

NM: How is the incoming information processed in such cases?

DH: To process this data and view the target destinations using a map-based overview, it is essential to have fully integrated systems with powerful core intelligence software and a directing system that has been tested in practice. This includes an intuitive user interface and having the most important information in place in the command centre, a control tower at the airport, for example.

NM: How big a role does manned-unmanned teaming play here?

DH: Manned-unmanned teaming relates only to the collaborative use of drone systems and manned aircraft. The expression “man-in-the-loop” is perhaps more appropriate for the case of drone defence since the law currently requires the decision to put countermeasures in place to be taken by an incident commander in an official position, such as a member of the police or armed forces, even though intelligent algorithms can evaluate data from various sensors like radar, wireless analysis, optical cameras and acoustics, and can reliably trigger alarms.

NM: What are the conditions the implementing parties must ensure are in place to maintain reliable air surveillance?

DH: Our practical experience shows that clear standard operating procedures (SOPs), well established technologies, systems tested in practice by the police, and well trained personnel are essential for this kind of police activity.

NM: The growing volume of commercial and civilian drone use makes it increasingly important to keep our air space safe. Can we therefore assume that every industrial park, power station and inner-city sector will have its own air safety system? Who do you believe will be responsible in the future for implementing and regulating air safety for unmanned aerial systems, and to defend against them, and how will this be done?

DH: Strategies for air security are an essential condition for the safe and orderly commercial use of drones. This includes a legal framework for the safe use of drones and coordinated efforts to monitor all drones that are legally in the air using transponder systems and unmanned traffic management networks (UTM). At the same time, we have to be capable of distinguishing these legal drone flights from illegal flights and have the technical resources available to enforce applicable law in response to deliberate misuse. Responsibility for monitoring legal requirements, all defensive actions and protecting the public lies with the police. Of course, private firms can do a better job of protecting their own interests and their physical and intellectual property against espionage using pure detection systems. This is therefore an area that is of great interest to the major automakers.

NM: You have been an exhibitor ever since U.T.SEC started. How important are these events in maintaining a focus on the question of defence against drones?

DH: Events highlighting both the safe use of drones and the risk posed by their misuse, as well as the appropriate safety precautions and countermeasures, are highly important in terms of sensitising the industry, policy-makers, industry professionals and the interested public, without causing undue worry. Comprehensive air safety will work only with a joint approach in place combining improved safety strategies, drone systems working on a collaborative basis, and improved protection using technology solutions. That is the only way for us to put a stop to uncooperative drones whose pilots deliberately act outside the law and violate applicable regulations with criminal or terrorist intent. It is precisely in this still very new sector, which still needs a more clearly defined legal framework and a uniform approach by the authorities, that events like U.T.SEC can drive forward the process of networking the various stakeholders and campaign for collaborative, targeted further action.

Security exhibitions at NürnbergMesse

NürnbergMesse has established and proven expertise in the safety and security field. With events such as Enforce Tac – Trade Fair for Law Enforcement, it-sa, it-sa Brazil and it-sa India – Trade Fairs for IT Security, FeuerTRUTZ – Trade Fair for Preventive Fire Protection as well as Perimeter Protection – Trade Fair for Perimeter Protection, FIRE & SECURITY INDIA EXPO and also U.T.SEC, it brings together a total of around 1,500 exhibitors and some 38,000 visitors from all over the world.

U.T.SEC – Summit for Drones, Unmanned Technologies & Security – will specifically address users, suppliers and experts covering every aspect of drones and security at the Exhibition Centre Nuremberg on Wednesday 6 and Thursday 7 March 2019. The patron of U.T.SEC is Hubert Aiwanger, Bavarian Minister for Economic Affairs, Regional Development and Energy.

For more information please visit: **nuernbergmesse.de/security**

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