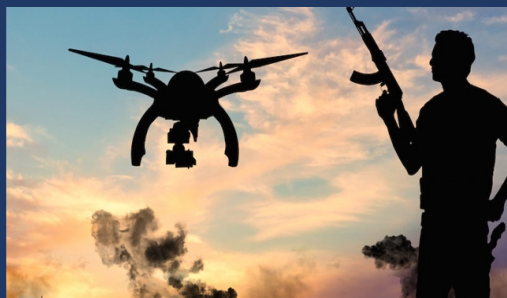
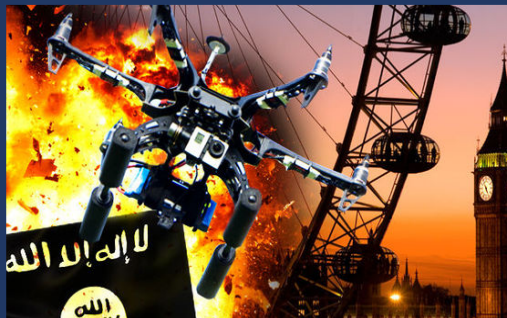




DroneWISE

Protecting public spaces from the terrorist use of drones



1. Introduction

1.1 The misuse of Unmanned Aerial Vehicles (UAVs) is a serious concern across the world as terrorists, activists and criminals adopt drone technology and develop new and creative ways in which to commit crime and terrorism. Despite measures in place to prohibited rogue drone activity, and the danger posed by the illegal use of UAVs, reports of rogue drone activity continue to occur with alarming regularity, causing substantial disruption and significant financial loss.

1.2 Recent rogue drone incidents at airports, stadiums and critical infrastructure sites have exposed fault lines in multi-agency first-responder cooperation, coordination, training, awareness and command and control processes. Therefore, the aim of the European Commission Internal Security Fund (ISFP) DroneWISE action is to: **significantly improve the security of public spaces by enhancing the cooperation and coordination between first responder agencies to effectively plan against and manage, the aftermath of a terrorist attack by use of UAVs.**

1.3 The DroneWISE project is being progressed by a multi-disciplinary consortium of partners bringing forward a broad European perspective and representing Law Enforcement Agencies, public authorities, private industry, research institutes and non-governmental organisations. The DroneWISE consortium is a unique collaboration, committed to tackling the terrorist use of UAV's which now presents a clear and present danger to the safety and security of public spaces across Europe.

2. Purpose

2.1 The purpose of this ***DroneWISE First-Responder Agency Operational Briefing*** is to disseminate information of direct relevance to all first-responder agencies arising from the first phase of project DroneWISE analysis of rogue drone incidents, drone and drone detection technologies, and the terrorist UAV threat to public spaces.

2.2 Following rigorous analysis of DroneWISE research, pertinent operational information has been extracted and is detailed in this ***DroneWISE First-Responder Agency Operational Briefing***, providing evidence of the threats and risks to first-responder agencies in their response to terrorist attacks on public places using a UAV.

2.3 The multi-agency, first-responder approach to responding to the terrorist use of drones to attack public places will be significantly enhanced if all in authority acknowledge the vulnerabilities in this ***DroneWISE First Responder Agency Operational Briefing***, and take positive steps with a degree of urgency to proactively embed the highlighted measures to develop the capacity and capability of first-responder agencies to counter drone terrorist threats targeting public spaces.



3. Terrorist UAV threat analysis

3.1 The terrorist use of UAVs as part of attack planning methodology is not an entirely new threat vector. On 20th March 1995 the Japanese cult Aum Shinrikyo (Supreme Truth), motivated by an apocalyptic ideology, placed containers of the toxic Sarin gas on five trains of the Tokyo underground network. Twelve people were killed in the attack and 5,500 commuting citizens were wounded. The police anti-terror investigation revealed the terrorist group had been experimenting with a remote-control helicopter as a new delivery mechanism, being attached with an aerosol dispersion device to release the Sarin gas. Although the terrorist group did not deploy the remote controlled helicopter component during the final operation, it provides insights to the early commitment and creativity of a terrorist group's intention to deliver mass murder by utilising the capacity and capability of UAVs.

3.2 The utility and attractiveness of UAVs for terrorist use is evidenced through their adoption by violent and insurgent groups in theatres of conflict. The Islamic State (IS) terror group first used drones to film suicide car bomb attacks, being posted online by militants as part of their propaganda campaigns to raise awareness to their cause and to recruit and radicalise others to their ranks. As their use of drone technology advanced, American and Iraqi military commanders revealed that IS drones were employed to support and engage in direct action on the battlefield.

3.3 During 2016, when Kurdish forces fighting IS in northern Iraq shot down a small drone the size of a model airplane, they believed it was like the dozens of drones the terrorist organisation had been flying for reconnaissance in the area. Seizing the drone and transporting it back to their outpost for further examination, the captured drone was thought to be able to provide intelligence on IS drone operations. But as they were taking it apart, the small Improvised Explosive Device (IED) contained inside detonated, killing two Kurdish fighters in what is believed to be the first time IS has successfully used a drone with explosives to kill troops on the battlefield. The drone IED attack was then followed by further IS drone operations, prompting American commanders in Iraq to issue a warning to forces fighting the group to treat any type of small flying aircraft as a potential explosive device.

3.4 Contemporary terrorist attacks across Europe have shown a recurrent targeting of public spaces, exploiting the intrinsic vulnerabilities of these so-called "soft targets" that result from their ready access and public character. Such attacks across Europe has concerned pedestrian precincts, tourist sites, transport hubs, shopping malls, outdoor markets, concert halls, city squares and places of worship, as seen in attacks in, for example, Barcelona, Berlin, Brussels, London, Manchester, Nice and Stockholm. In the search for new and effective ways in which to deliver mass casualty attacks and cause major disruption, it is expected that terrorists and terrorist groups will flirt with new technologies which now includes determined attempts to harness the capacity and capability of drones to attack crowded public spaces.

3.5 For terrorists, the accelerated development of drone technologies presents a unique opportunity to support ever more sophisticated surveillance activities, being used to conduct hostile reconnaissance on a target location, for ongoing mission support during an operation providing increased situational awareness, or as a rudimentary cyber surveillance platform to collect local electronic communications that are not well encrypted. But the gravest concern remains the continued exploration of terrorists to harness drones for the delivery of chemical and biological agents.

3.6 The terrorist threat from drones is currently outpacing the ability to respond to terrorist groups who aspire to use armed drones against homeland targets and interests overseas. But there are also a number of ways that drones can be used in a nonviolent manner by terrorist groups, including as a form of disruption at airports and protest for propaganda purposes, actions that can garner publicity for terrorist causes.

3.7 The terrorist use of drones serves to highlight the diverse range of methods used to progress extreme political, ideological or religious agendas and all in authority should not be surprised by the creativity, ingenuity or deadly determination of terrorists in seeking new ways to deliver mass murder, nor should they believe that tactics used by terrorist groups in different parts of the world will not be used in domestic attacks.

3.8 Every rogue drone incident at airports, stadiums, critical infrastructure sites and at public places reinforce security concerns, and inadvertently signal to would-be terrorist plotters the fault lines and significant vulnerabilities in the ability of public authorities and first responder agencies to prevent and protect public spaces from all manner of rogue drone-related incidents from the full range of small, medium and large commercially available UAVs.

4. Countermeasures

4.1 Taken together, the malevolent use of drones to disrupt, damage and destroy provides a complex and challenging threat landscape. The security challenges posed by the nefarious use of UAV technology are not insurmountable, but will require a determined, committed and collaborative response.

4.2 The UAV terrorist threat vector reveals a set of challenges that are now required be addressed by the respective authorities in order to improve their response to a variety of drone related incidents. As an important starting point, all first-responder agencies should have in place a detailed and documented drone response methodology, including Standard Operating Procedures, which is needed by relevant partner authorities, being fine-tuned to the specific nature of potential UAV terrorist threat scenarios in their jurisdiction.

4.3 Guidelines for responding to drone attacks taking place in specific crowded areas without jeopardising the safety of citizens should be drafted. Training of the related personnel in drone and drone-detection technology and terrorist threats is a fundamental step towards delivering a safe and effective incident response.



4.4 Trainings should be also designed, developed and delivered so the relevant authorities will be able to recognise specific drone attributes such as type, payload etc, serving to improve the initial sighting and detailed reporting of drone incidents.

4.5 All in authority must now examine and explore the efficient use of currently available counter-drone surveillance systems to better understand their capacity and capability. All in authority should encourage demonstrations of Counter-Unmanned Aerial Systems (C-UAS) to observe products in operation to ensure their effectiveness and seamless integration with existing security measures to enhance the broader strategic approach to counter the UAV terrorist threat to public spaces.

4.6 Training should be designed, developed and delivered to all first-responder agencies to improve professional competence when responding to a terrorist UAV event at a public space. An important part of this training will be the communication of safety concerns when responding to such an incident, alongside the appropriate forensic recovery of drones for post-incident analysis and continued investigation. This training must include inputs from the **INTERPOL Framework for Responding to a Drone Incident** which provides guidelines for First Responders and Digital Forensics Practitioners on how to respond to a drone incident. The INTERPOL framework is intended to provide technical guidance in managing and processing an incident.

4.7 To mitigate rogue drone risks, all in authority would be wise to learn that responding to the threat of drones is ineffective without fully understanding the threat landscape through increasing knowledge of drone and counter-drone technologies, alongside assessing motivations from hostile actors and specific risks and vulnerabilities of their intended target.

4.8 To defeat all manner of rogue drone threat vectors, the procurement and deployment of appropriate equipment is required, combined with the integration of that equipment into a comprehensive and coherent counter-drone strategy that is synchronised with existing security operations, and embedded within the very culture of resilience planning.

5. Conclusion

5.1 Given the persistent severity of the terrorist threat, governments across the world no longer accept that they should simply prepare to respond to the types of terrorist attack already encountered. All in authority now recognise that this reactive posture will not preserve their national security and so an increasingly proactive and creative approach has been implemented, dedicated to identifying new and emerging terrorist threat vectors, founded upon the security principles of preparedness and assessing risk and managing the consequence of past, present and future terrorist events. This new proactive posture now forms an essential part of tackling contemporary terrorism. One such emerging threat is the adoption of drones as a tactical attack planning option for terrorists to cause mass disruption, damage economic stability and threaten security. The adoption of drones for terrorist purposes is now a significant security concern for governments across the world.



5.2 Drones are becoming increasingly sophisticated which makes them more attractive for legitimate use, but also for hostile acts. The possible terrorist attack on a public place by means of an unmanned drone that could be equipped with biological warfare agents presents a clear and present danger. The terrorist use of UAVs, which has already materialised in theatres of conflict with devastating impact, are tactics and techniques that could be used as part of domestic terrorist events in Europe.

5.3 The new era of global international terrorism reveals with alarming regularity that terrorist plotters achieve their intended objectives, defeating all of the state's security measures put in place at the time. Unfortunately, this pattern is not set to change, governments across the world will prevent further terrorist atrocities, but there is a very strong likelihood that they will not stop them all. In the light of that conclusion, all in authority must dedicate themselves to increasing their knowledge and understanding of counter-terrorism and the new threat vector of the deadly and determined terrorist use of drones to attack public spaces.

6. Action

6.1 The multi-agency first-responder approach to responding to the terrorist use of drones to attack public places will be significantly enhanced if all in authority acknowledge the threats, risks and vulnerabilities in this ***DroneWISE First Responder Agency Operational Briefing***, and positive steps are taken with a degree of urgency to proactively embed the highlighted **countermeasures** to develop capacity and capability of first-responder agencies to counter drone terrorist threats.

6.2 All first-responder agencies must now examine their capacity and capability to effectively respond to a UAV terrorist attack on a public space, and take positive steps to develop a coherent and coordinated multi-agency plan to implement in response to a UAV terrorist attack. Moreover, this plan must be developed in collaboration with multiple first-responder agencies and other civil departments engaged in crisis response, and made subject to rigorous review and regular testing and exercising to ensure the joint response keeps pace with the developing UAV terrorist threat landscape.



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