The drone revolution?

Drones (also known as UAS, UAVs, RPAS etc) are changing the world of civil emergency response and the acquisition for safety-critical tasks of 'Incident Intelligence' as we currently know it.

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Innovative drone technologies, which are rapidly emerging and evolving, are seducing public safety organisations with the promises of reducing search times, improving situational awareness, enhancing team safety, reducing costs, or even perhaps delivering medical supplies ahead of the rescue teams.

Drones are credited with saving lives faster, safer and more cost effectively than ever before. Many examples were presented at the EENA Drone & Public Safety Summit, which took place in September 2018, in Brussels, Belgium. One outstanding example was put forward by Onofrio Lorusso, of the Air Rescue Coordination Office of the Italian National Fire Corps (CNVVF). They used their RPAS in rescue operations during the Morandi Bridge collapse in Genoa, Italy in August 2018.

Support services

Drones are used to provide a range of services to support all emergency services at a large variety of incidents, tasks which include (the limitations of which are clearly unbounded): SAR, major disaster response, on-scene investigations support, HAZMAT operations, toad traffic collisions, USAR, reconnaissance on wide area floods, complex incidents, crowd control/ supervision/surveillance, large-scale industrial fires or structural fires, earthquakes, tsunamis, major multi-agency public events or at incidents to aid 'JESIPs'.

No emergency service around the world is immune from the effects of this 'disruptive technology', from law enforcement through to voluntary search and rescue organisations and more. No-one can ignore the drone revolution!

Data driven

The drive for innovation in pursuit of efficiencies by the first responder services is clearly supported by the adoption of technology that is empowering the acquisition of data. This is particularly interesting to note, as many people seem to confuse drones as a complete solution, rather than realising they are simply a tool for capturing data, which ultimately empowers the 'first responder business'.

Externally to the 'first responder business', at around £104bn[1], the 'drone revolution' is booming. The 'Single European Sky ATM Research (SESAR), European Drones Outlook Study, November 2016', said that, "The development of the civil drone industry is dependent on the ability of drones to operate in various areas of the airspace, especially at very low levels that today are generally defined as being below 150 metres. In aggregate, some 7 million consumer leisure drones are expected to be operating across Europe and a fleet of 400,000 is expected to be used for commercial and government missions by 2050." Examples of some of the most influential missions, in terms of the potential number of drones and economic impact, include 'Public safety and security', where a forecasted fleet of approximately 50,000 drones would provide police and fire and rescue services the means to carry out civil protection and humanitarian missions.

Safety and security

With drones having already proven their worth in times of crisis. To do that reliably and at scale, rules need to be put in place to ensure that these UAS are reliable and safe to operate within the intended U-space fields (U-Space, the management system for drones in the European VLL – very low level – airspace). It refers to the 'drone allocated' low-level airspace and covers the ecosystem of services and specific procedures necessary for reliable and safe drone operations. Overlooking the importance of a proper legislative basis to regulate this potential use of drones poses a great risk to the safety of people on the ground and in the air.

However, among the optimism is an increasing concern about the security and safety threat that this technology presents to the commercial sectors, critical national infrastructure and national security.

> ## "The increased technological capabilities, affordability and availability of recreational and professional drone aircraft has introduced a whole host of new, unprecedented security concerns for us all."

Gatwick Airport was thrown into chaos over Christmas 2018 because this major international airport was shut down after an illegally flown drone repeatedly infringed their airspace. Reports said 760 flights were grounded and 110,000 people were stranded. The shutdown at Gatwick renewed calls for the use of anti-drone technology at British airports, including frequency jammers and early warning systems (now common in the USA).

Clearly, as 'High Reliability Organisations', emergency services are hard-wired to conduct relatively error free operations and attempt to identify all of the risks when using drones, and outline the steps that have been taken to reduce the risk. Generally, the potential risks include: weather – current and forecast conditions; human factors; equipment – limits and failures; overhead obstructions; proximity to buildings; over crowds; device jamming; and GPS failure etc.

Risk mitigation

Many aspects of 'risk mitigation' in the use of or the effects of the use of drones, legitimate or otherwise, is being questioned vigorously, especially in the media.

The increased technological capabilities, affordability and availability of recreational and professional drone

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aircraft has introduced a whole host of new, unprecedented security concerns for us all. Criminal and terrorist organisations have already started using drones for a wide variety of illegal activity, eg spying on police, smuggling contraband into prisons and dropping explosives (recall the drone attack on Venezuela President Nicolas Maduro, in August 2018).

Threats and risks can also arise to first responder usage from 'counter drone devices' or strategies. For example, when the Ministry of Defence was reported it had deployed 'specialist equipment' to deal with the Gatwick Airport situation after police requested help. What could that be? Could they have requested soldiers to use a weapon, maybe a 'Drone Dome' or 'kill-jammer', maybe "soft killing" a drone by knocking out its communications or 'hard killing' it by shooting it down with a laser from a distance or perhaps jamming the radio or GPS signals. The MoD reportedly did not confirm what it meant by 'specialist equipment'. The point being, when deployed, some counter measures can be area wide in their effects and could inadvertently affect the legitimate users.

There are the issues of understanding the effects of counter measures for their positive aspects AND, when in the wrong hands, their negative effects, eg enabling the high-jacking of a first responder drone for criminal or terrorist purposes. One wonders how that would play out in the media?

Currently there is no easy or quick technological solution for combatting malicious use of drones in the civil environment, while others are going about their lawful business, it is therefore unlikely that any government is wasting time in developing new counter-UAS/drone technology to better mitigate this threat.

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Reference:
1. https://www.cips.org/en/supply-management/news/2018/may/drone-market-worth-127bn/