



DroneWISE

Countering the terrorist use of drones



Drone accident reveals danger to public

Issue 4 | DroneWISE | Monday 7th September 2020

A UK Air Accident Investigation Branch (AAIB) report published last month examined a drone incident last year which provides an insight to the dangers drones currently pose. On 13th December 2019, a DJI M600 Pro drone collided with a house roof after a GPS-compass error occurred in Wallsend, Tyne and Wear in Northumberland.

The drone was being operated in an automated flight mode to survey a construction site when a GPS-compass error caused the aircraft to revert to a flight mode that required manual control. By the time the professional drone pilot and observer realised that it was not responding to the return-to-home (RTH) function, visual line of sight (VLOS) of the drone was lost when the aircraft drifted with the wind beyond a line of trees.

The drone subsequently collided with the roof of a house before falling into the property's rear garden. Fortunately, no persons were injured from the falling 12kg drone which was fitted with an under-mounted camera. At the time of the incident, the qualified drone pilot, and the observer who was also a qualified drone pilot, had operated drones since 2018 and had the required permissions from the UK Civil Aviation Authority (CAA). Both pilots had relied predominantly on the automated flight capability of their aircraft and had not, nor were required to have, practised for emergencies since completing their flying training in 2018.

The AAIB concluded that the professional drone pilot was required to take manual control of the aircraft following the loss of its automated flight modes due to signal interference. However, no manual control inputs were made, and the aircraft subsequently drifted with the wind until it collided with a house roof and fell to the ground. The AAIB noted that operators holding a Permission for Commercial Operations (PfCO) issued by the CAA are not currently required to practise routinely for emergencies or demonstrate the ability to fly their aircraft in a degraded flight mode. The AAIB reported that: "These skills are perishable but, as this accident shows, they may be needed at any time; it is important that they are maintained to prevent a risk of injury to people or damage to property."

To address this concern, AAIB recommended that the CAA require drone operators issued with a PfCO include in their operations manuals the need to practise routinely the actions to take in the event of emergencies, and specify how pilots will remain competent at maintaining manual control of their aircraft in the event that automated flight modes are lost. The operator's pilots have now undergone refresher training on responding to emergency situations and operating their multi-rotor drones in the altitude flight mode.

Dave Fortune, Director of Saher (Europe) stated: "The UK drone incident provides evidence that regular training for pilots is required, especially testing the continued control of drones during emergency situations due to technology or communication link malfunctions."

The drone incident in the UK has raised concerns for the potential of injury to members of the public, which is a major component of the DroneWISE project. The risk of injury to members of the public from out of control drones from careless or reckless pilots remains low but with the continued proliferation of drones above European towns and cities, when combined with a sustained terrorist threat, the danger of causing injuries and potential fatalities must be a lesson to be learned from this incident.

In its report the AAIB revealed that it was not aware of any research relating to the potential for injury from a falling drone. However, the AAIB did state that in the 1990s a Dropped Object Prevention Scheme (DROPS) was introduced as part of a safety initiative by the UK Oil and Gas industry. This program has since expanded to include 200 organisations, with the development of a DROPS analysis calculator. This calculator provides an indication as to the possible outcome of a blunt object in free fall striking a person wearing personal protective equipment (PPE), such as a hard hat and eye protection.

According to the AAIB report, the analysis using the DROPS calculator indicated that a blunt object with a mass of more than 2 kg falling from a height of 6 metres, which was the approximate height that the aircraft fell from the roof of the house, could result in a fatal injury to someone wearing a hard hat. Most importantly, the mass of the DJI M600 Pro drone in the incident was measured at 12.8 kg, far greater than the weight predicted to prove potentially fatal.

Andrew Staniforth, Director of Saher (Europe) stated: "The AAIB report provides a real safety concern and the recommendations and lessons learned will be directly fed into the Law Enforcement Agency and first-responder agency training and handbook being developed as a key part of project DroneWISE outputs."

Reference: UK Government, Air Accident investigation Branch DJI M600 Pro (UAS, registration n/a) 131219 Report [Online] <https://www.gov.uk/aaib-reports/aaib-investigation-to-dji-m600-pro-uas-registration-n-a-131219>

For further information please email: dronewise@saher-eu.com or to keep updated with project activities visit: <https://dronewise-project.eu> or follow the project on Twitter: [@DroneWISE_EU](https://twitter.com/DroneWISE_EU) and LinkedIn: <https://www.linkedin.com/company/dronewise-project>

