



Prospect Aviation Group Position Paper on Unmanned Aerial Vehicles

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Introduction

Prospect is an independent trade union representing over 113,000 professional, managerial, technical and scientific staff across the private and public sectors. Our members have a range of jobs in a variety of different areas including aviation, agriculture, defence, education, energy, environment, heritage, nuclear decommissioning and scientific research. Many of our members work in safety critical occupations and/or regulated industries.

Prospect's Aviation Group is responsible for over 5,000 members working in civil aviation. Our aviation branches cover Licensed Engineers in airlines and aircraft maintenance and repair organisations, Air Traffic Control Officers and systems engineers, and a number of management and operational staff in airports. The Group published a well-received analysis of the state of the industry in September 2015.¹

This document sets out the union's position on how Unmanned Aerial Vehicles (UAVs, popularly called drones and referred to as RPAS – Remotely Piloted Aircraft Systems – by the European Regulator, EASA) should be monitored, regulated and controlled with a view to ensuring that public safety is not compromised by the increased use of UAVs.

Recent publicity surrounding suspected air misses involving drones reflects growing public awareness of the rapid development and growing use of this technology. The announcement of a Modern Transport Bill in the Queen's Speech this month made the development of unmanned vehicles a strategic priority for the government.

Prospect's ATCOs' Branch has been monitoring the increasing number of reports of encounters with UAVs across the sector. And our Association of Licensed Aircraft Engineers Branch has questioned whether and, if so, how the airworthiness of these aircraft will be assured.

Our sister union BALPA has questioned whether the remote operators of drones will need to be trained and licensed, especially if their flights are for a commercial purpose.

There are lots of questions – most of which reflect public concern – but, as yet, few answers. The questions can be summarised as "How will the growing commercial use of UAVs be regulated?"

Definition of an Unmanned Aerial Vehicle

Unmanned Aerial Vehicles (UAVs) are defined as an aircraft with no pilot on board. They can be remotely controlled by a pilot on the ground or flown autonomously following a pre-defined route.

UAVs can also be referred to as drones, remotely piloted aircraft systems or quadcopters by the wider public and media; this document will refer to them simply as UAVs but it is intended to cover all aircraft that do not have a pilot on board.

Commercial v 'hobby' UAVs

There is a clear differentiation between UAVs used for commercial reasons and hobby UAVs that a member of the public can purchase cheaply and easily. The CAA has created

¹ *Towards a sustainable aviation industry for the UK: after the Airports Commission*, Prospect September 2015 <https://library.prospect.org.uk/download/2015/01106>

a definition for 'small' and 'large' UAVs – small UAVs being less than 20kg, operating below 400ft and being in direct visual contact with the operator.

Whilst this basic definition is acceptable, it is likely that not all 'hobby' operators will comply with these rules. A quick internet search will show how easy it is to modify the performance of smaller UAVs to enable higher operating altitudes and distances.

Commercial UAVs will clearly operate on far longer flights than those conducted by a hobby UAV. They are also likely to be considerably larger aircraft, especially if operated by logistics companies and even more so if those operations include bulk movement of goods between distribution centres.

Commercial UAVs are unlikely to have direct line-of-sight human control, or – where flying pre-defined routes – may have no human control at all. But they will need to integrate safely with civil and general aviation operating within prescribed airspace rules and regulations.

Integration of commercial UAVs within controlled airspace

Prospect acknowledges that the use of drones will become more prevalent – it is certain that a number of commercial companies and government agencies wish to use UAVs for delivery services, aerial surveys and surveillance. The government has made it clear that it sees the development of this sector as a driver for growth. Given the government's position on 'red tape', the government is likely to favour 'light touch' regulation of what is a new industry.

But there is considerable doubt as to how UAVs will be operated within controlled airspace. Prospect has the following concerns:

- Who are the 'pilots' of these UAVs?
- What experience level and training have these pilots had?
- How quickly can intervention be sought if a UAV needs to alter its flight trajectory?

These are some of a number of areas requiring clarification from the Civil Aviation Authority and the operators of UAVs prior to their full introduction into UK airspace.

Risk to aircraft

A long-standing concern from both aircrew and Air Traffic Controllers has been the risk to an aircraft if it is involved in a collision with a UAV. Reports of encounters between aircraft and UAVs are increasing at an exponential rate. Some of these encounters have been reported as an Airprox.² The encounters are not limited to low level; a number of reports received by Prospect ATCOs' Branch members have concerned aircraft encountering UAVs above 3,000ft.

The unknown in this instance is what would happen to an aircraft if there was a mid-air collision with a UAV. The potential for airframe damage, engine damage and crew

² Airprox: a situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised.

<https://www.airproxboard.org.uk/home/>

incapacitation is, as yet, unknown. We can surmise that there will be damage caused to the aircraft; however, it is not clear if an aircraft will be able to land safely following a collision. Prospect calls on the CAA and aircraft manufacturers to investigate fully the potential effects of a collision between a UAV and an aircraft.

We can speculate that the UAV is unlikely to survive a collision with an airliner. If the collision takes place over a residential area, the public safety implications are obvious.

It cannot be overstated that the psychological effects on a controller who experiences a mid-air collision between an aircraft under their control and a UAV will be significant.

Terrorism risk

It is clear that there is the potential for UAVs to be used by terrorist groups to cause harm either to people on the ground or to aircraft in the air. It is fair to say that the regulation of UAVs is unlikely to prevent this, but the risks still have to be assessed and mitigated so far as is possible.

Controller workload following UAV encounter

A number of members of Prospect's ATCOs' Branch have experienced pilots reporting an encounter with a UAV in UK airspace. Present rules require a CA4114 to be filed by the controller, along with reporting the location of the encounter on the R/T for a period of time following the report. This clearly increases workload for the controller. Additionally, aircrew may wish not to route into the affected airspace – thus further increasing controller workload.

Longer-term airspace ownership

In late 2013, Jeff Bezos (CEO of Amazon) revealed plans for Amazon Prime Air with the intention to use autonomously-flown UAVs to deliver packages to customers. It is inconceivable that Amazon – or some of the numerous other companies examining the commercial potential of drones – will not want to move items between main warehouses and local distribution hubs as well; something that would require much larger aircraft flying longer distances at greater height.

The intention is to fly the first wave of UAVs at low altitude, but it is clear that they will need integration into the UK airspace network. Will this be integration with present traffic, or will it see Amazon Prime Air 'owning' sections of airspace and using this airspace exclusively? This clearly affects both UK air traffic management and also potentially closes or restricts airspace for general aviation.

UK government

The Queen's Speech on 18 May 2016 announced a Modern Transport Bill. At present, there is not much detail, but it did entail press reports outlining the government's objectives as aiming to cut red tape and put in place a framework to encourage innovation in transport technology. In particular, light touch regulation will, the government contends, encourage investment in autonomous vehicles – be they driverless cars or UAVs.

The economic benefits of being at the forefront of UAV design and development are clear, but the need for regulation and safety appears not to be at the forefront of ministers' minds.

European regulation

Aviation safety strategy in the UK is led by EASA – the European Aviation Safety Agency. The UK Civil Aviation Authority has direct input into EASA, but is increasingly simply the UK enforcer of EASA regulations. However, in the case of UAVs, EASA's thrust is to delegate much of the detail to the national authorities.

Prospect broadly supports the 27 proposals contained within the EASA Technical Opinion, *Introduction of a Regulatory Framework for the Operation of Unmanned Aircraft* published in December 2015.³ We are, however, cautious about the suggestions made within that document and the European Commission's *Aviation Strategy for Europe*⁴ (Chapter V 4.1) that a risk-based approach to regulation of UAVs is to be favoured. The increasing introduction of UAVs into private and corporate use needs stronger regulation during these early periods of development and expansion – in effect, while the risks are being established and assessed.

Conclusions and recommendations

Prospect acknowledges the rapidly-developing markets and possibilities for the use of UAVs. The opportunities for individuals and business are mostly positive; however, we are concerned that the integration of UAVs with commercial and general aviation within UK airspace poses considerable safety risks.

The current regulation of UAVs needs urgent reassessment given the increasing number of reports of encounters with UAVs at both low and high altitude. The CAA must consider how to reinforce the regulation of UAV flying and ensure that all UAV operators abide by any rules that they set.

There is a clear need to assess the potential damage that may be caused to an aircraft should it collide with a UAV; while a UAV suffering a mechanical or systems failure could pose significant risks to the public if it crashed into a residential area or into an industrial facility.

It is possible that all UAVs, be they for hobby or commercial purposes, need constant monitoring and the ability to identify who they are being flown by and where they are being flown. The CAA should investigate how feasible such a monitoring programme would be. The licensing (at a minimum, certification of the training) of 'pilots' working for commercial operators should be mandatory.

The airworthiness of all but the smallest UAVs should be regulated – at production and sale through type approval and then through periodic certification of their maintenance. This is an essential *preventative* measure.

We call on the CAA, the DfT, BALPA, airlines and airport operators to collaborate with Prospect in developing a joint approach to understanding the implications of UAV operations on aircraft and UK airspace; and to develop adequate regulations to secure the safe operation of and public confidence in this new economic activity.

³ <https://www.easa.europa.eu/document-library/opinions/opinion-technical-nature>

⁴ http://ec.europa.eu/transport/modes/air/aviation-strategy/index_en.htm