

**Health and Safety
Performance Standard HSPS 015**

Use of Drones

Safety, Health and Environment Unit

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1. Introduction

Drones are becoming more popular as a teaching and research tool. The legal framework that regulates how they are operated is still developing and can be confusing. Drones do have the potential to cause serious harm to people and property, even causing deaths in rare cases. This policy aims to make sure that use of drones at the University is legal and safe.

Drones are called many different things in different documents. They may be referred to as Remote Piloted Aircraft Systems (RPA/RPAS), Unmanned Aerial Vehicles (UAV's), Unmanned Aircraft Systems (UAS's), Small Unmanned Aircraft (SUA's), Small Unmanned Surveillance Aircraft (SUSA's), multi-rotors, quadcopters, etc.; the list goes on. In this document we use the term drone to refer to remotely operated multi-rotor vehicles weighing less than 20 kg. This policy applies to all use of such drones on behalf of the University, whether in teaching, research or consulting activities.

Fixed wing vehicles and those weighing more than 20 kg are subject to more stringent legal, safety and insurance requirements. Any member of the University wishing to use such equipment should contact the Safety, Health and Environment Unit in the first instance.

2. Legal Framework

In legal terms within the United Kingdom drones of any size, even those that we may think of as toys, are considered aircraft and are subject to the rules contained within the Air Navigation Order (ANO) 2009, amended 2015. The ANO is enforced by the Civil Aviation Authority (CAA). Under the ANO it is the drone operator who holds legal responsibility for flight safety and will be deemed personally responsible, and potentially personally prosecuted, for any breaches of ANO rules. The CAA has also provided detailed guidance regarding drones in the document CAP 722, Unmanned Aircraft System Operations in UK Airspace: Guidance.

Aspects of Health and Safety legislation also apply. These include the general duties contained within the Health and Safety at Work Act, the need to carry out a risk assessment that comes from the Management of Health and Safety at Work Regulations, and the requirements of the Provision and Use of Work Equipment Regulations.

Use of drones is also restricted by limitations set by the University's Insurer.

If any drone operations collect data, operators should be aware of the requirements of the Data Protection Act. Guidance covering this is published on the Information Commissioners Office website as well as in section 7.3 of the CCTV code.

Anyone wishing to operate a drone abroad must check with the National Aviation Authority of the country they are visiting what rules apply.

3. Use of Drones at the University

It is University policy that drones used on behalf of the University, in research, teaching, study, etc. must obey the relevant ANO rules. In addition, where insurance requirements place greater limitations on their use, the insurance restrictions must be followed.

The relevant ANO rules are

3.1 Article 166: Small unmanned aircraft

- 1) A person must not cause or permit any article or animal (whether or not attached to a parachute) to be dropped from a small unmanned aircraft so as to endanger persons or property.
- 2) The person in charge of a small unmanned aircraft may only fly the aircraft if reasonably satisfied that the flight can be made safely.

- 3) The person in charge of a small unmanned aircraft must maintain direct, unaided visual contact with the aircraft sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions.
- 4) The person in charge of a small unmanned aircraft which has a mass of more than 7kg excluding its fuel but including any articles or equipment installed in or attached to the aircraft at the commencement of its flight, must not fly the aircraft:
 - a) in Class A, C, D or E airspace unless the permission of the appropriate air traffic control unit has been obtained;
 - b) within an aerodrome traffic zone during the notified hours of watch of the air traffic control unit (if any) at that aerodrome unless the permission of any such air traffic control unit has been obtained; or
 - c) at a height of more than 400 feet above the surface unless it is flying in airspace described in sub-paragraph (a) or (b) and in accordance with the requirements for that airspace.
- 5) The person in charge of a small unmanned aircraft must not fly the aircraft for the purposes of aerial work except in accordance with a permission granted by the CAA.

Guidance on Article 166

Paragraph 2: This perhaps is the most important rule as it is very general and almost by default any accident involving a drone suggests that this rule has not been met. Advice on actions to consider to ensure this rule is met are given in the Flight Safety section.

Paragraph 3: The CAA generally consider that for this rule to be met drones should not be operated at a height of more than 400 feet and a distance of more than 500 metres from the operator. These are limits re-enforced by the University's insurers.

Paragraph 5: Aerial work is defined as circumstances where valuable consideration is given or promised in respect of a flight. At its simplest valuable consideration is payment, but its meaning is much wider than that and can refer to the provision of goods and services. With respect to research, data collected exclusively for the operator's own use, such as data collected as part of a research project and intended for publication, would not usually be considered aerial work as long as the research was not directly funded by a business that intends to use the data for its own business purposes. Alternatively flights undertaken for contracted research for an external company or on a consultancy basis would be aerial work and requires a CAA permit.

In addition the CAA have provided the following guidance regarding aerial work stating that:

Flying operations such as research and development flights conducted in house are not normally considered as aerial work provided there is no valuable consideration given or promised in respect of that particular flight.

This is interpreted to mean that flights exclusively undertaken for research and development of drones and associated technology should not be considered aerial work.

In determining whether a flight is aerial work the essential question that should be asked is 'if payment / valuable consideration were not received for making the flight, would it still take place?'

3.2 Article 167: Small unmanned surveillance aircraft

- 1) The person in charge of a small unmanned surveillance aircraft must not fly the aircraft in any of the circumstances described in paragraph (2) except in accordance with a permission issued by the CAA.
- 2) The circumstances referred to in paragraph (1) are:
 - a) over or within 150 metres of any congested area;
 - b) over or within 150 metres of an organised open-air assembly of more than 1,000 persons;

- c) within 50 metres of any vessel, vehicle or structure which is not under the control of the person in charge of the aircraft; or
 - d) subject to paragraphs (3) and (4), within 50 metres of any person.
- 3) Subject to paragraph (4), during take-off or landing, a small unmanned surveillance aircraft must not be flown within 30 metres of any person.
 - 4) Paragraphs (2)(d) and (3) do not apply to the person in charge of the small unmanned surveillance aircraft or a person under the control of the person in charge of the aircraft.
 - 5) In this article ‘a small unmanned surveillance aircraft’ means a small unmanned aircraft which is equipped to undertake any form of surveillance or data acquisition.

Guidance on Article 167

Paragraph 2: The CAA have clarified what is meant by the phrase ‘congested area’. A congested area is any area of a city, town or settlement which is substantially used for residential, industrial, commercial or recreational purposes. It is important to note that under this definition for an area to be ‘congested’ it does not have to be populated with people at the time of the flight. The term ‘over’ is taken to mean directly overhead at any height.

Where the phrase ‘under the control of’ is used this means more than ‘under the supervision of’. It requires that any people present, including those in a building or vehicle, are there either solely to participate in the operation of the drone flight or are essential site personnel. These individuals must be expected to follow the directions of the drone operator and any safety precautions so that no unplanned interaction with the drone occurs. Simply put any flight will have a ‘footprint’ on the ground below the aircraft. No one unconnected to the drone operation should or should be able to enter this footprint during the flight.

Paragraph 5: Note that while the commonest type of surveillance equipment is a camera, it includes any data acquisition device that is monitoring anything other than the performance of the drone itself. If a drone possesses any such equipment all the above rules apply.

3.3 Additional insurance requirements

The additional restrictions imposed by the University’s current insurance arrangements are:

- 1) Drones must not be flown in controlled airspace, i.e. class A, C, D or E airspace or within an aerodrome traffic zone. This is regardless of drone weight or whether permission from air traffic control has been obtained. In simplistic terms this means that no flights are allowed within several miles of most airports. If you unsure you should consult the relevant airspace map.
- 2) Drones must not be flown at a height of more than 400 feet above the surface. Again this is regardless of drone weight or whether permission from air traffic control has been obtained.
- 3) Drones must not be flown over or within 150 metres of any congested area. This is regardless of whether or not they carry surveillance equipment or whether permission has been granted by the CAA.
- 4) Drones must not be operated more than 500 metres from the point of operation.

Any member of the University wishing to carry out a drone operation that conflicts with the restrictions imposed by the current University insurance cover should discuss this with the Safety, Health and Environment Unit in the first instance.

Note that only drones owned and operated by the University are covered by the University’s Public Liability Insurance. For this reason it is preferable that drones used in teaching or research activities are University owned. Schools and Departments should register any drones that they may purchase with the Safety, Health and Environment Unit and the Insurance Office. Drones owned personally by staff or students are not covered by University insurance. For this reason it is preferable that such drones are not used in teaching, research or study. If they are, they must be covered by appropriate third party liability insurance: the current minimum cover required being £750,000.

The University Public Liability Insurance covers drone operations carried out using University owned and operated equipment worldwide with the exception of USA and Canada. However, anyone using drones outside of the UK should make themselves aware of the local rules for drone use.

4. Use of Drones on the University's campuses

For any drone flight to be legal, the land owner must give permission for take-off and landing. The only circumstances for which permissions will be granted to fly on University property is where the drone is being used as part of the sanctioned research or teaching activities of an academic School or where a commercial drone operator has been contracted to undertake a specific activity such as a building survey or event filming. With respect to teaching and research, permissions will cover programmes of work and individual permissions will not be required for individual flights. Permissions should be sought through contacting Jim Bloor in the Safety, Health and Environment Unit in the first instance. In his absence contact Bernard Angus. Permissions will consist of a general permit to operate on University property, use of a specific area must be organised separately with those who have responsibility for managing that area. It should be noted that to meet the requirement of the University Insurers that drones must not be flown over or within 150 metres of any congested area there is very little of the main campus at Canterbury, including the Sports Fields and Southern Parklands, and none of the Medway campus over which flights can be made.

To be clear, the University does not permit recreational use of drones on its property by any person, be they staff, student or visitor.

5. Drone Flight Safety

All drone flights must be subject to a suitable and sufficient risk assessment. Not only will this ensure that the drone operator and anybody potentially at risk from the flight operation will be safe, it will also ensure that the general ANO rule that operators must be reasonably satisfied that all drone flights are safe will be met. A good starting point for any risk assessment are the rules from article 167 of the ANO. Although they specifically only apply to surveillance drones, they represent good safety practice and it is recommended that they are followed for all drone flights. Those that are also insurance requirements must be followed. In addition drone flights should never be carried out alone. A second person must always be present to enable the alarm to be raised in case of an accident.

The risk assessment should also consider the following:

1. **Training.** Do the drone operator, flight supervisor (if different from the flight operator) and flight observers have an appropriate level of training? Has this been documented?
2. **Planning.** Where is the take-off/landing zone sited? Has a formal permission from the landowner / manager been obtained? Are there any site specific hazards or risks? What are the roles of the individuals present? Have they been properly briefed on their role? What is the weather going to be like? Will it cause any problems for the flight?
3. **Prior incidents.** Have the lessons learnt from previous accidents, near misses or deviation from a flight plan been considered?
4. **Equipment maintenance.** Has the drone been properly maintained? Have battery logs been consulted to ensure that there is no decline to battery performance?
5. **Fail-safes.** Are fail-safes in place to deal with loss of the control signal with and without GPS? Have they been tested recently? (When flying regularly, they should be tested monthly). Can any autonomous or semi-autonomous operations be overridden by a remote operator who is able to take direct control of the flight at any stage? Have operators practised flying without the aid of GPS?
6. **Emergency procedures.** Are there emergency procedures in place for accidents, drone fly away, operator incapacitation, etc.?

Checklists covering, for example, drone maintenance, pre-deployment operations, pre-flight operations and post-flight close out are a useful way of ensuring that all aspects of flight safety have been checked.