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Operational Guidance for the use of Small Unmanned Aircraft

(also known as UAVs, UAS, RPAS, Drones, Quadcoptors, Model aircraft etc)

1. Visual Line of Sight Operations

1.1 Operating within Visual Line of Sight (VLOS) means that the remote pilot must be clearly able to see the unmanned aircraft and the surrounding airspace while it is airborne. The key requirement of any flight is to avoid collisions and a VLOS operation ensures that the remote pilot is able to monitor the aircraft's flight path and so manoeuvre it clear of anything that it might collide with. While corrective lenses may be used, the use of binoculars, telescopes, or any other forms of image enhancing devices are not permitted. Putting things in very simple terms, when operating VLOS, the aircraft must not be flown out of sight of the remote pilot's eyes.

1.2 Air Safety Support International (ASSI) will normally accept that the VLOS requirement is met when the Small Unmanned Aircraft (SUA) is flown out to a distance of 500 metres horizontally from the remote pilot, but only if the aircraft can still be seen at this distance. Operations at a greater distance from the remote pilot may be permitted if an acceptable safety case is submitted. For example, if the aircraft is large, it may be justifiable that its flight path can be monitored visually at a greater distance than 500 metres. Conversely, for some small aircraft, operations out to a distance of 500 metres may mean it is not possible to assure or maintain adequate visual contact, and so the aircraft must obviously be kept closer to the remote pilot.

2. Operating Height

2.1 The 'operating height' is limited to a maximum distance of 400 feet (120 metres) from the closest point of the earth's surface.

2.2 This height limitation is intended to contribute to the safety of manned aircraft from the risk of collision with an unmanned aircraft. With the obvious exception of take-off and landing, the majority of manned aircraft fly at heights greater than 500 ft (150 m) from the surface. While there are some other exceptions where manned aircraft fly at 'low level' (such as Police, Air Ambulance and Search and Rescue helicopters, as well as military aircraft), flying a SUA below 400 ft (120 m) significantly reduces the likelihood of an encounter with a manned aircraft.

2.3 In aviation terms, 'height' means the vertical distance of an object (in this case the unmanned aircraft) from a specified point or datum (in this case above the surface of the earth). To cater for the few occasions where an unmanned aircraft is being flown over hilly/undulating terrain or close to a cliff edge, the regulations specify a requirement to remain within a 400 feet (120 m) distance from the surface of the earth.

2.4 It must be noted that the 400 ft (120 m) limitation applies to 'heights above/distances from' the surface of the earth. It does not automatically apply to heights/distances from tall buildings or other structures.

3. VLOS Operations at Night

3.1 There are no specific prohibitions to VLOS operations during night time. The basic VLOS principles still apply (i.e. you must be able to see the aircraft and the surrounding airspace). Any applications for operational authorisations which include VLOS flight at night will be expected to include a 'night operations' section within the operations manual, which details the operating procedures to be followed and should include items such as:

- daylight reconnaissance and site safety assessment of the surrounding area,
- identification and recording of any hazards, restrictions and obstacles,
- illumination of the launch site,
- aircraft lighting/illumination requirements,
- weather limitations for operation.

4. Beyond Visual Line of Sight Operations (BVLOS) (Permission from ASSI Required)

4.1 Operation of an unmanned aircraft beyond a distance where the remote pilot is able to respond to or avoid other airspace users by direct visual means (i.e. the remote pilot's observation of the unmanned aircraft) is considered to be a BVLOS operation. BVLOS operations may only be conducted under the terms of an operational Permission issued by ASSI and based on a risk assessment.

4.2 Unmanned aircraft intended for BVLOS operations will require either:

i. A technical capability which has been accepted as being at least equivalent to the ability of a pilot of a manned aircraft to 'see and avoid' potential conflictions. This is referred to as a Detect and Avoid (DAA) capability; or

ii. A block of airspace to operate in which the unmanned aircraft is 'segregated' from other aircraft - because other aircraft are not permitted to enter this airspace block, the unmanned aircraft can operate without the risk of collision, or the need for other collision avoidance capabilities; or

iii. Clear evidence that the intended operation will pose 'no aviation threat' and that the safety of persons and objects on the ground has been properly addressed.

Note: The ultimate responsibility for avoiding collisions lies with the remote pilot.

5. BVLOS operations utilising visual observation (Extended Visual Line of Sight - EVLOS) (Permission from ASSI Required)

5.1 In some cases, the requirement for the remote pilot to maintain direct visual contact with the unmanned aircraft can be addressed via other non-technical 'visual observation' methods or procedures while still achieving the key responsibilities of avoiding collisions.

5.2 Although technically these are BVLOS operations (because the remote pilot cannot actually see the unmanned aircraft), they are more often referred to as 'Extended Visual Line of Sight' or EVLOS. It is important to note, however, that collision avoidance is still achieved through the 'unaided visual observation' of a human, either through the use of additional observers and/or visually 'scanning' a block of airspace for conflicts.

5.3 EVLOS operations may only be conducted under the terms of an operational Permission issued by ASSI and based on a risk assessment. Factors taken into consideration must include:

- the procedures for avoiding collisions,
- the size of the unmanned aircraft being used,
- the colour of and markings on the unmanned aircraft,
- any additional aids to observation,
- meteorological conditions and visibility, including background conditions (cloud /blue sky),
- the use of deployed observers, including suitable communication methods within the team, and
- operating range limits - suitable radio equipment must be fitted in order to be able to effect positive control over the SUA at all times.

6. Third Party/Uninvolved Persons

6.1 The primary focus for SUA operations is the protection of people that are not a part of the flying operation (i.e. third parties). An uninvolved person is a person that does not take part in the SUA operation, either directly or indirectly or who are not aware of the instructions and safety precautions given by the SUA operator, such as:

- Spectators or any other people gathered for sport activities or other mass public events for which the SUA operation is not the primary focus,
- People sitting on a beach, in a park or walking on a street/road.

6.2 A person may be considered to be ‘involved’, or under the control of the person in charge of the SUA, in a SUA operation if they:

- are solely present for the purpose of participating in the flight operation, or
- have given explicit consent to the SUA operator or to the remote pilot to be part of the SUA operation (even indirectly as a spectator or just accepting to be overflown by the SUA), and
- have received from the SUA operator or from the remote pilot clear instructions and safety precautions to follow in case the SUA exhibits any unplanned behaviour. Such persons could include building-site or other industrial workers, film and TV production staff and any other pre-briefed, nominated individuals with an essential task to perform in relation to the event.

6.3 In principle, this means that an involved person must:

- be able to decide whether or not to participate in the SUA operation,
- broadly understand the risks involved,
- have reasonable safeguards introduced for them, introduced by the site
- manager, the SUA operator or the remote pilot during any SUA operation, and
- be expected to follow the directions and safety precautions provided.

The SUA operator or remote pilot should check by asking simple questions to make sure, that the directions and safety precautions have been properly understood. Persons should not be restricted from taking part in the event or activity if they decide not to participate in the SUA operation.

Note: When filming with a SUA at a large music festival or public event, it is not sufficient to inform the audience, or anyone present via a public address system, or via a statement on the ticket, or in advance by email or text message. Those types of communication channels do not satisfy the points above. In order to be considered an 'involved person', each person should be asked for their permission and be made aware of the possible risk(s).

7. Vehicles, Vessels, Structures

7.1 Article 73 clearly states that a person in charge of the SUA must not fly the aircraft:

"*...within 150 feet of any vehicle, vessel or structure which is not under the control of the person in charge of the small unmanned aircraft*"

Note: Permission from ASSI is required for any reduction on distances stipulated within Article 73.

8. Privacy

The overall security and privacy situation must also be considered. There may be buildings in the area where it would be inadvisable, from a security or privacy standpoint, to be flying close to without first obtaining permission to do so. There may also be local privacy laws in place.

9. Private Land

SUA operators must be aware of their responsibilities regarding operations from private land and any requirements to obtain the appropriate permission before operating from a particular site. They must ensure that they observe the relevant trespass laws and do not unwittingly commit a trespass whilst conducting a flight.

10. First Person View (FPV)

Flying FPV drones makes use of an onboard camera that relays live video to goggles, mobile phones or tablet screens. Flying in FPV mode, you only have the vision transmitted from the drone's onboard camera while the drone is out of your visual sight. This can limit your situational awareness and may lead to disorientation. You may not be able to manoeuvre the drone in time to prevent a collision and so create an unsafe situation for you or others. This means that you would not be complying with the legal requirement to operate within VLOS. You will need a 'Visual Observer' to ensure safety. This is a person standing next to you, an observer who is keeping their eyes on the drone. The visual observer must be familiar with the rules but there are no qualifications needed. The visual observer's task is to watch the drone and scan the area around for any potential danger situations and to make sure you do not endanger other parties (eg aircraft, particularly helicopters, other drones, trees, birds, buildings or people). The visual observer must be able to communicate unimpaired with the pilot and give clear instructions on how to avoid a potential danger situation and, if needed, advise immediate landing to avoid collision. You must not fly over people, must be outside urban populated areas and be at least 150 feet away from vehicles, vessels, structures, or persons and not fly higher than 400ft above the surface.

Further information is available at: http://www.airsafety.aero/sua
Application Form available at: SUA Application Form