Chapter 10 – Small Unmanned Aerial Vehicle (sUAV) Surveys

Policy Statement

All projects which involve flights of Small Unmanned Aerial Vehicles (sUAV, also known as "drones") will be performed in conformance with the specifications as defined in this document.

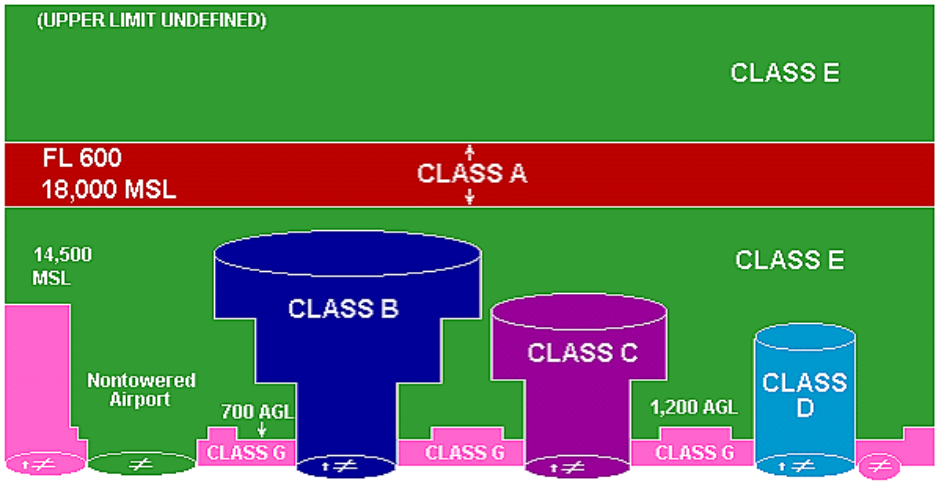
General Statement

There are many applications for using sUAV such as project documentation, monitoring, inspection, land surveying, photogrammetry, and emergency response. The use of sUAV presents a new and rapidly evolving technology and will ultimately change the way OC Survey performs its business, similar to the way GPS did back in the 1990s. These specifications will not cover methodology such as aerial target placement, photo overlap percentage, flying height, etc. At this time, these important details are currently being tested and developed by users of the industry. The procedures herein will focus on how to ***safely*** and ***legally*** fly sUAV.

Acronyms/Definitions

AGL – Above Ground Level, referring to flying height above ground

Airspace – regulated by the FAA; there are six *Classes* of airspace *(A, B, C, D, E, & G)* and four *Types* of airspace *(Controlled, Uncontrolled, Special Use, & Other)*. Class G is *Uncontrolled* and can be flown at any time during the day ***under 400 feet AGL*** as long as it is safe to do so. All other classes are *Controlled* and may require FAA authorization for flight.



COA – Certificate of Waiver or Authorization is an authorization issued by the Air Traffic Organization (ATO) to a public operator for a specific unmanned activity. This may be needed to fly in controlled airspaces.

sUAV Unit – flight crew consisting of at least two people, but preferably three: the PIC, the Pilot, and the VR (**the *PIC must have valid RPC)***
FAA – Federal Aviation Administration

PIC – Person In Charge which has the final authority and responsibility for the entire operation and safety (**the *PIC must have valid RPC)***

Pilot – Person flying and controlling the sUAV ***(this does not require an RPC)***

RPC - Remote Pilot Certificate is a FAA airman certificate specifically for the use and operation of sUAV

VR - Visual observer who maintains constant line of sight with sUAV and communicates with the Pilot on airspace conditions, obstructions, and other aerial vehicles ***(this does not require an RPC)***

Flight Plan

Before a flight can be conducted, the sUAV Unit must determine in which airspace the flight will occur and identify any other restrictions which affect the flight. If necessary, authorization in the form of a COA must be acquired before flight.

- The sUAV Unit will ensure that the sUAV is in proper working condition and that all batteries are charged

- The sUAV unit will carry DRONE PROGRAM 3-ringed binder at all times; this binder contains necessary paperwork such as UAV Preflight Check List, a copy of RPC certificates, Repair Log, sUAV Registrations, and COAs

Pre-Flight

When arriving at the flight location, the sUAV Unit will work together to inspect and discuss the airspace and note any weather issues or obstructions such as trees, buildings, power lines, etc.

- The PIC will notify the project person in charge, if present, that a flight will occur and discuss any possible issues or concerns

- **The PIC will determine whether or not it is safe to fly**

- Before flight, the sUAV Unit will review and follow all "sUAV Preflight Check List" procedures (see *Appendix A*)

- During flight, the VR will closely observe the sUAV and communicate with the Pilot regarding current conditions and concerns; any aircraft in area will be discussed

Post-Flight

- The sUAV unit will inspect the sUAV for any issues and note which batteries need to be charged

- All Flight Log information pertaining to the flight such as; Project, Date/Time, Flight Duration, Conditions, Drone, Pilots, etc., will be documented by using an ESRI mobile application on the flight IPAD. The application named "***Survey123***" can be downloaded from the App Store. Once downloaded, the user logs into the app with their ESRI OCPW account and downloads the survey named "***OC Survey sUAV Flight Log***". The user then fills in and answers all questions pertaining to the flight and then submits/uploads the form to the ESRI server. This information can then be viewed back in the office on their PC.

Appendix A - OC Survey sUAV Preflight Check List

Before any sUAV flight, the following procedures must be followed:

1. When arriving at the flight location, the entire sUAV Unit will visibly survey the area and discuss current conditions, including but not limited to:
    a. Trees, power lines, telephone poles or other obstructions
    b. People, cars, heavy equipment
    c. Weather conditions: wind, visibility, sun location

This information will be used to determine whether the flight can be performed *safely*

2. When preparing the sUAV for flight:
    a. Inspect all components of the sUAV; look for any possible damaged or compromised parts
    b. Inspect batteries for any deformation or leakage
    c. Clean iPad screens

3. The compass **must** be calibrated before every flight - do not ignore this step

4. When powering sUAV, ensure that:
    a. all controls are working properly
    b. "Auto Hold" is on (toggle in "P" position)
    c. the sUAV is functioning as it should
    d. the take-off/landing area is clear and safe

5. Before takeoff (using iPAD App), ensure that:
    a. the "HOME" point is set and plotted correctly on the map
    b. available battery power is sufficient for the flight
    c. the GPS is working properly
    d. there are NO warnings – warnings are not to be ignored!