Visual Observer (VO) Roles and Guidance

OISC CU Boulder Flight Operations Department

The following document has been created as both a rudimentary training outline and refresher document which can be used by and for VOs in order to improve their skills to become more effective crewmembers. VOs are required and important personnel for all UCB COA related UAS missions. Their initial training is important but it's crucial that VOs remember all relevant protocols and procedures when out in the field. Due to the fact the department doesn't require recurrent training for VOs its possible for VOs to have large gaps of time between active serving periods (this could lead to atrophy of VO skills). Even though the PIC should give a complete initial crew briefing which clearly states VO roles, reporting criteria, hazards, etc and answer any questions to VO may have, this document can be something the VO reviews before an event to familiarize themselves with what they were initially taught.

Reason for a visual observer (VO): Before we begin its important to note that the FAA owns and publishes rules for all of the airspace over the USA (despite misconceptions that landowners own airspace over a property). With that, the FAA grants UAS operators three ways to access the national airspace system (NAS). Hobbyist rules, part 107 rules, and COA rules. Hobbyist rules only apply for people accessing the airspace for pleasure and not commercial reasons. Part 107 and COAs allow users to access the NAS for commercial purposes. As a public entity, CU Boulder has established a relationship with the FAA who have allowed us to train CU affiliates to operate under COAs that were allowed to issue. As such we are responsible for training, compliance, and certification of our CU affiliates, in order to make sure everything is being done safety and correctly. Clauses from the FAA issued COA state that when operating UAS under a COA a minimum crew of two are required: one pilot in command (PIC) and one visual observer (VO). This is why we need VOs.

The definition of a VO from the Flight Operations Manual (FOM): The VO is the primary Visual Observer responsible for the safe visual de-confliction of all hazards to flight. Must communicate effectively with the PIC, PAC-M and PAC-O. This is an FAA required position.

Main VO roles: Typically, the PIC (commonly the pilot flying) is focused directly on the UAS, concerned about attitude changes, control inputs, and instrumentation. As this is task intensive, the pilot flying is really focused on a narrow scope of the entire environment. The VOs job is to effectively "open up" that environment; this can be done by notifying the pilot of certain criteria that the pilot may not be able to directly see but could be hazardous to the flight. The specifics will be discussed in the next paragraph.

Specific VO tasks: One of the main goals of the VO is to inform the pilot of other traffic in the air. This includes manned traffic, other UAS/RC traffic, and wildlife (It is crucial that our UAS operations give way to all other flight activity in the NAS). The VO may also help the pilot with ground-based hazards like relaying distances or proximity to airspace/powerlines/trees, conditions of vehicle traffic, location of people, or runway/landing zone conditions. The VO also acts as a barrier between the PIC and the public. In some cases the public may attempt to walk up and talk to the pilot, in this instance the VO could step in to keep the distractions, to the pilot, at a minimum. The VO could also help watch the weather and notify the pilot of the weather starts deteriorating. The VO can also keep track of time,

pilots are required to file NOTAMs when they file which gives them a window for UAS activity and its important that they do not fly beyond the NTOAM time. In general the VO should work closely with the PIC and understand the mission, this will allow the VO to report anything else that the pilot requests or anything that would be beneficial to mission safety. For all of these tasks the PIC and VO should have a well-developed plan for how everything is going to be reported and what specific reporting points are most important. By establishing this plan and relationship the VO will be even more of a valuable crewmember.

Training folder: For certification and upon completion of becoming a VO, each applicant will get a training folder. This will document the training that they have received as well as their checkride accomplishments. Any other CU related Flight Operations Training will go in this folder. It has no real applicable significance to most VOs but if requested you would have access to this folder.

Other stipulations or limitations: VOs must be able to read, write, speak, and understand the English language. Also once certified, VOs may operate as a VO on all UCB-owned UAS types (Independent of category, class, type, and or difficulty level)

Medical requirements:

Each VO must possess one of the following before they can act as a VO:

-Driver's License issued by a US State or US Territory

-FAA issued First, Second- or Third-class medical certificate. (First and Second-class medical certificates that have reverted to Third class are acceptable)

-Certificate showing the individual has 20/20 vision (corrected or uncorrected) and normal hearing in both ears issued by a medical professional licensed in the Unites States. Wardenberg Health Center can provide this certificate if needed.

Any crewmember who has a known condition, which in their opinion could impair their ability to safely operate a UAS, shall immediately remove themselves from flight duty until the condition is resolved.

Any crewmember who uses any medicine which could cause drowsiness, impaired judgement, impair any basic motor function, or otherwise impair the PICs ability to fly safely shall immediately remove themselves from any crewmember duty while the medicine is in effect.

If a crewmember requires corrective lenses to achieve 20/20 vision, these lenses must be worn during all flight operations and while performing any crew duty.

Becoming a VO: initial requirements for becoming a VO are quite simple. A quick training session will be held, reviewing material very similar to what is listed in this document. Then a simulated or actual flight will be conducted and the VO applicant will need to apply the skills learned and act as a VO.

Safety Action Reports (SARs): As a crewmember, VOs, are allowed to fill out safety action reports if they feel they are necessary. A safety action report can be filled out anytime some unsafe event occurs when flying or preparing to fly a UAS. For more information reference the flight operations manual (FOM).

Improving and being more effective: During each post flight briefing, ask questions if you were confused during any portion of the flight. Also ask about your performance or what you could do better for next time. This is the perfect time to reflect and communicate with the crew.

Resources and Contacts:

Flight Operations Manual (FOM): this is what contains all of the main regulations that PICs must follow, this includes FAA and University policies and rules. If you have any questions or hear the PIC referencing material this is most likely where that information is coming from. In the appendix is where you find forms to fill out SARs.

Website: The department has a great website with a lot more information. Feel free to visit it here at the following link – Flight Operations | Integrity, Safety and Compliance | University of Colorado Boulder

Contact: Contact information is also found on the website or here at the following link - Contact Us | Integrity, Safety and Compliance | University of Colorado Boulder

Simulated briefings: theses are a great way to know what to expect for briefings on your next mission - clarification_on_and_additional_information_regarding_required_flight_briefings_0.pdf (colorado.edu)