107 BVLOS Waivers

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§ 107.31 Visual Line of Sight Aircraft Operation

- (a) With vision that is unaided by any device other than corrective lenses, the remote pilot in command, the visual observer (if one is used), and the person manipulating the flight control of the small unmanned aircraft system must be able to see the unmanned aircraft throughout the entire flight in order to:

- (1) Know the unmanned aircraft's location;

- (2) Determine the unmanned aircraft's attitude, altitude, and direction of flight;

- (3) Observe the airspace for other air traffic or hazards; and

- (4) Determine that the unmanned aircraft does not endanger the life or property of another.

- (b) Throughout the entire flight of the small unmanned aircraft, the ability described in subsection (a) of this section must be exercised by either:

- (1) The remote pilot in command and the person manipulating the flight controls of the small unmanned aircraft system; or

- (2) A visual observer.

107.31 (a)(1) Know the Unmanned Aircrafts Location

- The RPIC <u>must</u> be able to determine the location of their sUA at all times

- Items to consider
  - C2 frequency and power, RF propagation, RF Interference Radio Line of Sight
  - FCC compliance
  - Leveraging published industry standards
  - ADS-B out is <u>NOT</u> an accepted solution to track a sUA

107.31 (a)(1) Know the Unmanned Aircrafts Location

- If the primary method of tracking/locating the sUA fails, how will the operation ensure safety of the NAS and non-participants is not compromised?

107.31 (a)(2) Determine the unmanned aircraft's attitude, altitude, and direction of flight

- Similar to 107.31 (a)(1)
    - When operating BVLOS, this information must be provided to the pilot in an accurate and timely manner
    - Can the RPIC obtain this information if the sUAS C2 link is lost?
        - How often will this occur

107.31 (a)(3) Observe the airspace for other air traffic or hazards

- Must be able to detect all air traffic or hazards
- VO(s) can be used as the Detect function in a DAA strategy
  - In most circumstances VO's must be able to scan a two mile radius of airspace surrounding the sUA inflight,
    - This distance is supported by research as the minimum safe distance to detect another aircraft with sufficient time to avoid when using humans as the "D" in DAA
    - Does not account for "Avoid" requirement of DAA
    - May require operating the sUA closer to the RPIC/VO to successfully Avoid other aircraft and not present a collision hazard
- DAA Technology
  - Does it detect both cooperative and non-cooperative air traffic
  - Is the Avoid response automated, or human in the loop
  - Has the technology been evaluated and validated

107.31 (a)(3) Observe the airspace for other air traffic or hazards

- 107.37(a) is listed as a regulation subject to waiver
    - The FAA has not yet issued a Waiver to 107.37(a)
    - (a) Each small unmanned aircraft must yield the right of way to all aircraft, airborne vehicles, and launch and reentry vehicles. Yielding the right of way means that the small unmanned aircraft must give way to the aircraft or vehicle and may not pass over, under, or ahead of it unless well clear.

107.31 (a)(3) Observe the airspace for other air traffic or hazards

- 107.37(b) is NOT a regulation subject to waiver
  - (b) No person may operate a small unmanned aircraft so close to another aircraft as to create a collision hazard.

- The FAA has not issued a waiver to 107.31 when the proposed operations could not meet the minimum level of safety listed 107.37

107.31 (a)(4) Determine that the unmanned aircraft does not endanger the life or property of another.

- Its up to you (RPIC) to ensure the sUA does not operate over people or moving vehicles while operating BVLOS
  - How will the RPIC not operate over human beings and moving vehicles when they cannot view the area being overflown
  - What are the mitigations to ensure the RPIC will not operate overfly over people
    - Even in an abnormal situations
- If the operator is unable to make these determinations, it will require a waiver to 107.39, operations over people
  - For example, using the calculated probability of overflying a person is not an acceptable means to comply 107.39

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Conclusion

- Think about how your operation provides an equivalent and acceptable level of safety to the sections above

- At minimum answer all applicable questions on the Waiver Safety Explanation Guidelines

- Provide as much detail as possible

- Assess all possible risk and how it will or will not be mitigated