

We at the FPV Freedom Coalition wish to share our comments on the recent Advisory Circular 91-57C regarding the Exception for Limited Recreational Operations of Unmanned Aircraft.

1.7.3

- “The operation of a UAS can endanger other aircraft, people, or property when the flight is conducted in a careless or reckless manner or in a manner that creates an undue hazard to persons or property.”
 - **FPVFC Response:** This serves no purpose but to promote fear around UAS. To date, there have been no deaths attributed to UAS, and actual incidents have been very minimal. Flying UAS has always been and will continue to be the safest way to take advantage of the NAS, and should be talked about as such. By continuing to pursue a fear driven basis around regulations, the FAA fosters an animus toward this segment of operators and pilots. If this is to remain in this AC, recommend citing sources and studies that contribute to its claim.

1.7.4

- “Pursuant to 49 U.S.C. § 44809(e), the Administrator may pursue an enforcement action against a person operating a UAS under the Exception who endangers the safety of the National Airspace System (NAS) (e.g., careless or reckless operations; operations endangering persons or property; or operations that interfere with or fail to give the right-of-way to any manned aircraft, airborne vehicle, or launch and reentry vehicles).”
 - **FPVFC Response:** While we understand that enforcement is a consequence to flying recklessly, incentives to fly safely and be an ambassador for safe flights would be looked upon much more favorably, similar to the FAA Safety Teams Wings Program. Maybe the UAS PROPS Program?

2.2.1.2.3

- “UAS flown as part of an educational program that is chartered by a recognized CBO, as defined in 49 U.S.C. § 44809(h).”
 - **FPVFC Response:** Thank you for including this in this AC. We love that CBO’s can provide educational programs that would allow members to train others how to fly UAS safely.

2.2.3.1

- “FPV devices are goggle-like viewing devices”
 - **FPVFC Response:** While many pilots do use FPV goggles to fly FPV, there are many others who use a screen such as a tablet, or a portable LED/LCD display to fly FPV. It is important to establish this.
- “These FPV devices often provide a restricted view of the surrounding area.”
 - **FPVFC Response:** This statement is fundamentally biased and factually inaccurate. If this statement is to remain, the FAA must cite sources and research to the affirmative. We would posit (and have before many times) that situational awareness is actually enhanced substantially versus almost any crewed aircraft pilot. We have fewer obstructions blocking our views (no instruments, aircraft frame, other flight crews’ bodies), and often have as almost as wide a field of view (FOV) as the human eye,

depending on cameras on board the UAS. Coupling that together with the ability to yaw, pitch, and roll the aircraft much faster than any crewed aircraft, situational awareness is enhanced much beyond that of a crewed aircraft pilot. (Hear) Please remove this statement.

2.2.4

- Section 44809(a)(4). “The aircraft is operated in a manner that does not interfere with and gives way to any manned aircraft.” The recreational flyer of a UA is responsible for knowing, at all times, the position of the aircraft in relation to other aircraft; for maintaining a safe distance from other aircraft; and for giving the right-of-way to all **manned aircraft, airborne vehicles, and launch and reentry vehicles in all circumstances**.
 - **FPVFC Response:** This needs to be clarified to specify crewed varieties of all of these. UAS pilots often fly in close proximity to one another when in a recreational setting, and this could be construed as to deem that is against regulations. Take for example an FPV multirotor or fixed wing race, where oftentimes there are several pilots in the air at the same time flying the same course.

2.2.5.2

- **“Note:** Recreational flyers should not contact ATC facilities to obtain airspace authorizations to fly in controlled airspace.”
 - **FPVFC Response:** This needs to be reworded, as it still implies that a pilot can call ATC for airspace authorizations, just that they really shouldn’t. Perhaps “Recreational flyers cannot obtain airspace authorizations to fly in controlled airspace by contacting ATC facilities”

2.2.5.3

- “The recreational flyer should submit the request **at least 90 days prior** to the proposed flight to allow the FAA time to review the airspace and the justification provided for the flight”
 - **FPVFC Response:** 90 days is far too long in advance to request an airspace authorization for a flight at / around a facility not serviced by LAANC. This needs to be reduced dramatically. What is the incentive for airports to comply with the LAANC system, and why haven’t all airports come online as of now? This establishes roadblocks to entering the NAS, and an undue burden without an appropriate or effective solution from the FAA.

2.2.8

- Section 44809(a)(8). “The aircraft is registered and marked [with its FAA-assigned registration number] and proof of registration is made available to the Administrator ... or law enforcement upon request.”
 - **FPVFC Response:** Please add “Aircraft that are over 250g or .55lbs”

2.2.8.1

- **“Recreational flyers must label their UA** with the registration number for the aircraft in accordance with the requirements of 14 CFR part 48. Refer to part 48, § [48.205](#). The labeling must be legibly displayed on an external surface of the UA and must be affixed in a manner that ensures it will remain affixed for the duration of each flight.”

- o **FPVFC Response:** Please add “if over 250g or .55lbs” after the bolded area.

3.3.2

- “Institutions of higher education, the JROTC, or any other entity may choose to request recognition as CBO, as described in paragraph [3.2](#).”
 - o **FPVFC Response:** This is a little confusing, as if you follow the reference here to paragraph 3.2, it says to reference paragraph 3.1 for the requirements. Using that logic path, do Institutions of higher learning, JROTC, or other educational institutions that may want to become a CBO still need to be a 501c.3?

3.4.3

- “A comprehensive set of safety guidelines may include topics that span beyond the limitations listed at 49 U.S.C. § 44809(a). **The FAA encourages, but does not require**, CBOs to develop comprehensive sets of safety guidelines to enhance the safety and security of all operations in the NAS and people and property on the ground.”
 - o **FPVFC Response:** This contradicts the requirement from 3.1.1.4 that a CBO must provide a comprehensive set of safety guidelines. Does a CBO need to provide these or not?

3.4.3.1.1

- *“Prohibition on modifying UAS and the carriage of hazardous materials or weapons.* CBOs should restrict their members from customizing or modifying the aircraft in such a way that creates a danger to the public or the NAS. CBOs should include a statement prohibiting the carriage of hazardous materials or requiring compliance with applicable laws and rules for the carriage of hazardous materials. Refer to 49 CFR parts [171](#) through [180](#). CBOs should also remind operators that Federal law prohibits equipping or arming any UAS with a dangerous weapon. See Section 363 of the FAA Reauthorization Act of 2018.”
 - o **FPVFC Response:** This is already an established regulation. There is no need for a CBO to create guidelines that serve only to repeat existing regulations beyond basic safety tenets.
- *“Prohibition on engaging in careless or reckless behavior.* Guidelines should include information on avoiding careless or reckless behavior. The FAA recommends including information on the five hazardous attitudes in aeronautical decision making (refer to the [Pilot’s Handbook of Aeronautical Knowledge](#), Figure 2-4) and the “Dirty Dozen” human behaviors in aircraft maintenance (refer to <https://www.faasafety.gov/files/gslac/library/documents/2012/Nov/71574/DirtyDozenWeb3.pdf>).
 - o **FPVFC Response:** While this information is good, UAS aviation is not crewed aircraft, and it’s principles differ as well. While this information is good, the FAA should make the effort to align these concepts more in tune with UAS flights instead of attempting to force crewed aircraft precepts on UAS.
- *“Preflight safety”*
 - o **FPVFC Response:** What is the FAA’s definition of Preflight? Is a preflight assessment and inspection checklist needed before every battery pack when multiple flights are to be conducted? Is this up to the operator? What’s the threshold for compliance?

- *“In-flight safety.* Guidelines for in-flight safety should remind recreational flyers to assess the UA’s performance continually; **monitor the strength of command and control links**; watch for changing weather conditions; and watch for unexpected people or aircraft in the area of operation.”
 - **FPVFC Response:** Not all UAS display this information to the pilot. Add “if available” after “links”
- *“Post-flight safety.* Guidelines for post-flight inspection should include encouraging recreational flyers to review the flight to determine whether any unplanned events occurred that presented a risk to the operation. Guidelines should also consider including recommendations for safely securing UA between flights to include removing batteries and protecting fragile parts from wear and tear **per the manufacturer’s recommendations.**”
 - **FPVFC Response:** Not all UAS have manufacturers recommendations for wear and tear, especially those purchased as individual parts and assembled by the operator. Please strike, use operator discretion for wear and tear.

3.4.3.3.1

- “Recommended Safety Guidelines. If a CBO supports FPV flying, comprehensive safety guidelines should include, at least, the following minimum guidance for operating UAS under FPV. These suggested guidelines are provided as examples to assist CBOs. CBOs should tailor the guidelines to fit their particular needs.”
 - **FPVFC Response:** 3.1.1.4 states that a CBO must provide a set of safety guidelines for “all aspects of model aviation”. The ‘IF’ implies this is not true. Either allow CBO’s to specialize in one or certain type of model aviation, or remove the “IF”. If the “IF” is removed, consider rephrasing to “When a CBO creates comprehensive safety guidelines for FPV flying, it should include, at least, the following minimum guidance for operating UAS using FPV systems.”
- “FPV flyers should be proficient in flying their UA without an FPV device prior to starting FPV flights.”
 - **FPVFC Response:** FPV devices make flying a UA easier, and not all operators may have the skill necessary to pilot the aircraft line of sight. Rephrase to “FPV fliers should have the basic skills necessary to terminate a flight safely if the FPV system fails during the operation.”
- “Visual observers must be co-located with the FPV flyer and maintain visual line of sight (VLOS) with the aircraft at all times. Visual observation of the aircraft must be made with unaided vision, except in the case of vision that is corrected by the use of eyeglasses or contact lenses. Vision aids, such as binoculars, may be used only momentarily to enhance situational awareness. Visual observers must be in direct communication with the FPV flyer.
 - **FPVFC Response:** As per the TRUST, the visual observer may have a brief moment of loss of sight of the UA. Please add this clarification to this recommended guideline.
- “FPV flyers must have the capacity to see the aircraft at all times. Although a visual observer may be watching the UA, the FPV flyer must ensure that, throughout the operation of the UA, he or she would have the ability to immediately see the UA if the FPV device was removed.”
 - **FPVFC Response:** From a biological perspective, no person would be able to “immediately see” anything moving from a dark environment such as from behind a set

of goggles to a bright sunlit day. The eyes will take several seconds to adjust to the change in environment. Recommend removing “immediately”.

- “An FPV system should not be used when the weight of the UA exceeds 55 pounds.”
 - **FPVFC Response:** What is the reason for this? Please cite research or risk assessments stating why this needs to be present. If none exist, please remove.

3.4.3.4.1

- “Maintenance of the UAS and its components should be conducted in accordance with the manufacturer’s instructions.”
 - **FPVFC Response:** Not all UAS have manufacturer instructions on maintenance. Please rephrase to “Maintenance of the UAS and its components should be conducted to the recreational flyer’s best judgement or in accordance with the manufacturer’s instructions if available.”
- “Recreational flyers should routinely check for software updates and, if available, consider updating to the latest manufacturer upgrades prior to flight.”
 - **FPVFC Response:** The latest software and firmware updates may not always be the best or safest. Often, updates have been known to cause security or stability opportunities. If software / firmware currently on the device is stable and free of these opportunities, it should be up to the operator’s discretion for update schedules.
- “Flight-critical systems (e.g., rotors, battery, controls) should be checked for damage prior to flight and repaired or replaced if any damage is found.”
 - **FPVFC Response:** There are many times where minimal damage does not correlate to safety risk. A bent propeller can often be straightened, a scratch on the plastic or carbon fiber frame does not change flight characteristics. Should be changed to “if any significant damage that affects the flight characteristics or flight performance of the UA”.
- “Control links should be tested prior to flight and no flight should be attempted if command and control signal strength is anticipated to be inadequate for completion of the flight.”
 - **FPVFC Response:** This information is not always available and competing signals in an area can oftentimes lead to unpredictable events with control links. This may not be present at the preflight, but can occur during the operation. Please add “if shared or available to the recreational flyer” at the beginning.
- “Guidance systems and instruments (e.g., Global Positioning System (GPS), compass, altimeter) should be accurate and performing as expected.”
 - **FPVFC Response:** Not all UAS have guidance or GPS systems. Add “if available” to end.
- “Automated features (e.g., return to home, auto land) should function correctly and as expected.”
 - **FPVFC Response:** Not all UAS have automated features. Add “if available” to end.
- “The expected flight path should be free of other people, aircraft, and obstacles.”
 - **FPVFC Response:** FPV multirotor and fixed wing racing often happens where multiple UA are in the air at the same time, flying around an obstacle course. This would mean that FPV Racing is not allowed. Additionally, FPV freestyle pilots use natural and human-made features and obstacles to fly around. Please specify “people and manned aircraft” and remove “obstacles”.

- **“Note:** When addressing maintenance and inspections in comprehensive safety guidelines, CBOs should build on rather than replace the recommendations of the manufacturer. The FAA strongly discourages CBOs from establishing any guidelines that would relieve members from having to comply with any manufacturer-recommended maintenance or inspection. For further assistance, a sample inspection chart can be found in AC 107-2, Appendix C, Small UAS Maintenance and Inspection Best Practices.”
 - **FPVFC Response:** Not all UAS have manufacturer recommendations. Please add “if available”.

3.4.3.5

- **“Procedures for Night Flight.** Flyers must maintain VLOS throughout the flight when flying at night. To achieve this, the FAA recommends the CBO develop comprehensive safety guidelines that include a requirement for CBO members to equip UA with lights that can be seen from 3 statute miles away and to arrange the UA lights in such a way that allows recreational flyers to determine the orientation of the aircraft. In addition to UA-lighting guidelines for flying at night in unlit or low-light areas, the safety guidelines should also permit members to conduct recreational flights at night without requiring UA lighting in areas that are sufficiently illuminated so that members can maintain VLOS of the aircraft throughout the flight and identify any potential ground or airborne hazards.”
 - **FPVFC Response:** This is not currently in the regulations in the FAA Reauthorization Act of 2018 as a requirement of recreational flight. As such, there is no way to enforce this, and should not be a requirement of CBO’s to enforce this. Additionally, there are many small aircraft available that would not be able to adhere to this burden, as lights strong enough to be seen from 3SM are inherently heavier than some UA can carry.

3.4.3.6.1

- **“Recommended Safety Standards.** Comprehensive safety guidelines should include certain minimum standards for CBO members to be fit for flight prior to conducting any limited recreational aircraft operation. **For example, CBOs should prohibit any person from flying a UA, serving as a visual observer, or participating in the operation of a UAS if the person knows, or has reason to know, that they have a physical or mental condition that would interfere with the safe operation of the UAS.**
 - **FPVFC Response:** Recreational flight of UA both LOS and FPV have been demonstrated to have therapeutic effect for people suffering from mental conditions such as PTSD, anxiety, depression, etc. Additionally, there are individuals who may have a physical disability (e.g. deaf, limited mobility, etc.) that may limit their day-to-day activities in one form or another, but are more than capable of flying a UA with or without reasonable accommodation. It is no one person’s or one organization’s duty to restrict the ability to fly based on this, but should be left to the judgement of the recreational flyer. Recommend removing this sentence.
- 3.4.3.6.3
- **“Stress—Is the recreational flyer experiencing any psychological or emotional factors which might affect his or her performance?”**
 - **FPVFC Response:** Like many athletes and performers, stress is a part of UA flight, especially in circumstances such as multirotor and fixed wing races, competitions,

demonstrations, etc. Additionally, recreational flyers often fly as a form of stress relief. Recommend changing to “Is the recreational flyer experiencing any significant psychological or emotional factors which might deem the flight operation unsafe?”

- “Emotion—Is the recreational flyer emotionally upset?”
 - **FPVFC Response:** As stated earlier, recreational flight of UA both LOS and FPV have been demonstrated to have therapeutic effect for people suffering from mental conditions such as PTSD, anxiety, depression, etc. It is no one person or one organization's duty to restrict the ability to fly based on this, but should be left to the judgement of the recreational flyer.

3.4.3.8

- **Safety Event Reporting Procedures.** To support and promote a safety culture among all CBOs and recreational flyers, the FAA recommends, but does not require, that comprehensive safety guidelines address safety events. CBOs should consider including a safety event reporting requirement for recreational flyers. Depending on the size and mission of the CBO, gathering such data may provide substantial benefits to CBOs, as they would better understand the trends and risks posed by a UAS and could use the information to devise appropriate mitigations. Suggested criteria for triggering safety event reporting includes: (Bulleted List)
 - **FPVFC Response:** This data would be of limited to no use to the CBO, and would result in an onerous amount of data to be collected and stored by the CBO. Additionally, a CBO could be the overarching organization but be host to many chapters who function independently of one another. Additionally, these types of “safety events” happen at a minute detail almost all the time. A bent propeller would constitute a “functional failure” and a broken arm of a multirotor would constitute a “structural failure”. Neither of these occurrences would justify the CBO organization to step in to review. Recommend either removing this entire section, or at it’s most basic level, ask CBO’s to recommend that the recreational flyer submit data relating to a safety event of substantial happening at their discretion to the NASA UAS Safety Reporting System, where the user and their data can be appropriately anonymized. Recommend removing this section.

3.4.3.8.2

- “While it is not required, a CBO that elects to gather safety event reports is strongly encouraged to submit the data voluntarily to the UAS Safety Team at <https://unmannedaircraftsafetyteam.org/report/>. CBOs should also inform members that additional reporting requirements may apply (e.g., National Transportation Safety Board (NTSB)). Refer to 49 CFR part 830.”
 - **FPVFC Response:** As above, CBO’s should not need to report any kind of “Safety Event” to the UAS Safety Team. That data should be submitted by the recreational flyer at their discretion to the NASA UAS Safety Reporting System, where the user and their data can be appropriately anonymized. The UAS Safety Team can use the system to identify trends that may need attention and communication to the recreational UAS community as a whole. Recommend changing this section in accordance with this comment.