



# Wisconsin County Code Administrators Conference

26 October 2023

Unmanned Aerial Systems (UAS)  
Drone Regulations and Zoning  
Applications

*Tim Tyre, Certified FAA Flight Instructor (CFI)  
@ Copyright Terra Vigilis Security Group*

# Introduction

The purpose of this briefing will be to present an overview of current FAA regulations regarding the commercial use of sUAS (drones) and their technical capabilities. In addition, a presentation on end use applications for aerial survey work will be provided. Presentations will be followed with a panel format Q & A to address specific audience interests. Copies of the briefings are available upon request.

# Small Unmanned Aircraft Systems (sUAS)

The FAA has adopted a series of rules which allow operation of sUAS within the National Airspace System (NAS) for commercial purposes. These rules derive from the Code of Federal Regulations (14 CFR) Part 107, “Small Unmanned Aircraft Systems”. These rules apply specifically to commercial operations and do not apply to hobby or recreational use of these systems.

sUAS is defined as an aircraft which:

- Weighs less than 55 lbs (including everything onboard and attached payload)
- Allow operations without human intervention from within or onboard (i.e. via Remote Pilot In Command (PIC))

# Definitions

- **Control Station (CS)**...Interface between PIC and the UAS
- **Person manipulating controls**...controller other than PIC
- **Remote Pilot-In-Command (PIC)**...person holding an FAA part 107 remote pilot certificate with final authority for operation and safety of sUAS operations conducted
- **Small Unmanned Aircraft (UA)**...A UA weighing less than 55 lbs
- **Small Unmanned Aircraft System (sUAS)**...A small UA as above including the Control Station
- **Unmanned Aircraft (UA)**...aircraft operated without possibility of direct human intervention on or within the aircraft
- **Visual Line of Sight (VLOS)**... Ability to directly see the UAS at all times
- **Visual Observer (VO)**...a person acting as crewmember who assists PIC to see and avoid other air traffic

# FAA Regulations Requirements Part 107

---

To apply for the Part 107  
Remote Pilot:

At least 16 years of age

Read, speak, write and  
understand English

No disqualifying medical  
or mental condition  
relative to safe operations

Fulfill training and testing  
requirements

\*\* A person acting as a  
Remote Pilot under Part  
107 must have the sUAS  
rating issued by the FAA  
prior to performing UAS  
operations.

# Commercial 107 Pilot Privileges



The remote PIC is the final authority and is responsible for the operations of the UAS. The PIC must:



Be designated before each flight



Assure that sUAS operations pose no threat to persons or property in the event of loss of control



Operate the sUAS to assure compliance with applicable regulations (National Airspace, State and Local)



Cannot operate more than one sUAS at a time



Maintain VLOS with the UAS at all times



# Part 107 Autonomous Operations

---

Certain UAS platforms allow autonomous operations (pre-set flight operations) without direct pilot inputs. \*

- The remote PIC must have an ability to change routing or altitude or command the aircraft to land immediately.

\* Example: Autonomous flight to a waypoint or a 3D mapping mission.

# Part 107 Visual Observer (VO)

The primary responsibility of the VO is to alert the rest of the crew to hazards in flight. Use of VO is optional. If a VO is in use the PIC must:

- Assure the VOs are positioned to have continuous sight of the sUAS during operations
- Assure communications are active between the PIC, and person manipulating the controls.



# Part 107 Accident Reporting

A remote 107 PIC must report any accident to the FAA within 10 days if the following criteria are met:

- Serious injury to any person or any loss of consciousness
- Damage to property greater than \$500.00 to repair or replace
- All accident reports must be made to the FAA Regional Operations center (ROC) within 10 calendar days

# FAA Inspection of the sUAS

Upon request, the FAA can require an inspection of the sUAS. Documentation required to accompany the inspection may include:

- Pilot certificate
- Aircraft registration
- Waiver documentation
- Other documentation as requested



# Part 107 sUAS Registration

All sUAS devices weighing less than 55 lbs and more than .55 lbs must be registered with the FAA prior to use in the national airspace. A foreign aircraft permit is required of an sUAS registered in a foreign country or owned by a non-U.S. citizen before it is used.

## Registration Markings:

- Must be a unique identifier number (FAA issued)
- Legible and durable (engraved or self-adhesive labelled)
- Visible (displayed on the external surface of the sUAS)

\* \* An airworthiness certificate is not required for sUAS...the PIC must inspect the sUAS prior to each flight to assure capacity for safe flight.

# Part 107 Preflight and Inspection

The remote PIC must complete a preflight familiarization, inspection, and crew briefing prior to flight operations. In addition, the PIC should:

- Assess the flight environment (weather, local airspace, NOTAMS, flight restrictions, ground hazards and locations of persons and property adjacent)
- Brief crew members on their specific roles and responsibilities, emergency procedures, and potential hazards identified.
- Inspect the sUAS to assure readiness for safe flight, test control links, attachment integrity of items on the sUAS, battery life and identifier status.
- Maintain documents required in the event of an FAA inspection (pilot certificate, registration, certificate of waiver)



## Part 107 Visual Line of Sight (VLOS)

---

All sUAS operations must occur within visual line of sight of the PIC and or crewmembers with vision unaided by any device other than corrected normal eyesight (glasses can be worn). Binoculars can only be used to aid situational awareness. Use of the sUAS camera is *not* VLOS.

Brief loss of VLOS must be corrected as soon as practicable, and the “see and avoid” requirement for all air operations continues throughout.

# Part 107 sUAS Operating Limitations



- Ground speed no faster than 87 knots (100 mph)
- Altitude no higher than 400 ft Above Ground Level (AGL)\*

\*Unless flown within a 400 ft radius of a structure and not higher than 400 ft above the structure's uppermost limit.

- Minimum surface visibility of 3 statute miles from control station (CS)
- Minimum distance from clouds is 500 ft below and 2,000 ft horizontal separation.

# Part 107 Right of Way Regulations

The operation of sUAS at or near airports is a critical area for safety of flight considerations. No interference with airport traffic operations including seaplane bases and heliports can occur. The PIC must:

*Special Note...* "first person camera view" does not satisfy see and avoid requirements.

Know the location and flight path of his/her sUAS at all times

Be aware of all other aircraft, persons and property adjacent

Be immediately able to maneuver the sUAS to avoid collision and prevent other aircraft from taking evasive actions

Yield right of way to all other aircraft

# Part 107 Operations over People

---



No sUAS operations can occur over another person unless that person is PIC, designated crew, or a Visual Observer.

Suggested guidelines include the following:

- Select an operational area carefully (sparsely populated ideal)
- Operations over a populated area should include a plan to keep persons clear
- If sUAS operations are from a moving vehicle, include a plan to keep persons clear of the area



# Part 107

## Local Laws & Privacy Issues

---

No person may operate an sUAS in a reckless fashion that could endanger other person's life or property. Examples include overloading the drone beyond capabilities or endangering the operations of manned aircraft.

Other laws may apply including state and local privacy laws. The remote PIC is obligated to review all pertinent laws prior to where operations will be conducted. Examples include: Temporary Flight Restrictions (TFRs), Wildlife Refuges, Military Facilities, National Parks, many State, County, and Municipal Parks, many Schools.

Remote PICs are strongly encouraged to also review the Dept of Commerce National Telecommunications and Information Administration (NTIA) best practices document regarding privacy laws related to sUAS. A formal “**letter of authorization**” from county corporation counsel, or other local authority is encouraged.

# Know Restricted Airspace Warren, WI

**B4UFLY**

**LAANC**

Search for a location

LAT: 43.99919142  
LONG: -90.75457814

**Controlled Airspace**  
Airspace authorization required. See details below.

[Notify & Fly](#)

**SPARTA CLASS D**  
*Class: D* [more](#)

**UAS Facility Map**

[About FAA](#) [About Aloft](#) [Terms of Use](#)



# Part 107 Waivers

---

Part 107 remote pilots who wish to operate outside the published regulations for sUAS operations can apply for an FAA issued “waiver”. Examples of this option include operations beyond visual line of sight (BVLOS) and nighttime operations. Completion of FAA Form 7711-1 is a requirement in this regard.

Areas within 5 miles of an airport may have Low Altitude flight restrictions. Immediate waivers under certain conditions can be obtained through LAANC.\*

\* (Low Altitude Authorization Notification Capability)

# sUAS Checklist Item Content

1. Visual condition inspection
2. Airframe structural integrity
3. Linkages, flight controls
4. Registration markings
5. Moveable control surfaces
6. Servo motors and attachments
7. Propulsion system: rotors, fans
8. Battery supply
9. Transceiver links, antenna
10. Display panel (handheld)
11. Ground support equipment
12. Control link check
13. Calibration of compass
14. Correct movement of control surfaces
15. Onboard navigation/comm links
16. Flight termination systems
17. Fuel and or battery backups
18. Camera attachments secure
19. Verification of GPS links
20. Propeller start for balance check
21. Accuracy of heading/altitude comms
22. Surface obstruction survey area of ops
23. Low altitude check on electronic jams
24. Software updates and geo-fencing ops
25. Letter of authorization

# sUAS Communications

---

FAA requirements specify that the remote pilot and crewmembers are coordinated to assure safety of flight operations. This requirement includes scanning for collision avoidance and visual observation of sUAS position. Several remote pilot set-up methodologies are recommended to enhance this safety climate.

---

Open communications with all team members

---

Practice communications procedure prior to flight operations

---

Select standard communication equipment and assure frequency compatibility

---

Monitor and advise entire crew of changes required during operations

---



# sUAS Emergency Procedures

There are a series of common emergency events that occur with sUAS operations. These can include:

- **Lost Link** (loss of radio transmitted control of the sUAS, not necessarily an emergency)
- **Flyaways** (software malfunction may induce a flyaway) ATC may require notification if operations are occurring in airspace which requires authorization)
- **Loss of GPS** (NOTAMs should be checked for GPS signal issues prior to ops).
- **Battery Fire** (before each flight batteries should be checked for damage, bloating and or excessive heat)

The remote sUAS pilot is obligated to follow manufacturer guidance in identified emergency situations and or deviate from any part 107 rule to the extent necessary to meet the emergency. A good practice is to review potential emergency procedures with ground crew prior to flight operations.



# Final Thoughts...

---

Commercial sUAS operations are complex and require a fully certificated FAA part 107 commercial pilot in command. Demonstrated experience in the application of drone technologies peculiar to mission parameters should be assured.