

Waiver [REF NUMBER]

Module 1

Ground Lesson 2

Lesson Objective

- The student shall gain knowledge of the Operator's Beyond Visual Line of Sight (BVLOS) Certificate of Waiver

Quick Notes

- This is a Part 91 waiver and operation, not Part 107
- There will be small **provision numbers** next to some slide text, this number denotes the waiver provision to cross reference

Visual Line of Sight Operations

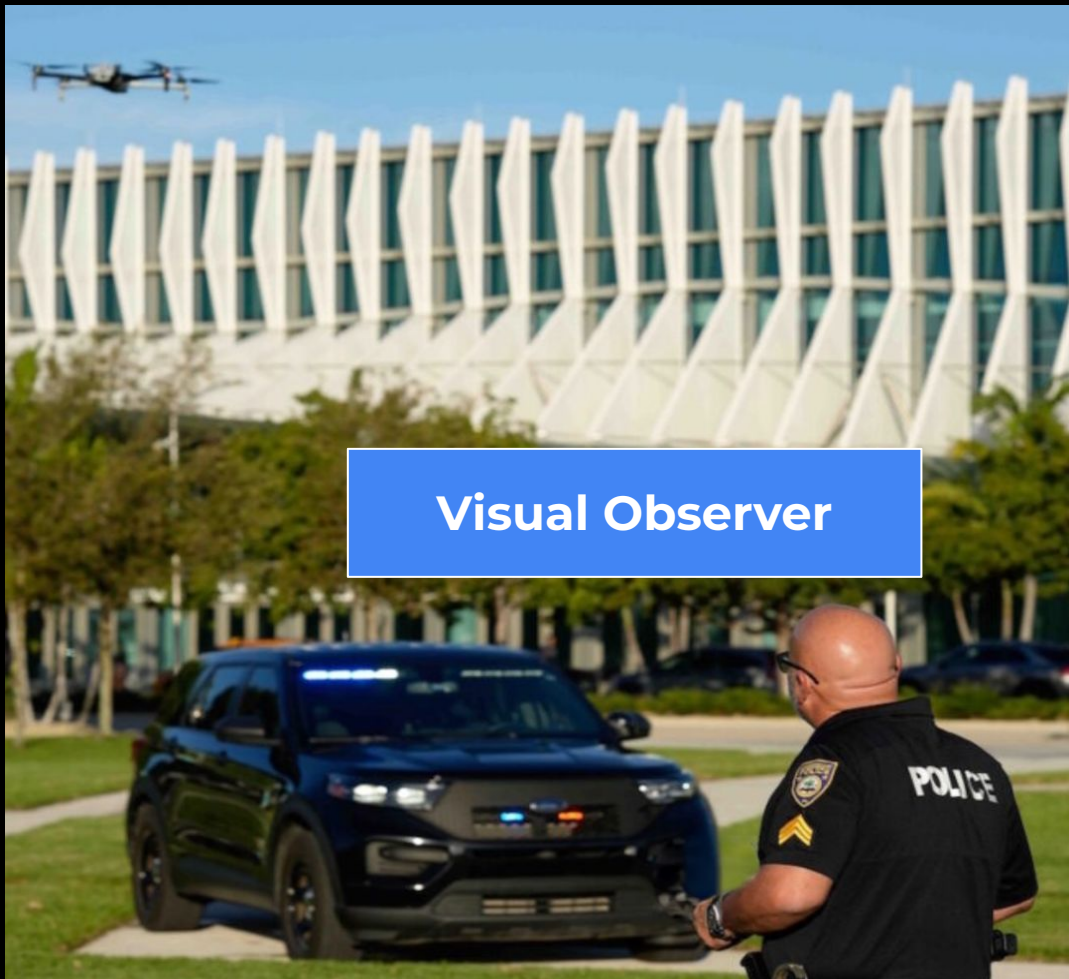
Provision #10

VLOS Provisions

- Altitude
 - Up to 400' AGL, or
 - Up to the UAS Facility Map altitude
- All members of the flight crew must be able to see the drone throughout the entire flight
 - Minimum flight crew is a Pilot in Command
 - Person Manipulating Controls and Visual Observer are optional



✓ VLOS



Visual Observer



PIC / Person
Manipulating the Controls

X BVLOS with VO

Beyond Visual Line of Sight Operations

Provision #11

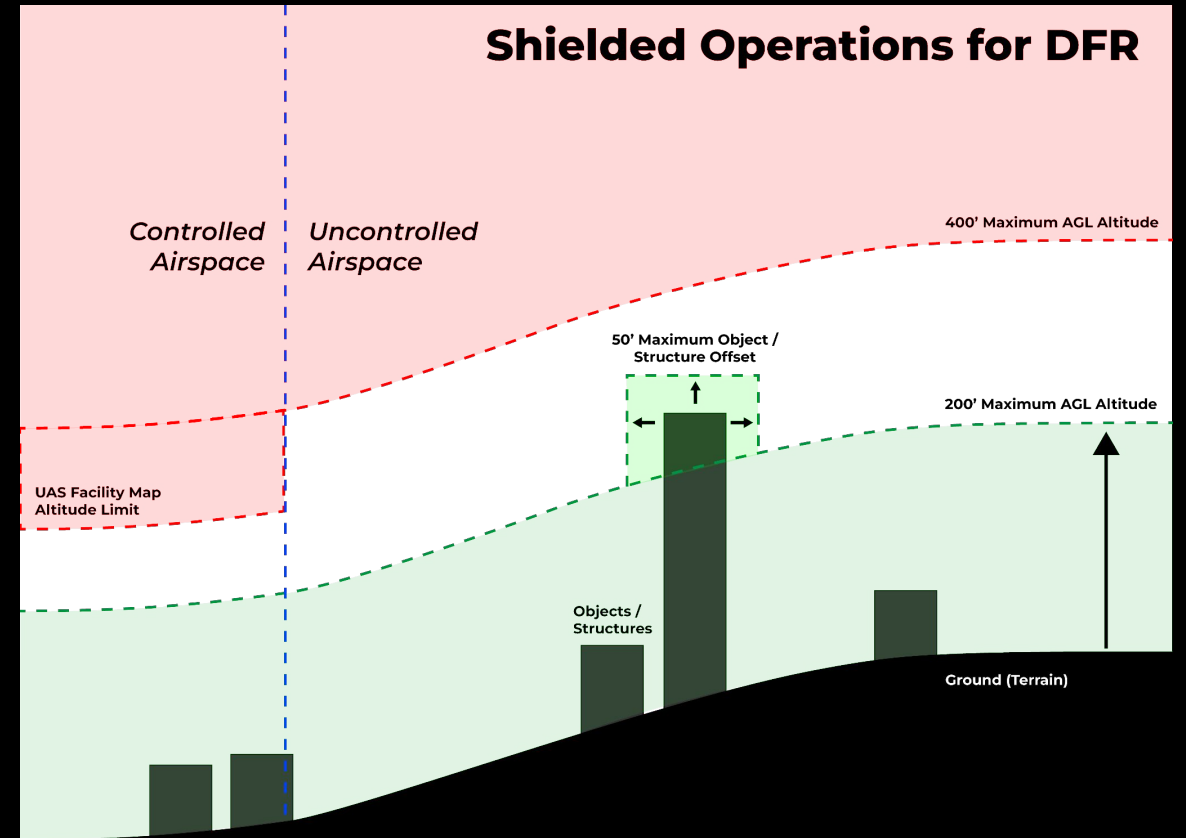
BVLOS Altitudes

11 ←

- Up to 200' AGL,
 - Or above 200' AGL if within 100' of an obstruction

11c ←

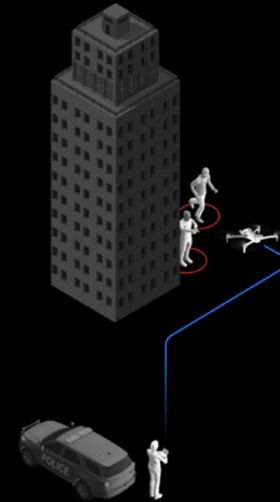
- Must remain at or below the UAS Facility Map altitudes still



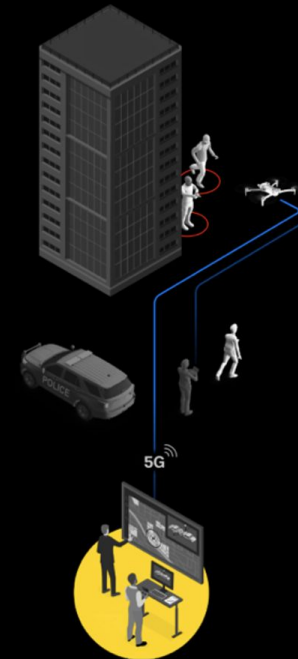
BVL0S Methods

- X10 meets the waiver requirements whether it is:
 - ✓ Operated via controller
 - ✓ Street launched and flown remotely
 - ✓ Dock launched and flown remotely

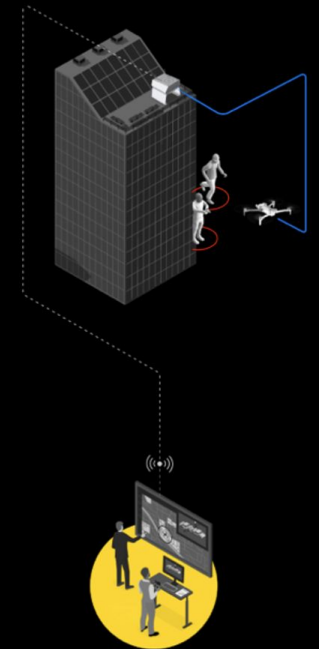
Operator Led



Patrol Led



Dock Based



ADS-B In required for all
operations.

Provisions #34 and 35

ADS-B Technical Requirements

34 ←

- Must detect both ADS-B Out frequencies (978 and 1090 MHz)

35 ←

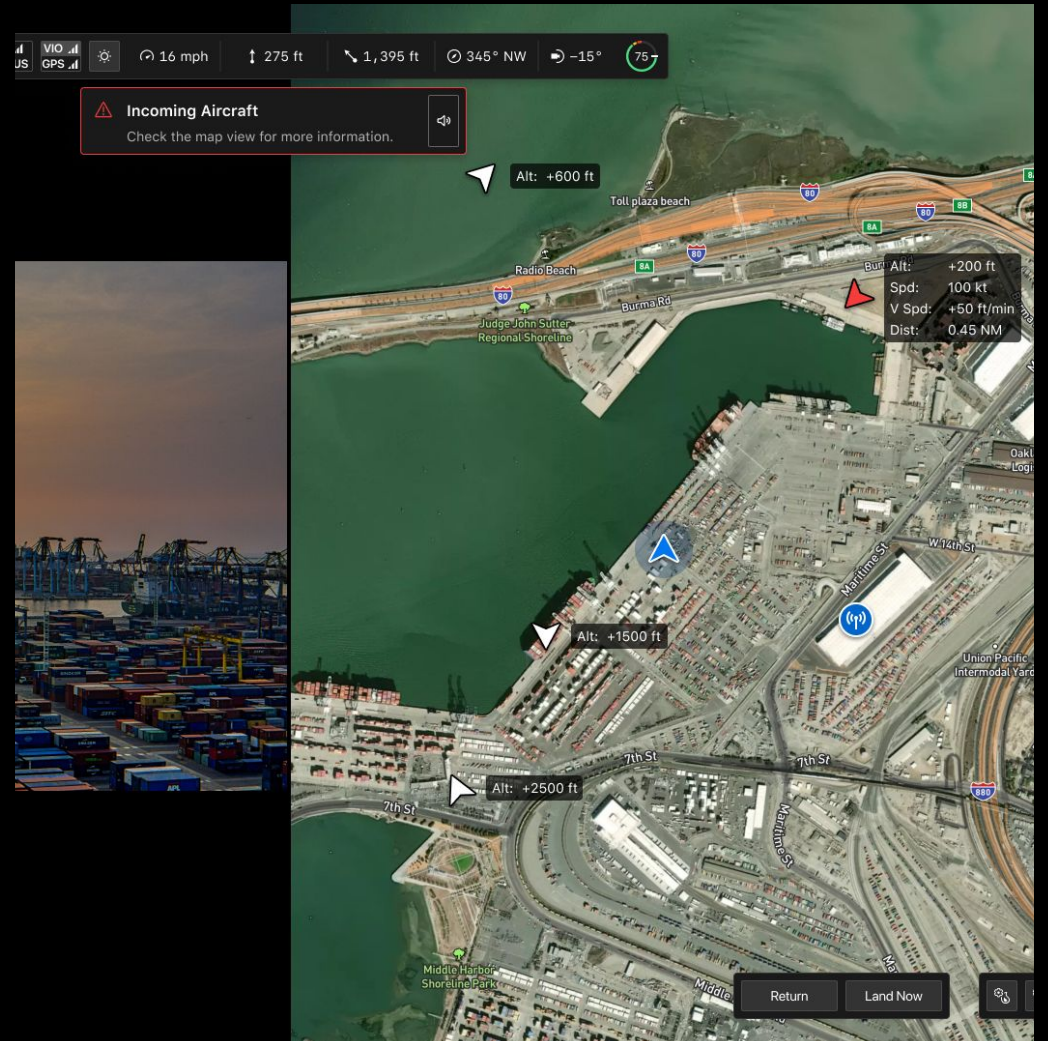
- Must be a local sensor or an FAA approved UTM third party data service provider

• Examples

- ✓ X10 on-board receiver
- ✓ X10 Dock ground receiver
- ✓ DedroneBeyond installation
- ✗ FlightAware
- ✗ FlightRadar24
- ✗ Foreflight

Consider how the ADS-B data is displayed.

- Is the data easy to understand by operators?
- What alerts does the system provide?
- Do alerts give the operator enough time to react and maintain a safe distance from aircraft?



Anti-collision lighting
required for all operations.

Provisions #13

Operations below and above UAS Facility Map altitudes.

Below: Provisions #34 and 35

Above: Provisions #12 and #31

Operate below UAS Facility Map altitudes

- 10b, 11c ← • Operations below UAS Facility Map altitudes are approved, with no further action/approval needed
 - LAANC is not needed
- 26 ← • No radio communication is required
- 27 ← • No additional airspace clearance is required

Operate **above** UAS Facility Map altitudes

- 31 ← 1. Request an SGI
 - Used on a case-by-case basis, not for routine operations
 - URL: https://www.faa.gov/uas/advanced_operations/emergency_situations
- 12 ← 2. Request an airspace authorization
 - Purpose is to approve routine operations
 - FAA is still developing a process for approving this type of request

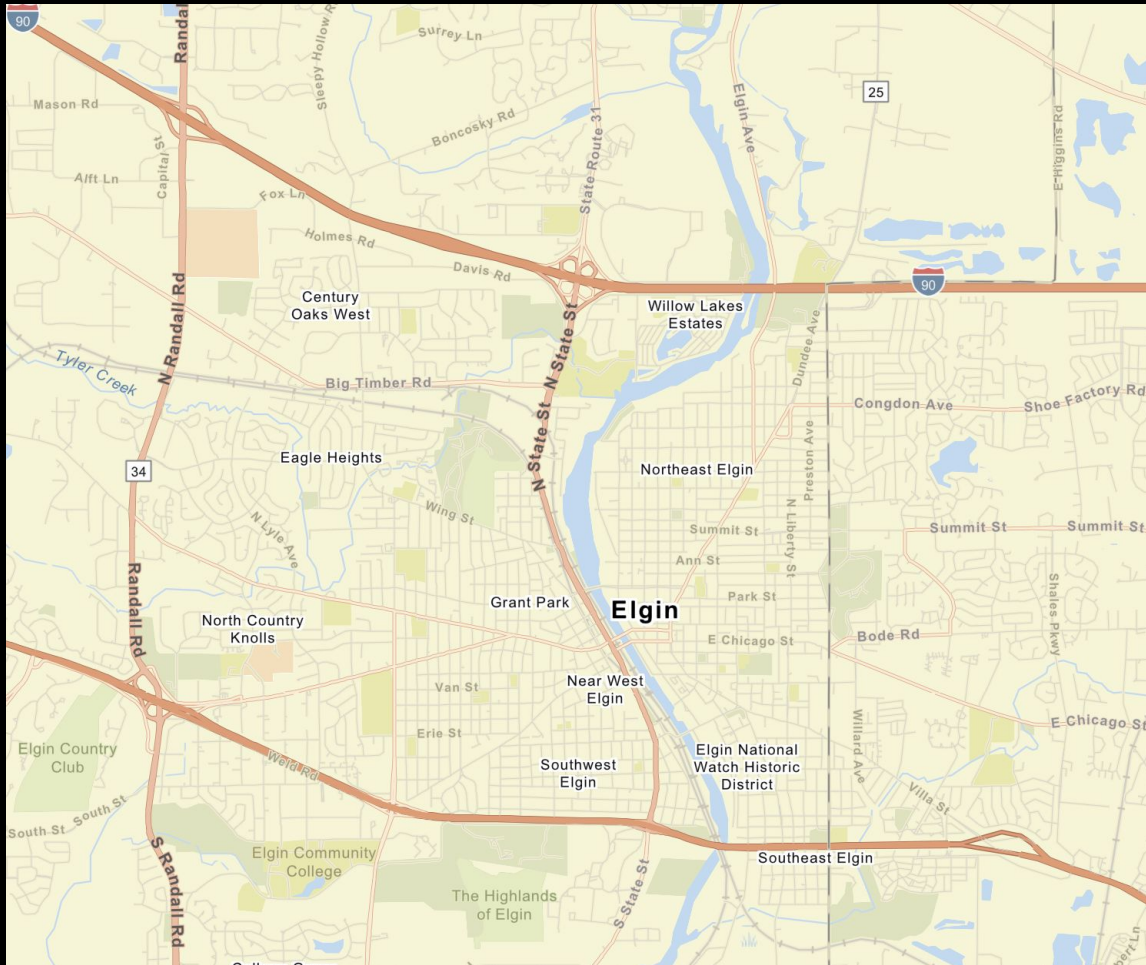
Operations **near** heliports and uncontrolled airports

Provisions #21 and 22

The waiver contains three “catch alls”

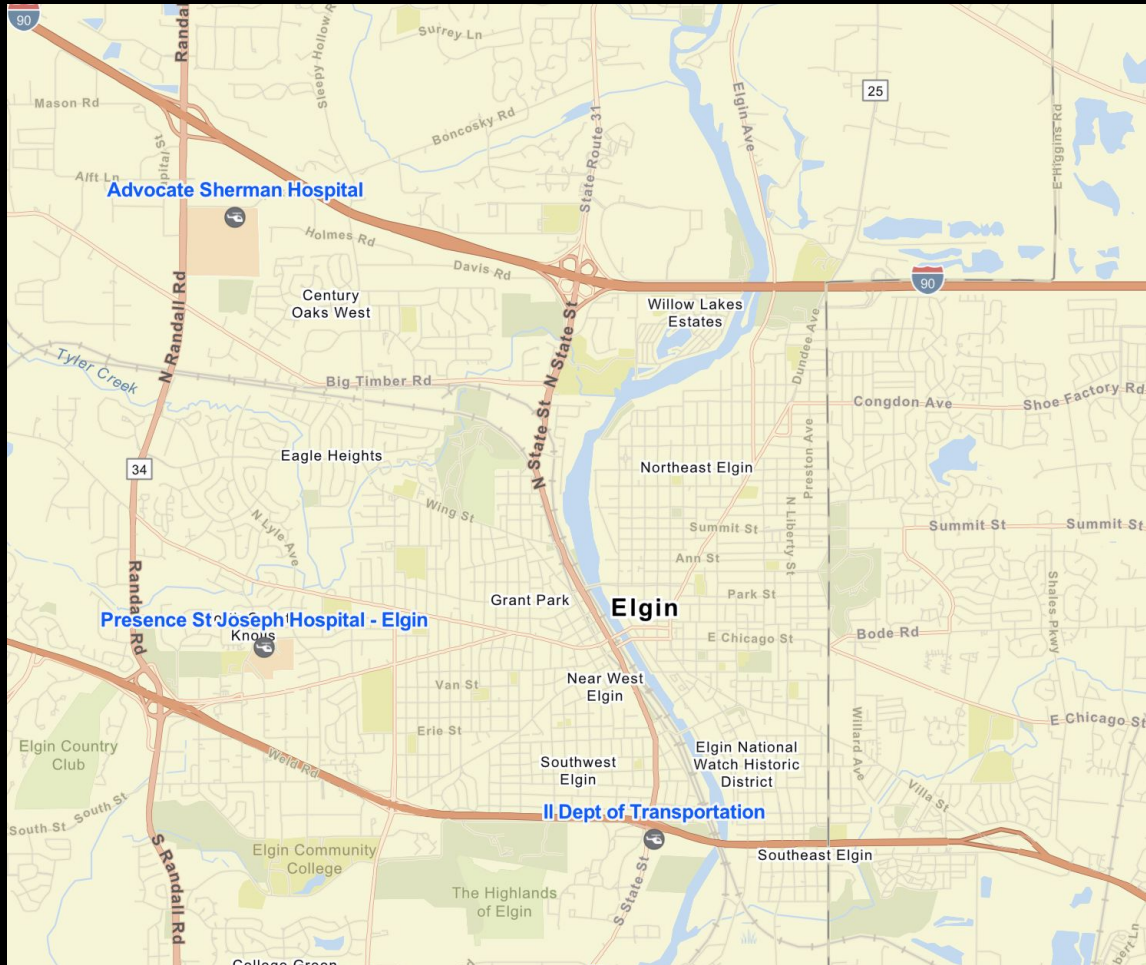
- 21 ← • The PIC must have situational awareness of air traffic and not pose a collision hazard
- 22 ← • The PIC must ensure there is always a safe operating distance between other aviation activities and the sUA
- 22 ← • The sUA must not be operated in a manner that interferes with operations or traffic patterns at any airport, heliport, or seaplane bas

An example from Elgin, IL



- All Class G airspace with no altitude restrictions
- Nothing shown in FAA UAS Visualize It

An example from Elgin, IL



- However, there are two hospitals with helipads in the operating area!

A couple suggestions

- Outreach to the hospital to learn about typical flight paths in/out and share information about the drone operation
- Include the heliport locations in your preflight review
- Geofencing can be used to create a buffer around the heliport

A few more notes on airspace

- 25 ← 1. Special authorization is needed to fly in prohibited or restricted areas
- 21 ← 2. Special authorization is needed to fly in TFRs
- 11 ← 3. When operating BVLOS without a VO, flight altitude is still limited to 200' AGL even if the UAS Facility Map altitude is greater

Operations over human beings

Provision #20

Allowed, but depends on the flight purpose

- 20c ← 1. When conducting operations for the purpose of safeguarding human life:
- Flight over human beings may occur without a parachute recovery system
 - Minimize flight over people to the extent possible (altitude and duration)

- 20 ← 2. In any other case:
- The drone must be Part 107 Subpart D Cat 1, 2, 3 or 4 compliant, or

20a ← The drone must be equipped with:

- 20b ←
- A mechanism to stop the propellers, and
 - A parachute recovery system compliant with ASTM F3322-18 or later

Check if a drone is Part 107 Subpart D compliant at:

<https://uasdoc.faa.gov/listDocs?docType=oop>

Drone airworthiness

- How to accomplish this?
 - Have an airworthiness statement on file
 - Follow OEM recommendations for maintenance actions
 - Scheduled maintenance
 - Unscheduled maintenance
 - Conduct functional check flights after maintenance
 - Recordkeeping
 - Conduct preflight inspections
 - PIC verifies aircraft is in a safe condition for flight
 - Include OEM recommendations and add additional requirements as needed

Operator qualifications & training

Provisions #1 and #13(b)

Waiver Requirements

- 1 ← • Responsible Person is responsible for ensuring the flight crew:
 - Is trained and certified by the agency as having requisite knowledge to safely operate in the NAS
 - Is informed of the Waiver
 - Is informed and familiar with Part 91 regulations
- 13b ← • The flight crew must be trained on night visual illusions and physiological conditions

*The Remote Pilot Certificate **partially** covers these requirements.*

A blue bucket is being filled with water from a large pipe. The water is splashing into the bucket, which is sitting on a large, shallow, circular basin. In the background, a city skyline is visible at sunset, with several tall buildings and a warm, golden light. The scene is set on a rooftop or a high vantage point.

**Knowledge
&
Skills**

**Fill the
bucket to
create
proficient
operators.**

A blue bucket is being filled with water from a hose. The background shows a city skyline with a prominent skyscraper. The scene is set on a rooftop or balcony with a railing.

FAA Requirement

Agency Responsibility

Recurring Training / Currency

In-House Agency Training

OEM / Vendor Training

**Remote Pilot
Certificate**

Part 107

Part 91

Recordkeeping and reporting

Provisions #1, 5, 6, 13(b), 33, 35, 36

Recordkeeping

- The Responsible Person must track the following:

- 1, 13(b) ← • Evidence of training
- 5 ← • Current list of pilots by name operating under the waiver
- 6 ← • Current list of sUA by registration number operating under the waiver
- 33 ← • All flight times for flight under the waiver

This information is provided to the FAA upon request.

Reporting

- NTSB

- 36 ← • 40 CFR 830 requirements

- Note that these apply to **all** sUA operation, even under Part 107

- <https://www.nts.gov/investigations/process/Documents/NTSB-Advisory-Drones.pdf>

- FAA

- 37a ← 1. Events where a UA was operated less than 500' from crewed aircraft

- 37b ← 2. Date and description of any loss of control event