UAS/Drones in Agriculture

FAA REGULATIONS FOR AGRICULTURAL OPERATIONS
Milestones in Civilian Drones
This is a VERY New Industry

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>2012</td>
<td>Congress mandated FAA create rules for the operation of drones</td>
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<td>2014</td>
<td>FAA provided authorization for film and TV production companies for Tom Cruise to star in <em>Top Gun 2</em> alongside drones</td>
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<tr>
<td>2015</td>
<td>FAA began requiring small drones to be registered</td>
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<tr>
<td>2016</td>
<td>FAA rules regarding hobbyists versus commercial drone operators went into effect (Part 107)</td>
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Today more than 1 million drones are registered in the U.S. Forecasts are for 7 million by 2021

Compare to 250,000 manned aircraft in 100+ years of flight

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**sUAS Fleet in USA**

<table>
<thead>
<tr>
<th>Year</th>
<th>Millions</th>
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<tbody>
<tr>
<td>2016</td>
<td>Hobbyist: 2, Commercial: 7</td>
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<tr>
<td>2017</td>
<td>Hobbyist: 3, Commercial: 10</td>
</tr>
<tr>
<td>2018</td>
<td>Hobbyist: 4, Commercial: 13</td>
</tr>
<tr>
<td>2019</td>
<td>Hobbyist: 5, Commercial: 16</td>
</tr>
<tr>
<td>2020</td>
<td>Hobbyist: 6, Commercial: 19</td>
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<tr>
<td>2021</td>
<td>Hobbyist: 7, Commercial: 22</td>
</tr>
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25% Commercial, 75% Hobbyist
<table>
<thead>
<tr>
<th>Hobbyist</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Flying for enjoyment, recreation, outside of work and not for work, business purposes, or for compensation or hire.”</td>
<td>“Flying for work, business, non-recreational reasons, or commercial gain.”</td>
</tr>
<tr>
<td>Considered a model aircraft</td>
<td>This typically includes flying a drone for hire, compensation, to provide a service, or for economic benefit of an entity or person. Intended use, not compensation, is the determining factor.</td>
</tr>
<tr>
<td>Does not require a drone pilot license</td>
<td>Considered FAA regulated aircraft operations under Part 107 and requires a licensed drone pilot</td>
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<tr>
<td>EXAMPLE:</td>
<td>EXAMPLES:</td>
</tr>
<tr>
<td>Farmer using recreational drone to view farm from the air</td>
<td>Farmer uses drone weekly to capture multispectral images of crops to support watering and pesticide application</td>
</tr>
<tr>
<td></td>
<td>Agronomist uses drone to survey farms in support of advising farmers on health of crops</td>
</tr>
</tbody>
</table>
Commercial Ops & Registration

FAA Part 107 Rule

If a drone is being flown as hobbyist, no licensing is required.

If a drone is being flown commercially, under the FAA UAS Part 107 rule, the pilot must obtain a “Remote Pilot Airman Certificate” As of the end of 2017, there were 70,000 licensed, commercial drone pilots.

- **FAA Remote Pilot Knowledge Test**: 60 question multiple-choice exam administered at FAA-approved knowledge testing centers; costs $150
- **Other requirements**: Pilot must be 16 years of age and must pass TSA security vetting. There is no practical testing of a pilot’s operating skills.

Penalty for not complying with rules is $1,100 per violation for the pilot and $11,000 for the organization

Registration with FAA

Federal law requires that ALL small unmanned aircraft (drones) weighing more than .55 pounds and less than 55 pounds be registered with the FAA

Registration is required for both recreational and commercial use

- Registration for hobbyist has been controversial, but Congress passed a law Dec 2017 requiring all drones to be registered under the National Defense Authorization Act

Drones must be marked with the registration number
Government vs. Civil Operators (AC 00-1.1A)

“public aircraft” means any of the following:

◦ Aircraft used only for the United States Government
◦ An aircraft owned (or leased for at least 90 days) and operated by the government of a State, the District of Columbia, or a territory, or a local government
◦ An aircraft chartered to provide transportation or other commercial air service to the armed forces

“public aircraft operation” means:

◦ Aircraft operated in accordance with Title 10 (Military rules);
◦ Aircraft operated in the performance of a governmental function or
◦ Aircraft chartered to provide transportation or other commercial air service to the armed forces

“civil aircraft” are any aircraft that are not “public aircraft”

Public Aircraft become civil aircraft if they are operated for transportation of persons or property for compensation or hire
Part 137 Agricultural Aircraft Operations

This regulation prescribes rules governing Agricultural aircraft operations within the United States; and the issue of commercial and private agricultural aircraft operator certificates”

**Private operator**— must hold a current U.S. private, commercial, or airline transport pilot certificate

**Commercial operator**— must have available at least one person who holds a current U.S. commercial or airline transport pilot certificate

**Aircraft** -- must have at least one certificated and airworthy aircraft, equipped for agricultural operation.

**Knowledge and skill tests** -- The chief supervisor of agricultural aircraft operations must show satisfactory knowledge and skill regarding agricultural aircraft operations (includes EPA Rules on chemical handling)

“No person may conduct agricultural aircraft operations without, or in violation of, an agricultural aircraft operator certificate issued under this part.”
Waiver or Exemption?

PART 107 RULES THAT CAN BE WAIVED

(a) Operation from a moving vehicle or aircraft. (not for package delivery)
(b) Daylight operation.
(c) Visual line of sight aircraft operation. (not for package delivery)
(d) Visual observer.
(e) Operation of multiple drones per pilot
(f) Yielding the right of way to manned aircraft
(g) Operation over people.
(h) Operation in controlled airspace.
(i) Speed, altitude, and visibility limitations

Waiver process for operations in controlled airspace: Low Altitude Authorization and Notification Capability (LAANC – pronounced “lance”)

EXEMPTIONS

Any FAA regulation can be exempted if not required by law

Examples:

- UAS over 55lbs. Operated per Part 107 (Yamaha Fazer)
- Snap Drone – Approved for flight over people
Questions?
Airspace Categories - Regulatory and Non-regulatory

The two categories of airspace are: Regulatory and Non-Regulatory.

Within these two categories there are four types:

- Controlled, Uncontrolled, Special use, and other airspace.
Current Civil UAS Airspace Environment

NOTE:
Some limited EVLOS/BVLOS Civil Ops in very remote areas

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