

Unmanned Aerial Systems (UAS) aka Drones

The commercial use of Unmanned Aerial Systems (UAS), commonly known as drones, is rapidly increasing. According to a report issued by the Aerospace Industries Association, commercial spending on drones will almost double over the next decade, and is expected to generate \$89 billion in the next 10 years.

The FAA estimates there could be as many as 7,500 small commercial drones in use in the United States by 2018. Companies across the country are also looking at a wide range of ways for drones to help them improve their business.



As of June 23, 2016 the FAA granted 5,309 exemptions to commercial UAS operators. This is a 15.6 percent increase over the total exemptions issued as of April, 2016 and a 120 percent increase over the last 9 months. In a January 22, 2016, the FAA reported that nearly 300,000 owners registered their small unmanned aircraft in the first 30 days after the December 21, 2015 registration requirement.

Commercial Uses

Drones have a wide variety of commercial uses including:

- Real estate surveys
- General aerial surveying
- Agriculture
- Construction
- Film and television
- Utility inspection
- Environmental uses
- Search and rescue
- Emergency management
- Insurance

Experimentation of UAS for wider applications continues. For example, drones are being tested as part of control systems for the operation of unmanned construction equipment.



Benefits

While there are reports of misuse, the benefits of UAS to businesses are expected to outweigh the detriments:

- Job safety is likely to improve as these units are used more often for high hazard inspection and surveying purposes. Equipped with a camera, recording capabilities, and fail-safe technology, drones are being used for inspections of towers, stacks, bridges, tanks and vessels. With about the same level of quality for far less cost, drones can perform these inspections much faster than workers.
- Construction managers can deploy drones for the purpose of monitoring safe work practices at remote jobsites and inspecting the quality of completed work.

Surveying and mapping large areas and performing specialty and high-risk tasks can be performed more safely and cost-effectively with UAS. Examples include:

- Monitoring storms and hurricanes during the event and surveying post-storm damage
- Excavation, tunneling, and trenching sites
- Investigations of catastrophic events such as:
 - Landslides
 - Earthquakes, floods and tsunamis
 - Aircraft and train crashes
- Land surveying in extreme environments (temperature and terrain)
- Inspecting bridges and other infrastructure
- Close visual inspections of live flare stacks, flare tips and live transmission lines and tower
- Aiding in search and rescue, and helping emergency personnel find missing people in difficult-to-access locations
- Delivering supplies to disaster areas struck by catastrophes including earthquakes, hurricanes, floods and tornadoes (upon FAA approval)
- Enabling filmmakers and broadcasters to take advantage of aerial cinematography and special effects without risk to camera teams
- Allowing access to new visual perspectives and enabling access to areas that are currently inaccessible

Insurance carrier opportunities

Some insurers are utilizing drones for the following:



- Loss control inspections of roofs, bridges and difficult to access damaged property
- Claims management
- Workers' compensation investigations and surveillance of suspected claimant fraud
 - UAS are proving to be more cost effective and efficient than traditional stakeouts
 - Cameras can be set to motion-activation and can automatically zoom in
- Scene investigations to accurately depict conditions when accidents occurred, including machine locations and conditions of premises (ex. Photos of a faulty roof or high piece of scaffolding). This also protects the adjuster from inspecting a piece of equipment which contributed to the workplace accident.

When drones are used for surveillance, guidelines need to be in place to assure compliance with applicable state privacy and trespass laws.

Regulations

The FAA has issued Final Rule 107 on June 21, 2016 governing the commercial use of drones weighing less than 55 pounds. All owners of UAS for commercial use must register their units and receive a Section 333 exemption. When granted, the exception will define the permitted uses of the drones. Additional requirements are noted below.

Operational Requirements

- Unmanned aircraft must weigh less than 55 lbs
- While FAA airworthiness certification is not required, the remote pilot must conduct a pre-flight check to ensure its safe operation
- The UAS must remain within the pilot's visual line of sight
- Line of sight means the ability to see the UAS without the aid of any device or corrective lenses
- UAS may not operate over any persons not directly participating in the operation, under a covered structure, or inside a covered stationary vehicle
- Daylight-only operations — including 30 minutes before sunrise and 30 minutes after sunset, provided that the UAS is equipped with anti-collision lighting
- Must yield right of way to other aircraft
- First-person view camera cannot satisfy "see-and-avoid" requirement but can be used as long as requirement is satisfied in other ways



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- Maximum groundspeed of 100 mph
- Maximum altitude of 400 feet above ground level or within 400 feet of a structure
- Minimum weather visibility of 3 miles from control station
- Prohibited operation in Class B, C, D, & E airspace unless approved by air traffic control
- Only one operator per UAS at any time. UAS cannot be operated from a moving aircraft or motor vehicle
- UAS cannot carry hazardous materials
- Requires pre-flight inspection by the remote pilot in command
- A non-US registered UAS can be used if they satisfy the requirements of part 375.
- A UAS can be used to carry loads provided that it does not adversely impact the flight characteristics or control
- Transportation of property for compensation or hire is allowed provided that:
 - The combined weight of the UAS, attached systems, payload and cargo is less than 55 lbs
 - The flight is conducted within visual line of sight and not from a moving vehicle or aircraft; and occurs wholly within the bounds of a State and does not involve transport between Hawaii and another place in Hawaii through airspace outside Hawaii; (2) the District of Columbia and another place in the District of Columbia; or (3) a territory or possession of the United States and another place in the same territory or possession

Operator Requirements

- A person operating a UAS must either hold a remote pilot airman certificate with a small UAS rating, or be under the direct supervision of a person who holds a remote pilot certificate (remote pilot in command) and be at least 16 years of age
- Foreign certificated UAS pilots will be required to obtain an FAA-issued remote pilot certificate
- Report to the FAA within 10 days of any operation that results in at least serious injury, loss of consciousness, or property damage of at least \$500
- Conduct a preflight inspection, to include specific aircraft and control station systems checks to ensure the UAS is in a condition for safe operation
- A remote pilot in command may deviate from the requirements of this rule in response to an in-flight emergency



The FAA also noted that most of the requirements may be waived if the applicant demonstrates that his or her operation can be safely conducted under the terms of a certificate of waiver.

In addition to these federal requirements, many states have enacted or are considering UAS regulations.

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