UP, UP & AWAY:

UNMANNED

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Now that a final rule has been issued to regulate the use of small unmanned aircraft systems (UAS) for commercial purposes, use of this technology is expected to increase quickly. No longer will using unmanned aircraft, commonly called drones, in commercial activities require a cumbersome application seeking specific exceptions to federal aviation regulations.

As of August 29, 2016, unmanned aircraft weighing less than 55 pounds can be legally flown in commercial operations within the parameters established by the Federal Aviation Administration (FAA) in Title 14 of the Code of Federal Regulations (14 CFR) part 107, Small Unmanned Aircraft Systems.
Construction, agriculture, real estate, energy, film, insurance, photography, and retail delivery are just some of the industries that are poised to capitalize on drone capabilities. The allure of UAS is their ability to perform tasks and achieve results safer, faster, and cheaper than traditional methods.

Camera-mounted UAS provide a unique visual perspective and the ability to inspect and document physical conditions over wide areas and in hard to reach places. External components of a high-rise building or bridge can be inspected without putting a person at risk.

The once cost-prohibitive daily documentation via photographs of a project’s progress with a large footprint is now both fast and cheap. And because they are battery operated, using UAS to perform tasks that previously required another form of transportation can reduce the environmental impact of a contractor’s operations.

Despite their many uses and advantages, drones present risks of their own, some of which could be catastrophic. Contractors that choose to use this technology should be deliberate to establish and enforce safety protocols and best practices for drone use.

**Types & Uses of Unmanned Aircraft**

Drones come in all shapes and sizes. The larger the drone, the more stability, battery life, and weight-bearing capacity it will offer. Large drones, such as those used by the military, can approach the size of a small airplane.

Most commercial drone applications can be accomplished with smaller devices that weigh about 10-20 pounds.

For regulation purposes, the FAA defines a small drone as one weighing less than 55 pounds.

Rotary-blade drones are much more common in commercial applications than fixed-wing drones. Rotary-blade drones look and function similar to helicopters, having vertical take-off and landing (VTOL) capabilities as well as the ability to hover in place.

The benefits of rotary blade drones come with the trade-off of lower speed and shorter range flight capabilities than with fixed-wing drones. Available in single- or multi-rotor designs, additional propellers give rotary-blade drones greater stability and weight-bearing capacity, but also put a greater drain on the battery.

**Regulation of Unmanned Aircraft**

In 2012, Congress charged the FAA with developing standards for safely incorporating small UAS into the national airspace. The top priorities in this endeavor unquestionably remain avoiding interference with manned aircraft and protecting the wellbeing and privacy of individuals on the ground.

Over the past several years, the FAA has grappled with finding a way to balance safety and privacy concerns while allowing the market to capitalize on the potential benefits and capabilities UAS offer.

In February 2015, the FAA issued draft regulations that provided a preliminary framework for widespread commercial use of small UAS within specified parameters. As the business community waited for final regulations to be issued allowing widespread commercial use of small UAS, more than 3,500 requests for exemptions were granted by the FAA that allowed approved companies to use small UAS for specified operations.

As of August 29, 2016, all commercial entities are able to utilize drones within the parameters of 14 CFR Part 107. The rules pertaining to small UAS regulate three key areas:

1) The UAS device

2) Operator qualifications

3) In-flight operations

A key change between the draft rule and final rule is the establishment of a remote pilot in command requirement, which stipulates that the person operating the UAS must either hold a remote pilot airman certificate or be under the direct supervision of a person who holds the certificate.
Key limitations on small UAS operations include no nighttime operations, visual line of sight requirements, maximum speed of 100 miles per hour, and maximum altitude of 400 feet above ground (unless within 400 feet of a structure). Operators must also comply with restrictions on flight in controlled airspace and yield to other aircraft at all times. Additional limitations and requirements can be found at www.faa.gov/uas.

**Prohibited: Flight Over People Not Directly Participating**

Contractors should note that FAA rules prohibit unmanned aircraft flying over people not “directly participating” in the flight operation unless they are under shelter or in a stationary vehicle. The purpose of this requirement is to protect people on the ground who are likely unaware of the drone flying overhead and could be injured if control of the aircraft was lost.

For example, suppose a contractor is adding a new building to a hospital campus. Clearly, patients and visitors entering and leaving the campus are not participating in the operation, so drones should not be flown over public parking locations or entries and exits to existing buildings.

Some contractors have been operating under an assumption that subcontractors, suppliers, and visitors to the construction site are part of the “operation,” but the FAA clarified in the preamble of the final rule that only the remote pilot in command, the person operating the controls (if different), the visual observer, and any other person who is necessary for the safety of the operation are considered to be “directly participating” in the operation.

Therefore, flying an unmanned aircraft over an active, open construction site would require the contractor to obtain a waiver from the FAA.

**Primary Risk Exposures for UAS Owners/Operators**

Unmanned aircraft present most of the same risks as other forms of aircraft, but on a smaller scale. For most commercial UAS users, the most likely losses include:

- Injury or damage due to collision or interference with another aircraft
- Injury or damage to people or property on the ground
- Damage to the unmanned aircraft
- Violation of another’s rights when flying over private property
- Unauthorized collection, use, or storage of data

Clearly, the most catastrophic exposure, and the one that regulators are most concerned with preventing, is interference with a manned aircraft, such as a commercial passenger jet. A number of near misses have already been reported by airline pilots as they approach or take off from urban airports. In most cases, these drones were flown by hobbyists, not commercial users, and were operating – knowingly or unknowingly – in violation of the rules.

A UAS crash landing can also cause serious injury or damage on the ground, albeit on a smaller scale. Damage to the hull (the aircraft itself) is perhaps the least worrisome of all UAS risks because it is quantifiable and the devices used in most commercial operations are relatively inexpensive. Unmanned aircraft also have the potential to create personal injury claims, including interference with one’s personal rights (the right to privacy and the right to refuse entry onto one’s property).

Regardless of intent, the prospect of being observed or photographed in the privacy of one’s own backyard is no small concern. Because UAS can collect and hold personally identifiable data, cyber exposures related to how data is stored, used, and protected must be examined. For most incidental operations – obtaining pictures or conducting visual inspections of private property with the owner’s permission – this risk would appear to be low.

**Insuring Unmanned Aircraft Exposures**

It has become widely accepted in the insurance industry that unmanned aircraft constitute “aircraft.” As such, they are treated like manned aircraft when determining coverage for the exposures associated with owning and using unmanned aircraft. Standard commercial property and liability policies do not cover most aircraft exposures unless such coverage has been added to the policy. Therefore, companies that own, lease, or rent UAS to conduct operations have an uninsured liability unless they have taken specific steps to cover this risk.

Standard endorsements are available for adding coverage for damage to unmanned aircraft (the hull exposure) to property policies and for adding liability insurance to the CGL and umbrella policies. Alternatively, hull and liability coverage can be obtained on an aviation policy or on one of the many new unmanned aircraft forms that have been introduced specifically for this industry in the past 18 months.

The market for aviation insurance for unmanned aircraft is fairly robust, as UAS present a tremendous growth opportunity for a mature industry that already has the expertise in place to write the coverage. Some CGL insurers will agree
to cover the unmanned aircraft exposure for little or no additional premium for companies that use small UAS to perform tasks that are incidental to the company’s revenue-generating operations, with restrictions on the type, size, or usage of the device in some cases.

As CGL underwriters collect data on types of UAS (size, safety features, etc.) that have higher incidence rates, expect more conscientious underwriting of this exposure to occur.

**Safety Features**

UAS crashes are most commonly caused by mechanical failure (e.g., a rotor breaks), battery failure, loss of connection to the control unit, weather (especially wind), and operator error or distraction. Many unmanned aircraft devices have safety features built into the software that help to prevent accidents.

Of course, safety features come with a cost, but as the industry evolves, the price of a relatively sophisticated device will almost certainly come down, even as safety technologies improve. The lighter the UAS, the more susceptible it will be to wind and other weather conditions. A moderate wind can blow a small UAS off course and make it difficult to control.

The best strategy for avoiding this risk is to not fly when weather conditions are unfavorable or when wind speeds are too high for the device to be flown safely.

Unfortunately, unmanned aircraft manufacturers are not required to test or specify the conditions under which a UAS can be expected to operate safely. Remote pilot certification should improve operator awareness of how weather may affect a UAS flight, but the proposed FAA regulations do not specifically address weather conditions other than visibility.

**Best Practices for UAS Operations**

The regulations issued by the FAA stipulate only what is allowed in the use of unmanned aircraft. As minimum standards, the FAA rules say little about mission planning, record-keeping, and maintenance. Here are some best practices for the use of unmanned aircraft that address these concerns:

**Follow a Regular Maintenance Schedule**

The small UAS regulations issued by FAA do not specifically mention maintenance requirements, other than requiring the remote pilot in command to conduct an inspection before each flight to ensure the device is safe to operate. Replacing worn parts would presumably be part of that process, but no minimum maintenance requirements are stipulated. Unfortunately, UAS manufacturers typically do not provide recommended maintenance schedules, putting the onus on the owners and operators of such aircraft to determine when maintenance should be performed.

Two crucial components of a maintenance plan include replacement of moving parts and replacement of the battery. On many of the unmanned aircraft in use today, the rotors are made of plastic, which can break. Replacing the rotors after a specified number of flight hours will reduce the risk of a broken rotor, which would render the device uncontrollable and almost certainly result in a crash landing. Likewise, batteries lose their ability to hold a charge over time and should be replaced after a specified number of charges. (If the battery dies while a UAS is in flight, it drops to the ground.)

Following a conservative maintenance plan (e.g., shave 15-20% off the expected life expectancy of the part in question) will substantially lessen the risk of a failed component during flight. The operating software should also be updated regularly to ensure optimal performance of the aircraft, including any fail-safe features.

**Prepare & Stick to a Mission Plan**

While unmanned aircraft operators are not required to file a formal flight plan, preparing a mission plan has a number of benefits. It requires the operator to think through the best place to launch and the optimal flight path to avoid pedes-
trian pathways, as well as natural and man-made obstacles (trees, power lines, etc.).

Estimate the time required to complete the task from takeoff to landing to ensure it is well within the battery capacity. (The battery on many small rotary-blade drones will hold only a 20-30-minute charge.) Weather and other aviation risks should also be considered in preparing the plan.

Once in the air, stick to the mission plan and avoid the temptation to expand the mission by taking on additional tasks, as doing so could present unidentified hazards or exceed the battery life. A better approach is to complete the original mission, land the aircraft, and then relaunch after preparing a new mission plan for the additional tasks.

**Conduct a Preflight Inspection**

Before launching the unmanned aircraft, the remote pilot in command is required to perform a visual inspection of the UAS to determine whether it is in a condition for safe operation and to confirm that all control links between the control station and the UAS are functioning properly.

Look for signs of excessive wear and tear, loose wires or connections (that are not supposed to be loose), leaks, and any other abnormalities in the appearance of the aircraft. Replace any parts that indicate an increased risk of failure. Likewise, verify that the battery is fully charged. If the UAS is determined or suspected to not be safe for operation, the flight must be postponed or discontinued (if already in flight).

**Check Weather Conditions**

Weather conditions – especially wind – should be assessed and forecasts consulted before an unmanned aircraft is launched. Small UAS can be especially difficult to control in windy conditions, and can easily fly off course. Fog, rain, snow, or other conditions that reduce visibility should also be taken into consideration. If weather presents any concern at all, postpone the operation for another day.

**Assign a Visual Observer**

Successful completion of a mission requires paying attention to the speed, height, and location of the unmanned aircraft, as well as various external factors. A visual observer is someone other than the UA operator who is assigned to assist with the mission in a variety of ways, including watching for unexpected hazards (manned aircraft, birds, power lines) or helping the operator determine how close the UA is to the object being inspected or photographed.

In some cases, the visual observer may be asked to keep an eye on the operator, who may become preoccupied with flying the aircraft and lose awareness of his or her surroundings. The observer can alert the operator to tripping hazards, approaching vehicles, or other dangerous conditions, which can both reduce the risk of injury to the operator and prevent a disruption in the control of the aircraft.

**Hold a Debriefing**

Talk through the mission, including whether the purpose of the mission was accomplished, and identify any unexpected obstacles or challenges encountered. Document any lessons learned or recommendations that should be incorporated into the corporate best practices for future UA operations.

**Keep a Flight Log**

Although the FAA does not require a flight log to be kept, maintaining a record of all UAS operations, including the date, time, purpose, and location of the flight, is useful for not only determining when scheduled maintenance should be performed on the UAS, but to also provide a defense against third-party claims. That is, the ability to produce a record showing when and where unmanned aircrafts were in the air could be persuasive evidence in refuting a claim for third-party injury or damages.
The popularity of unmanned aircraft for both personal and professional use is growing daily. However, the potential for loss surrounding UAS should not be ignored. In addition to complying with FAA regulations, operators are advised to use common sense when flying UAS by following the best practices for safe operation.

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