Drone Zone

# Civil Liability Arising Out of the Commercial Ownership and Operation of Drones

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**D**espite the disharmonious regulatory environment for drones, organizations can take some precautionary measures to manage liability risk.

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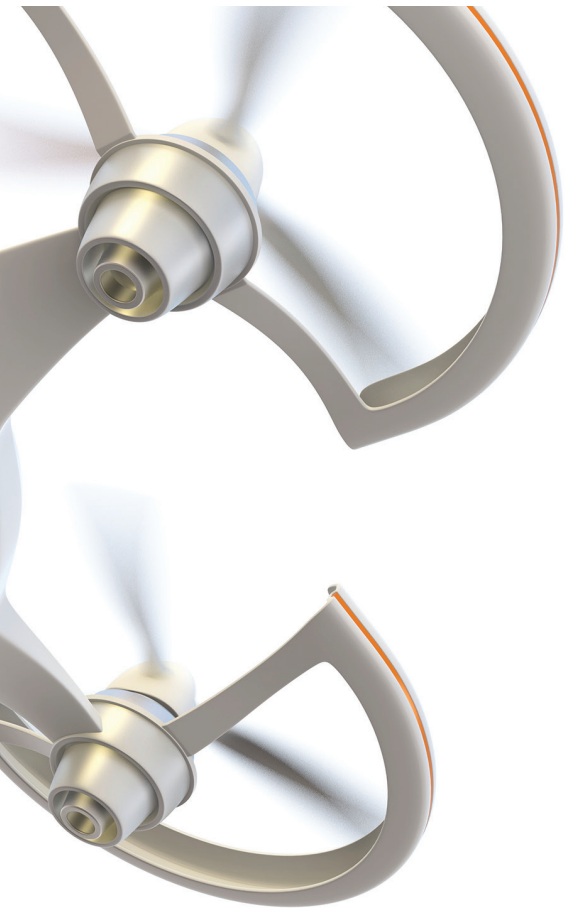

Generally, drones are robotic aircraft. They are not much different from the model airplanes that enthusiasts have been flying for decades. A couple of innovations have allowed the old-model airplane technology to advance so rapidly that these toys are poised to become ubiquitous tools comparable to cars, computers, cameras, and mobile phones. People and organizations that own or operate drones are exposed to civil liability risk from both the ownership and the operations of drones.

Individual private operators are generally people who buy drones for recreational or other hobby uses. These are operators who typically own and operate a drone themselves and use it as a hobby rather than a tool. This category includes children using drones as toys and drones used for amateur photography. These operators are exposed to many of the same risks as commercial operators, but they are considered distinct from commercial operators for the purpose of this article.

Commercial operators are corporate or institutional users that intend to use drones as a tool for their business. This could include rescue operations that need to see into disaster areas, a film production company, a utility company that needs to survey its transmission and distribution network, a surveying company that needs to fly remote sensors over large areas, a short-haul package delivery service, a police department or security company that needs targeted surveillance or persistent surveillance of an area, or a rental company that provides drone rentals.

The word "drone" can refer to a few different categories of robotic aircraft including remotely piloted vehicles (RPV) and autonomous aerial vehicles (AAV). The same robotic aircraft can be used as an RPV or an AAV depending upon the operator. The distinction between these operating modes can be important in assessing liability risk to an operator of an aircraft.

A remotely piloted vehicle (RPV) refers to an aircraft that is under the continuous, meaningful control of a human operator at all times. Examples of this mode of operation range from radio-controlled (RC) model airplanes flown by aviation enthusiasts to military weapons such as the Predator and the Sentinel models. This mode of operation can be further divided into what is called "first-person" and "third-person" operation. First-person operation refers to a mode in which the aircraft transmits a video stream to the operator in near real-time to provide a birds-eye view. Some people fly drones recreationally in first-person mode using virtual-reality goggles for example. Third-person operation refers to an RPV mode in which the operator flies the aircraft by looking at it from the ground or some other operational environment. This is the typical mode of operation for recreational drones and RC model airplanes.

Third-person operation is the oldest mode of operation and has been used for RC toys of all kinds (such as model cars) for many decades. Currently, this is the most common mode of operation because the technology and equipment is the simplest (and least costly). Over the long term this mode of operation will see less use, especially in the commercial sector where planning and operational control can be more important than active human control of the aircraft. Third-person operation requires an operator to remain in visual contact with a drone at all times.

An unmanned aerial vehicle (AAV) is a more general term that could include RPVs but usually refers to robotic aircraft that do not need (or are not provided with) continuous, meaningful human control. Indeed,

the original definition of "drone" refers to this mode: an aircraft that can navigate to and loiter above an area without meaningful human interaction.

In the military context, such a semiautonomous drone could be preprogrammed with commands to destroy a specific target automatically—person or vehicle or structure—if it is encountered. The human operator has control of the launch of the drone, and even the path taken by the drone, but if the human cannot approve or directly control all the actions of the drone, the human may not have *meaningful* control. Similarly, a commercial drone can divert to a preprogrammed flight path and destination under certain conditions. For example, a commercial drone can be preprogrammed to take over its own flight once the battery power falls below a certain level.

**Even though drones** operate in national airspace, the FAA does not currently have specific rules for drones.

Another example of this semiautonomous mode of operation is a drone that is preprogrammed with a specific flight path to follow from launch to destination. This would be the proposed mode of operation for delivery services to known addresses, which is what Amazon has proposed. This is also the preferred mode for surveillance operations such as flying a gas detector over a known gas pipeline network.

But drones can operate with even more autonomy. A human could task a drone with delivering a package to a specific address without having control over the path taken by the drone through space or the interaction with other objects along the way. The drone would make autonomous decisions about the path to take. In this case, the human would have control of the drone in that the human could begin the delivery operation and even terminate the delivery under certain conditions. However, if the human could not make nearly real-time decisions about the path the drone takes and how it interacts with the changing environment over that path, then the human would not have meaningful control over the drone at all times.

There are specific liability considerations with this fully autonomous mode of operation, and this mode may be the dominant one in the future. Self-driving cars are also dealing with the same issues regarding meaningful human control. Right now, most drone operations are conducted with meaningful human control of the aircraft, and this article will concentrate on liability considerations in the cases when a human has meaningful control.

## Regulatory Environment

Drones are considered aircraft that fall within the jurisdiction of the Federal Aviation Administration (FAA), which is responsible for national airspace. *Huerta v. Pirker*, NTSB Docket CP-217, NTSB Order No. EA-5730 (Nov. 18, 2014); 2014 WL 8095629, at *5. Even though drones operate in national airspace, the FAA does not currently have specific rules for drones. Special rules may be needed for drones because the airspace within which most current drones operate is the least restrictive airspace—the airspace from the surface up to 1,200-feet above ground level (AGL). This airspace is currently classified as G depending upon the level of urbanization. The vast majority of the national airspace is classified as G from the surface up to 1,200-feet AGL. Class G airspace has almost no restrictions. The main restriction is to stay clear of clouds. The more restrictive airspaces all require maintaining specified separation distances from aircraft, clouds, and ground-based objects, in addition to communication and reporting requirements. *See generally* Aeronautical Information Manual, April 3, 2014, Sec. 3-3-1. It is unlikely that the classification of airspace or the requirements of a particular class of airspace (such as G) will be changed for drones since this airspace is used by very diverse operators such as hot air balloons, blimps, gliders, and model rockets. For this reason, the FAA will likely have to define what a drone is and make regulations specifically for drones.

Congress authorized the FAA to promulgate comprehensive drone regulations as part of the FAA Modernization and Reform Act of 2012 (FMRA). Pub. L. No. 112-95, 126 Stat. 11 §336 (2012). The FAA was tasked with publishing guidelines for the integration of "small unmanned aircraft systems" into national airspace by December 14, 2015. *Id*. at §332 (b)(1), (2). "Small unmanned aircraft systems" are drones that weigh less than 55 pounds and are operated without "direct human intervention." *Id*. at §331 (6), (8). The FMRA specifically prohibited the FAA from creating rules for model drones, which are unmanned aircraft flown for hobby or recreational use. *Id*. at §336.

On February 15, 2015, the FAA announced proposed rulemaking for the private use of small drones (under 55 pounds). Press Release, FAA, DOT and FAA Propose New Rules for Small Unmanned Aircraft Systems (Feb. 15, 2016), https://www.faa.gov/news/press_releases/news_story.cfm?newsId=18295; 80 Fed. Reg. 9543 (Feb. 23, 2015). The proposed regulations address operating limitations, height restrictions, operator certifications and aircraft registrations. (Part 107). The new rules will not apply to model aircraft, which will continue to be governed by Section 336 of the FMRA. Of these proposed regulations, the only one currently expected to become law is related to the registration of drones, which would require drone registration much as the government requires the registration of aircraft and automobiles. While this type of regulation is expected first, it will not have the same effect or enforceability as registering conventional aircraft because unlike conventional aircraft, drone operations are not intimately tied to runways and other prepared aircraft facilities. We will have to wait for the development of more substantial operating rules to understand the direction of the future regulatory framework.

In response to the FAA's delay in proposing and adopting drone regulations, there have been significant state and local efforts to regulate drones. According to the National Conference of State Legislatures, almost every state has considered bills related to drones. *Current Unmanned Aircraft State Law Landscape*, Nat'l Conf. of State Legislatures (Feb. 26, 2016), http://

www.ncsl.org/research/transportation/current-unmanned-aircraft-state-law-landscape.aspx. However, only 32 states have enacted laws or adopted resolutions related to the use of drones. These laws cover a wide range of drone uses addressing everything from privacy interests to agricultural applications. Many cities are taking drone regulations one step further by adopting "drone-free" or "no-fly" zones for airports, national monuments and parks, and event venues. Currently, the FAA has the authority to issue Temporary Flight Restrictions in the vicinity of aerial demonstrations and major sporting events. 14 C.F.R. §91.145.

Despite the lack of a comprehensive regulatory framework, businesses cannot ignore the risks of owning and operating drones. In fact, the lack of regulation may actually increase liability risk now compared with the future. Given this current lack of uniform regulation, and the expected arrival of widely varying forms of regulation for drones, it is difficult to offer guidance right now about how to manage liability risk within a regulatory framework. With a little understanding of how drones work and how they are expected to be used, however, there are some guidelines that we can offer based upon experience with other similar liability risks involving aircraft operations and automotive fleet operations.

## Liability Issues Faced by Owners and Operators of Drones

With the increased use of drones comes an increased risk of liability, particularly for owners and operators of drones. Compliance with FAA regulations does not insulate owners and operators from civil liability. A drone accident gives rise to liability much similar to an automobile accident. For the operation of automobiles and other transportation equipment, we have a system of laws and regulations that took decades to develop. The laws concerned with civil liability are based on the idea of negligent operation of the automobile. Similarly, there are laws and regulations related to aircraft operation that may apply directly to drones. For example, "no person may operate an aircraft in a careless or reckless manner so as to endanger the life or property of another." 14 C.F.R. §91.13.

It is impossible to imagine all the ways that a drone could get its owner or operator in trouble. We will attempt to describe through examples some common expected modes of drone loss or accident that could give rise to civil liability. This is not an exhaustive list, but rather a starting point to begin thinking about loss scenarios.

### Scenario 1: Drone–Person Interaction

This is the one that everyone thinks of when discussing drone liability. What happens when a drone falls out of the air injuring someone? Cue the drone injury lawyers. More and more there are reported incidents of personal injuries caused by drones. Take for instance two publicized incidents occurring in June 2015: Singer Enrique Iglesias was injured after grabbing a drone that flew onto a stage during a concert and a woman was knocked unconscious by a drone while attending the Seattle Pride Parade. Emanuella Grinberg & Vivian Kuo, *Enrique Iglesias Injured in Concert mishap with a Drone*, CNN (June 2, 2015), http://www.cnn.com/2015/05/31/entertainment/enrique-iglesias-drone-feat/index.html; Tom Liddy, *Woman Knocked Out by Drone at Seattle Pride Parade, City Says*, ABC News (June 29, 2015), http://abcnews.go.com/US/woman-knocked-drone-seattle-pride-parade-city/story?id=32112670.

The risk of drone–person interactions will attract early attention, but the risks of this may be the easiest to manage as we develop regulations. In the early days of automobiles, before traffic laws and rules, the physical interaction between cars and people was unpredictable and unmanaged.

Liability arising from a drone contacting a person, or even affecting an individual in a non-physical way, is likely to be the largest source of liability facing insurers. This is expected from our experience with automotive personal injury cases. Not only will the severity of the claimed injuries increase over time as drones become larger and heavier, but the overall rate of claims for damages arising from people interacting with drones will go up. This will happen because there will be more interactions between drones and people, and because the FAA registration requirement should make identification of owners and operators easier.

In considering this liability risk and developing strategies to reduce the risk, individuals working to manage risk will want to keep in mind the unique attributes of a drone compared to an automobile. While a drone typically does not have as much speed as a car or even a bicycle, it can develop considerable speed when free falling from altitude. The common rotorcraft drones also have high-speed propellers without guards. Many of the design strategies used for safety, such as guarding of the propellers or the provision for a parachute, are not always possible for these drone aircraft because of their need to be light to fly.

**The proposed regulations** address operating limitations, height restrictions, operator certifications and aircraft registrations.

### Scenario 2: Drone–Property Interaction

Drone–property interaction-related loss is a very broad category of losses in which a drone interacts with something other than a person and causes a loss. In some of these cases, a person could suffer an injury along with the property loss, but we are not considering the personal injury in these scenarios. For example, a drone could collide with another aircraft (including another drone), a moving vehicle, a building, an animal, or power lines. As drones get larger, the ability to cause property damage and the consequence of the property damage will go up.

As discussed earlier, operators have a choice about the mode of operation to use. An operator can fly a drone manually within line of sight, or in a semiautonomous mode during which the drone is out of the operator's sight and may be making flight decisions on its own. The choice of mode to use has a direct effect on the loss risk that is not simple to assess and can be counterintuitive.

For example, consider an investigator flying a commercial drone over a free-

way to document evidence on the roadway. The great advantage of using a drone in this case is the ability to take pictures of the freeway surface without necessarily stopping traffic or risking the presence of humans so close to cars. The risks of using a drone in this case include the creation of a traffic collision on the freeway (with the drone or another car) through operator error or mechanical failure of the drone, or through loss of battery power. If the drone is flown in "third-person" mode in which the operator observes from the ground and visually guides the drone through the desired path over the freeway, then there is a risk that the human will make a flight error or the battery will be depleted to a point that the drone cannot be operated safely and leading to a collision on the freeway.

**It is impossible** to imagine all the ways that a drone could get its owner or operator in trouble.

To help with this problem, many commercial drones can be programmed with a safe-landing zone that the drone will automatically go to in the event that the battery charge falls below a certain level. This certainly helps with the risk of power loss, but it introduces a new problem in that the drone will now automatically fly to a safe destination from an arbitrary starting point and may collide with a large truck in the process. Commercially available drones do not yet have the ability to detect and avoid obstacles on their own. With the current technology there is a tradeoff between the risks when choosing different operating modes.

An alternative method of doing this would be to fly the drone on a preprogrammed flight path from the launch area to the portion of the freeway to take photographs and then to the landing zone. This way the path of the drone is fixed and any emergency landing areas can be reached using a safe path since the drone's flight path is known to the drone. There are other advantages to this method. The operator's flight skill is less important; the preprogrammed flight path can be documented and checked by another person before flight; and the operator's duties can be changed from pilot to oversight of the operation.

All of these changes also shift some of the risk of the operation from flight operation to planning, which can reduce the associated liability risk. Similar to operating a fleet of road vehicles or off-road equipment, the procurement, training, procedures, policies, and oversight of the drone and the operator are all areas where the organization needs to manage risk.

### Scenario 3: Drone Lost

In the aviation world, "drone lost" is known as "missed at destination" because learning of a problem first happens when the aircraft does not arrive at the destination on time. Drones can be lost in some scenarios that we already discussed involving a drone that collides with an object or a person. But a drone can be lost for countless reasons, and sometimes the loss is recoverable.

Drones are property that can be damaged much akin to automobiles. This damage can occur from the collision between two drones or by third parties. In Modesto, California, a man shot down a drone that was flying over his property. The drone owner sued the property owner in small claims court. The property owner was ordered to reimburse the drone owner $850. *Eric Joe v. Brett McBray*, Stanislaus County Superior Court, Small Claims, Case No. 2101429 (Claim filed Dec. 22, 2014).

One lost drone scenario that can create liability risk is flying into a restricted area. The restricted area could be a local event that is restricted only to drone flight, or it could be a restricted area in the national airspace. These no-fly zones will only increase over time and an organization should have a plan to know about them.

There are thousands of permanent (White House) and temporary (Air Force One movement) no-fly zones in the national airspace, and traditional pilots are required by law to be familiar with all such restrictions before each flight. Permanent no-fly zones are marked on charts and temporary no-fly zones (TFRs) are sent out as "notices to airmen" (NOTAMS) from air traffic control facilities. Recently, wildland fire-fighting operations listed in NOTAMS in California had to be suspended because drones were interfering with the other aircraft. Kenzi Abou-Sabe, *Consumer Drones Interfere with CA Firefighting Efforts*, PBS NewsHour (July 19, 2015), http://www.pbs.org/newshour/rundown/drones-california-fire/.

Drone operators generally don't follow FAA procedures. A man trying out his new drone accidently flew it onto the White House lawn last year. Michael S. Schmidt & Michael D. Shearjan. *A Drone, Too Small for Radar to Detect, Rattles the White House,* N.Y. Times, Jan. 26, 2015, http://www.nytimes.com/2015/01/27/us/white-house-drone.html. Even if drone operators wanted to follow these procedures, currently there is no way to get NOTAMS to drone operators. Some manufacturers have added the ability to program no-fly-zones into a drone itself, and one manufacturer has indicated that it will program no-fly zones into the products that it ships. An organization considering a drone purchase should look at the need for flight planning in general.

The loss of a drone carries with it other risks, too, because now someone has your drone, and with it, the payload and the data. Drones are currently used for imaging more than for any other purpose. The imaging could be automated, similar to the surveillance of a utility network, or it could happen in real-time with an operator observing and recording everything seen by the drone. This visual imaging is rapidly being augmented with infrared and other radiation signal detection (radio and other wireless communications).

A drone flight to a pipeline for the purpose of photo documentation of the pipeline could gather other photographic information along the way that may be protected by current or future privacy laws. An organization should make decisions beforehand about which data to gather, how much of that to store, and how to secure it. The data that an organization would need to consider would include both what the organization intended to gather (the objective of the flight), and unintended data such as images taken on the way to the objective.

Laws may change to provide homeowners and other persons with the right to deny the airspace above their property

to drones. A drone operator needs to consider the liability of flying (and imaging or sensing) over private property, and the liability of gathering and storing unnecessary data from the drone. It is possible that data gathered and stored legally today may not be legal to gather or keep in the future.

Once an organization has gathered data, the organization may have a responsibility to protect this data comparable to the responsibility required by HIPAA. In the scenario in which a drone is lost, the data is also lost with it, which creates a liability risk. This risk of data loss needs to be considered in an organization's IT security plan with mitigation measures such as encryption.

## Recommendations

We offer two recommendations to help manage the liability risks arising from the ownership or the operation of drones. The first recommendation is to consider adopting what is being proposed for drone regulations even if some or many will never become law. The second is to consider acquiring and operating a drone or several drones as analogous to buying and operating a truck or a truck fleet rather than to operating a piece of camera equipment.

When assessing risk, we can learn from other industries with emerging unmanned technology, such as self-driving trucks in the automotive industry. Drawing from these other industries, the following tips offer suggestions on how to manage the risk of owning and operating drones.

### Training, Certification, and Licensing

Consider implementing a drone training program. Properly trained operators of equipment tend to be safer and have fewer accidents. There are schools that offer training and certification for drone operation. This is similar to organizations that offer training and certification for forklift operators or truck drivers.

### Knowledge Requirements

Organizations that own or operate a fleet of drones should consider having a licensed pilot on staff or available for consultation to develop knowledge requirements for drone pilots. These knowledge requirements should include coursework and a written test.

Despite the similarities between drones and vehicles, there are also numerous technical and operational differences. Drone operation requires knowledge of airspace restrictions, weather phenomena, flight dynamics, and other operations in the national airspace. An automotive fleet manager will not have this knowledge.

### Performance Standards and Proficiency

Consider establishing minimum performance standards for drone pilots along with a program to assess pilot proficiency. This is akin to police officers who are required to undergo yearly firearm qualifications and traditional pilots who must demonstrate proficiency to keep their licenses.

### Operational Plan, Specifications, and Procurement

Drones should be treated as a vehicle or a fleet of vehicles, as opposed to a tool. Drones should not be treated as an ordinary purchase. Rather, organizations should have a plan for the operational use of drones before purchase, and they should make deliberate choices about options and features during procurement. Some drone models are generic, but most commercial drones are made to order.

It is difficult to know what options to get without first having a detailed operational plan for the drone. For example, a drone that will be used in urban areas may need the ability to automatically avoid no-fly zones.

### Injury and Illness Prevention Plan (IIPP)

Similar to any business that operates vehicles and equipment, an organization should have an IIPP in place to help protect drone owners and their employees from the risk of injury. The plan should address known hazards, training requirements, and how to respond to a drone accident or injury. The plan should cover the safety of the public too.

### Data Management

Drones can generate a lot of remote-sensing data over public and private spaces. A data-retention policy is needed to determine what to do with the information recorded during drone flights and to protect the privacy of the people and the places overflown, either intentionally or accidentally. A drone or a fleet of drones should be integrated into an IT security plan.

### Insurance

Insurance carriers are beginning to develop policies to cover drone exposures. However, most general commercial liability policies specifically exclude drones. Drone owners need to confirm that they have the coverage required for their ownership, and operators need to confirm coverage for operations. Contractors operating drones for the benefit of a business should consider indemnification and additional insured provisions.

**As drones get larger,** the ability to cause property damage and the consequence of the property damage will go up.

## Concluding Thoughts

Businesses that provide drones to others (as cinematography rentals for example), but that do not operate them may have unique liability risks, but these risks may be comparable to those of other equipment and vehicle rental services, and their risk management strategies should be considered as a starting point.

Despite the disharmonious regulatory environment for drones, with some understanding of how drones work and how organizations expect to use them, by drawing from experience and the liability risks involving aircraft operations and automotive fleet operations, organizations can take some precautionary measures to manage liability risk. Among other things, organizations can consider adopting proposed drone regulations even if some or many will never become law. They can also consider acquiring and operating a drone or several drones as analogous to buying and operating a truck or a truck fleet rather than as analogous to operating camera equipment.