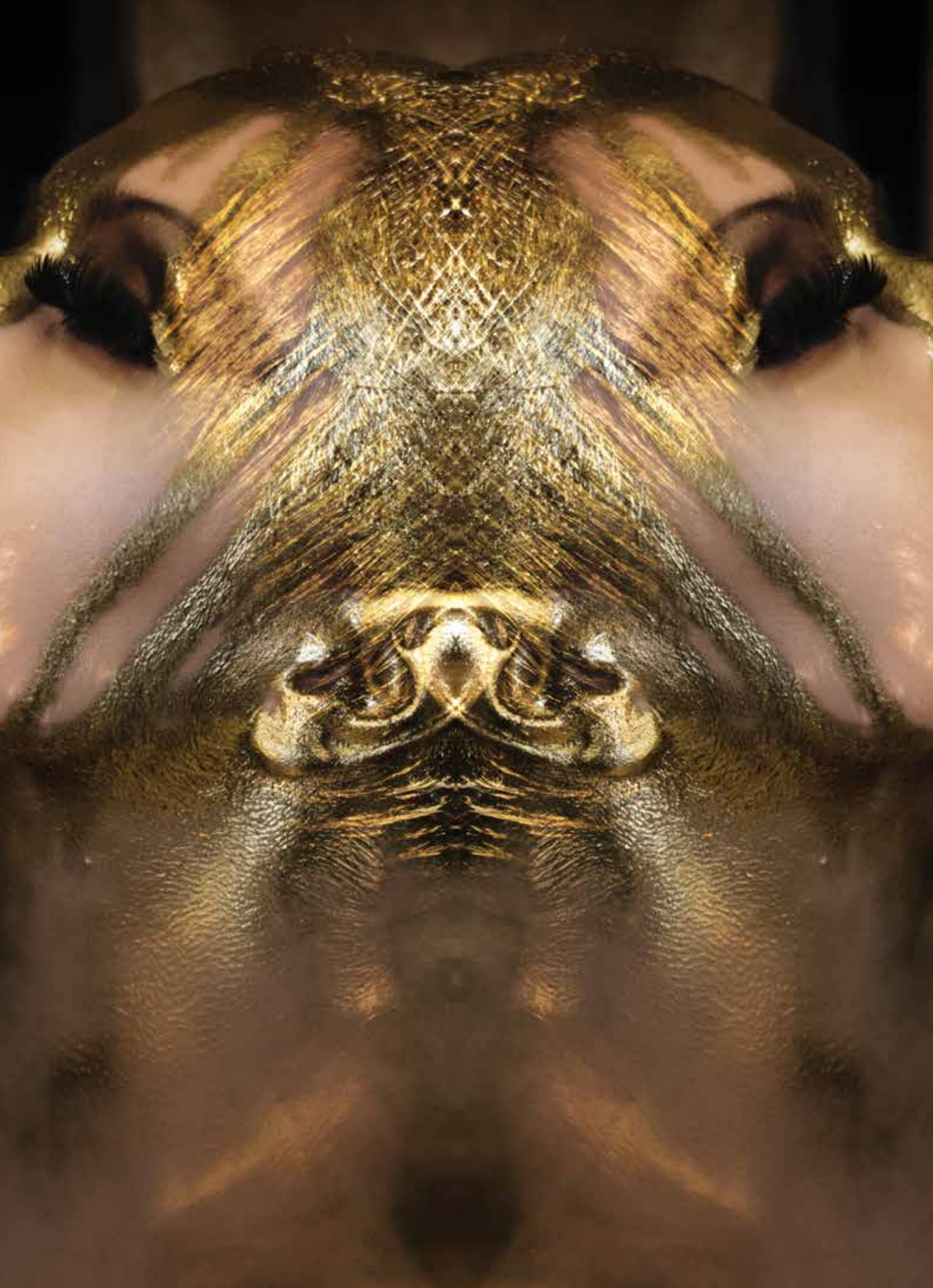

360 DEGREES HOT

A drone can collect more data more safely and in more situations than can traditional collection methods.

By Matt McCutcheon, Doug Kent and David Amori

When a catastrophe hits, unmanned aerial systems (UASs, also called "drones") can quickly and effectively provide a bird's-eye view of inaccessible and unsafe areas as well as major losses. Such visual access can drastically change the life of the insurance claim, making drone use a rapidly expanding data-collection method.

But cyber breaches, privacy violations, property damage, human injury and flight-time restrictions are among a variety of concerns facing adjusters and other investigators dealing with construction claims. Cost may be another area of pause in some circumstances since the best technology, such as infrared imaging and ultra-high-resolution capture, can run into the thousands of dollars per unit.

That said, the benefits of UAS data collection seem to be outweighing the drawbacks. Drone technology can offer several advantages when assessing inaccessible areas. Subject to airspace restrictions, they can be flown from any point, either close to the loss or from a safe distance if access is restricted. Changes in Federal Aviation Administration rules and licensing requirements, as well as smart safety practices, are making it easier for companies to use drones effectively for inspection and investigation.

Where Are We Now?

For the past few years the insurance industry has recognized how beneficial unmanned aerial vehicles, also referred to sometimes as UAVs, can be in the claims and underwriting process. Recent developments from the FAA have made it feasible for insurance companies, independent adjusting companies, engineers and other construction-related industries to obtain commercial licenses for their adjusters, inspectors and engineers.

Effective Aug. 29, 2016, the FAA implemented UAS Rule Part 107, a departure from its more stringent rules. This change allows all insurance carriers, independent adjusting firms and construction-related industries to obtain commercial licenses for the use of drones.

The use of drone technology offers many safety and service advantages including:

- Reducing the chance of injury to the inspector by avoiding the risk of ladder displacement and slips and falls
- Increasing the efficiency of the roof, underwriting or construction site inspection process and decreasing cycle time for claim handling
- Eliminating potential damage to the building or roof that the inspector may cause by walking on the material (clay, tile and metal roofs).

Most importantly, drones can improve the quality of the inspections because drones can go places that human inspectors cannot.

The aerial images drones provide are key to visualizing losses or exposures not normally detected from a ground inspection. For example, drones can be deployed to assess damage from floods when adjusters may not be able to access the location on the ground until floodwater recedes. Drones can also be particularly effective where a loss occurs at height—for example, fire damage to a block of homes or a factory building. Drones are also useful because they can view an area even while firefighters are extinguishing a fire or in situations where asbestos or other dangerous substances are in the air, preventing human inspection. Rather than use a costly cherry picker to view damage to a tall building, a drone can be used for superior results.

UAS Technology Advances

As the ability for insurance companies to use drone technology becomes more prominent, drone technology and capabilities are improving to meet industry needs.

The most popular drones available for residential, commercial and insurance inspections are called Quad Copters. These (as opposed to fixed-wing drones) allow the user to hover in one place and slowly move the drone over structures, construction sites, accident scenes or other inspection areas. However, the cost of these drones typically runs $1,200 to $2,400. Additionally, drones equipped with infrared cameras typically run $8,000 to $25,000 or more.

Some key advantages of these Quad Copters include:

- **Ease of use** – Quad Copters are simple to operate with use of "return to home" or "hover in place" features. As with any flight operation, precision control will take practice and training, but the obstacle-avoidance features make accidents less likely. The pilot has the ability to control the aircraft while viewing the image from the camera via a smart phone or tablet mounted to the controller.
- **Hands-free functionality** – While wind and other weather conditions can be a factor when flying drones, new UAVs have technology that stabilizes the vehicle even when the operator ceases to maintain hands-on control each minute. This is particularly useful when it is gusty or windy (above 15-20 mph).

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It is generally not safe to fly drones when winds exceed 20-25 mph or in foggy or stormy conditions.

- **Video capabilities** – The ultra-high-definition cameras offered on some drones provide exceptional clarity and detail, which is key in the inspection process. However, to make the most of this UHD video, users may find they need PCs with increased storage space and faster data processors.
- **Infrared thermography** – Infrared thermography provides a convenient and relatively non-destructive approach to determine where water may be trapped under the membrane in a low-slope roof. The optimal position for an infrared camera is directly over the roof, so this becomes a perfect application for use of a drone. Low-slope roof systems often have the insulation installed directly under the membrane and above the deck. When delineating storm-related damage to this type of system, the extent of where water may have infiltrated the system becomes part of the assessment. A roofing system (membrane, insulation, deck and fasteners) is heated from solar load during the day. At night, that energy is radiated back into space. The dry insulation and roof system will radiate heat back to space relatively quickly. Moisture trapped in the system would be expected to have a higher specific heat than the roof system components and would radiate this energy at a different rate. This can be detected with an Infrared Thermal Imaging Camera (IR Camera) in the form of a thermal anomaly. These waves of electromagnetic energy propagate perpendicular to the surface, so, for the assessment, the optimal position for the IR camera is directly overhead—much better than walking on the roof. Drones are the perfect application for this evaluation. With the correct equipment, a large area can be assessed in a relatively short amount of time, and the locations of thermal anomalies can be identified with much greater precision using IR than when measured through other methods. Unfortunately, flying drones at night is largely prohibited, so this is an opportunity for the industry to continue to consult with legislators and regulators and, hopefully, get public policy modified.

Understanding the Rules and Regulations

The use of drone technology has increased dramatically over the past two years in the construction and insurance industries. During this same time period, federal, state and local governments have enacted laws and implemented regulations regarding the operation of drones. It is critical that you research and analyze the most recent laws in your particular jurisdiction before you operate a drone.

The U.S. government has the exclusive power to regulate the National Airspace System and has directed the FAA to perform this function, though some municipalities and states are passing their own, tougher rules.

Highlights of New FAA Rules

Below is a summary of UAS Part 107. Complete details can be found at www.faa.gov/uas/.

Unmanned Aircraft Operational Limitations:

- Must weigh less than 55 lbs.
- Must be used in visual line of sight only.
- May not operate over any persons or property not directly participating in the operation.
- Must be operated only during daylight or civil twilight (30 minutes before official sunrise to 30 minutes after official sunset).
- Drone flight is capped at an altitude 400 feet above ground, and higher altitudes are permissible only when the drone remains at 400 feet above a structure.
- Requires pre-flight inspection by the remote pilot in command.

Remote Pilot in Command Certification:

- Establishes a remote pilot in command position.
- A person operating a small 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.

To qualify for a Remote Pilot certificate, a person must meet the following three requirements:

1. Demonstrate aeronautical knowledge by either:
   a. Passing an initial aeronautical knowledge test at an FAA-approved knowledge testing center or
   b. Holding a Part 61 pilot certificate other than student pilot, completing a flight review within the previous 24 months, and completing a small UAS online training course provided by the FAA.
2. Be vetted by the Transportation Security Administration.
3. Be at least 16 years of age.

In addition to the revised FAA requirements, many local governments have enacted ordinances and resolutions regarding the use of drones in an attempt to regulate the airspace above their cities. For example, Los Angeles prohibits operation of drones after sunset, while Charlottesville, Va., has banned drone use entirely.

Understanding the Liabilities of Drone Use

While there are certainly many advantages of using drones to expedite an insurance claim or other inspection, there are also serious potential liability concerns that make the need for regulation necessary. The two major liability concerns involve: (1) bodily injury or property damage caused by the operation of the drone, and (2) the cause of action for invasion of privacy.

As the use of drones increases, the liability claims associated with them are

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expected to increase as well.

To date, people have been injured because of the operation and use of drones in several states resulting in lacerations and head injuries. Drones have injured performers and spectators at events when crashing into people or crowds, and there have been several cases of property damage because of accidental UAS crashes.

Concerns have also been expressed over the nightmare scenario of a UAV hitting a commercial airplane and automobile accidents caused by a low-flying drone.

Drone owners and operators face potential exposure for invasion of privacy under both common law and state statutes, such as the Florida Freedom from Unwarranted Surveillance Act (FUSA). Florida's FUSA prohibits a person from using a UAS "to record an image of privately owned real property or of the owner, tenant, occupant, invitee or licensee of such property with the intent to conduct surveillance on the individual or property captured in the image in violation of such person's reasonable expectation of privacy without his or her written consent," with certain exceptions. More information about FUSA can be found at www.flsenate.gov/Laws/Statutes/2016/934.50.

States, including Idaho, North Carolina, Oregon, Tennessee and Texas, have begun enacting statutes regarding drones and the possible invasion of privacy by drone operators. In light of potential legal liabilities, many companies are employing specialists and outside firms for drone operation.

Best Practices and Safe Use of Drones

Best practices for UAS use are critical whether the drone is being operated by you, your employees or a vendor.

- A drone operator must be in full compliance with the FAA's Part 107 guidelines and all applicable laws, which must be monitored for changes.
- The operator and/or crew should complete a pre-flight checklist to evaluate any risks for each particular operation. The checklist should include:
  - ✔ Details on how you are avoiding any non-participating people, vessels, vehicles and structures.
  - ✔ An evaluation of the drone itself to determine that its systems are properly functioning and are in compliance with any operations manuals, safety procedures or guidelines.
  - ✔ Step-by-step instructions to ensure the pilot has fully evaluated himself, the crew, the audiovisual, mission system and environment so the flight path will be free of any obstructions, power lines, trees or other problems. There is an easy-to-use smart phone application, B4UFLY, which helps UAS operators determine whether there are any restrictions or requirements in effect for a particular location.
  - ✔ Detailed maintenance logs should be kept regarding each inspection and all maintenance performed. Maintenance should include the drone itself (e.g., batteries and blades) as well as the software and hardware.
  - ✔ The drone pilot should keep an accurate flight log regarding every flight including at a minimum the date, the time the flight begins and ends, the pilot and any crewmembers' identity, the location or flight path of the drone, and any use of the camera and infrared or other data recording functions. It is critical to maintain camera footage should a dispute arise.
  - ✔ You should consider sending written and verbal notices to the surrounding property owners to the extent necessary for your drone use. The notice should include at a minimum the general time frame and flight plan of the drone and the scope and reason for its use. If possible, you should obtain permission from the surrounding property owner(s) before the drone use. You may be able to change your flight path or use depending upon which owners provide permission to you for flight over their property. You should confirm all permissions granted by letter and retain a copy for your file.
  - ✔ Your drone should be analyzed for any potential data security issues. There should be a written security policy with respect to the collection, use, storage and dissemination of the collected data. You should make reasonable efforts to regularly monitor the systems for any breach or data security risks.
  - ✔ The drone operator and his crew should be wearing proper and professional attire, such as a helmet, safety eyeglasses and a high-visibility safety vest. Warning or caution signs should be placed in the area.

In the last two years, at least 17 insurance companies have applied for, and received, permission to operate drones as part of their business in connection with the underwriting of policies, loss control, risk management, and the investigation of claims. We expect to see the use of drones to become even more common in the insurance and construction industries—and in other applications—in the years ahead. In the meantime, the FAA is trying to catch up on policies to regulate this airspace. It is important to keep a careful eye on these changes and play a part in their development. ■

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