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Why Using Drones Is Taking Off With Insurers

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It's fair to say drones have had a bit of a PR crisis of late. The drone sightings at London's Gatwick Airport in December resulted in almost 36 hours of flight interruption, with 1,000 flights being diverted or cancelled and around ten thousand passengers left waiting.

Three weeks later, London's Heathrow Airport experienced a similar drone-related nightmare, with departures halted for 45 minutes after a drone was detected in the no-fly zone.¹ Add in complaints about unauthorised photos infringing people's privacy, and negative press surrounding the use of military drones and one can understand why they have received such a bad rap.

However, drones are increasingly aiding many aspects of our lives, significantly reducing the risk of danger to people and slashing expenditure on time and materials in many different industries. This is certainly the case in (re)insurance where the potential of drones as a new risk assessment tool and means to accelerate claims processing has begun to be realised, especially in the non-life and liability segments.

This article explores the current uses, and limitations, of drones in different industries including special applications for commercial/industrial non-life and liability insurance and a brief forecast of how their use will likely develop in the future.

Drones defined

For the purposes of this article, a drone is defined as an unmanned aerial vehicle that is controlled either remotely by a human or by a built-in or remote computer, and as such operates partially or fully autonomously. Using technical jargon, drones are generally referred to as "remotely piloted aircraft systems" (RPAS). Other names



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Created for our clients, our Property Matters publication provides an in-depth look at timely and important topics affecting commercial and personal lines of property insurance.



include "unmanned aerial vehicle" (UAV), "unmanned aircraft" (UA) and "unmanned aircraft system" (UAS). The term UAS denotes the aerial vehicle itself as well as the components of the overall system (e.g., control elements, ground control, and the power supply).

Drones are controlled using a smartphone or remote operating system, although it is also possible to programme a drone to execute its mission autonomously before deploying it. Often, there is a built-in camera which allows the operator to observe the environment from the drone's perspective on a screen.

Drones are available in a wide range of technical specifications, from recreational drones weighing just a few grams to those for professional purposes, weighing in at several hundred kilograms. They often have control systems with multi-axial sensor and stabilisation systems, GPS, and cameras that make it easier for the operator to control the system.

What are drones being used for?

The range of potential uses of drones is extremely diverse and growing steadily. Drones do not require runways. They can hover over buildings and landscapes and take detailed images and videos of buildings, structures, and the environment. They can also survey areas that humans simply cannot reach or that would pose a significant risk to life and limb.

The triumphant rise of drones on the commercial stage is being driven by the fact that they represent considerable savings. Enormous amounts of time and money can be saved by avoiding preparatory work that would otherwise be necessary (e.g., building expensive scaffolding for an inspection, and deactivating processing facilities for checks to be carried out). Current uses include:

- Examination and inspection of structures (e.g., their structural integrity).
- Examination and inspection of technical facilities and installations (e.g., the condition of solar cells in a photovoltaic power station, industrial pipes, wind turbines, broadcast towers, highvoltage or overhead lines) and documentation of their condition.
- Investigation of inaccessible or not easily accessible areas (e.g., inspections of tanks, flues, shafts, roofs, fire protection systems, and drainage pipes).
- Measurement of buildings and facilities (e.g., to calculate volume and space).
- Generation of landscape and location analyses, hydrological modelling and digital elevation modelling.
- Observation of areas threatened by natural disasters, to provide early warnings and allow safety measures to be implemented.
- Corporate security duties such as perimeter protection, monitoring of premises, and investigation of alarms.
- Carrying devices (e.g., infrared cameras to examine electrical systems at altitude, hotspots in photovoltaic power stations, heat bridges, hotspots in heat-conducting or electrical systems, leakages).
- Monitoring of major incident sites to deploy and coordinate effective support from emergency and security services (especially in confusing situations, inaccessible areas and/or those not yet deemed to be safe).
- Identification and documentation (video, sound, and photos) of the causes and timelines of losses (e.g., building, fire, environmental or system damage) to preserve evidence.
- Transporting goods and checking inventory in the mail and logistics sectors (e.g., flying from shelf to shelf in large warehouses, recording labels and other relevant location and item data that are then processed automatically).

- Replacing manned flight operations:
 - > To supervise and control agricultural and forestry measures such as pest control.
 - > For the media, film and photo industry.
 - > To map and measure land and buildings for the purposes of geodesy.
 - > To support the field of archaeology.

Important considerations for drone use

With the use of drones on the rise, so too is the risk of drone-related damage. Given the consequences could be fatal (e.g., if a drone crashes), it goes without saying that operators should be experienced. However, undertaking a wider risk assessment is also prudent, especially before using a drone for commercial or industrial purposes.

The risk assessment should examine both limitations and risks and define potential safety measures such as take-off, landing and emergency landing areas and other emergency procedures. For example, one measure might be to prepare checklists for different tasks. Before use, the suitability and technical readiness of the equipment should be verified to make sure that no problems arise while the drone is being operated.

Already, there are many specific aviation, data protection and copyright regulations on drone use to take in to account. These include:

- Mandatory registration (e.g., for all drones weighing over 250 g).
- Licence to operate drones/UAVs weighing over 5 kg and at night.
- Evidence of proficiency (i.e., a drone licence) for drones weighing over 2 kg.
- Exclusion zones. For example, areas where police and emergency services are operating, conservation areas, main roads, power stations, prisons, hospitals, airfields, railways, industrial sites, military sites, and public gatherings. Additionally, drones capable of taking photos or recording sound are not permitted to fly over residential land without the express prior consent of the residents.

- A special permit for operating at altitudes of over 100 m.
- Drones must generally stay in the line of sight of the operator unless the operator has a special permit (e.g., from the state aviation authority).
- Obligation to give way to manned aerial vehicles and unmanned balloons.
- Special liability insurance (regardless of whether the drone is used for commercial or purely recreational purposes).

As conditions of use vary country to country, it's vital that operators familiarise themselves with the regulations of the specific country where they wish to use the drone before doing so (dedicated websites are available to give an initial overview).²

Here in Europe, a set of standardised regulations is currently being drafted by the European Union to harmonise the different national requirements and regulations. These are expected to come into force this year (2019).³

How are insurers using drones?

Currently, insurers are mainly using drones to deliver and document aerial footage of houses, building sites, landscapes, and events that are known to be occurring. When it comes to assessing risks and measuring losses, they already represent significant extra value to the industry.

Risk assessment

Drones are being put to excellent use providing insurers with information about the location, dimensions and condition of buildings and technical facilities. As mentioned earlier, they make it possible to survey buildings and facilities quickly and safely, without the need for extensive preparatory work, such as shutting down production or implementing safety measures prior to an inspection.

They also make it possible to include areas that were once completely inaccessible (at least without considerable extra effort and expense) due to their elevation, location or technology – outdoor installations, piping, wind turbines, high bay warehouses, broadcast towers and high-rise buildings to name just a few. Another big advantage is that using drones, insurers can factor the surrounding area into a risk assessment too, for instance the distance to neighbouring facilities and buildings, bodies of water in the vicinity, locations on hillsides, depressions, vegetation, excavations or access routes. Drones can be used to record and document the risks found and survey details on a larger scale with high-resolution optical cameras (i.e., by zooming in) and infrared cameras (e.g., by identifying temperature differences). This way, hazards, defects and/or errors can be identified and documented with certainty.

> Furthermore, the risk situation can be analysed and evaluated even if the underwriter or expert was not on site in person. The recorded data make it possible to evaluate the insurance exposure for a non-life or liability insurance policy in detail and on a sound basis.

Claims processing

Drones are quickly becoming an integral part of claims processing. Experts and arson investigators, for example, regularly use drones to determine the causes of fires and identify damaged areas.

They have also become a proven method for investigating and settling losses caused by natural hazards, verifying damage allegedly caused by earthquakes, floods, storms, hailstorms, landslides and bushfires.⁴ Losses and their scale (such as the scope of destruction and the condition

of and damage to individual properties), can be documented and settled at a reasonable cost and without delay.⁵ This also makes it easier for insurers to determine accumulated and major losses following a natural disaster.

With regards to technical insurance, the highresolution images allow damage to be identified and repaired quickly. They are the preferred option for identifying damage caused during construction and delays in construction work, as well as structural problems or damage to, for example, static structures, outer surfaces and roof structures. Even damage to systems and machines such as photovoltaic systems and wind turbines that would otherwise be difficult to spot, can be swiftly identified and documented.

Drones are also being used to survey damages in connection with marine insurance in a helpful, exceptionally efficient way (e.g., hull damage, superstructures, ship cargo).^{6,7}

In terms of environmental impairment liability insurance, drones can provide a prompt overview of the affected areas and be used to limit and repair environmental damage quickly (such as that caused by oil spills or other environmentally hazardous substances) and assess the expected scale of the loss.

Overall, the use of drone technology makes it possible to investigate damaged areas and losses without an expert or claims adjuster having to put themselves at risk. Ultimately, they also help the claims adjuster reach a final decision regarding the basic obligation of the insurer to pay compensation as well as the amount of the loss. It should also be mentioned that by surveying a loss quickly and effectively, the legality of a claim can be determined, and any cases of insurance fraud curtailed.

Future developments for insurance

The next wave of development is unlikely to be centred on the drones themselves, but rather the data they collect. The challenge is to integrate this data into a company and its products as seamlessly as possible – making it easily accessible to brokers, underwriters, claims adjusters and reinsurers.

The information obtained by drones will contribute to accelerated claims processes and significantly reducing time and costs. However, the information will also affect decisions on whether to accept an insurance policy and the definition of premiums according to the risk situation. It will no longer be necessary to carry out inspections with experts to the same extent as before and the amount of time needed to record information will be reduced.

The aerial images taken on-site could, for example, be input automatically into the artificial intelligence (AI) systems of an insurer. The exposure data of







relevance to an insurer could be extracted, processed and evaluated automatically, giving the underwriter recommendations on the risk, any aggravating or mitigating risk features and a premium. Should a loss occur, the expected loss amount could be estimated more quickly and more accurately.

Over time, the information and data collected will pave the way for better catastrophe models (e.g., for the local, natural catastrophe exposure), with a higher degree of regional detail than is possible with radar and satellite data.

If it proves possible to integrate AI into drone technology, underwriting and claims handling processes will be simplified and accelerated, resulting in cost reductions and ultimately improved customer satisfaction thanks to faster decision-making.

However, there are hurdles to overcome. Current statutory and official regulations, and technology and data protection legislation do not permit largescale data collection. Additionally, the emergency measures implemented by authorities following a catastrophe normally prohibit UAV operations.

Summary

Drones have long been commonplace in science and industry, making work easier in many different fields. However, the range of their use is growing with the ongoing development of technology. From historical monuments and modern highrise buildings, to bridges and dams, drones are creating previously unimaginable opportunities for engineers and proving their worth in numerous sectors.

Insurers have also begun to discover the benefits of drone technology and the new possibilities it presents, particularly for risk assessment and claims processing. If the industry can fully embrace their potential, drones will accelerate processes, facilitate quality checks, assess problems and suggest alternatives – whilst reducing workloads and improving the efficiency of human resource allocation. It's an exciting time for drones, and we will be watching their progress closely. If issues about regulations and system integration can be resolved, the sky's the limit.

Endnotes

- 1 https://www.bbc.co.uk/news/uk-46803713
- 2 https://droneregulations.info
- 3 Draft available at: https://www.easa.europa.eu/sites/ default/files/dfu/DRAFT%20COMMISSION%20 REGULATION%20%28EU%29%20...-...%20laying%20 down%20rules%20and%20procedures%20for%20the %20operation%20of%20unmanned%20aircraft.pdf?
- 4 http://www.govtech.com/public-safety/How-Fleets-of-Drones-Are-Helping-Assess-Damage-from-Hurricane-Harvey.html
- 5 https://www.nerdwallet.com/blog/insurance/ drones-home-insurance-claims-inspectors
- 6 https://insurancemarinenews.com/insurance-marinenews/the-use-of-drones-in-shipping-coverageimplications/
- 7 https://www.businessinsurance.com/article/ 00010101/STORY/912323718/Drones-used-toexamine-ship,-cargo-damage-Allianz

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