

## Executive Summary

### The landscape today

10%

of the global civil aviation fleet could be unmanned in 10 years<sup>4</sup>

Use of drones or unmanned aircraft systems (UAS) in public airspace is increasing dramatically. In the US the Federal Aviation Administration (FAA) projects that by the end of 2016 over 600,000 UAS will be deployed for commercial use – three times the amount of manned general aviation aircraft. In addition, 1.9 million UAS are expected to be in recreational use. The number of UAS is set to triple by 2020.<sup>1</sup>

Globally, UAS market volume is forecast to reach 4.7 million<sup>2</sup> units by 2020 (other estimates are even higher), with the market for commercial application of UAS technology estimated to soar from \$2bn to \$127bn<sup>3</sup>. Such projections are driven by UAS becoming cheaper, smaller and easier to use, as well as regulatory progress.

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### Uses and benefits

\$1bn

Potential value of commercial drone insurance market by 2020<sup>5</sup>

Piloted remotely on the ground via control stations, UAS are increasingly used for menial or dangerous tasks, potentially solving problems and overcoming challenges across numerous countries and industries, improving the safety of thousands of workers every year and significantly reducing costs.

UAS are commercially used in a variety of situations, the most popular of which are industrial inspections, aerial photography, agriculture (surveying crops) and law enforcement. As UAS technology penetrates further, a decline in workers compensation losses can be anticipated, particularly related to building inspections.

Insurers are also increasingly utilizing UAS to survey loss damage from floods and other catastrophic events, to help alleviate distress and damage to victims and property more quickly.

Emerging UAS usage includes delivering blood and vaccines to remote locations in Africa, as monitoring tools to prevent the exploitation of slave labor in Brazil, fighting grass fires and even delivering pizza and coffee. Subsidiary UAS industries are also being created, such as the emergence of third party “**drone for service**” vendors, who rent UAS to commercial operators.

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### The risk landscape

As recreational and commercial UAS usage increases, new risk exposures are emerging. More incidents likely will occur once regulations are finalized that encourage more widespread use. Such incidents could result in multi-million dollar claims against businesses, operators and manufacturers.

Hobbyists account for the majority of UAS owners yet remain largely unregulated in many countries, raising safety concerns, as many can be untrained and inexperienced. Insurers have already seen loss activity resulting from novice control of UAS. Regardless of technological sophistication or operator skill, however, accidents happen.

UAS raise two priority safety concerns: mid-air collisions and the loss of control. A collision can occur if the pilot cannot see and avoid manned aircraft in time. Most at risk are manned aircraft which fly below 500 feet, such as helicopters, agricultural planes and aircraft landing or departing from airports.

Loss of control can result from system failure or flying beyond signal range; a major risk that has already caused incidents involving injuries. A scenario involving a pilot losing control of a UAS during a building inspection could result in a loss easily in excess of \$5m. Damage from “**foreign objects**”, such as bird strikes for example, is already an issue for the aviation sector,

<sup>1</sup> FAA Aerospace Forecast FY2016-2036 <sup>2</sup> Unmanned Aerial Vehicles Market, By Value and Volume Analysis and Forecast 2015-2020 – Research and Markets

<sup>3</sup> Drones will take \$127bn worth of human work by 2020, PwC says – The Independent, Clarity from above – PricewaterhouseCoopers

<sup>4</sup> New Era for Aviation: Opening the Aviation Market for Civil Use of Remotely Piloted Aircraft Systems In A Safe and Sustainable Manner – European Commission, 2014 <sup>5</sup> Allianz Global Corporate & Specialty

\$1m

Minimum amount of insurance coverage required for commercial operators to protect against risk exposures

as it is the fifth largest generator of insurance claims<sup>6</sup>. A collision involving a UAS striking the engine of an airliner could cause \$10m in physical damage alone.

As with manned aircraft there are concerns UAS may be used for malicious acts. An emerging peril is the potential threat from UAS being used to target critical infrastructure. There have been a number of incidents of drone overflights at power stations. There are also concerns that UAS could be utilized to attack sports stadiums or other events where large crowds gather.

## Regulation

Regulations have been a significant barrier to more widespread use of UAS. Standards differ remarkably around the world, as evidenced by the hundreds of working groups trying to harmonize rules. Another challenge is posed by the fact that regulations cannot keep pace with technological advancement.

In most cases, the designation between commercial and recreational UAS use is the starting point. Other common standards exist such as visual line of sight (VLOS) requirements for pilots, size restrictions (usually

Other risk scenarios include the prospect of hackers **"spoofing"** a UAS radio signal, potentially leading to a crash, the potential loss or theft of valuable recorded data when the device is transmitting information to the control station or after the flight by cyber-attack when the data has been stored. In addition to data protection, there are also many public concerns around such issues as privacy and trespass and nuisance.

Increasing use of UAS is also altering the risk profile of many industries. For example, a real estate agent has little bodily injury exposure but this changes if it engages UAS to take aerial photographs.

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<55 lbs/25 kg.), and restrictions against operating UAS near airports or outdoor venues.

New rules for commercial use in the US (*effective August 2016*) represent a milestone as they lower the barrier to entry for new commercial users and are expected to significantly increase the number of units in operation. These new regulations will likely influence other countries to adopt similar laws. The European Union (EU) is also working towards UAS rules.

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## Improving UAS safety: insurance and risk mitigation

As UAS ownership grows so will expectations around safety education. Operators should make this a top priority and obtain the necessary training and experience to competently pilot their UAS.

Training is crucial to reducing the number of incidents and operators should focus on flight time calculation, meteorology, security checks for aircraft navigation systems, emergency instructions, and air traffic law. For businesses, additional training should include on-board camera image uses, flight communications and planning, system maintenance and a host of other technological issues. Even basic safety checklists can help.

In many countries UAS registration is not required, causing problems for insurers and claimants.

Identification of both UAS and operator will be essential for maintaining proper liability in future. Introduction of car registration-style schemes will help.

Insurance can protect both operators and the public from risk of mid-air collision, as well as physical or property damage or injury to others. Manufacturers, owners and operators of UAS are exposed to a number of risks, as are businesses which sell and service UAS.

If growth projections for the commercial UAS industry in the US materialize, there is potential for the drone insurance market to be worth \$500m+ by end of 2020. Globally, its value could be approaching \$1bn<sup>7</sup>.

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<sup>6</sup> Global Claims Review, Allianz Global Corporate & Specialty <sup>7</sup> Allianz Global Corporate & Specialty