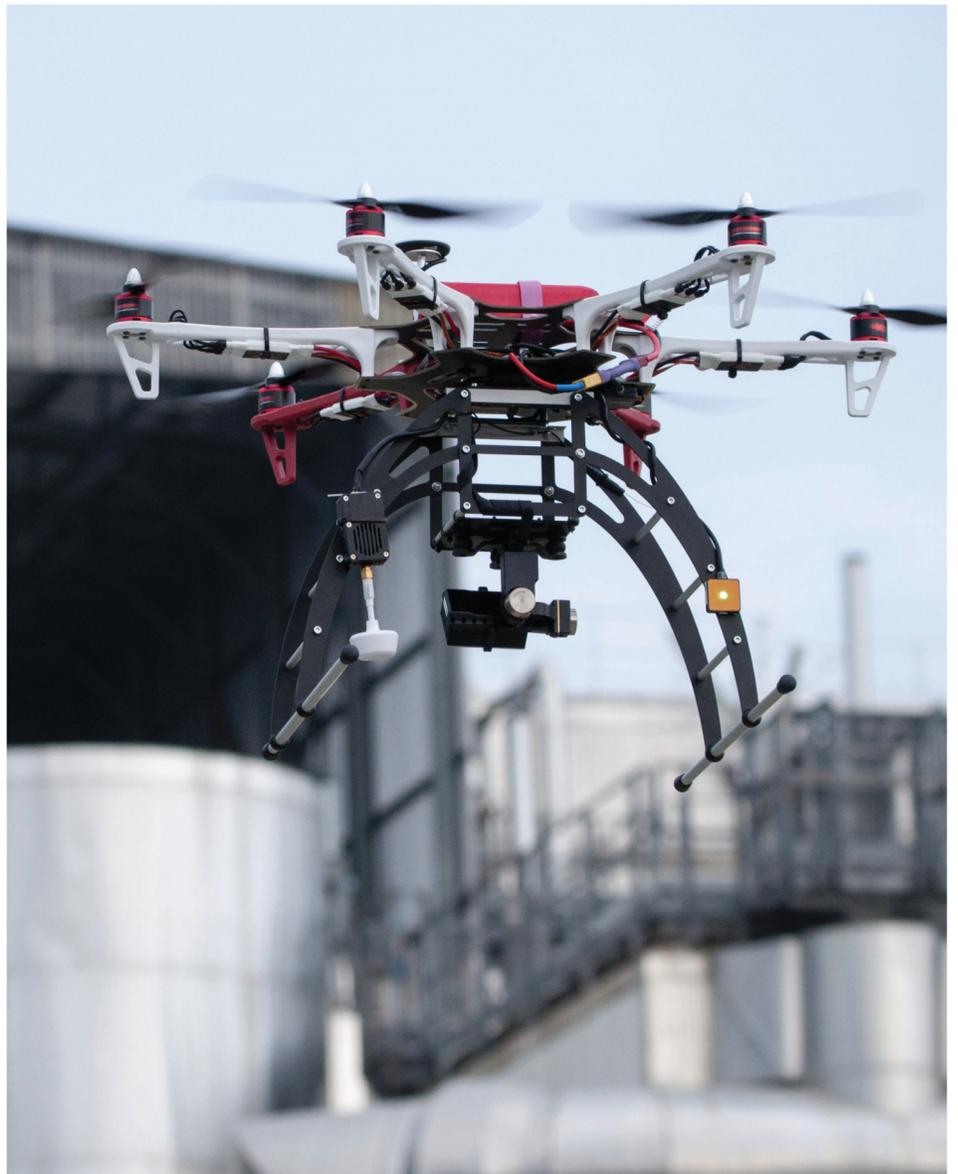


WHITE PAPER:

Sky High Drone Growth Presents Challenges and Opportunities



GLOBAL AEROSPACE



INSURE WITH CONFIDENCE

SKY HIGH DRONE GROWTH PRESENTS CHALLENGES AND OPPORTUNITIES

Introduction

During 2016, much has been written about the proliferation of drones and the potential for the utilization of unmanned aircraft across many diverse industries. Uses range from local, line-of-sight inspections to international cargo delivery. As a leading provider of insurance for the sector, Global Aerospace has a unique awareness of the realities of the Unmanned Aircraft Systems (UAS) market today.

Our customers' use of drones is rapidly increasing. The industry has been encouraged by sensible regulations, tools to help establish safe operations, an abundance of platform choices and a desire to exploit the latest technology. However, early adopters of new technology assume additional risk. A predicted consolidation of companies across the entire industry threatens to leave some users without the long-term support network they may have envisioned.

Global Aerospace has insured small UAS (<55lbs) since 2012. That may be a brief moment in aviation terms, but it's a lifetime of experience in the world of small drones. What have we seen and learned during that time? How many accidents have occurred and why? How has the use of new technology influenced risk-related outcomes?

The first part of this paper is designed to update our previously published white papers in this series. Since April, 2015, when the first paper titled *Unmanned Aviation Risk Management, Accident Prevention and Insurance* was published, there has been significant growth in the use of drones and the way in which the insurance market has reacted to these new risks. While much of the content covered in that paper is still valid, some things have changed. Perhaps the most significant is the current regulatory environment.

A huge number of companies—including many Global Aerospace customers—are assessing the risks and rewards of developing their own drone programs. In the second part of this paper, we assess the merits of doing so in-house as contrasted to outsourcing with one of the many professional operators in business today.

Part I

NEW REGULATIONS, NEW OPPORTUNITY

On August 29, 2016, a moment the industry had been anxiously awaiting finally arrived: Part 107 of the Federal Aviation Regulations was enacted by Congress. By far the biggest change was the relaxation of rules around who could legally fly drones in the United States. Requirements for a pilot license were dropped. Instead, commercial drone operators must now hold a remote pilot airman certificate with a small UAS rating or be under the direct supervision of a person who does. (An important fact: the direct supervisor must be able to immediately take control of the drone.)

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From a risk perspective, another significant item is the continued absence of any aircraft airworthiness certification requirement.

New operators must pass an aeronautical knowledge test, be vetted by the Transportation Security Administration (TSA) and be at least 16 years old. For licensed pilots, the test is replaced by requirements to hold a Part 61 certificate and complete a short training course.

Global Aerospace is encouraged by the appropriately rigorous nature of the written test for new operators. Operator certification, while stopping short of hands-on practical training and testing, is detailed enough to require some serious study and commitment. The pass rate at the end of October was 86% suggesting the FAA has set the bar at about the right level. Almost 9,000 people have passed the test.

For some in the industry, the operational restrictions in Part 107 remain too stringent. Restrictions of flights beyond visual line of sight (VLOS), night flights and flights over persons not directly participating in the operation are most frequently cited by those wishing to exploit the technology to its greatest extent.

Operations are now allowed in class G airspace without Air Traffic Control (ATC) permission. This change alleviates a heavy burden for operators who previously would have had to contact any helipad or airport within five miles of their operation under their Section 333 authorization. Nevertheless, the burden is clearly on the drone operator to yield right of way and not to operate in a careless or reckless manner.

From a risk perspective, another significant item is the continued absence of any aircraft airworthiness certification requirement. Essentially, any manufacturer can sell a drone that can be operated legally without any regulatory oversight at all. This is one area where a considerable amount of diligence will be required of insurance carriers.

How do the new regulations affect insurability?

Without insurance, many operators will be unable to perform the contracts on which they bid. And, without an insurable platform, their business is unsustainable. While Global Aerospace is not aware of any drones that currently fall into this category, it is possible that some units may develop a reputation for high failure rates over time. Effective initial certification could eliminate some of those potential issues.

BIG HATS, NO CATTLE

If you follow some drone companies on social media, you may conclude they have impressive balance sheets, solid profit margins and expanding workforces. While we are seeing some companies deliver on all three items, for the most part many start-ups (and even established aviation and tech companies) are still trying to identify their niche, purpose and future. It's easy to see why.

The broad use-cases are plainly obvious. From reducing the risks associated with infrastructure inspections by taking people off ladders to optimizing warehouse efficiencies and many things in between, it doesn't take much imagination to see how drones can perform a myriad of beneficial tasks. Nevertheless, significant challenges exist with ongoing technology optimization, largely unproven cost benefits and the risks associated with being an early adopter in the space.



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For companies with a few years' experience, the risk will almost certainly pay off. While the funding some start-ups have received is no guarantee of success, for the Fortune 500s the investment and risks are relatively low. Consider what companies like Intel, Google, Amazon and others are doing in this space to develop technologies for drones that will develop applications leading to driverless cars, precise infrastructure inspection and other robotic processes. For the likes of Boeing and Airbus, the value proposition is different. They can foresee the time when unmanned flight is the present, not the future. At the very least, technology developed with unmanned operations in mind will contribute greatly to the efficiency and safety of traditional manned aviation.

Many big guns have already started acquiring or investing in start-ups. This trend is likely to continue, especially in an age where data is the new gold. Regardless of the role played in achieving the desired output, ultimately it is a data-driven market. For that reason, many hardware companies are pivoting to software or establishing separate units to handle that side of the business. Data is where the profit is going to be derived for all but the few manufacturers who end up with the dominant market share. We will explore how data will drive the insurance for drones later.

Another critical industry element that is starting to manifest itself is the clear need for more traditional aviation companies and pilots to enter the drone market. Aviators may not have the skills to become the best data collectors, much as data professionals may not make the best aviators. Drones are where these two worlds converge and the successful marriage of both skill sets may become the catalyst for those who best utilize the value of their product and succeed in the long run.

SO WHAT IS THE REALITY?

Global Aerospace has seen a continuous and accelerating need for drone insurance over the last three years. Year-over-year growth has been almost threefold. Some periods have seen nearly a doubling of applications from one month to the next. Only for a short period after the FAA fined Skypan \$1.9 million for illegal flights (October, 2015) did we see a brief falloff in the numbers.

Although they are truly the exceptions, some fleets of drones now number in the hundreds. We have witnessed some operators invest exclusively in a single platform, while others are hedging by testing a number of different systems. For the most part, a gap is developing between industries and the drones they use. The aerial photographer/videographer can produce a great product from a system that sells for \$2,500 or less. For Hollywood quality, the investment will be a great deal more than that as cameras alone can approach \$100k. Start adding the latest Light Detection and Ranging (LIDAR) and multi-spectral payloads and the investment becomes significant, especially if the business intends to build a statewide or nationwide fleet.

Since early September, 2016, Global Aerospace has again seen a surge in interest, prompted in part by Part 107. Not only did regulation help operators who might have been risking all by operating illegally, it also paved the way for insurers, investors and those wanting to adopt the technology into their own organizations. With the certainty and attainability Part 107 brings to the industry, we believe we will now see explosive growth from all areas eyeing the future of unmanned aviation.

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Of course, not everyone sees the loosening of regulations as a positive development. Within a month of Part 107 becoming effective, Global Aerospace had witnessed many operators cancelling their insurance, citing the loss of potential to make money in an increasingly cluttered field as the primary reason.

The rise in the need for insurance coverage for drones is also due to the developing requirement for insurance from those companies hiring drone operators. The days of operating uninsured or with a General Liability policy that excludes aircraft operations are short lived; similarly, relying upon the Academy of Model Aeronautics, whose members' policy excludes commercial use, is no longer feasible.

Insurance is available for virtually all operators, equipment and uses. For those in need of a reliable insurance policy, simply find a professional insurance producer to get the process started. A quick web search will generate more results than you bargained for.

WHAT IS THE INSURANCE MARKET DOING TO KEEP UP?

In our first white paper, we explored the insurance market and available insurance in detail. Because the information provided in that paper remains valid, we will not repeat it here.

Insurance providers are adapting to the evolving environment in three ways: 1) by changing their products; 2) by updating the means of distributing and selling those products; and 3) by expanding the way in which customers can tailor insurance programs to their individual needs via on-demand products.

Insurance is available from a number of specialist aviation insurance providers. Some, such as Global Aerospace, have developed specific policy forms to cover the particular needs of the drone market; others still rely upon amended aircraft policies. Some providers offer comprehensive coverage for physical damage to owned, leased or rented equipment and third party liability (covering damage to third party persons and property); others offer only liability insurance. It is now easier to obtain insurance for related risks such as invasion of privacy, malicious damage and hijacking. We anticipate that insurers will continue to expand their product offerings over time.

However, the specialist insurance providers continue to lead the way. We have witnessed some General Liability (GL) carriers begin to offer limited coverage, only to withdraw soon after. When it is offered, coverage is limited at best. Operators may be attracted by the low premiums or even complementary coverage they provide, but the devil is often in the details. Does the GL policy contain a broad illegal acts exclusion? (We have also seen these limited products from the specialists.) Will the policy respond if you violate any of the regulations under Part 107? What happens when you need to rent and insure an expensive camera? Will that be easily arranged at 5pm on the Friday evening prior to a holiday weekend? (Which is when you always need it, right?)

A specialist aviation insurance provider is best equipped to deliver the level of coverage and flexibility needed by a professional drone operator.



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In terms of distribution, Global Aerospace is not alone in feeling the effect of the explosive growth in the sheer volume of business being transacted. Our clients now number in the thousands. The insurance market is continuously working to find ways to simplify and improve the customer experience, while at the same time increasing efficiencies. Global Aerospace and others invested in the industry are working on modern solutions demanded by tech-savvy millennials that dominate the customer base.

Insurance producers and brokers have an active and important role in the process, but they, too, must adapt their models to satisfy the volume and ease of accessibility demanded by these clients. For many operators, an annual policy providing broad coverage and the certainty of being insured 24/7 is the solution. For those who operate drones occasionally or who prefer to pay-as-you-go, a solution called Verify has hit the market. Verify is a smartphone app that allows users to purchase liability insurance in small time increments for a specific location. This may be the solution for up to an estimated 80% of uninsured commercial operators. Expect similar or complementary products to become available in due course.

Yet another significant development in drone insurance relates to ways in which operators purchase insurance to meet their specific needs. From one commercial contract to the next, operators may be using different equipment or may be required to carry different liability limits. Combine that need with insurance coverage that responds accordingly, and you have a tool that charges premiums consistent with the specific needs of the user. Adoption will take time and investment but this type of system could revolutionize the way drone insurance is procured.

FAILURE POINTS

So what about accidents? A show of hands in any room of drone operators will indicate that most (if not all) have at some point suffered some type of accident, system failure or loss of control. How does this translate into the accident history that is important to insurers?

As one of the few insurance providers offering comprehensive physical damage and liability coverage, we have sustained a significant number of claims. Our stock of wrecked drones and payload items is growing (offers invited), but so, too, is our knowledge and experience with certain models. For the most part, system failure or user error account for the vast majority of our claims. Quite often, the lines between the two are blurred. Was the “fly-away” the result of erroneous programming or was it a genuine problem with the drone? Did the battery fail to deliver its promised power or was it insufficiently charged?

Some manufacturers are quick to step in and repair a crashed drone as they prefer to absorb the financial impact to preserve their reputation. Some may offer viable repair options, but many don't. Some have become great customers, partners and friends. It is a fine line to balance shifting product and building a sustainable business.

For now, especially given the increasing demand for insurance, we anticipate that our collection of salvaged drones will continue to grow.

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Part II

Commercial drone use is developing quickly. The release of Part 107 has proven to be a significant milestone, allowing an entirely new group of operators to start flying. There are a number of lofty projections about the anticipated market value of the commercial drone industry by 2020 and beyond. While these are interesting—but debatable—observations, the doubling of insurance applications we have seen between July and September, 2016, is real evidence that explosive growth is unlikely to be a fad.

But what about the companies that want to use drones in a big way? Many companies may have a nationwide or even global need for the applications that drones permit. Is it better to go it alone and develop your own program or call in an established operator to perform the flights for you?

Both strategies are being followed successfully by different companies. We have seen companies go it alone, only to migrate to using external resources. Others are taking a blended approach.

A great deal depends upon the type of data required, the scale and complexity of the project and the level of investment needed. Other factors could include something as simple as the corporate culture of your organization or existing internal resource levels.

In many ways, complexity may be the most significant driving force. An analogy can be drawn with how construction companies tend to use outside experts for such jobs as scaffolding and crane services. Scaffolding is complex and highly specialized, while cranes are expensive and may only be useful for a small part of the project. Similarly, while the investment may not be as great, a farmer may decide that there is little point in owning specialized drone equipment used only for a limited part of the year.

One common tip, whether using internal or external services, is to start by identifying the end product. What data are you looking for? What value will it eventually provide to your organization? Will it save expense in others areas by making the task more efficient? Will it add value to the service or product you offer by delivering a data set that you don't currently have? How much are you prepared to invest to achieve your goals?

DEVELOP YOUR OWN PROGRAM OR SUBCONTRACT?

What are some of the benefits of going it alone? It certainly can provide a degree of flexibility and control over the project. It allows you to train or re-train existing employees and ultimately allows the drones to become an integrated part of the organization. If you choose to go this route, here are some points to consider:

- Get strong internal buy-in from both senior management and the line managers whose departments will be affected. Will investment continue to flow if the first few tries are unsuccessful? Demonstrate the effectiveness of the systems where possible.
- Choose the right tool or range of tools. Clearly multi-rotor is better for local jobs requiring precision and fixed wing for larger scale projects. There are many platform choices. What weight is the payload? Is endurance or heavy-lift capability more important?
- Don't bite off too much, but allow for growth.

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- Experiment with different drones and payloads.
- Understand the regulations and respect the environment.
- Educate your workforce and conduct regular and relevant training. Drones are regulated as aviation risks and should be treated as such. Finding well-qualified operators is one of the big challenges right now, but nothing can replace experience and training.
- Invest in flight management tools or build your own safety management system.

If you decide to subcontract:

- Find a contractor who fully understands your specific needs, as good, well-trained people may be hard to find. Part 107 has opened the door to broad adoption and there is a big gap between those truly equipped and those who have just hung a shingle.
- Ensure safety as a priority. Detailed information on the best way to select a drone operator can be found here: [White Paper: Unmanned Aviation Risk Management, Accident Prevention and Insurance](#).
- Set achievable goals and timelines.
- Get references and review prior projects to verify credentials.

The benefits of using an external provider include the ability to easily measure results, scale faster with less up-front investment, experiment with different contractors and systems, and manage risk better (risk of drones not working for you, or risk of accidental damage or reputational damage).

The downsides could include a contractor who may promise more than they are able to deliver. Additionally, you might lose control of the mission or project.

Maybe the right path forward is to find a blend between internal and external – start with smaller tasks and expand from there. Alternatively, you can operate the drones yourself while subcontracting the flight management, data analysis or cloud services to others.

CONCLUSION

The drone industry is growing before our eyes in ways that will affect many of our lives and at a speed that will challenge our expectations. Developing a drone program in any size enterprise will involve investment and risk. Global Aerospace works with a significant number of companies to help them establish their own programs and get this incredible technology to work safely, in a way that will foster long-term success.

Please contact any one of our expanding group of drone experts for more information.

Is it better to go it alone and develop your own program or call in an established operator to perform the flights for you?



About Global Aerospace

As a leading provider of aerospace insurance serving a worldwide portfolio of clients engaged in every aspect of the aviation and space industries, Global Aerospace is already providing insurance and risk management support for unmanned aircraft operations. A 90-year history of innovation and leadership in aerospace insurance gives the company the experienced insight into emerging, new technologies and associated risks.

Global Aerospace is headquartered in London, with offices in Canada, Cologne, Paris, Zurich and throughout the United States. Across the world, the company employs over 350 people and is backed by a pool of high quality insurance underwriters representing the most respected names in the business.

Policies are issued by one or more member companies of the Global Aerospace Pool. American Alternative Insurance Corporation, Tokio Marine America Insurance Company, Mitsui Sumitomo Insurance Company of America, National Indemnity Company, National Indemnity Company of the South, Central States Indemnity Company of Omaha, American Commerce Insurance Company.

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