



How are Mining & Aggregates Professionals Using Drones in 2017?

By Jeremiah Karpowicz

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THE POTENTIAL USES of drone technology in mining & aggregates have been talked about for years now, as many recognized the efficiencies UAVs could create as soon as the technology debuted. Users could send a drone to perform visual inspections on volumetrics and topography in order to help keep tabs on stockpiles. Traditional measurement practices are often performed on a quarterly or even annual basis, but drones allow users to easily take measurements monthly, weekly or even daily. These are just a few examples around the kinds of benefits drones can enable to positively impact the bottom line.

The value of these tools goes beyond economics though. Using a drone means that someone now doesn't have to literally climb that stockpile to get a measurement. It means those same people no longer have to expose themselves to unstable terrain and share the operating area with heavy machinery. It means they can stay out of harm's way.

It's a difference operators and stakeholders can appreciate in different ways, but the distinction isn't important because safety ties back into the value propositions created by the tools. Keeping operators out of potentially dangerous situations means info can be gathered much faster, and drones typically won't interfere with anything else happening on the job site and causing delays. All of these items further establish that efficiency and safety aren't separate issues for anyone interested in the technology.

Emmanuel de Maistre has seen for himself how these questions around value and safety are tied together. He's the Vice President of the AEC department at Airware, but he's also the co-founder of Redbird, drone data analytics pioneer, that developed a powerful cloud solution for the heavy industries, which was acquired by Airware in 2016.

"Safety issues are the #1 reason why mining and construction companies sometimes have to shut down their sites," said de Maistre. "Stockpile surveying is still a long and dangerous process. I would even say an outdated process. Surveyors are tasked with measuring roads, by taking data point after data point, walking closely to machinery, and as a result are exposed to danger. Flying a drone instead, while being outside the quarry, makes a big difference.

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Professionals are aware of this difference as surveyors are now turning into drone operators.”

That transition is taking place at an increasing rate because of changes to regulation in the United States that have opened up drone technology for individuals and organizations. It's also one that is impacting the very approach professionals have and will soon take for mining & aggregates projects of all sizes.

Removing Barriers to Adoption

WHAT IT MEANS TO LEGALLY OPERATE a drone for commercial purposes has been a question that many in the United States have struggled with ever since the technology was rolled out. It was very possible to utilize UAV technology under a Section 333 Exemption, but Part 107 going into effect in August of 2016 was considered a watershed moment for the industry. For the first time, operators have definitive guidelines around how they can legally take to the skies, and that fact alone has changed the outlook for numerous professionals.

Logan Campbell is the founder of Aerotas, an independent drone-consulting firm that brings knowledge and experience to organizations for using drones safely, legally, and profitably. He's been involved in countless conversations with stakeholders who have expressed concerns about regulation, and he's also seen how those discussions have changed under Part 107.

“Now that flying legally is completely doable, we are seeing a huge uptick in the number of firms using drones,” said Campbell. “It definitely was the last big hurdle that the industry had to overcome. The value proposition is clear; now that regulation is cleared up, we are just seeing the usual technology adoption curve play out.”

That value proposition, especially as it relates to safety, is one that many have recognized and known about for years now, but regulation had been a reason for stakeholders to hold out either because of the ambiguity around the laws or uncertainty with the technology. In some cases, that uncertainty wasn't about drones themselves, but instead about the way in which people are able to embrace something new.

David Shearer is the Vice President of Marketing at Kespry, a manufacturer whose industrial drone platform is designed to make aerial data capture and analysis of critical business information quick and simple and is now being used by nearly 200 customers in 20 countries around the world, including several of the world's leading aggregates companies. He



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mentioned that there’s often skepticism in the early days with innovative technologies as use cases and proof points need to be established, and that’s certainly been the case with drones. How regulation has been a part of this process is a key consideration though.

“The structure that Part 107 provides both legitimizes the use of UAVs for industrial applications and is a solid first step to clearing the way for professionals to harness the incredible potential drones offer over current, very labor intensive, methods of data capture,” said Shearer. “Regulation hasn’t been a barrier to adoption in mining and aggregate operations more than the lack of it has. Part 107 has provided a simple framework that makes adoption for industrial applications, like mining, easier.”

Questions and issues around regulation kept some from fully exploring the technology, and Part 107 has provided answers and resolutions. This development has meant that specific challenges around how UAVs can and should be used can now be addressed.

Data, Answers and Solutions

OUTSIDE OF REGULATION, the biggest issue around drone adoption is related to the logistics of what it means for an operator or organization to fully leverage the technology. It’s easy enough to talk about safety and efficiency, but what does that actually mean for professionals that need to quantify exactly how and where UAV technology will make a difference on a given project?






These can be tough questions to answer, and it’s one of the reasons we’ve seen so much talk about a “complete drone solution” which would allow operators to easily and simply utilize these tools. Daniel Katz, co-founder and Head of Strategy at Aerotas, is just one of many people that is working to reposition this desire in a way that will be more beneficial to people on every side of a project.

“As end users are gaining more experience, they are learning the importance of approaching an entire drone program as this ‘complete solution,’” Katz mentioned. “We are routinely contacted by companies who bought a high-end drone and have spent a year struggling with integrating it into their business. What we tell them is that the drone itself is just a minor part of a complete drone solution. Operational procedures, data workflow, training, insurance, and legal compliance should all be included as well.”

Such details are ones that often get pushed aside in order to focus on drone hardware and software, but those details are the exact sort that will create value which can be quantified.

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Gathering data isn't enough, and that realization is one more and more people are coming to.

“I think professionals are quickly understanding the value that aerial data provides,” said de Maistre. “But the real value goes beyond making aerial data easier to collect - it is about what you are doing with it. Ultimately, it is about turning aerial data into actionable information to generate business outcomes. Enterprises need more than a bunch of photos and a web interface. They need industry-specific analytics tools that enable them to optimize global operations and use of equipment, track progress over time, and meet site safety requirements.”

This “complete drone solution” is one that will need to be about more than a drone, and as proof of how important the concept is, the very people I connected with are all working to create these kinds of sensible options for their customers. The **Kespry system** has been autonomous and a complete end-to-end solution - integrating all the hardware, software, analytics and cloud services required to easily capture, process and use field information - since it first launched in 2013. **Airware** not only brings data to the hands of site managers, but everything from training to analytics and contextual information in the form of detailed reports about production, productivity and safety of the job site to its customers. The **Aerotas Mapping System** includes everything you need to survey by drone.

Where and how these solutions provide a fit for an organization or project is a question that needs to be explored by stakeholders. How these solutions come together in the present will be a major factor in the sort of changes we'll see to the mining industry itself in the near future.

Digitizing and Optimizing Mining Operations

DRONE TECHNOLOGY ADVOCATES often have a tendency to position UAVs as something completely new and different, and while they certainly do open up fresh opportunities, of greater significance is their role in a digitization process that goes beyond hardware and software. The way in which mining projects are holistically approached is changing, and drones are a critical part of that process.

“Currently, we are seeing the quarry, mining and construction industries quickly adopting drone technologies because they are moving towards the digital job site,” said de Maistre. “As enterprises look to digitize and optimize operations, and as job sites become increasingly intelligent, drone technology is at the forefront of enabling new efficiencies. What we are looking at now is a paradigm shift where we are bringing job sites into the digital world by leveraging drone technology.”

Exactly how that paradigm shift will take place is a matter of opinion, and regulation will remain a key consideration in that process. The capabilities to operate beyond visual line of sight (BVLOS) are there, but that kind of operation is not covered under Part 107. Large operations such as big mines will eventually require BVLOS operations at scale. Nonetheless, the technology itself will continue to evolve, and those evolutions are being driven by a digitization process that will go beyond what many ever envisioned when they first encountered UAVs.

“Most of the industry growth to date has been driven by optical sensors which, from an application development perspective, is still in its infancy,” said Shearer. “Many new sensor types are already coming to market but we believe the main focus will remain on optical sensors in 2017, and how they can be used with AI applications and machine learning to accelerate corporate performance.”

It's impossible to not keep an eye on where things are going with drone technology in the mining industry, because that future with AI applications and machine learning is going to arrive sooner than anyone thinks. However, it's even more important to focus on what can work with the technology today, and under Part 107, as there's little reason to avoid exploring those possibilities. ■



About the Author:

Jeremiah Karpowicz is the Executive Editor for Commercial UAV News. He has created articles, videos, newsletters, ebooks and plenty more for various communities as a contributor and editor. He is also the author of a number of industry specific reports that feature exclusive insights and information around how drones are being used in various markets. You can read all of those reports [here](#).

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Commercial UAV Expo is a conference and exhibition exclusively focused on the commercial drone market. Launched to great success in the US in 2015, the organizers are bringing their winning formula to Brussels with a European-centric event.

In the conference program, UAV industry experts share key insights into the issues large enterprise asset owners face when implementing UAS, including systems selection and integration; developing enterprise workflows, guidelines and policies; data management and integration; and legal, safety and regulatory considerations. Plenary sessions and panels cover topics of interest to all end-users regardless of industry while breakout sessions focus on UAV technology, applications and opportunities in the vertical markets listed above.

The international Exhibition includes airframe manufacturers, component suppliers, software suppliers and service companies.

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