The use of drones: Terminal surveillance from above

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Where management staff struggle with the protection of cargo and maintenance of property in port terminals and other transport hubs, the use of drones can provide the speed of deployment and improved visibility. In the Australian cargo sector, grain terminals are a pertinent case in point. TT Club's Senior Underwriter for grain based in Sydney, Rhys Richards, looks in detail at the beneficial use of this developing technology.

> *"The use of drones is expanding quickly, with many industries realising multiple benefits of deployment."*

The typical size and layout of port facilities can make monitoring and asset management difficult, since the line of sight at ground level can be obscured by cargo, buildings, and handling equipment. Similarly, the physical distance sometimes required to travel across the facility, compounded by the potential disruption to automated operations, adds to the challenges.

Grain handling facilities in particular use a wide range of handling equipment assets to serve the global supply chain in the movement and storage of bulk grain. There is also the requirement to protect the grain from damage or contamination, an onerous task considering the sheer amount of grain required to fulfil global demand. Conducting regular, thorough inspections of both handling equipment and grain stores is vital. Given the nature of the operations, assets regularly see significant wear and tear over their service life and grain stores are often under attack from both weather and pests. Therefore, to ensure safe and efficient operations, managers must be able to make informed decisions based on the condition of their assets in real time.

With regards to handling equipment, an operator needs to build knowledge of performance, and plan maintenance interventions appropriately, which makes the quality of the data gathered vital. Similarly, should the quality of the grain be compromised, fast action is imperative. However, given the typical location of these assets, together with their sheer size – access can present danger.

The use of drones in these circumstances offers significant benefit in terms of safety by reducing the requirement to place personnel in high-risk locations. Likewise, there are tangible benefits in terms of the quality of the data that can be gathered through the utilisation of this technology.

For insurers like TT Club, there is a clear benefit to the widespread use of drone technology in the cargo handling industry. Where a claim arises, drones could be used to rapidly assess the severity of the loss or damage, potentially before a surveyor is able to attend. In these instances, much earlier assessments could be made relating to estimated loss values that could enable a claim to progress more quickly.

A well-managed drone operation, adhering to sound industry practice and relevant regulatory controls, can prove beneficial. However, the implementation of in-house or third-party drone capabilities within a grain terminal environment needs to be done carefully to avoid introducing new risks.

Background on drones

Drones, also known as UAVs (uncrewed aerial vehicles), are being developed at a rapid pace for deployment in a wide array of industries across the globe. There is rapid adoption for anything from asset inspection to support for emergency services. It is this growth and development which is unlocking potential for the use of drones within the grain handling industry.

Drones, with the correct equipment, training, and management, can not only reduce risk in your facility – for example avoiding the need to work at height, in grain silos or alongside equipment – but also may improve operational efficiency due to the ease of deployment and the minimal disruption to operations.

However, there are several regulatory requirements that must be fulfilled to get your own drone operation 'off the ground'. Fortunately, as an expanding market, there are many local providers with experience in delivering appropriate training in their respective regions to assist in getting drone operations up and running.

Asset Management Use-cases

As already mentioned, the use of drones can remove the need to place people in these high-risk areas. Nevertheless, care is required to ensure the data collected is of sufficient quality for the asset managers to make decisions over the service life of the asset. Here is a summary of the tools typically able to be deployed by drones.

- Inspection and surveying are pivotal in asset management, preserving and optimising resources. Drones can be employed to monitor asset condition proactively, enhancing safety and reliability.
- Photogrammetry uses the images taken by the drone camera, the global positioning system (GPS) data and using specialist software to produce accurate 3D images and analytics. Where this technology really comes into its own is the ability to survey large or awkward assets (or cargoes) accurately, such as large grain stocks covered in tarpaulin.
- LIDAR (light detection and ranging) produces a similar data output to photogrammetry but uses quite different methods to capture the data. It lends itself to coverage of larger areas.
- Thermal imaging provides an ability to detect possible issues that are not visible to the naked eye. This may give some data enrichment over the use of the regular cameras. This technology can provide insight into possible electrical overheating faults, allowing engineers to investigate and rectify before the issue escalates into an asset fire.

Conclusion

The use of drones is expanding quickly, with many industries realising multiple benefits of deployment. There are three key benefits to using drones in grain handling facilities:

1. Safety - Eliminate the risk to life by removing the need for staff to enter grain bins or work at height.

2. Cost – drone inspections are much cheaper to conduct.

3. Less downtime – a drone inspection takes much less time and can eliminate downtime completely in some instances.

The implementation of the technology can at first sight appear daunting, but with a defined use-case and the support of appropriate drone industry specialists, the deployment of drones within the port and terminal environment can follow a logical roadmap.

The use of drones is expanding across all industries, with a significant amount of research and development underway. Therefore, we are likely to see ever-increasing use-cases and technological advances over the coming years.

Drones can eliminate placing the workforce in dangerous environments, while gathering enhanced data at regular intervals. This technology simply cannot be ignored within the grain handling industry.