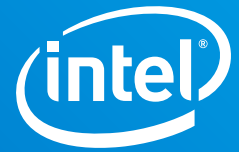


CASE STUDY

Oil and Gas
Intel® Falcon™ 8+ drone



How Intel® Falcon™ 8+ Drones Expedite Advancements in Facilities Management

Data gathered by the Intel® Falcon™ 8+ System assists in creating 3D modeling for virtual asset management.

Intel® Falcon™ 8+ drones are proving to be valuable tools in the adoption of new processes.

- Helps to quickly and safely gather information from hazardous and hard to reach areas without shutdowns
- Flight performance, stability, and high quality sensors help to increase quality and accuracy of data
- Digital data can be utilized by software programs or predictive analytics with little delay

“The contrast of the results between the Falcon 8+ and other models was black and white... the Falcon 8+ nailed every single waypoint.”

Francois Alberts
Chief Controller - Airscope

Safety for a gas processing facility starts with preventive maintenance. For Santos Limited, operating 150 gas fields and 90 oil fields in the Cooper Basin of Australia, the job is huge. And expensive. To manage facilities efficiently, without impacting performance and productivity, Santos Limited is evaluating new opportunities such as virtual asset management. Using information from databases, asset management processes and 3D models to plan, build and maintain complex facilities, including material requirements and workforce needed for repair or expansion work, is referred to as Building Information Modeling (BIM). Companies implementing BIM programs have found they are able to make more timely and informed maintenance decisions, resulting in overall lower operating costs.

Challenge

With the availability of online data, BIM is becoming a more popular method to administrate the complete life-cycle of large infrastructure facilities. However, information needed is not always available in digital form. For example, original architectural drawings may not match the current structures, creating an inaccurate basis for the 3D modeling required for the BIM model.

Santos's main hydrocarbon processing facility in Moomba, South Australia, first commissioned nearly 50 years ago, has definitely expanded since originally built. It currently receives production from surrounding oil and gas fields through approximately 5,600 kilometers of pipelines and flowlines via 24 oil and gas satellite facilities. Natural gas liquids are recovered via a refrigeration process in the Moomba Plant and sent together with stabilized crude oil and condensate through a 659-kilometer pipeline to Port Bonython near Whyalla, South Australia, while shale gas is sent from Moomba to Adelaide via a 790-kilometer pipeline and to Sydney via an 1160-kilometer pipeline. Up to date information would definitely be needed to create 3D models of the Moomba facility.



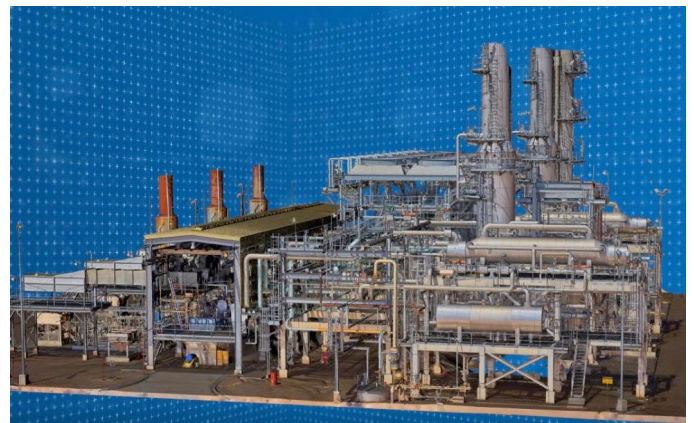
Image of the Intel® Falcon™ 8+ drone being deployed at the Moomba Plant, South Australia.

Solution

In order to evaluate the efficacy of implementing virtual asset management at the Moomba plant, Airscope was contracted to pilot a test case. Specializing in the creation of photo realistic virtual representations of real world infrastructure using drone technology, Airscope utilized the Intel® Falcon™ 8+ system (abbreviated as Falcon 8+) to capture enough images to create a model of one part of the plant. "For us the real efficiencies and return on investment with a client come from providing them with a digital 3D print of their assets," says Chris Leslie, Director at Airscope. "We do this by combining terrestrial 3D laser scanning with 3D photogrammetry." In this case, the photo output consisted of 473 images captured by the Falcon 8+ payload and geo tagged by the AscTec Navigator flight planning software, which only took a total of 16 minutes to complete.

"We did a thorough investigation of 37 different aircraft comparing capabilities and flight plans with actual flights. The contrast of the results between the Falcon 8+ (system) and other models was black and white, ... the Falcon 8+ nailed every single waypoint," stated Francois Alberts, chief controller at Airscope. The unique v shaped industrial design

of the Falcon 8+ system is simple to set up and operate, features redundant autopilot and has the stability to provide very precise data. Payload packages for survey or inspection feature high quality image capture.



3D model of one side of the Liquids Recovery Plant calculated by Airscope using only 473 images from the Intel® Falcon™ 8+ system, reduced to 10 million faces.

Conclusion

To create accurate 3D models of the entire Santos Limited Moomba facility, Airscope estimated that more than 5 million photos would be required from the Falcon 8+ payload in addition to photos from the ground. And while Santos is yet evaluating the benefits of implementing virtual asset management, e. g. BIM to administrate its facilities, it is clear that the Falcon 8+ is highly capable of capturing the quality of data required, efficiently and safely, to help Santos adopt new maintenance models today and future models based on predictive analytics.

Where to Get More Information

To learn more about this use case visit:

<http://www.intel.com/content/www/us/en/products/docs/drones/falcon-8-plus-santos-moomba-video.htm>

For more information on the Intel® Falcon™ 8+ system visit: <https://www.intel.com/commercialdrones>



No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document.

Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade.

The pilot is responsible for knowing and complying with all laws and regulations applicable to the airspace in which the drone is operated.

Intel, the Intel logo, and Intel Falcon are trademarks of Intel Corporation in the U.S. and/or other countries.

*Other names and brands may be claimed as the property of others

© 2018 Intel Corporation. All rights reserved.

Printed in USA

0318/RP/DG

Please Recycle