DroneDeploy

Drones in Oil & Gas

Pushing the Boundaries of Aerial Inspection

Explore this eBook

01 Introduction

Some of the largest oil and gas companies around the world deploy unmanned aerial vehicles (UAVs), better known as drones, to address a wide variety of operational challenges. This rapidly improving technology, along with advances in big data and artificial intelligence, is poised to transform the O&G industry. That's because the aerial intelligence provided by drones offers several key benefits, including making inspections safer and helping companies comply with regulatory requirements — while saving them millions of dollars in labor, remediation, and other costs.

Drones provide practical, economical solutions for upstream, midstream and downstream operations.[1] These rugged, remote-operated birds can maneuver effortlessly around flare stacks, oil rigs and underdecks, as well as above new construction sites and along miles of pipeline. They enable companies to discard reactive measures and adopt proactive approaches to leak detection and other maintenance and compliance processes. Drones are an indispensable high-tech tool for O&G operators, streamlining many current industry practices. Read on to learn:

- The key workflows where drones provide value
- The benefits drones deliver oil and gas companies
- How today's oil and gas innovators are putting drones to work
- How to get started with drones and DroneDeploy

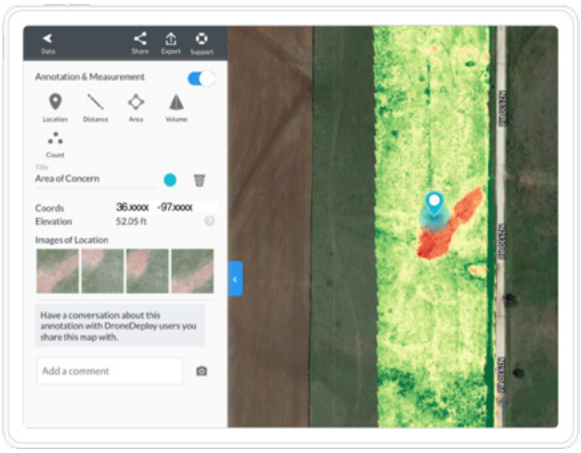
02 Puttting Drones to Work in the Field

Drones are the perfect solution for making visual inspections of infrastructure and gathering extensive data. An increasing number of O&G companies use drones to perform three basic industry functions — pipeline inspection and monitoring, oil well and rig inspection, and surveying and construction monitoring — at a significantly lower cost than ground, manned aircraft or helicopter inspection crews.

Pipeline Inspection and Monitoring

By taking photos and videos of above-ground pipelines, drones allow inspectors in the field or engineers in a remote location to view pipes, either in real time or later. The operator can zero in on areas of concern to gather additional information and, if necessary, recommend that a ground crew visually check the area.

To detect potential underground leaks, drones take photos along pipeline routes. User-friendly software combines these images, creating high-resolution vegetation maps that identify plant kill-off zones, which may indicate a leak. Equipping a drone with an infrared camera provides an additional way to inspect pipelines: Thermal imagery of pipeline routes reveal hotspots, which may indicate potential defects in pipeline insulation or leaks invisible to the human eye.



By examining the vegetation index, inspectors can identify specific areas of concern with DroneDeploy, catching leaks before they spread. Read the case study.

Drone images also detect anomalies along a pipeline network or any encroachments, such as construction or roadwork, on a right-of-way that could threaten the integrity of the pipeline. In case of significant leaks, explosions or other emergency situations, drones provide real-time video to help emergency response teams assess the situation before sending in crews.

Oil Well and Rig Inspection

O&G companies also use drones to photograph oil wells and offshore rigs throughout the initial drilling process. Once the well is operating, drones efficiently monitor operations. For example, they provide a close-up look at a flare stack while it's in service. That provides a real benefit to the traditional approach: shutting down the flare system and assigning an inspector to climb the stack to examine it. In this case, a drone inspection saves weeks of physical inspection preparation and avoids significant loss of productivity and revenue due to an operational shutdown.

Drone inspections help companies prevent health, safety, and environmental (HSE) events, allowing them to address operational issues without sending employees into dangerous zones. Drones also provide easy surveillance of remote or hard-to-reach assets, such as storage tanks.

Surveying and Construction Monitoring

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03 The Benefits of Drones on the Job Site

Drones provide O&G companies with many benefits, including cost savings, improved communication, a safer work environment, and more accurate data. Read on to explore the key ways drones can transform your workflows.

Cost-saving Inspections

Inspecting O&G infrastructure and gathering critical data with drones costs substantially less than traditional inspection methods that require ground crews or manned flights. Many drones can even withstand harsh temperatures, winds, and other conditions. They get much closer to infrastructure than a helicopter or airplane, providing better visuals and data. Drones also minimize downtime by avoiding the need to shut down operations for inspections and by catching leaks and other maintenance issues early, lowering remediation costs.

Drones enable employees to conduct inspection and monitoring tasks without exposing themselves to the typical dangers of O&G operations. As a result, work hours lost due to injuries decline, medical expenses and insurance costs shrink, and the number of workplace events reported to OSHA and other regulatory agencies drop.

Safer Work Environments

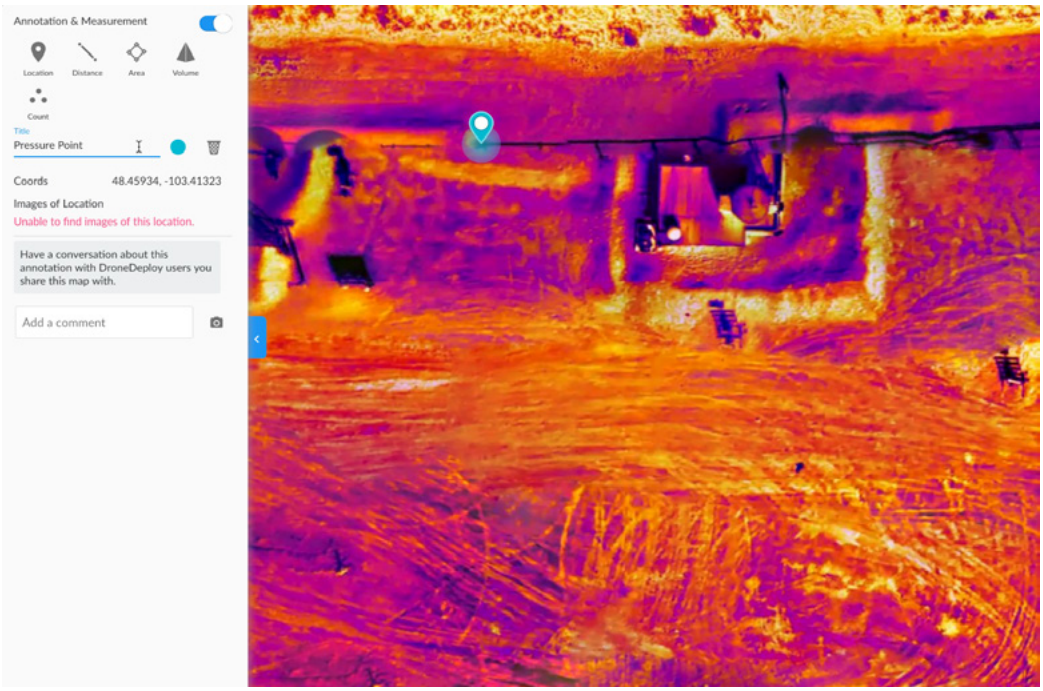
Manual infrastructure inspections are often dangerous.[4] Inspectors at wells and offshore rigs must climb up and down ladders and along catwalks — and even use cranes or harnesses and rappelling equipment to reach equipment. Inspectors often work in close proximity to harmful chemicals and dangerous machinery.

Drones perform inspections without risking employee safety. They're particularly useful for inspections after blowouts or natural disasters — or when sending a ground crew to a site may be difficult, costly, or unsafe.

Faster, More Accurate Data Collection

Drones provide a flexible platform for a wide range of cameras and sensors. They can collect data needed for situations requiring real-time solutions or store data for analysis downstream. Businesses can easily integrate imagery and other data from drone flights into analytical and AI solutions for advanced processing. For example, software solutions use topographical and geological data gathered by drones to create models that help identify promising oil and gas drill sites.

Not only do drones gather information more efficiently than human inspectors, the digital data enables employees to make better, data-driven decisions. This drastically reduces downtime, catches conflicts and issues faster, and helps keep your operation running at peak efficiency.



Using thermal sensors mounted on drones you can detect pressure points and mark areas for follow up with DroneDeploy.

Superior Communication

The remote nature of oil and gas work often requires operators to communicate with workers on sites around the world. This can present a challenge to managers and engineers working from the headquarters and collaborating with the boots on the ground. But drones can make things easier. Workers on the ground can fly drones on their site and upload the data to the cloud where back office managers can review and coordinate further inspection or follow ups—all without leaving the desk chair. Using software such as DroneDeploy makes it easy for the back office to markup maps or drop in annotations in real time so that inspectors can check on pressure points, leaks, or other potential issues.

04 Real World Results: Customer Case Studies

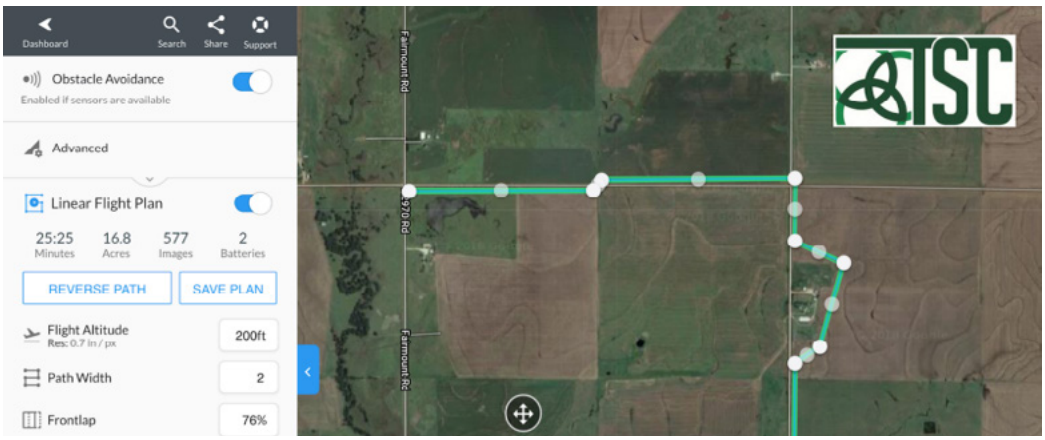
Drones are no longer a pie-in-the-sky technology. They're solutions that are working today in the O&G industry. Here are two real-world examples of DroneDeploy customers using aerial insights to solve problems in the field:

Drones Simplify Early Detection of Pipeline Leaks

Trinity Services and Consulting, LLC (TSC), frequently works with O&G companies to monitor pipelines. TSC used drones to identify possible saltwater leaks along two separate sections of a client's produced-water pipeline in northern Oklahoma.[3] TSC flew drones over 180 miles of pipeline and captured more than 50,000 photos, which were processed in DroneDeploy to create a map of the pipeline with a vegetation analysis.

Over the past two years, TSC's client had experienced three saltwater leaks that resulted in more than $1.5 million in total clean-up costs. By using drones, TSC will save its client millions of dollars in remediation costs over time by detecting leaks early — at a much lower cost than deploying ground crews or manned aircraft.

Read the Full Case Study



DroneDeploy's Linear Flight planning feature makes pipeline inspection fast and simple.

Drone Mapping at the Largest Oil Storage Facility in North America

An O&G company hired drone services firm Hover Visions to provide aerial photography to help monitor the construction of an oil storage site.[4]

To get aerial views of construction progress, most oil storage facilities rely on standard photography taken via helicopter. Hover Vision's drones replaced these helicopter flights, delivering a cost savings of around $3,500 over the five-month period.

Hover Vision also used DroneDeploy's orthomosaic, elevation and 3D maps to help project managers conduct some of their construction oversight tasks remotely. Not only were the project managers able to visit the site less often, but they also had more comprehensive information to aid their oversight duties. The managers, as well as company engineers and executives, now factor drones into various aspects of their business model.

Read the Full Case Study

DroneDeploy's processed 3D models were critical to the oversight workflow for project managers that worked off site.

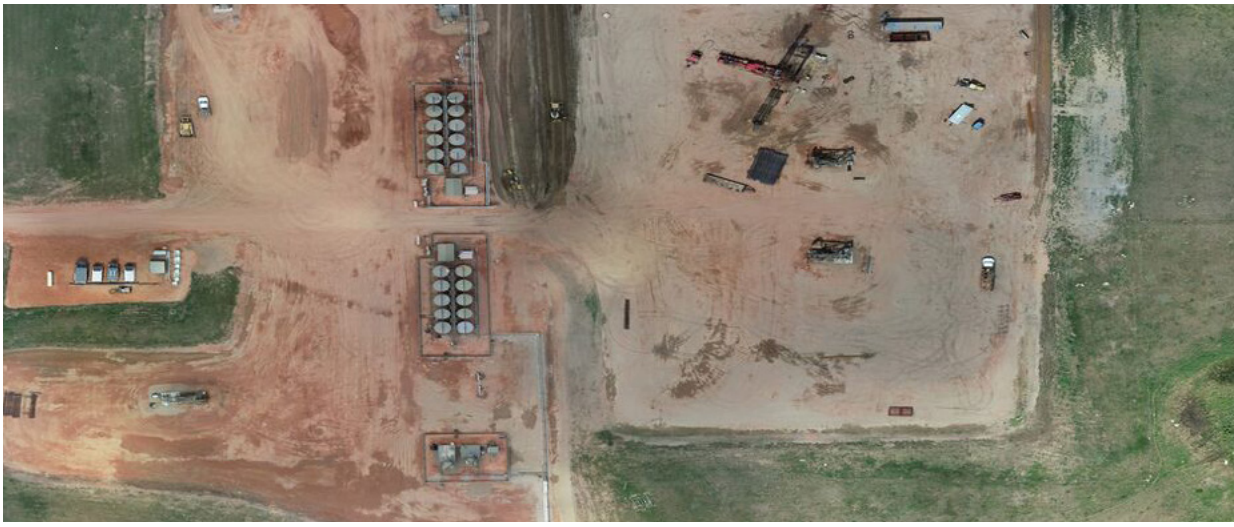
05 Conclusion

Drones provide extremely precise aerial intelligence that simplifies and improves a wide range of O&G workflows. Whether inspecting hundreds of miles of oil pipelines for leaks, helping employees keep operations in compliance with regulations or enabling companies to construct infrastructure more efficiently, agile and flexible UAVs have quickly become a go-to tool for operators around the world.[5]

Drones automate inspection workflows, making them faster, safer and less expensive. They enable O&G companies to spend fewer resources on surveying and monitoring, so employees are able to focus their time and efforts on deeper analyses of data from drones and other sources.

Drones are part of the larger trend toward the automation of tasks in the O&G industry. Automation will allow companies to make better decisions, reduce costs and produce energy products more efficiently.

06 Getting Started with Drones and DroneDeploy



Getting started with drones can seem challenging at first. But it doesn't have to be. DroneDeploy has worked with thousands of businesses to bring drones to their job sites, farms, mines, and properties. We know how to assist your team in getting a successulful drone operation off the ground. Our software is easy to use so you can start mapping and monitoring your projects without the added complexities of other solutions.

Want to learn how DroneDeploy can help your business? Visit www.dronedeploy.com to start your free trial or request a consultation with one of our team members. The DroneDeploy mobile application is also available for free download on both iOS and Android devices.

Ready to bring drones to your job site? Read our guide to starting a drone program and watch the short video below from our customer Bruin E&P Partners.

Sources

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3. DroneDeploy, “Drones Simplify Early Detection of Pipeline Leaks,” https://blog.dronedeploy.com/drones-simplify-early-detection-of-pipeline-leaks-ccf5cc6805bb

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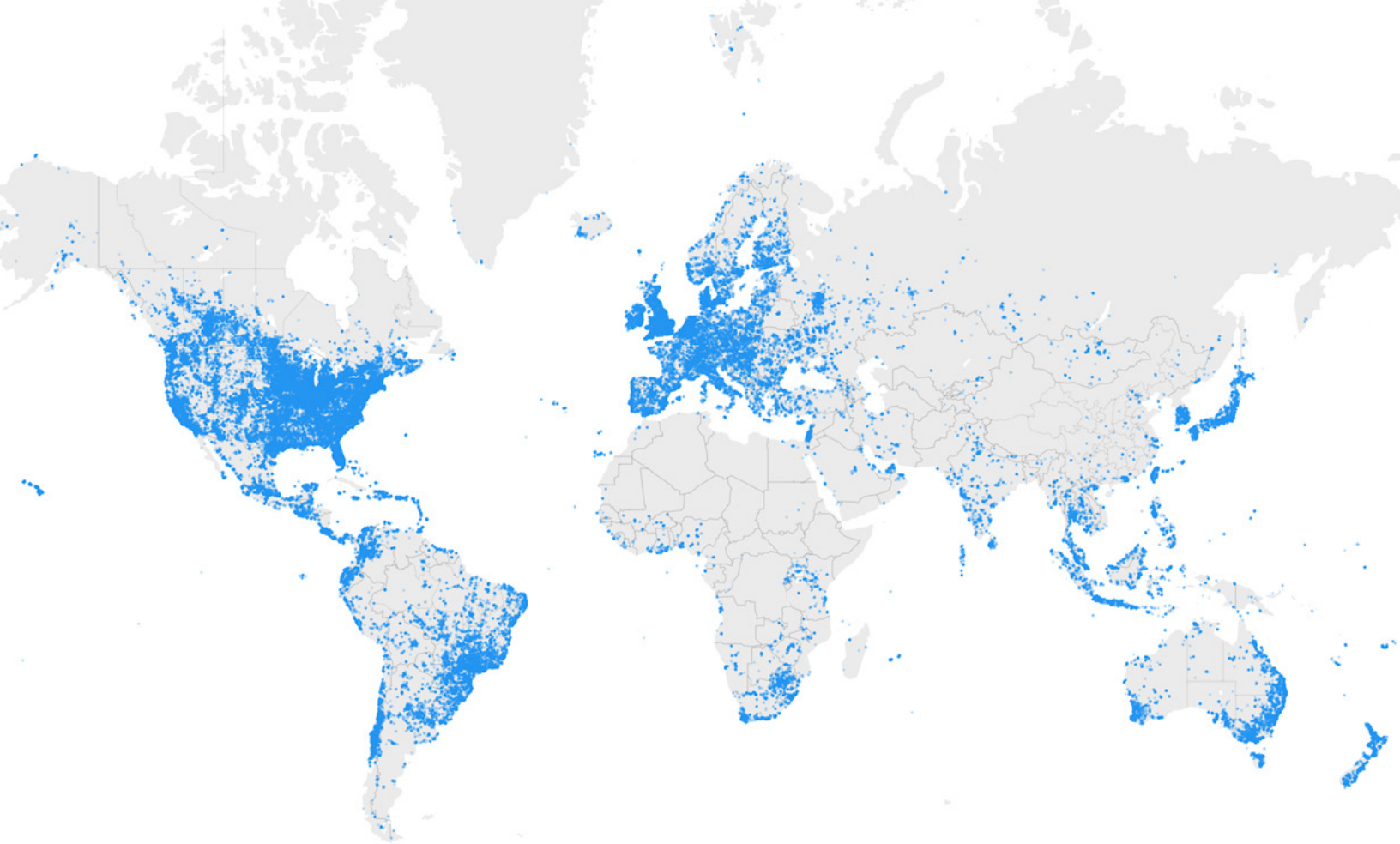

Areas Mapped with DroneDeploy

7 Continents **180 Countries** **40 Million Acres**

About DroneDeploy

DroneDeploy is the leading cloud software platform for commercial drones, and is making the power of aerial data accessible and productive for everyone.

Trusted by leading brands globally, DroneDeploy is transforming the way businesses leverage drones and aerial data across industries, including agriculture, construction, mining, inspection and surveying. Simple by design, DroneDeploy enables professional-grade imagery and analysis, 3D modeling and more from any drone on any device.

DroneDeploy is located in the heart of San Francisco.
To learn more visit us online and join the conversation on Twitter.

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