

Using Drone Technology for Auditing and Inspecting



AECOM is uniquely positioned to pull the required technologies, tools, subject matter expertise together to innovatively solve data collection processes cost-effectively using UAV technology.

Areas of Expertise

Inspection for High-Hazard Areas

- Stacks
- Enclosed areas
- Mines
- Dams
- High tension wires
- Roofs
- Sewers
- High-rise construction
- Disaster areas
- Demolition/deconstruction

Marine Impact Assessment



Overview

Organizations are trying to leverage innovative technologies for HSE needs such as improved training/retention and collecting and using high volumes of quality data. The benefits of using unmanned aerial vehicles are numerous including improving safety, expediting data retrieval, reduced operational downtime, high-quality imagery.

AECOM is working with partner vendors and clients to develop and validate use cases and pilot real world scenarios for these technologies.

Benefits

- More information from a different perspective on the job site
- More accurately estimate earth work before building starts
- On demand, near real time, less disruptive assessments of work progress
- Provides a low-cost alternative to laser-scanning
- Projects/sites can be inspected regularly, safely, efficiently, cost effectively and in more detail
- Capture as-built information in detail (conduits, rebar position)
- Leverage for more productive, shorter meetings
- View places where your personnel can not go without costly and uncomfortable equipment
- Share current details with remote stakeholders
- Monitor housekeeping on job sites without the need for on-site visits
- Conduct safety assessments in virtual reality
- Inventory management and asset tracking
- Tracking logistics - how materials flow onto the site
- Take advanced measurements of conditions on site
- Site modeling "as built" vs "as planned" in greater detail and with higher quality
- Creates a permanent, accurate record
- Ability to visualize work progress in third dimension

Most of these benefits can be achieved in one flight

Our Approach

AECOM employs several size/types of Unmanned Aerial Vehicles (UAVs) with varying capabilities, depending on project needs. Many times inspections/audits can be dull, dirty and dangerous to personnel. Detailed health and safety plans and multiple personnel may be necessary to implement a traditional inspection. Use of UAVs reduces manpower and safety risks while improving project turnaround time, and project imagery. Overall, use of a UAV translates into reduced costs and risks for our client.

EXAMPLE - Stack Inspection Comparison, Protecting Your Resources

TRADITIONAL APPROACH:

- Scaffolding
- Rappelling
- Visual inspection
- Weeks to complete

AECOM INNOVATIVE DRONE/UAV APPROACH:

- Three personnel-One sUAS
- High Definition, Archival Imagery
- Completed within three hours of stack shutdown



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Using Drone Technology for Auditing and Inspecting *(continued)*



EXAMPLE - Minimizing Exposure Comparison

AECOM Flight Operation to image marine turtle nesting activities (turtles, tracks, and nests)

TRADITIONAL APPROACH:

- Several Weeks
- Over 200 personnel
- Small aircraft low level over shark infested waters
- Poor quality photography
- Handwritten notes

AECOM INNOVATIVE APPROACH

- Two aircraft, three personnel
- Six days, 60 hours of flight time
- Captured > 1 terabyte of imagery
- High Definition Imagery
- Geo-Rectified and ortho-rectified data
- Enabled robust analysis

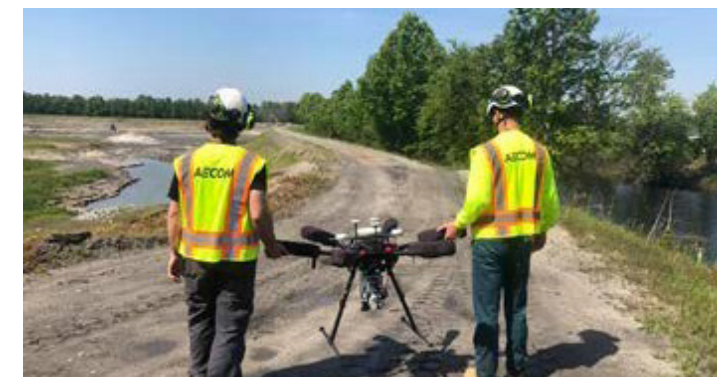
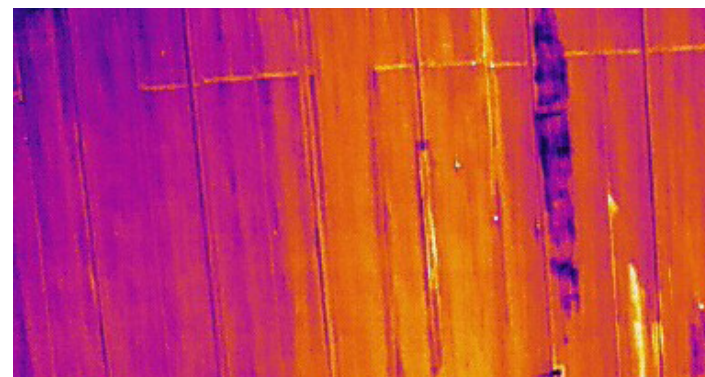
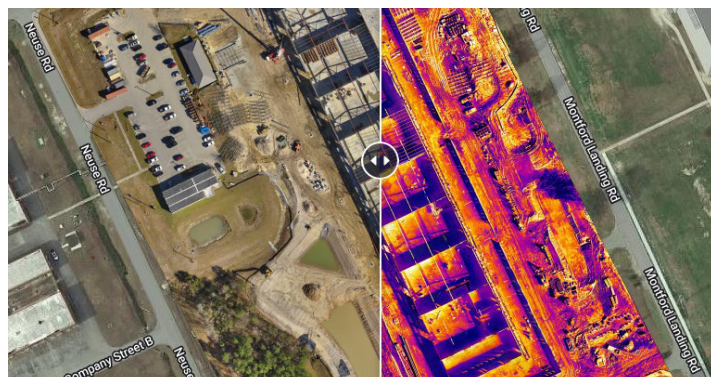
EXAMPLE - Improving Quality, Reducing Risk, Saving Time and Money

TRADITIONAL APPROACH:

- Bucket Truck
- Climbers
- Hand-held camera
- 2 or 3 inspected per day

AECOM INNOVATE DRONE APPROACH

- Two personnel; two drones
- Standoff zoom cameras
- 12 to 20 inspected per day
- Archival data



Key AECOM Attributes

With a long history of technical innovation, AECOM has developed a dedicated UAS program to continuously follow the ever-changing regulatory standards and technology advancements of the drone industry. Our program includes:

- Commercial UAS Services
- 50+ UAS Pilots
- 50+ UAVs (drones)
- Work performed in 30+ states
- Diverse use of a variety of technologies brings broad experience base
- Enables a cost effective way to collect inspection/audit information
- Offers opportunities to collect “eyes on” information in areas that either never are reviewed or are checked so infrequently that this becomes a HSE risk
- Provides access and detailed observation opportunities to areas, systems, equipment that can be both complicated and high risk to auditors/inspectors
- Creates robust methods to collect the details that would be extremely difficult to record using notes and even still shots
- Delivers detailed supplemental information to an inspection or audit that helps facilitate corrective actions needed—pinpoints exactly WHERE and WHAT would be appropriate corrective action(s)