7. Drones and Landfill

Drone technology is being deployed to help landfill owners and operators save time and money by reducing operations, maintenance expenses and environmental liability. Drones and remote monitoring and control (RMC) systems also play a major role when it comes to employee safety.

A session titled "Data, Drones & Case Studies: The Latest Trends in Landfill Management" addressed the latest tools and trends being used in landfill management. During a presentation on using RMC systems for various landfill systems including flares, landfill gas and leachate systems to identify, troubleshoot and solve real problems, David Hostetter, regional RMC manager at SCS Engineers, explained RMC is a way to integrate separate sensors and controls into one packaged control visualization, data monitoring alarm system that can be accessed remotely.

With RMCs, landfill operators can use IoT technology to combine separate controls and sensors into one package, allowing operators to collect data and use a radio system to send the data back and forth across the landfill. The systems can gather flare information, like flow rates, temperatures, statuses of the flares, etc. RMC systems also can monitor landfill gas-to-energy plants to monitor flow rate and how much energy is being produced and what the different pressures and temperatures are. They also can analyze depths, pressures and flow rates, statuses and alarms from leachate centers.

In addition, video cameras can be set up at landfill gates with alarms to alert operators when people are at the facility when they shouldn't be. Once the data from the RMC is collected, operators can use the systems to remotely start and stop blowers, pull up video camera surveillance and do nearly anything via the control system that can be done locally.

During a presentation on how World Bank recently utilized drone technology to create a plan for upgrading a St. Maarten landfill, Melissa Russo, RMC national project coordinator for SCS Engineers and a licensed drone pilot, detailed the five major reasons why using a drone is an upgrade from everyday field practices:

1. Employee Safety—Survey work is done in rough terrain and in the elements, putting workers at risk of fatigue and injury. A drone surveyor eliminates several risks associated with ground surveyance —like heavy equipment and hazardous injuries. Drones allow for autonomous flight and upload the data to a secure cloud in a matter of hours.

2. Speed Survey and Data Deliverables—Land surveyance requires long hours and carrying heavy equipment from one point to another. Drone surveyance will take a single day, or a matter of hours, compared to weeks from ground surveyors.

3. Accuracy—Drones can cover 100 hours of landfill surveyance within a couple hours with better accuracy.

4. Cost Savings—Speed and efficiency equal cost savings for landfill owners and operators.

5. Capabilities—2D images, 3D rendering, infrared surveyance, infrastructure assessment, thermal infrared survey and more.

The St. Maarten Thermal Infrared Survey took place in August 2018 and was funded by World Bank. SCS was called out to complete a thermal infrared survey of the dumpsite and landfill, which had on numerous occasions gone up in flames. The site was hit by Hurricanes Irma and Maria in 2017, and the local main landfill was flooded with debris. Upon arrival, SCS found out that the main landfill was past its expiry and that trash was not sorted and covered properly, creating an environment for spontaneous combustion. Data captured from a drone quickly identified elevated surface temperatures and directed efforts to contain and extinguish landfill fires. Aside from thermal surveillance, landfill drones can provide methane leak detection, 3D topographic mapping, stockpile calculations, near infrared photography and infrastructure analysis.