

September 23, 2016

Detecting Radiological, Biological and Chemical Threats with Drones

Jeremiah Karpowicz

- Emergency Response & Search and Rescue
- Power, Process & Utilities



We've talked about the [dull, dirty and dangerous](#) jobs that drones are performing these days, but capabilities are now about so much more than making a task simpler or easier. UAVs can and are be utilized to detect radiological, biological and chemical threats to ensure the safety of countless people. Developments in this area are coming from places you might expect, and even from some you wouldn't.

[FlyCam UAV](#) is a company known for capturing the amazing aerial images and video utilized in countless film and television productions, but their partnership with the US Nuclear Corp has allowed them to make an impact from the sky in a much different way. FlyCam UAV has launched the Cypher 6 and the NEO, which are designed for use with US Nuclear Corp's DroneRad aerial radiation detection system. DroneRad detects particles that contain radiation, and the UAVs can be used to provide data around where these chemicals might be present in various situations and circumstances. Full details are available [via the press release below](#).



A look at The NEO, which will be displaying at the show,

I'll be looking to talk with FlyCam UAV at the [Commercial UAV Expo](#) to talk discuss further details about this product and what else they're working on, and you'll be able to stop by booth #614 and have that same option. Until then, I was able to get hold of Jeff Barnett, Operations Manager / Lead Pilot at FlyCam UAV to talk through a few details around The Cypher 6, NEO, DroneRad and more.

Jeremiah Karpowicz: Making the jump from film to nuclear power isn't one I imagine many companies have made. Can you tell us how the opportunity came about?

Jeff Barnett: As you mentioned, our background is in aerial cinematography and photography. When we launched FlyCam UAV, along with aerial production, we wanted to also have a retail location to bring the amazing technology of UAV's to people in our local area. One day while in the store the CEO of U.S. Nuclear Corp. came in and asked

us if it would be possible fly a nuclear sniffing sensor. Always up for a challenge to find new uses for UAV systems, we said yes and we were off and running.

We first did a “proof of concept” and flew the sensor using one of our medium lift quadcopters, however we’re really big on redundancy and decided one of our custom built hexacopters would be more suited to carry this particular payload as in the event of a motor or prop failure the system would not drop from the sky. At that point we moved the detection system to a redundant platform and the Cypher 6 came into play. The Cypher 6 proved to be a solid and reliable platform to carry the sensor, however it had one weak point which was the inability to fly in rough weather such as heavy rain, wind or snow. We found the answer to that problem with the NEO system which is all weather capable.

Had US Nuclear Corp’s DroneRad aerial radiation detection system previously been used in any other context or situation? Or was it specifically made to be used on the Cypher 6 and NEO?

Previously both of the sensors we currently fly were utilized in a ground based application where an operator could possibly run the risk of radiation exposure. Having the ability to keep the operator at a safe distance from the threat was key.

Do you see this development changing the approach that officials are currently using to monitor events and sea ports for potential hazardous materials?

Absolutely. Having the ability to quickly deploy the DroneRad over any threat would certainly be an advantage for not only sea ports its other applications could be for first responders both police and fire departments as well as border patrol use and threat detection. Another good example would be a major sporting event or anywhere that large groups of people may congregate.

How do you see these products and advances impacting other industries and uses of UAV technology? What type of professional should take a closer look at these developments?

I feel anyone in law enforcement, border protection, fire departments, etc. should look closely at this technology. If there were a fire in a hospital with a nuclear medicine department, the DroneRad with the plume sniffer could be quickly deployed to fly through the smoke plume and sample the possible threat before sending in fire fighters. With the current climate and the constant threats of “dirty bombs” hidden inside of suspicious vehicles or ships, the DroneRad can quickly take to the air and investigate the possible threat keeping first responders at a safe distance while receiving real time data from the DroneRad to determine the type of material and the threat level it may contain thus informing the operator of what approach to take when addressing the threat.



Southern California Commercial UAV Company Teams Up with a Radiation Detection Company to Create a Life Saving UAV

You may have seen FlyCam UAV's aerial production work, but the UAV company that's known for its stunning cinematography recently partnered with US Nuclear Corp to create a new device that's right out of the movies — and can save real lives.

FlyCam UAV launched the Cypher 6, a commercial-grade hexacopter, and The NEO, an all-weather commercial co-axial octocopter. The platforms are designed for use with US Nuclear Corp's DroneRad aerial radiation detection system. DroneRad detects particles that contain alpha, beta, gamma and neutron radiation. A gas collection option tests for the presence of chlorine, biological particulates, and aerosols such as anthrax and nerve gas, making the FlyCam UAV/US Nuclear Corp UAV suitable for radiological, chemical and biological detection missions. Future upgrades to the DroneSensor package will detect methane and diesel fumes.

The UAVs can be used to detect radiation leaks in nuclear power plants or flown into plumes of smoke from a burning building to give first responders immediate data about what kinds of hazards might be present. It can also be used for to monitor public events, sea ports or geographic areas to detect possible dirty radiological bombs or the use of chemical and biological agents.

The DroneRad with the Cypher 6 and NEO UAV configurations acquires and relays data to the operator in real-time. The data can be tagged with GPS coordinates and stored on-board for post-flight download and viewing, or it can transmit data to a base station wirelessly for live monitoring. The data consists of a series of measurements of radioactive intensity tagged with GPS data for color coded display on a map. The data

can be displayed as a full gamma spectrum, allowing the identification of radioactive isotopes.

“Sensors mounted on UAVs is the perfect marriage of two technologies that will be a game changer for a variety of different industries,” Jeri Donaldson, CEO and owner of FlyCam UAV, said. “In addition, the need for security is at an all-time high and our technology can remove the human element from a potentially dangerous situation. The practical and potential applications of the Cypher 6 and Neo with US Nuclear Corp.’s DroneRad sensor package are enormous and we have yet to see all of the use cases of the devices.”

The Cypher 6, Neo and DroneRad are available now through FlyCam UAV and US Nuclear Corp. For more information, visit <http://www.flycamuav.com> or <http://www.usnuclearcorp.co>

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About FlyCam UAV:

FlyCam UAV utilizes aerial imaging systems to deliver stunning footage for film and television to agricultural and industrial inspections. From 10 feet off the ground to 400 feet in the air, FlyCam UAV gets it done on time and on budget. The company recently partnered with US Nuclear Corporation to create the Cypher 6 and NEO UAV platforms and the DroneRad sensor package, which can detect radiological threats. With a gas collection option, it can also find chemical and biological agents.



About the Author

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- Jeremiah Karpowicz is the Executive Editor for Commercial UAV News. He has created articles, videos, newsletters, ebooks and plenty more for various communities as a contributor and editor. He is also the author of a number of industry specific reports that feature exclusive insights and information around how drones are being used in various markets. You can read all of those reports [here](#). Get in touch with him on Twitter: [@jeremiahkarp](#)

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