Advisory

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If you have any questions about this Advisory, please contact:

DAVID HALL
215.988.8325
dhall@wiggin.com

DAVID LINCOLN
203.498.4390
dlincoln@wiggin.com

NJIT and American Aerospace: A COA Case Study

The FAA Modernization and Reform Act of 2012, Section 334, requires the FAA to set up a system that allows public entities to operate unmanned aerial systems (UAS). This has opened up the use of UAS to public organizations, ranging from federal agencies to fire and police departments and public universities. To obtain such authorization, public entities apply to the FAA for a Certificate of Waiver or Authorization ("COA"), waiving the airworthiness requirements of Title 49 of U.S. Code to authorize flight in the National Airspace System (NAS). While the application process itself is relatively straightforward, a public entity must show the FAA that it can conduct UAS operations safely.

The New Jersey Institute of Technology (NJIT), a public institution, recently obtained a COA to research the use of UAS data-collection sensors for homeland security and emergency management functions.

On January 29, 2014, NJIT conducted a test flight at the U.S. Coast Guard Training Center in Cape May, New Jersey for the RS-16 unmanned aircraft. The RS-16 is gas-powered and weighs 85 pounds, with a 12 foot wingspan, 15,000 foot flight ceiling, and a 25 pound payload. Its maximum speed is 65 knots, with a cruising speed of 55 knots, and a stall speed of 31 knots.

The test employed a pilot, multiple ground crew members, ground observers, a launching system, and a flight operations ground vehicle. The RS-16 itself is not owned by NJIT, but was leased from its developer, American Aerospace Advisors, Inc. NJIT also hired American Aerospace to provide the trained pilots necessary for the flight.

An Emergency Operations Center (EOC) housed in an RV and provided by Cape May County was present with EMT personnel, a requirement of the COA. The COA also imposed a ceiling of 3,000 feet and a range of one nautical mile from the takeoff location. The Pilot-in-Command (PIC) was in constant communication with Air Traffic Control (ATC), had filed Notices to Airmen (NOTAMs) with the FAA to advise other aviators about the flight, and had received clearance from ATC immediately prior to take-off. The PIC has a Pilot Certificate

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and Class 2 Medical Certificate. Two additional certified pilots acted as the ground observers, as required by the COA.

The ground observers are necessary to comply with the FAA "sense-and-avoid" requirement; the requirement that an aircraft have first-hand situational awareness of its environment so as to be able to avoid other aircraft. With UAS, this is accomplished either by having ground observers who are trained pilots, or by having a manned "chase aircraft," performing the same function. For this test flight, ground observers were sufficient, but the COA will eventually allow NJIT to fly up to 10,000 feet and out to 14.5 NM over the Atlantic Ocean, necessitating a chase aircraft.

Dr. Edward Mahoney, the Mayor of Cape May, and Gerald Thornton, the Freeholder Director of Cape May County, discussed the potential they see in UAS. They hope that UAS can be employed in disaster situations, such as Super Storm Sandy, to aid stranded residents and to survey damage. They also noted that UAS can aid ground personnel in more traditional fire and medical emergencies. Citizens raised questions about privacy during the development of the plan, but were assured that the program is not a police surveillance tool. They also hope that by leading the R&D effort they will attract the UAS industry to southern New Jersey.

A number of people, including the FAA research group, had questions about the legal liabilities one could incur in using a UAS. Needless to say, this is a fact-specific subject that cannot be answered sufficiently in the abstract. But, as suggested by the questions, potential UAS users should consider the relevant risks of their proposed operations, such as product liability exposure and export compliance requirements, as well as the steps that can be taken to mitigate such risks.

All observers were required to remain in a predetermined safe zone starting fifteen minutes prior to take-off, a requirement of the COA. The RS-16 was then launched by catapult and the test began. A computer within the EOC had the capability to receive real-time data, including high-quality imagery, from the RS-16 and to link numerous emergency agencies into this data via Virtual Private Network (VPN) technology. After about 30 minutes in the air, the RS-16 landed successfully.

The NJIT partnership with American Aerospace exemplifies how to advance unmanned flight technology under an FAA COA.