

Senate Aviation Caucus Meeting
Informational Briefing
Use of Drone (UAS) Technology
Room 14 East Wing
Harrisburg, PA 17120
Tuesday, September 29, 2015

Introduction:

- I am a Senior Vice President and the company's Practice leader for geospatial services, which includes Unmanned Aerial Systems (UAS)
- Michael Baker International is a Company formed in Pennsylvania 75 years ago to provide professional engineering and architecture services nationally and internationally
- We employ 6000 personnel worldwide
- Pennsylvania represents our largest number of domestic staff that are employed in any state.
- I am not a licensed pilot, but the manager of our pilots' activities related to UAS. I am the officer responsible for Michael Baker International's ownership and operation of our UAS systems.

Position Statement:

- I appreciate being able to address The Senate Aviation Caucus today
- I understand the need for Senate Bill 971
- Michael Baker International supports the intentions of Bill 971 and will make itself available for future consultation, assistance or guidance as the Bill progresses.
- We understand the need to establish a two-year moratorium on the use of government owned or operated drones except under certain emergency circumstances.
- Let me begin by stating ownership and operation of UAS involves a deep understanding of FAA processes and regulations, and the responsibilities that come with safe, lawful operation of any aircraft in US airspace.

Lawful Commercial UAS operations includes:

- Obtaining a Certificate of Authorization to commercially operate any UAS
- Obtaining a grant of exemption for the specific aircraft and their operation
- Obtaining the actual aircraft registration, and;

- Knowing the allowed usage of UAS in the US airspace, regardless of additional local or state ordinances.

We see UAS as important to our work on infrastructure projects and for land and environmental characterization and observation.

As professional engineers, we are using the systems to perform construction inspection, topographic mapping, and videography for our architectural projects.

Our UAS activities involve trained and licensed professionals who have an economic interest in collecting information about a very specific area of interest.

These professionals are licensed in their profession (pilots, engineers, architects, surveyors); and such licensing includes requirements to perform their services in an ethical and legal manner.

Our professionals have no interest economically, socially, or professionally to fly over and collect information outside our specific study areas.

We operate UAS for specific projects and do not operate UAS for the purposes of collecting information about individual people for surveillance or any other purpose.

Our flights are being monitored by the FAA through the COA process and through flight plans submitted to the local Air Traffic Control (FAA-ATC) for each flight that requires a site-specific authorization.

We must report monthly to the FAA on all the UAS flights we conduct.

The sophisticated UAS we use, are operated by pre-loading a flight area into the aircraft's navigation system onboard the UAS, and the flight is accomplished autonomously according to real-time atmospheric conditions and the plan developed directly by the aircraft's software.

The likelihood of persons in the engineering or surveying profession actually conducting an aerial UAS survey in such a way as to infringe on individual privacy, are negligible.

Comments on FAA Process:

- I'd now like to discuss the process to obtain a CERTIFICATE OF WAIVER OR AUTHORIZATION (COA)
- Obtaining a COA to commercially operate a UAS is a very detailed process.
- One must know the entire application process to be successful and it will take many months to acquire a COA.
- We possess a COA for commercial operation of UAS. Our Company: FAA-2015-0777-333E effective from May 31, 2015 to May 31, 2017.

- We have a blanket COA to operate at or below 200 feet Above Ground Level (AGL) for the purpose of aerial data collection as described in our COA.

Michael Baker International owns and operates four UAS aircraft:

- 1 Fixed wing: 45 min flight duration
- 3 Quadcopters: 15-18 min flight durations (VTOL - Vertical takeoff and Landing).
- All are registered with the FAA, with a registration and serial number
- We have received exemptions to operate each aircraft with their own associated restrictions
- Each required submission an "Affidavit of Ownership for Amateur Built and Other Non-Type Certificate" to define our ownership of the aircraft
- An "N" number is also issued for each aircraft, similar to an airplane number
- An "N" number is Issued by the FAA Flight Standards Bureau and needed to acquire a registration
- The Affidavit of Ownership and the "N" number also requires submission of a separate form (OMB Form No. 2120-0042) to the FAA to receive a registration
- We completed a separate registration application for each aircraft
- Registration is achieved with the receipt of OMB 8050-C (the official registration form)
- The bottom-line is there are lots of steps and paperwork to register a single UAS for commercial operation after getting a COA

Commercial Operation and the Role of a Pilot in Command

- COA Background
 - Our COA allows us to operate our small UAS (all must be 55 pounds or less) during daytime Visual Flight Rules (VFR) conditions:
 - (1) At or below 200 feet AGL; and
 - (2) We can operate beyond certain distances from the airport reference point (ARP) of a public use airport, heliport, gliderport, seaplane base and military airports listed in the Airport/Facility Directory
 - We require special permission from the FAA if operate within:
 - a) 5 nautical miles (NM) from an airport having an operational control tower; or
 - b) 3 NM from an airport having a published instrument flight procedure, but not having an operational control tower; or

c) 2 NM from an airport not having a published instrument flight procedure or an operational control tower; or

d) 2 NM from a heliport, gliderport or seaplane base.

- These restrictions are significant and an exception to them requires the submission of a site-specific COA to the FAA, which is another far more detailed application process for the specific site

Insurance to Operate

- Michael Baker International, as a commercial operator, has insured its flight operations with accident coverage of \$1M per occurrence, for each of its aircraft.
- Such coverage is consistent with our professional services contract requirements that include the operation of vehicles and other equipment.
- Our UAS insurance policy requires the identification of our Pilot in Command;
 - Aircraft Experience (types and hours) is required in the application for each of our PIC;
 - Current types of license(s);
 - Formalized safety training in operation of a UAS from the insurer's program.
 - Actual flight logs (e.g., 10 hours of familiarization and operation) and experience with the specific aircraft to be flown, this needs to be provided before commencement of any commercial flights.
- A Pilot in Command is crucial to the safe operation of a UAS, for example;
 - They possess a national background check to obtain and retain their pilot's license.
 - They are trained and tested on their knowledge of the US Airspace.
 - They are evaluated bi-annually on competency by a certified flight instructor.
 - They know the processes for communicating with the FAA, airfield tower personnel, and reporting any incidents or accidents associated with the UAS operations.

Collision Avoidance Requirements

UAS have no on-board pilot to perform see-and-avoid responsibilities, the PIC is critical to UAS operational safety.

The pilot in command (PIC) is responsible:

- To ensure the UAS gives way to all manned aviation operations and activities at all times,
- For the safety of persons or property on the surface with respect to the UAS,
- For compliance with operations near other aircraft (CFR Parts 91.111), giving right of way (CFR Part 91.113) and giving right of way for water operations (CFR 91.115)
- Visual observers must be used at all times by the PIC and maintain instantaneous communication with the PIC.
- The PIC is responsible to ensure visual observer(s) are:
 - Able to see the UAS and the surrounding airspace throughout the entire flight, and;
 - Able to provide the PIC with the UA's flight path, and proximity to all aviation activities and other hazards (e.g., terrain, weather, structures) sufficiently for the PIC to exercise effective control of the UAS to prevent the UAS from creating a collision hazard.
 - Visual observer(s) must be able to communicate clearly to the pilot any instructions required to remain clear of conflicting traffic.

Closing Comments on Senate Bill 971

Understanding the above, it is prudent that The Senate Aviation Caucus seriously consider the importance and the need for Senate Bill 971 and Senator Folmer's legislation.

Notwithstanding the more widely communicated issues with privacy, Michael Baker International is most concerned with the safe operation of aircraft.

State agencies could spend significantly to develop UAS capabilities that are not often used by an agency and such capabilities already exist within the private sector and from companies such as mine

We have done all things the right way to ensure our compliance with the FAA on commercial operations of UAS. We have invested heavily to develop our capabilities

We do believe there is an economic boon to the economy from the emerging UAS market; however, safety must come first and we fully support the FAA's emphasis on the safety issue.

Over the next two years, the Commonwealth can turn to the FAA and firms such as ours to gain insights into the rule or regulation changes that emit for the FAA and take a smart, careful course of action for investment into these systems by agencies or expansion of the use of private sector operators.