ALABAMA DEPARTMENT OF TRANSPORTATION
AERONAUTICS BUREAU

ADEM

2016 Drinking Water / Surface Water Meeting

October 27, 2016

SMALL UNMANNED AERIAL SYSTEMS* 101

- TODAY'S GOALS
  - INTRODUCTION TO THE WORLD OF sUAS
  - FEDERAL ROLE IN REGULATING sUAS
  - STATE'S ROLE IN ADDRESSING sUAS OPERATIONS
  - INTRODUCTION TO FEDERAL AIR REGULATION PART107 (FAR PART 107)

*Hereafter referred to as Drones

THE DRONE (R)EVOLUTION
(A REALLY, REALLY BRIEF HISTORY)

- WHAT IS A "DRONE?"
  - Early "drone" R&D began in the 1950s for the military
  - Essentially, anything that flies through the air without a pilot
  - Fixed wing and quadcopters
  - Can be flown autonomously or remotely guided
  - Widespread recent military use in the Mideast
  - Civilian sector applications have exploded due to technology and low cost
  - Utilized for a wide range of civil applications
    - Aerial mapping & surveying (ALDOT is already testing/evaluating this use)
    - Structural inspections (power lines, buildings, off shore oil rigs, flare stacks, etc.)
    - Surveillance

SOME OTHER DRONE APPLICATIONS

FILMING | POWER LINE INSPECTION | PRECISION AGRICULTURE | FLARE STACK INSPECTION

FEDERAL REGULATORY ROLE

- THE FEDERAL AVIATION ADMINISTRATION HAS ULTIMATE AUTHORITY OVER AIRCRAFT AND MANAGING THE NATION'S AIRSPACE
- DRONES ARE CONSIDERED AIRCRAFT BY FAA, AND THUS SUBJECT TO REGULATION
- **FAA'S MAJOR CHALLENGE – HOW TO SAFELY INTEGRATE DRONE FLIGHTS INTO THE NATION'S AIRSPACE SYSTEM (NAS)**

THE NATIONAL AIRSPACE SYSTEM
(IN A NUTSHELL)

- 1956 GRAND CANYON MID-AIR COLLISION OF TWO AIRLINERS PROMPTED CONGRESS TO GRANT AUTHORITY TO FAA TO MANAGE NATION'S AIRSPACE
- IN 1958 CONGRESS AUTHORIZED FAA TO REGULATE AIRSPACE USE, MANAGEMENT, SAFETY, AIR TRAFFIC CONTROL, NAVIGATION & EFFICIENCY
- AIR TRAFFIC CONTROL SYSTEM BASED ON PILOTED AIRCRAFT, RADAR CONTROL, TWO-WAY RADIO COMMUNICATION, SEE-AND-AVOID, ETC.
- AS ORIGINALLY DESIGNED, THE CURRENT SYSTEM DID NOT ANTICIPATE UNMANNED AIRCRAFT
- THE NAS CONSISTS OF A COMPLEX NETWORK OF AIRSPACE CLASSES, AIRWAYS, AIRPORTS & NAVIGATIONAL AIDS

FAA's FIRST STEPS

- IMPLEMENTED WAIVER/EXEMPTION PROCESS FOR DRONE OPERATORS
- DRONE REGISTRATION REQUIREMENT IMPLEMENTED JANUARY 2016
- PUBLISHED A FINAL SET OF UAS RULES (FAR PART 107) EFFECTIVE AUGUST 27, 2016 (sUAS >55 lbs)
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  - THESE RULES ADDRESS CERTAIN OPERATIONAL LIMITS, OPERATOR TRAINING, UAS REQUIREMENTS & MODEL AIRCRAFT
  - DOES NOT ADDRESS AIRSPACE CONTROL ISSUES
- MICRO-UAS (>4.4 lbs.) RULES IN PROGRESS

WHAT IS ALABAMA DOING?

- Governor's Executive Order of January 23, 2015 – Designated ALDOT Aeronautics Bureau as the Lead Agency for all Unmanned Aerial Systems
- Established an 8-member UAS Council composed of agency directors, legislative members, and an airport authority member
- Initial Focus – Prepare state agencies to operate sUAS aircraft (>55 lbs.)
- Legislation introduced in the 2016 Session but withdrawn by the sponsors
- UAS Council has formed a working group to draft comprehensive drone legislation for the 2017 session

INTRODUCTION TO FAR PART 107

- Became effective in late August 2016
- Generally regulates small UAS operations (drones > 55 lbs.), up to 400 feet above ground level, with flight speeds 100 MPH or less
- Does not apply to radio controlled model aircraft
- Does not apply to UAS operations inside an enclosed structure

REMOTE PILOT CERTIFICATE REQUIRED

- Part 107 Established a Remote Pilot Certificate for Drones
  - Remote Pilot in Command (RPIC)
- RPC must be obtained prior to acting as a Remote Pilot in Command
- Requirements
  - 16 years old or older
  - English proficiency
  - Pass TSA Background Check
  - Pass FAA Written Exam & Every 24 Months Thereafter
  - No Demonstrated Flight Proficiency
  - No medical certificate required

NON-RP(I)C OPERATORS

- Uncertificated drone operators can fly a drone as long as he/she is directly supervised by a qualified RPIC

- RPIC must be close enough to the uncertificated operator to physically take over the drone controls if necessary

VISUAL LINE OF SIGHT (VLOS)

- DRONES MUST BE OPERATED WITHIN THE VISUAL LINE OF SIGHT OF THE RPIC THRU-OUT THE ENTIRE FLIGHT
- RPIC MUST KNOW THE DRONE'S LOCATION, ALTITUDE AND DIRECTION OF FLIGHT AT ALL TIMES
- DOES ALLOW FOR THE MOMENTARY LOSS OF SIGHT (e.g., flies behind a tree)
- VISUAL OBSERVERS (VOs) MAY BE USED TO ASSIST RPiC IN MAINTAINING VLOS
- VLOS REQUIREMENTS ARE WAIVABLE
- VLOS WAIVER MUST BE APPIED FOR

OPERATING ALTITUDES

- DRONES CAN FLY UP TO 400 FEET ABOVE GROUND LEVEL (AGL)
- EXECEPTION – CAN OPERATE ABOVE 400’ AGL IF FLOWN WITHIN A 400-FOOT RADIUS OF A STRUCTURE BUT NO HIGHER THAN 400’ ABOVE THE STRUCTURE’S UPPERMOST HEIGHT
- 400 FOOT AGL LIMIT IS WAIVABLE UNDER PART 107
- WAIVER MUST BE APPLIED FOR

WEATHER AND VISIBILITY

- MINIMUM FLIGHT VISIBILITY OF 3 STATUTE MILES (CHECK WITH NEAREST WEATHER REPORTING SERVICE)
- MINIMUM CLOUD DISTANCE – 500’ BELOW THE CLOUD; 2,000’ HORIZONTALLY AWAY FROM CLOUD
- WEATHER & VISIBILITY MINIMUMS WAIVABLE
  - WAIVER MUST BE APPLIED FOR

MISCELLANEOUS RESTRICTIONS

- FLIGHTS OVER PEOPLE PROHIBITTED (EXCEPT THOSE DIRECTLY PARTICIPATING IN THE DRONE OPERATION)
  - OVER" MEANS ***DIRECTLY*** OVER ANY PART OF A PERSON
- FLIGHTS IN CONGESTED AREAS
- RECKLESS OPERATIONS PROHIBITTED (ENDANGERS LIFE OR PROPERTY)
- NIGHTTIME OPERATIONS PROHIBITTED (BASED ON CIVIL TWILIGHT)
- NIGHTTIME BAN WAIVABLE
  - WAIVER MUST BE APPLIED FOR
- DRONE MUST YIELD RIGHT OF WAY TO ALL OTHER AIRCRAFT OR VEHICLES

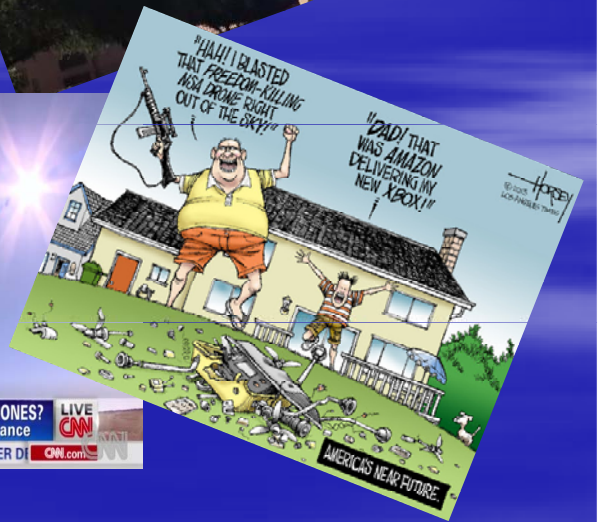
DRONE OPERATIONS NEAR AIRPORTS / HELIPORTS

- ***KNOW WHERE YOU ARE FLYING***
  - CHECK FAA'S BEFORE YOU FLY WEBSITE OR APP
- MAY OPERATE WITHIN CLASS G AIRSPACE WITHOUT PRIOR APPROVAL, INCLUDING AIRPORTS / AIRPORTS IN CLASS G AIRSPACE
  - IN CLASS G AIRSPACE, NO FAA AIR TRAFFIC CONTROL APPROVAL REQUIRED
- DRONE OPERATIONS PROHIBITTED THAT INTERFERE WITH OPERATIONS AND/OR TRAFFIC PATTERNS AT ANY AIRPORT, HELIPORT OR SEAPLANE BASE
- MUST ALWAYS YIELD R-O-W TO OTHER MANNED AIRCRAFT

OTHER THINGS TO CONSIDER

- DRONE INSPECTIONS AND MAINTENANCE
- DRONE FLIGHT LOGS AND RECORDKEEPING REQUIREMENTS
- OPERATIONS IN PROHIBITTED OR RESTRICTED AREAS
- ACCIDENT REPORTING
- OPERATIONS THAN CAN & CAN'T BE WAIVERED
- OPERATIONS FROM A MOVING VEHICLE
- FLIGHTS OVER SOMEONE ELSE'S PROPERTY (PERMISSABLE …***BUT!!***)
- EXTERNAL LOADS / TOWING AND DROPPING OBJECTS
- OPERATING LIMITS IN OTHER THAN CLASS G AIRSPACE / ATC APPROVAL

QUESTIONS, COMMENTS, DISCUSSION



FOR MORE INFORMATION

(CALL YOUR LAWYER, OR ...)

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