

Drones and Natural Disasters: What you can do after a disaster and how you get permission to do it

The UAS Webinar Series



Presenters



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UAS Integration Pilot Program

- **Choctaw Nation of Oklahoma, Durant, OK** – Agricultural, public safety and infrastructure inspections, with planned Beyond Visual Line of Sight (BVLOS) operations over people and nighttime operations.
- **City of San Diego, CA** – Border protection and package delivery of food, with a secondary focus on international commerce, Smart City/autonomous vehicle interoperability and surveillance.
- **Innovation and Entrepreneurship Investment Authority, Herndon, VA** – Package delivery in rural and urban settings. It includes the use of enabling technologies such as detect and avoid, identification and tracking, radar systems, and mapping tools.
- **Kansas Department of Transportation, Topeka, KS** – Support BVLOS operations in rural communities. It seeks to leverage a statewide unmanned traffic management system to facilitate precision agriculture operations.
- **Lee County Mosquito Control District, Ft. Myers, FL** – Low-altitude aerial applications to control/surveille the mosquito population using a 1500-lb. UAS.
- **Memphis-Shelby County Airport Authority, Memphis, TN** – inspection of FedEx aircraft and autonomous operations for perimeter security surveillance and package delivery.
- **North Carolina Department of Transportation, Raleigh, NC** – Test localized package delivery within a defined airspace by establishing drone delivery stations in local communities.
- **North Dakota Department of Transportation, Bismarck, ND** – Wide variety of diverse operations that incorporate advanced technologies that seek to expand UAS operations at night and Beyond Visual Line of Sight.
- **City of Reno, NV** – Time-sensitive delivery of life-saving medical equipment, such as defibrillators in emergency situations in both urban and rural environments.
- **University of Alaska-Fairbanks, Fairbanks, AK** – Pipeline inspection and surveying in remote areas and harsh climatic conditions

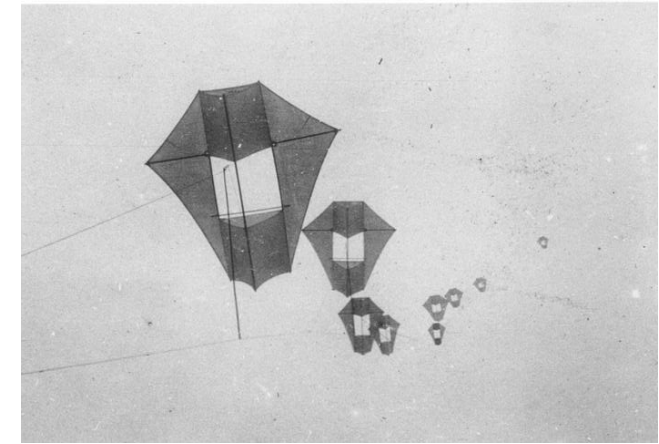


Expansion of (LAANC) Program

- Low Altitude Authorization and Notification Capability
- FAA considers the testing of the prototype that started in November 2017 a success.
- Plans a new “beta test” phase to deploy the system incrementally at nearly 300 air traffic facilities covering approximately 500 airports.
- FAA plans to expand to new providers where LAANC services are currently provided by AirMap, Project Wing, Rockwell Collins and Skyward.
- LAANC can provide drone operators near real-time airspace authorizations.
- Dramatically decreases the wait experienced using the manual authorization process and allows operators to quickly plan their flights.
- LAANC uses airspace data provided through temporary flight restrictions; NOTAMS and UAS facility maps that show the maximum altitude ceiling around airports where the FAA may authorize operations under Part 107.



Aviation and Natural Disasters



Natural Disasters Prior to 2017

- Primary concern is control of the airspace
- Widespread concern that UAS will hamper relief and recovery efforts
- UAS viewed as of low utility due to operational limitations
- Surveillance and reconnaissance primarily using manned aircraft
- Inability to track or coordinate UAS and manned aircraft
- Undeveloped regulatory system for aircraft and pilot pre-Part 107



Hurricanes Harvey and Irma

- Part 107 and existing waivers provide a pool of qualified operators
- Heightened ability to coordinate operations
- Commitment of resources by FAA
- Engagement by FAA in real time to facilitate approvals
- Recognition of value by state and local governments



Hurricanes Harvey and Irma

- “So we basically made the decision that anyone with a legitimate reason to fly an unmanned aircraft would be able to do so. In most cases, we were able to approve individual operations within minutes of receiving a request.” - Michael Huerta
- In the first six days after Harvey hit, the FAA issued more than 40 separate authorizations for emergency drone activities.
- In the first 10 days, over 100 authorizations issued, including for some types of flight (BVLOS) not normally permitted



Post-disaster use cases - Utilities

- Florida Power and Light (FPL) employed 49 drone teams to survey parts of the state not accessible by vehicles.
- Some of the drone operators FPL hired were flying within an hour after the storm winds subsided.
- Estimate that power was restored 36-48 hours earlier than using traditional methods of locating downed wires and transformers.
- AT&T Verizon made extensive use of UAS
- Used for inspections in areas a vehicle cannot reach
- Embedded in repair teams to evaluate damage



Post-disaster use cases - Rail

- Union Pacific Railroad used unmanned aircraft in the Houston area to inspect bridges and signal equipment in areas where roads were inaccessible.
- BNSF deployed 2 flight teams to Houston to do volumetric analysis, provide heightened perspective, and inspection in hard to reach areas.
- BNSF found washouts and high water on their mainlines and brought operations at all Houston area switching facilities to a halt.



Post-disaster use cases - Insurance

- Texas state law requires insurers acknowledge a claim within 15 days of receiving it, and accept or reject it within 15 days of getting all required information about it.
- FAA treated Insurance adjusting as an integral part of recovery efforts and gave them high level access to airspace in the same way as utility and other recovery missions.
- In Texas, USAA utilized 12 drones
- Travellers used approximately 24 drones
- Farmers Insurance used 14 drones in Texas
- Allstate used a number of contractors for adjustment flights



Access to the Airspace

- Access to the airspace may be restricted based on the magnitude of the disaster, and may change as the recovery efforts progress.
- Part 107
- Waivers
- COAs
- TFRs



Access to the Airspace

- For many types of disasters that are localized, the FAA may not put in place any restrictions.
- Normal rules of the road under Part 107 will apply
- Waivers will be useful to speed efforts such as night operations
- Use of LAANC will ease access where available.



Temporary Flight Restrictions

- Who can request a TFR?
 - Military commands;
 - Federal security/intelligence agencies;
 - Regional directors of the Office of Emergency Planning,
 - Civil Defense State Directors;
 - Civil authorities directing or coordinating organized relief air operations (e.g., Office of Emergency Planning; law enforcement agencies; U.S. Forest Service; state aeronautical agencies);
- TFRs for disasters generally issued by the ATO Service Center Director with jurisdiction over the area or FAA Headquarters



Temporary Flight Restrictions

[TFR List](#)
[TFR Map](#)
[Map Airports](#)
[TFR Help](#)
[PilotWeb](#)
[SUA](#)

Center GO
 State GO
 Type GO
 TUE, 15 MAY 2018 14:39 UTC

[Reset Filter](#)

Click column headings to sort data.

Date	NOTAM	Facility	State	Type	Description	Zoom
05/15/2018	8/6690	ZMA	FL	AIR SHOWS/SPORTS	MIAMI BEACH, FL, Friday, May 25, 2018 through Sunday, May 27, 2018 UTC New	
05/15/2018	8/6645	ZDC	VA	SPACE OPERATIONS	A..AIRSPACE WALLOPS FLIGHT FACILITY.TEMPORARY FLT RESTRICTIO, VA, Tuesday, May 22, 2018 UTC New	
05/15/2018	8/6631	ZDC	VA	SPACE OPERATIONS	A..AIRSPACE WALLOPS FLIGHT FACILITY.TEMPORARY FLT RESTRICTIO, VA, Monday, May 21, 2018 UTC New	
05/15/2018	8/6630	ZDC	VA	SPACE OPERATIONS	A..AIRSPACE WALLOPS FLIGHT FACILITY.TEMPORARY FLT RESTRICTIO, VA, Sunday, May 20, 2018 UTC New	
05/14/2018	8/5818	ZDV	CO	AIR SHOWS/SPORTS	Colorado Springs, CO, Monday, May 21, 2018 through Wednesday, May 23, 2018 UTC	
05/14/2018	8/5786	ZAU	IL	AIR SHOWS/SPORTS	Peru, IL, Saturday, May 19, 2018 UTC	
05/14/2018	8/5564	ZAB	AZ	HAZARDS	DOUGLAS, AZ, Monday, May 14, 2018 through Thursday, June 14, 2018 UTC	
05/13/2018	8/5440	ZAB	TX	HAZARDS	16 NM SE OF CLAUD, TX, Sunday, May 13, 2018 through Friday, May 18, 2018 UTC	
05/12/2018	8/5280	ZMA	FL	HAZARDS	12NM E OF OCHOPPEE, FL, Saturday, May 12, 2018 through Thursday, May 31, 2018 UTC	
05/12/2018	8/5278	ZMA	FL	HAZARDS	14NM SE OF IMMOKALEE, FL, Saturday, May 12, 2018 through Thursday, May 31, 2018 UTC	
05/11/2018	8/5101	ZDC	VA	AIR SHOWS/SPORTS	HAMPTON, VA, Tuesday, May 15, 2018 through Sunday, May 20, 2018 UTC	
05/11/2018	8/4994	ZMP	MN	HAZARDS	HIBBING, MN, Friday, May 18, 2018 UTC	



Temporary Flight Restrictions

[TFR List](#) [TFR Map](#) [Map Airports](#) [TFR Help](#) [PilotWeb](#) [SUA](#)

NOTAM

Number : FDC 8/5280 Download shapefiles
Issue Date : May 12, 2018 at 0132 UTC
Location : 12NM E OF OCHOPPEE, Florida
Beginning Date and Time : May 12, 2018 UTC 1100-0030 Daily
Ending Date and Time : May 31, 2018 UTC
Reason for NOTAM : TO PROVIDE A SAFE ENVIRONMENT FOR FIRE FIGHTING AVIATION OPERATIONS
Type : Hazards
Replaced NOTAM(s) : N/A
Pilots May Contact : MIAMI (ZMA) ARTCC, 305-716-1588

Jump To: [Affected Areas](#)
[Operating Restrictions and Requirements](#)
[Other Information](#)

Affected Area(s)

[Top](#)

Airspace Definition:

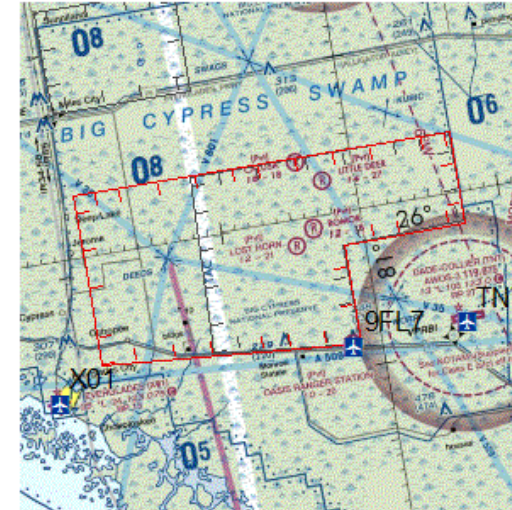
Region bounded by:

	<u>Latitude:</u>	<u>Longitude:</u>	<u>FRD:</u>
From:	26°04'00"N	81°20'00"W	RSW141036.6
To:	26°04'00"N	80°52'50"W	DHP303032.9
To:	25°58'00"N	80°52'50"W	DHP293030.4
To:	25°58'00"N	81°01'30"W	DHP289037.9
To:	25°51'32"N	81°01'30"W	DHP280036.8
To:	25°53'00"N	81°20'00"W	RSW150045.5

Altitude: From the surface up to and including 3000 feet MSL

Effective Date(s):

In UTC:



[Click for Sectional](#)

[NOTAM Text](#)



Temporary Flight Restrictions

- § 91.137 Temporary flight restrictions in the vicinity of disaster/hazard areas
 - (a) The Administrator will issue a Notice to Airmen (NOTAM) designating an area within which temporary flight restrictions apply and specifying the hazard or condition requiring their imposition, whenever he determines it is necessary in order to
 - (1) Protect persons and property on the surface or in the air from a hazard associated with an incident on the surface;
 - (2) Provide a safe environment for the operation of disaster relief aircraft; or
 - (3) Prevent an unsafe congestion of sightseeing and other aircraft above an incident or event which may generate a high degree of public interest.
 - (b) When a NOTAM has been issued under paragraph (a)(1) of this section, no person may operate an aircraft within the designated area unless that aircraft is participating in the hazard relief activities and is being operated under the direction of the official in charge of on scene emergency response activities.



Temporary Flight Restrictions

- (c) When a NOTAM has been issued under paragraph (a)(2) of this section, no person may operate an aircraft within the designated area unless at least one of the following conditions are met:
 - (1) The aircraft is participating in hazard relief activities and is being operated under the direction of the official in charge of on scene emergency response activities.
 - (2) The aircraft is carrying law enforcement officials.
 - (3) The aircraft is operating under the ATC approved IFR flight plan.
 - (4) The operation is conducted directly to or from an airport within the area, or is necessitated by the impracticability of VFR flight above or around the area due to weather, or terrain; notification is given to the Flight Service Station (FSS) or ATC facility specified in the NOTAM to receive advisories concerning disaster relief aircraft operations; and the operation does not hamper or endanger relief activities and is not conducted for the purpose of observing the disaster.
 - (5) The aircraft is carrying properly accredited news representatives, and, prior to entering the area, a flight plan is filed with the appropriate FAA or ATC facility specified in the Notice to Airmen and the operation is conducted above the altitude used by the disaster relief aircraft, unless otherwise authorized by the official in charge of on scene emergency response activities.



Access to the Airspace

- Key to access - The aircraft is participating in hazard relief activities and is being operated under the direction of the official in charge of on scene emergency response activities.
- Use of Airmap or similar services to coordinate activities
- Many states have emergency response operations centers and offices that have worked to integrate UAS operations into response plans
- For a large disaster there will be a team or person who will coordinate requests and provide the link to FAA



Access to the Airspace- SGI

- FAA's Special Governmental Interest (SGI) process:
 - Firefighting
 - Search and Rescue
 - Law Enforcement
 - Utility or Other Critical Infrastructure Restoration
 - Incident Awareness and Analysis
 - Damage Assessments Supporting Disaster Recovery Related Insurance Claims
 - Media Coverage Providing Crucial Information to the Public
- Fly in airspace (including controlled airspace and disaster Temporary Flight Restrictions) and/or at altitudes not otherwise permitted
- Fly Beyond Visual Line of Sight (BVLOS)
- Fly at night



Access to the Airspace- SGI

- The proponent must be operating under the authority of an active COA (including Blanket COAs) or in compliance with Part 107, as determined by System Operations Security.
- The UAS operations to be authorized must be conducted within a timeframe incompatible with the processing time required for regular COA or Part 107 processes, as determined by System Operations Security.
- The requested operations must be flown by a governmental entity or sponsored/supported by a governmental entity (i.e., the operation is to be flown at the request of or is specifically supported by a governmental entity) as determined by System Operations Security.
- The operations must directly support an active (e.g., not demonstration) homeland security, law enforcement, or emergency operations effort, or some other response, relief, or recovery activity benefiting a critical public good – for example, restoration of an electrical grid or some other critical infrastructure, or media coverage. The fulfillment of this requirement is determined by System Operations Security in consultation, as needed, with the FAA's interagency partners.



Access to the Airspace- SGI

- Contact Systems Operations Support Center (SOSC), part of Systems Operations Security at 202-267-8276 for support.
- Fill out the Emergency Operation Request Form (MS Word) and send to the FAA's System Operations Support Center (SOSC) at 9-ator-hq-sosc@faa.gov.
- If the proposed UAS flight is to be conducted within a disaster Temporary Flight Restriction, the FAA's SOSC, as appropriate, may need to pre-coordinate the requested operation with a responsible Incident Commander or Unified Command (IC/UC) to ensure their activity will support or, at a minimum, not interfere with broader response and recover efforts.



Access to the Airspace- SGI

- The FAA will then coordinate with the effected Air Traffic facilities to:
 - Review your proposed operation and determine whether it meets the necessary criteria for emergency approval.
 - Implement any necessary mitigations to minimize impact on other air traffic operations.
 - Contact you within one hour or sooner regarding the status of your request or to request additional information.
- **If approved**, the FAA will add an amendment to your existing COA or Remote Pilot Certificate that authorizes you to fly under certain conditions for the specified operation.
- **If denied**, operators should NOT fly outside the provisions of their existing COA or part 107. Operators have the option to amend their requests.



Access to Airspace

- Flying without permission diverts resources and potentially causes conflicts with planned operations
 - License suspension
 - License revocation
 - Civil Penalty per flight
 - State criminal prosecution



Flight After Disaster – State Law Issues

- California Penal Code 402
 - (1) Every person who goes to the scene of an emergency, or stops at the scene of an emergency, for the purpose of viewing the scene or the activities of police officers, firefighters, emergency medical, or other emergency personnel, or military personnel coping with the emergency in the course of their duties during the time it is necessary for emergency vehicles or those personnel to be at the scene of the emergency or to be moving to or from the scene of the emergency for the purpose of protecting lives or property, unless it is part of the duties of that person's employment to view that scene or those activities, and thereby impedes police officers, firefighters, emergency medical, or other emergency personnel or military personnel, in the performance of their duties in coping with the emergency, is guilty of a misdemeanor.



Flight After Disaster – State Law Issues

- California Civil Code 43.101.
 - (a) An emergency responder shall not be liable for any damage to an unmanned aircraft or unmanned aircraft system, if that damage was caused while the emergency responder was providing, and the unmanned aircraft or unmanned aircraft system was interfering with, the operation, support, or enabling of the emergency services listed in Section 853 of the Government Code



Operating after a Disaster – Practical Concerns

- Government entities responsible for managing the disaster are the gatekeepers, establish a relationship and explore procedures now, if possible
- Emergency operations require a strong foundation
 - Work now to get waivers you might need
 - Establish a track record as a responsible operator with FAA
 - Discuss procedures and needs in advance with System Operations Security
 - Explore public partnerships with COA holders that can be leveraged on short notice
 - If a public operator, get a COA now that can be amended as needed



Operating after a Disaster – Practical Concerns

- Revise Standard Operating Procedures to provide a practical guide to use in an emergency
- Gather needed forms and phone numbers such as the Expedited SGI Waiver
- Checklists of equipment needed to support operations in harsh conditions
 - Batteries
 - Communications
 - Food
 - Water
 - Gas
 - Shelter



Operating after a Disaster – Practical Concerns

- Can you reposition and where to ensure you are close, but not caught in the disaster?
- How much data do you really need to collect?
- Terabytes of data are useless if they can't be transmitted or overwhelm the persons needed to analyze the data.
- Prioritize your operations.
- Can you maintain contact while in the field to update missions and ensure de-confliction with other operators?
- How are you going to coordinate and interact with local law enforcement on the scene who think you might be operating illegally, have your paperwork with you.
- How are you going to fit into the state's response scheme?
- How are you going to navigate if the cellular system is down - can you read a paper map?

