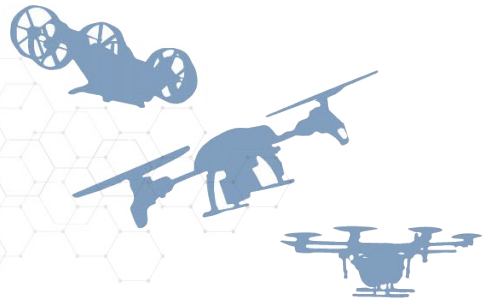




**Federal Aviation
Administration**



Southeast Asia Webinar, AUS-430 Brief

September 14, 2020

Purpose

This presentation provides an overview of four Concept of Operations (ConOps) in which various entities have sought and obtained Federal Aviation Administration (FAA) approval for integrating unmanned aircraft systems (UASs) into their lines of business.

Prior to promulgation of Part 107 (June 2016) the FAA approved UAS operations through various mechanisms such as special airworthiness certificates, exemptions, and certificates of waiver or authorization. This opened the door for commercial use of UASs within the United State's national air space (NAS) for cargo delivery, infrastructure inspection, agriculture and disaster response.



United Parcel Service (UPS) - Flight Forward

United Parcel Service (UPS) - Flight Forward began operations in 2019 under Part 135 delivering medical samples within a hospital campus.

Aircraft

- Small UAS < 55 lbs. MGOW
- Electrically powered quad-rotor
- Flight Termination System (FTS) with parachute
- Autopilot



United Parcel Service (UPS) - Flight Forward

continued...

Operational Environment

- Uncontrolled airspace at or below 400 feet above ground level (AGL)
- Coordinates operations with onsite medivac operator

Operates

- Beyond visual line of sight (BVLOS)
- Daytime, visual flight rules (VFR)
- Remote pilots, visual observers (VOs) and aircraft mechanics are FAA certificated
- Transporting hazardous materials



Google - Wing Aviation

Google - Wing Aviation began Part 135 package pick up and delivery operations for the public in 2019

Aircraft

- sUAS <55 lbs. MGOW
- Electrically powered Hybrid (VTOL/Fixed-wing)
- Redundant power, propulsion, sensing and control elements



Google - Wing Aviation

Continued...

Operational Environment

- Uncontrolled airspace at or below 400 feet
- Extended Visual Line of Sight (EVLOS) through use of VOs
- Over people with standoff distances
- Fully automated flight

Operates

- Flight plan routes around known obstacles and terrain
- Monitor regional automatic dependent surveillance–broadcast (ADS–B)
- LAND NOW will be initiated if package is unsecured or there's interference
- Detects retraction or latching failures



Xcel Energy

Xcel Energy began operations in 2015 under Part 107 performing inspections of power line infrastructure

Aircraft

- sUAS < 55 lbs. MGOW
- Helicopter, electric single rotor
- Autopilot

Operational Environment

- Uncontrolled airspace at or below 400 feet AGL
- No BVLOS flights will occur within 5 nm of a public airport
- 100 feet vertically and 20 feet horizontally of infrastructure

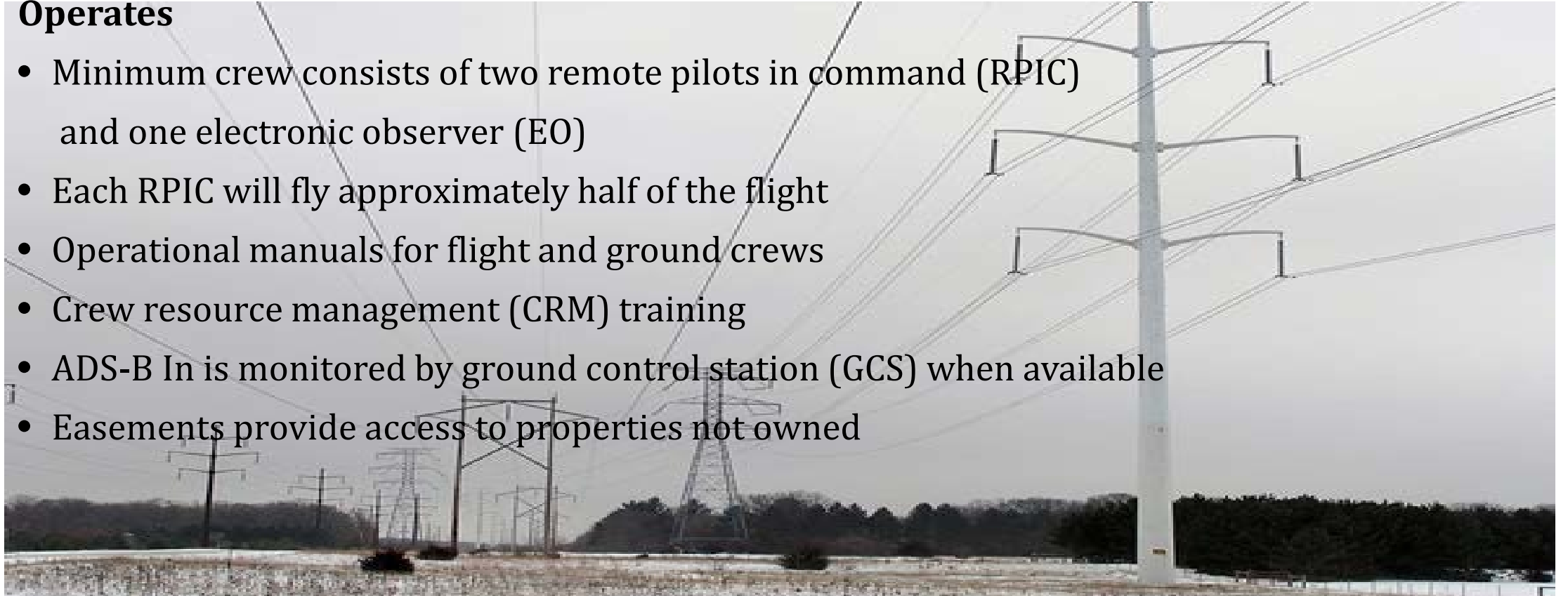


Xcel Energy

continued...

Operates

- Minimum crew consists of two remote pilots in command (RPIC) and one electronic observer (EO)
- Each RPIC will fly approximately half of the flight
- Operational manuals for flight and ground crews
- Crew resource management (CRM) training
- ADS-B In is monitored by ground control station (GCS) when available
- Easements provide access to properties not owned

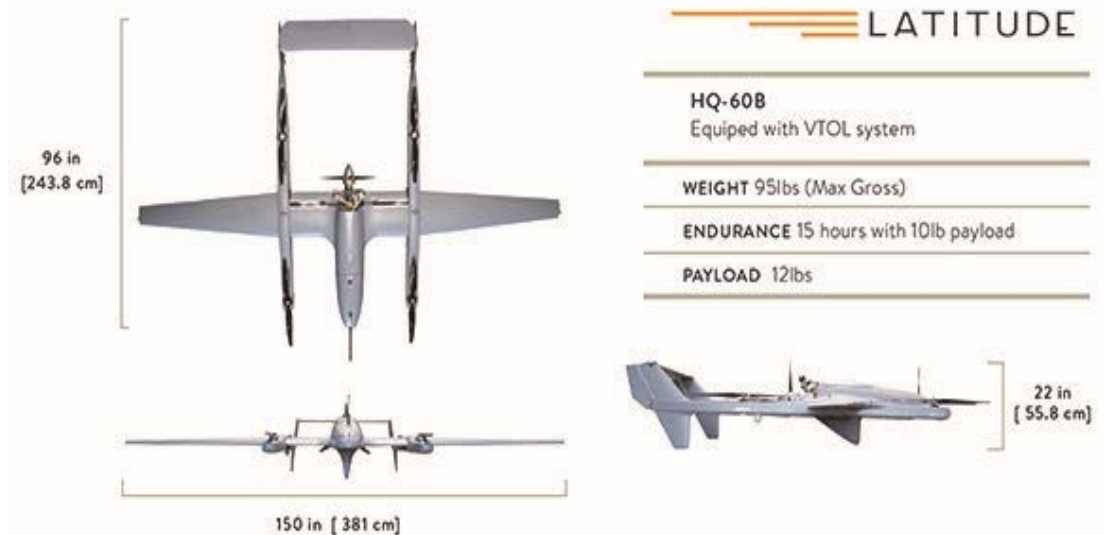


Burlington Northern Santa Fe (BNSF) Railway

BNSF began operations in 2016 under Part 91 inspecting railway track and infrastructures

Aircraft

- UAS > 55 lbs. MGOW
- Hybrid rotorcraft with electric motors and 2-cycle gas engine
- Electrical powered generator onboard
- Redundant flight control actuators



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BNSF

continued...

Operational Environment

- Uncontrolled airspace at or below 400 feet AGL
- RPIC is able to take control of the aircraft during auto flight
- Waypoint database system contains terrain and obstacle information

Operates

- Day and night operations
- VMC conditions
- BVLOS
- Part 107 (using sUAS)



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What is an Agricultural Aircraft Operation?

- §137.3 Definition of terms.

For the purposes of this part—

Agricultural aircraft operation means

the operation of an aircraft for the purpose of

(1) dispensing any economic poison,

(2) dispensing any other substance intended for plant nourishment, soil treatment, propagation of plant life, or pest control, or

(3) engaging in dispensing activities directly affecting agriculture, horticulture, or forest preservation, but not including the dispensing of live insects.

- Use of sensors and multi spectral digital imaging to monitor crop conditions is not considered an Agricultural Aircraft Operation (AAOC)



Types of Agricultural Aircraft Operating Certificates

- UAS aerial application can be conducted as a civil or public operation
- Civil aircraft operations must be conducted under 14 CFR part 137
 - Either a Private, or Commercial operating certificate is required
- Public aircraft operations do not require an Agricultural Aircraft Operating Certificate (AAOC) as required for Civil aircraft operations
- However:
 - Public aircraft operators must comply with the applicable sections of part 137



Two Paths for Civil Operations

- Operations conducted with a small UAS (< 55 lbs..) must operate in accordance with 14 CFR parts:
 - 107 Small Unmanned Aircraft Systems
 - 137 Agricultural Aircraft Operations
- Operations conducted with a large UAS (55 lbs.. or >) must operate in accordance with 14 CFR parts:
 - 61 Certification: Pilots, Flight Instructors, and Ground Instructors
 - 91 General Operating and Flight Rules
 - 137 Agricultural Aircraft Operations
- Both large and small UAS require an exemption to receive an AAOC



Part 137 Certification Process

- Certification process for UAS operators is virtually the same as for manned, with some exceptions:
 - UAS have unique differences compared to manned aircraft; therefore, some regulations do not apply e.g. the pilot is not located in the aircraft
 - Proposed civil operators must have submitted a petition for exemption by Phase 2 (Formal application) of the FAA certification process
 - Proposed civil operators must have received their grant of exemption by Phase 4 (Demonstration) of the FAA certification process
 - A Knowledge and Skills test must be passed prior to issuance of the AAOC
 - Exemptions list specific operating conditions/limitations that must be followed



Part 137 Certification Statistics

- 34 AAOC have been issued to UAS operators by the FAA
- 10 AAOC applications are currently in process
- 5944 agricultural aircraft operational flights conducted in 2018
- Agricultural aircraft operations comprise 17% of all commercial UAS operations (2019 data) in the United States
- 8 UAS over 55 lbs.. have been approved for agricultural aircraft ops
- Several others are under review by FAA engineers
- The heaviest UAS approved for agricultural ops weighs 273 lbs..
 - A tri-motor UAS with a total operating weight of 1124 lbs.. is under review



Disinfectants for COVID-19?

- §137.3 Definition of terms.
- §*Economic poison* means (1) any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any insects, rodents, nematodes, fungi, weeds, and other forms of plant or animal life or *viruses*, except viruses on or in living man or other animals, which the Secretary of Agriculture shall declare to be a pest, and (2) any substance or mixture of substances intended for use as a plant regulator, defoliant or desiccant.
- Not all economic poisons are considered hazardous substances; however,
- FAA interpretation states that disinfectants used to mitigate the effects of COVID-19, or similar viruses such as SARS, are considered economic poisons
- Dispensing economic poisons is defined as an agricultural aircraft operation



Drones for Disaster Response Operations

Wildfires



Hurricanes



Earthquakes

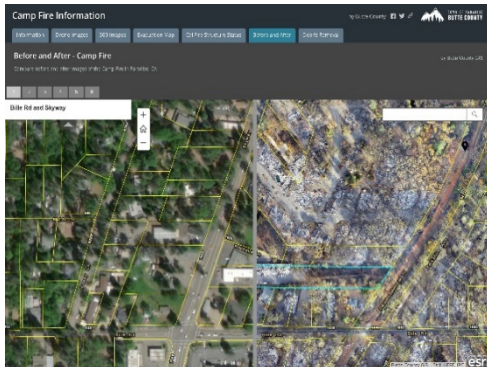


Tornados



Innovative Applications:

- Situational Awareness
- Monitor the Event
- Access the Damage
- 2D/3D Mapping
- Search Missions
- Remediation Support



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Drones for Disaster Response Operations

FAA Enabling Drones for Disaster Response

24/7 Public Safety Assistance

Emergency Public Safety Operations

Already flying under Part 107 or a COA, but need additional operational provisions? ✓

Need to fly in a Temporary Flight Restriction (TFR)? ✓

Need to fly in controlled airspace? ✓

If you checked any of these boxes, call the FAA System Operations Support Center (SOSC) at 202-267-8276

https://www.faa.gov/uas/getting_started/emergency_approval/



Innovative Solutions

- Drone As First Responder
- COVID-19 Test Site Monitoring
- Tactical Beyond Visual Line of Sight



Dedicated Public Safety Team

Expertise from across the FAA:

- Office of UAS Integrations (AUS)
- Flight Standards (AFS)
- Airspace Security (AJO)
- Law Enforcement Assistance Program (LEAP AXE)



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Questions

