A New Bird in the Alaskan Arctic: Lessons learned during coordination of manned and unmanned aerial operations in 2013 and 2014

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Background information

The FAA Modernization and Reform Act of 2012 required the FAA to:

- Initiate a process to work with relevant Federal agencies and national and international communities to designate permanent areas in the Arctic where small unmanned aircraft may operate 24 hours per day for research and commercial purposes and the purposes of Search and Rescue (SAR) operations.

- Develop a process for performing operations in the airspace subject to the requirements of the FAA regulations.

- Ensure coordination among manned and unmanned aircraft projects in the Alaskan Arctic.

Concerns

- How to deconflict the airspace among all of the manned and unmanned aircraft and UAS?
- The deconfliction processes included senior staff with authority in their fields who were knowledgeable about the manned and unmanned aerial projects and aviation.
- Arctic Aerial Survey Coordination Group

- Established in 2014
- Enables information to be shared among airspace users, including commercial manned aircraft pilots, UAS pilots, research groups (private, governmental, and academic), and FAA.

- Daily simultaneous operations (‘SIMOPs’) calls
- Enables airspace users to communicate directly to ask questions or solve problems.
- Permanent details about UAS and manned aircraft operation changed over the course of the field seasons. The SIMOPs calls provided a way to efficiently address issues in order to revise protocols, as necessary.
- Distribution of detailed flight plans (map or radius around ship) using a widely available communication system like telephone and email.
- How many UAS will be flying?
- Where will UAS be flying relative to others in the AASCG?

Achievements in 2013 and 2014

- During summer and fall of each year, 2013 and 2014, 3 UAS operations and 1 large-scale aerial survey project safely and successfully shared the Northern Arctic airspace.

- The deconfliction processes included senior staff with authority in their fields who were knowledgeable about the manned and unmanned aerial projects and aviation.

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Abstract

Airspace over the northeastern Chukchi and western Beaufort sea is one of three locations in the Arctic where the Federal Aviation Administration (FAA) plans to establish permanent operational areas and corridor routes for access to coastal launch sites for operating small UAS (UAS) for research and commercial purposes. This action would enable over-water flights from the surface to at least 2,000 ft AGL. The airspace in this Alaskan Arctic area has been used for decades by manned aircraft transporting passengers and cargo, conducting scientific research, military missions, search and rescue operations, and other activities. The level of UAS activity in the Alaskan Arctic has increased in recent years and is expected to continue to increase in the future; however, this increased UAS traffic presents the development and standardization of UAS technology to detect and avoid other aircraft. While the FAA is working to develop rules, standards, and regulations specific to UAS operations, the airspace users community is proactively working to develop protocols to create an environment where a variety of aircraft operations can occur safely, efficiently, and successfully. In 2013 and 2014, the airspace users worked together to develop a process to deconflict the Alaskan Arctic airspace. We report on the lessons learned during the coordination of aerial operations in 2013 and 2014. Some of the achievements made during these years were: 1) creation of an Arctic Aerial Survey Coordination Group (AASCG), which included representatives from manned and unmanned aerial projects; 2) daily simultaneous operations (SIMOPs) phone calls to allow the AASCG to communicate directly with field teams; 3) distribution of detailed flight plans throughout the AASCG; and 4) execution and revision of communication protocols once operations commenced. Recommendations for improving coordination among manned and unmanned aircraft projects in the Alaskan Arctic in the future include designating a central authority to coordinate all flights in the UAS airspace, developing a grid-based system that can be referenced when communicating flight plans, and ensuring that all aircraft operators distribute detailed information about their proposed projects to airspace users well in advance of project start dates.

Recommendations for improvement

- Organize and authorize a centralized coordination system, like the system used to coordinate airplanes flying through hurricanes.
- Implement a grid system to help communicate the location of daily flight plans.
- Ensure that all airspace users, manned and unmanned, participate in the AASCG and SIMOPs calls.
- Provide detailed information about UAS projects at least 7 days prior to the start of operations, including:
  - Location of study area (coordinates or GIS file)
  - Date of operations
  - Maximum number of UAS authorized to operate simultaneously
  - Typical time and duration of flights
  - Flight altitudes
  - Point contact for questions arising prior to or during field operations
- In-field communication information:
  - VHF and marine band radio frequencies
  - Phone numbers
  - Email addresses
  - Websites
- Study overview or concept of operations
- Instructions for viewing the real-time location of the UAS (if possible)
- Communications protocol