

Unmanned Aerial Vehicle Collaboration Between University of Alaska Fairbanks and the US Coast Guard

Summary

In 2001 The University of Alaska Fairbanks Geophysical Institute entered into a collaborative effort with the New Mexico State University Technical Analysis and Application Center (TAAC) and the University of Hawaii Pacific Aerospace Training Center. This effort leverages the internationally recognized Unmanned Aerial Vehicle (UAV) airspace development ability at the TAAC to a high-altitude long-range flight test facility. This facility spans the western United States and the North Pacific Ocean.

In November 2003, the US Coast Guard evaluated a pair of General Atomics *Predator A* UAV's near King Salmon Alaska. In June 2004 they will conduct a more extensive evaluation of two higher altitude and faster General Atomics UAV's, either two *Predator Bs* or a *Predator B* and an *Altair*, to support the Alaska USCG Detachment mission along the Maritime Boundary Line and the High Seas Drift Net area. The USCG Summer 2004 demonstration is working within a \$5 to \$7M dollar budget.

These two efforts have recently joined forces, providing to the University consortium a user for the airspace development and expert airspace development for the USCG.



University Effort

The formation of the Unmanned Aerial Vehicle Systems Operations Validation Program (USOVP) is a congressionally initiated US Air Force (USAF) lead effort to begin the process of opening the National Airspace (NAS) to UAV operations. Initially, the USOVP will establish test flight airspace for High-Altitude Long-Endurance (HALE) UAV's between New Mexico, Alaska, and Hawaii. Objectives of this effort are threefold:

- Develop and validate proposed UAV regulations for routine flights in civil airspace.
- Test and evaluate technologies and processes that enable safe operation of HALE UAV's in civil airspace.
- Conduct homeland defense, civil, or commercial HALE UAV demonstrations while operating in the airspace connecting NM, AK, and HI either enroute or at a node.

To date the USOVP has been funded with a \$7M dollar budget. The customer for the work is the USAF 46 test group at Holloman AFB. Near term milestones include expanding processes and operations originally developed jointly by the TAAC and the FAA to efficiently obtain a Generic Certificate of Authorization for unmanned flights along the entire permitted airspace, while facilitating DoD, civil, and commercial UAV demonstrations that exploit the permitted airspace. Typical Certificates of Authorization take 90 to 180 days to acquire and are for a specific mission, altitude, aircraft, and time. The unique Generic Authorization TAAC developed opens up every category of restriction and is annually renewable and requires 48 hour notice before flight. Over the past 15 years the staff at the TAAC have been key in obtaining over 90% of the airspace permits granted for UAV flights in the NAS.



This effort is providing confidence building and early testing opportunities that could eventually lead to general opening of the NAS to UAV's. Specifically, this work is helping the FAA to better understand the airspace transformations they are considering as part of other programs, such as ACCESS-5, a NASA funded effort (\$100M). ACCESS-5 is a joint industry/NASA program including AeroVironment, Aurora Flight Sciences, The Boeing Company, General Atomics Aeronautical Systems, Inc., Lockheed Martin, and Northrop Grumman. The work also ties well to the Secretary of Defense's UAV roadmap. Work with the USCG demonstration efforts provides further opportunities to share the broad spectrum of lessons learned on airspace integration to both the FAA and industry.

In addition to airspace development for the USCG the University of Alaska is helping establish partners for the USCG who would also benefit from cooperative the flight demonstrations and eventual operations. At this time both the NOAA Forecasting Systems Laboratory in Boulder and the NASA Airborne Remote Sensing Group at Dryden are planning on partnering with the USCG/ University team to leverage these flight opportunities.

USCG Effort

The USCG Deepwater program aims at fielding both tactical and higher altitude UAV's starting within two years. Acquisition programs have already begun for some platforms. The demonstrations in Alaska are aiding that fielding plan as a push to accelerate the Deepwater acquisition schedules occurs. In the near future the USCG will likely become the most demanding UAV operators in the NAS. Partnering with the expertise of this University consortium increases the likelihood of successful safe integration into the NAS enabling the USCG efforts become reality.