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DEPARTMENT OF HOMELAND SECURITY

U. S. COAST GUARD

STATEMENT OF

RDML WAYNE JUSTICE

ON THE

UNMANNED AERIAL SYSTEMS IN ALASKA: A FRAMEWORK FOR THE NATION

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE AND TRANSPORTATION

U. S. SENATE

JULY 13, 2006

Good afternoon Mr. Chairman and distinguished members of the committee. It is my pleasure to be here today to discuss the future of Unmanned Aircraft Systems (UAS) in protecting our maritime borders and ensuring our national security.

This is an important issue because of the potential enhancements that UASs bring to securing our maritime borders. The Coast Guard is keenly aware of the safety concerns surrounding UAS programs and is working with the Federal Aviation Administration (FAA), the Department of Defense (DoD), and Customs and Border Protection (CBP) Air and Marine to implement viable plans for this emerging technology.

Cutter based Vertical Unmanned Aerial Vehicle (VUAV) and High Altitude Endurance Unmanned Aerial Vehicle (HAEUAV)

The post 9-11 Deepwater implementation plan calls for the procurement of 45 VUAVs and the purchase of High Altitude Endurance Unmanned Aerial Vehicle sensor data utilizing land based, long endurance UASs.

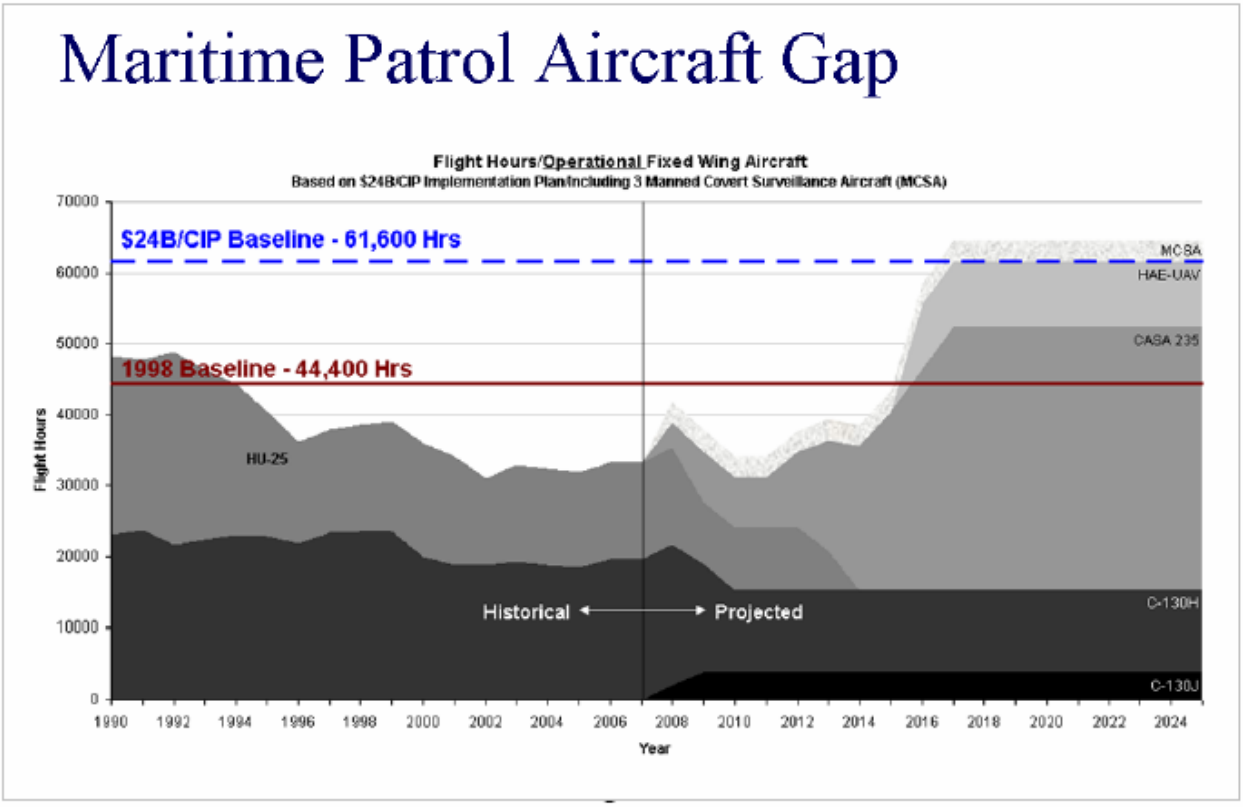
The Eagle Eye VUAV is being developed to deploy on both National Security Cutters and Offshore Patrol Cutters. The project is currently in the System Design and Development phase and will shortly begin the System Assembly and Demonstration phase, with the first flight planned for December 2008. Funding availability has pushed the delivery of the Initial Operating Capability (IOC) for the VUAV to approximately 2012. The VUAV will be a transformational tactical asset for the Coast Guard and will expand cutters' surveillance capabilities for the detection, classification, and identification of targets to a distance of 100 miles.

The high altitude UAS are a land based, wide area surveillance platforms with a long endurance/dwell time capability. The high altitude UAS are scheduled for initial implementation in 2016. The Coast Guard is also exploring the feasibility of performing this mission with more versatile and less expensive alternatives, such as Medium Altitude Long Endurance (MALE) platforms.

Using Unmanned Aircraft Systems to help close the Maritime Patrol Aircraft gap

Figure 1 shows the existing Maritime Patrol Aircraft (MPA) gap. The current Coast Guard legacy manned MPA fleet falls short of providing the targeted end state of 61,600 MPA flight hours per year. Under the 1998 Revised Deepwater Implementation Plan, the Coast Guard expects to close the gap with new Deepwater MPA platforms by 2016. Note that UAS is a key component of the MPA gap mitigation strategy. With the capability to fly for more than 30 hours without refueling, these land based UASs have a significant on-scene persistence advantage over manned aircraft, resulting in a significant improvement of Coast Guard maritime domain awareness. However, I must emphasize the importance of proper sensorization, lest a high performance aircraft actually fail to meet mission requirements. Sensorization includes outfitting the aircraft with equipment to detect targets of interest (i.e. sensitive marine radars, electro optical infrared to see at night).

Figure 1 – MPA Gap



Operational Exercises in Alaska

The Coast Guard Research and Development Center led two major tests of a medium altitude long endurance UAS in Alaska. The first was a Predator A concept demonstration in November 2003, and the second was an Altair (Predator B variant) evaluation in July 2004.

The November 2003 test of the Predator A was the first-ever flight of a medium altitude long endurance UAS in the harsh Alaskan environment. The evaluation provided the Coast Guard with important information on the logistics of deploying UASs to remote areas and information about the challenges of operating a UAS in adverse weather conditions. Weather conditions including temperature, cloud cover, wind and precipitation were important variables during the operational tests. (Difficultly starting the vehicle in cold weather, lack of de-icing capability during periods of forecast icing, and lack of required visibility were responsible for the cancellation of four of five flights.)

The July 2004 Altair concept demonstration focused on operations within the National Airspace using a Beyond-Line-of-Sight (BLOS) communications to control the aircraft and receive sensor data. Scheduled missions included flights along the Maritime Boundary Line and within the High Seas Drift Net region. The Altair aircraft was equipped with wide-band and BLOS satellite communications equipment, a maritime radar, and vessel Automatic Identification System (AIS) interrogator.

The Coast Guard was able to remotely pilot the Altair vehicle from a ground control station in San Diego, CA during its transit along the West Coast to Alaska, demonstrating BLOS capability. However, satellite coverage in the northern latitudes is limited and, therefore, results in a very low

"look angle" with the platform, preventing reliable BLOS command and control. As a result, the aircraft had to be flown at higher altitudes and above the cloud cover, which severely limited sensor capabilities during major portions of the test period. The Altair used AIS to provide intelligence about commercial vessels approximately 280 miles from the aircraft and was successfully used as a communications link to Coast Guard cutters within line of sight of the vehicle. Airframe sensor integration issues prevented a successful operational test of the maritime radar and wide area surveillance capability.

Similar to the first test, weather proved to be the biggest challenge. Ten of seventeen flights were cancelled due to forecasted icing, low cloud ceilings and poor visibility on scene and at the airport. The Altair never made it to either the Maritime Boundary Line or the High Seas Drift Net area. In fact, the Altair was not able to make a 360-degree turn anywhere within the Alaskan region due to the possibility of losing communications with the satellite.

Challenges facing the operational employment of UAS in the Maritime Domain.

The FAA and International Civil Aeronautical Organization (ICAO) are charged with maintaining safe and efficient aeronautical airspace. There are three areas the Coast Guard has concern relating to UAS flight safety: crew qualification, system airworthiness, and flight rules – especially collision avoidance. To gain access to national and international airspace we must and will work with FAA and ICAO to ensure the above areas of concern are adequately addressed so there is no detriment to civil aviation or public safety. The Coast Guard will utilize the FAA's Certificate of Waiver and Authorization (COA) process for domestic flight and 'with due regard for civil aviation' over international waters. This process allows for limited scheduling of Coast Guard UAS operations in domestic airspace. We will continue to work closely with the FAA to overcome these challenges.

Coast Guard outreach regarding the design and operation of UAS.

The Coast Guard continues to work with CBP, FAA and DoD on airspace access issues. We participated in CBP's source selection of the Secure Border Initiative UAS and are actively working with the Joint UAS Center of Excellence, the U.S. Marine Corps and Navy UAS working groups, DoD's Joint "Sense and Avoid" and airspace integration working group, and two FAA policy recommendation organizations.

Conclusion

In conclusion, I re-emphasize three main points:

- The Coast Guard remains eager to work closely with our interagency partners to operationally test and evaluate UAS technologies in the maritime environment. While UASs are not suitable for all mission types and may not replace manned aircraft in many of our current missions, they do provide potentially effective and economical capabilities that could become force multipliers for our maritime domain surveillance and detection missions. The Coast Guard has very little experience operating UAS but remains interested in realizing their potential as a long endurance wide area surveillance aircraft in the maritime environment.

- The Coast Guard envisions using a maritime sensor equipped, land based UAS to help mitigate the Maritime Patrol Aircraft (MPA) gap. The Coast Guard will continue to actively look for opportunities to use UASs to help close the existing MPA gap.

- Land based UAS operations have many distinct challenges. Several of those challenges were experienced in the Alaska maritime environment including degraded UAS satellite communications and sensor effectiveness due to weather conditions, lack of alternate landing sites and the limited number of remote/alternate runways that can accommodate UASs. The Coast Guard looks forward to additional opportunities to conduct further tests and evaluations of UAS technologies to accomplish wide area surveillance in the maritime environment.

Thank you for the opportunity to appear before the Committee today. I am happy to address any questions you may have.