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## **USCG RDC Evaluates Flexrotor UAS for Robotic Aircraft for Maritime Public Safety (RAMPS)**

NOAA UAS Program, OMAO and NMFS Participate - Fish Spotted with UAS at 4.5 Kilometers

The United States Coast Guard (USCG) Research and Development Center (RDC) hosted Aerovel's Flexrotor Unmanned Aircraft System (UAS) at the Robotic Aircraft for Maritime Public Safety (RAMPS) demonstration during the last week of October at Webster Field, MD. The NOAA UAS Program joined the joint assessment of the shipboard capable UAS including a Search and Rescue (SAR), ship identification, and maritime survey operations with partner line-offices and organizations.

The Flexrotor successfully ran through the Coast Guard's demonstration objectives, including detection of boats and small objects in wide-area search over the Bay, tracking and inspection of fast boats, and transfer of control between stations ashore and aboard a 45-foot Response Boat (RB-M).

Aerovel's operator, squeezed behind the boat's tiny wheelhouse table barely big enough for his laptop and monitor, had also operated Flexrotors aboard an expedition yacht during an anti-poaching trial off Costa Rica's Cocos Island.

The USCG RDC's RAMPS Lead, Steve Dunn observed, "One of the most significant Flexrotor sensor search features involved performing a ladder search pattern. The Flexrotor ground control station software had the ability to perform what was described as a "Side Scan" search function. The Side Scan search mode created a visual reference for the operator to see the Inner Field of View (IFOV)

and Outer Field of View (OFOV) or sensor swath path providing the operator with two key parameters. First where the sensor was looking during the leg of each search leg and secondly overlaps for each leg searched ensuring all the search area was covered."

Flexrotor's inventor Tad McGeer reported, "We had shown that Flexrotor can operate from a small boat, but the key remaining question was whether it could effectively spot fish. Now we've done that, with one 'foamer' after another popping up on-screen as the turret scanned the middle distance." (A foamer is a whitish patch caused by a school of feeding predators - in this case apparently bluefish.) "Actually we were looking for a boat. The fish were serendipitous, and on seiners we will be searching for bigger schools at comparable distance. So while search is hard work for anyone - on a helicopter or watching a monitor - we've shown that Flexrotor can get the job done well." The fish were spotted at a distance of 4.5 kilometers.

Aerovel's Flexrotor UAS has caught NOAA and the USCG's attention with its unique combination of small size, light footprint, VTOL, long endurance, and economy. UAS users with experience on a variety of maritime vessels spotted a potential game-changer: an asset which could operate in numbers from boats large or small, and multiply the effectiveness of any of them at low cost. For Aerovel's crew, however, it was the fish that were new and exciting. "We look forward to supporting the Coast Guard and NOAA in their ongoing studies of unmanned aircraft" said McGeer, "but meanwhile we start work on tuna seiners early in 2016." The Flexrotor can replace helicopters, which are expensive and appallingly accident-prone. The NOAA UAS Program is also examining the use of Flexrotor for atmospheric research including in hazardous weather.

**Is this is an issue of potential concern?**

**This item has high visibility**

**Geographic Location (Relevant region, city location)** Patuxent River, MD, Potomac River, Chesapeake

**Partnering offices** OAR, NOAA UAS Program, OMAO, NMFS

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