ANALYSIS: INDUSTRY PITCHES NEW USES FOR COMMERCIAL UAVS

News / Airlines

The enthusiasm that people have for the unmanned air vehicle (**UAV**) market is infectious. And existing technology is being adapted to applications previously not thought of in order for them to have a share of the opportunity.

The **commercial UAV** world got together in London from 20-21 October, bursting with ideas on how to use these systems – ranging from parcel delivery to natural-disaster monitoring and fog dissipation for runways.

“We wanted to create drones for not just image collection, but something that is really needed,” says Sameera Almulla, research assistant at Khalifa University in Abu Dhabi, which has been researching using UAVs for fog dissipation.

The university researched the concept of spraying a brine solution from a UAV's 40kg (88lb) payload into the fog that overhangs a runway, which would create water droplets large enough to the ground. It found that by using seven UAVs carrying out this technique, in 20min a 95% improvement in visibility was made, so runways could be back in service quicker than would

otherwise have been experienced.

The same approach has also been designed for use over highways, which Almulla says it has been tested for. The team itself admits that the concept has not yet been tested over a runway, but that with support from aviation authorities it could easily be done.

Another application that could benefit the manned aviation industry is a participation in the last-mile delivery of cargo that has been shipped using air freighters. One such example is Swiss Post and Swiss WorldCargo – the air-freight division of Swiss International Air Lines – which began testing the Matternet One UAV in July 2015 to bolster its cargo service.

Oliver Evans, chief cargo officer at Swiss International, says that operators are no longer just competing with each other – something he claims is difficult enough – but also other modes of transport.

This last-mile delivery of packages weighing 2-5kg (4.4-11lb) is growing in competition, and Evans says this can be fulfilled by using a UAV and not road transport. “We believe this will have a fundamental impact on the air cargo world,” he says.

A trial is now going to move towards introducing low-risk commercial operations, with a next phase to start in the coming months.

Evans says that once the regulations have caught up, “even urban logistics will be able to benefit from unmanned technology”, although this is the last area that will be addressed in the UAV parcel-delivery market.

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Swiss Post

NASA is helping facilitate this sort of work by looking at how UAVs can fit into low-altitude air-traffic management.

Four generations of model for this are planned, the first of which was tested in August. This assessed a system for use over unpopulated areas with minimal aviation traffic, and will now be rolled out to the FAA’s UAV test sites to further validate the system.

The second build, in October 2016, is to test beyond-line-of-sight and longer range-operations, but still over sparsely populated areas. Build three – to be carried out in January 2018 – will allow for limited parcel delivery, with full-scale delivery operations expected by build four in March 2019. This anticipates the introduction of a beyond line-of-sight system for use over densely populated urban areas.

“There are calls for a persistent system and a field-portable system,” Parimal Kopardekar, manager of the NextGen concepts and technology development project at NASA’s Ames Research Center, said at the show. “You need some way to manage the density of systems that we will see in the next 10 years.”

Kopardekar calls for flexibility where possible and structure where needed, because scalable operations will be needed for economic growth in low-altitude operations.

In terms of utilising the easily deployable aspect of UAVs, humanitarian work in areas that have been hit by natural disasters is rising in popularity.

A team from the Qatar Computing Research Institute’s UAViators Humanitarian UAV Network has carried out work using rotary-wing UAVs such as the DJI Phantom to help assess the aftermath of the earthquake in Nepal in April 2015. This included performing 60 flights in Kathmandu in September 2015, authorised by the Civil Aviation Authority of Nepal.

In six months’ time, the team is planning to also test some fixed-wing systems in Nepal. Patrick Meier, director of social innovation at the institute and founder of UAViators, is calling on more teams with a desire to help to join them.

Similar to the operations in Nepal, Chinese authorities used unmanned vehicles to help assess the damage after a massive industrial explosion in Tianjin earlier this year. And in the wake of Cyclone Pam, which hit Vanuatu last March, UAV teams were deployed to monitor and map the area, including from Heliwest and X-Craft.

In that instance, it was demonstrated that UAVs could be easily integrated with manned aircraft operations at airfields, as the assets were used alongside Royal Australian Air Force Lockheed Martin C-130Js transports that were making cargo deliveries to the area.

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