

## ACCIDENT

<b>Aircraft Type and Registration:</b>	1) UVify IFO 1 2) UVify IFO 2
<b>No &amp; Type of Engines:</b>	1) 4 electric motors 2) 4 electric motors
<b>Year of Manufacture:</b>	1) 2021 (Serial no: 213682ifod0106000497) 2) 2021 (Serial no: 213682ifod0106000370)
<b>Date &amp; Time (UTC):</b>	31 December 2022 at 2359 hrs
<b>Location:</b>	Horse Guards Parade, Whitehall, London
<b>Type of Flight:</b>	Commercial Operations (UAS)
<b>Persons on Board:</b>	Crew - N/A                      Passengers - N/A
<b>Injuries:</b>	Crew - N/A                      Passengers - N/A
<b>Nature of Damage:</b>	Both UA's airframes damaged beyond repair
<b>Commander's Licence:</b>	Other
<b>Commander's Age:</b>	36 years
<b>Commander's Flying Experience:</b>	33 hours (of which 33 were on type) Last 90 days - 4 hours Last 28 days - 0 hours
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot

## Synopsis

During a public display of 400 synchronised unmanned aircraft (UA), several were seen to deviate briefly from their pre-programmed position. Shortly afterwards, two UA fell to the ground and sustained damage. It is likely the deviation was caused by a gust of wind resulting in two UA colliding and losing control. The safety zone put in place on the ground by the operator and organiser mitigated any risk to the public.

## History of the flight

Four hundred UA were launched as part of a synchronised swarm to carry out a public New Year's Eve display. About 30 seconds into the display, several UA briefly failed to maintain their pre-programmed position. This slight deviation lasted for approximately 2 seconds. About 5 seconds afterwards two of the UA were seen in an uncontrolled descent eventually hitting the ground. They landed in the safety zone, Horse Guards Parade in the centre of London, beneath the display area. Both UA were damaged beyond repair. The remainder of the swarm completed the display sequence and landed without incident.

## Investigation

The operator conducted a detailed investigation to establish the cause. A download and analysis of the on-board data logs found no technical reason for the UA deviation. An

assessment of the weather conditions at the time suggested that a localised gust of wind may have affected some of the UA. It is possible that the two UA that fell to the ground sustained damage by colliding with each other. This compromised their flightworthiness and caused them to descend out of control. To mitigate the possibility of this happening again, the operator is researching a way by which to measure wind speed within the display envelope to supplement the preparatory wind speed measurements taken at ground level.

### **AAIB Observation**

The use of multiple UA, in this case 400, for public display and entertainment will, by their nature, attract large numbers of people on the ground. Displays such as these are generally carried out in a large three-dimensional area of the sky and the UA at the top of the swarm, in some cases, may reach heights of several hundred feet agl. In this case the operator and organisers of this display had taken this into account and a large safety zone had been established on the ground. This greatly reduced any risk to the public and meant a safe outcome in this accident.