

**SERIOUS INCIDENT**

<b>Aircraft Type and Registration:</b>	DJI Inspire 2	
<b>No &amp; Type of Engines:</b>	4 Electric Motors	
<b>Year of Manufacture:</b>	2020 (Serial no: 0003)	
<b>Date &amp; Time (UTC):</b>	19 July 2022 at 1030 hrs	
<b>Location:</b>	Morlais Quarry, Mid Glamorgan	
<b>Type of Flight:</b>	Commercial Operations (UAS)	
<b>Persons on Board:</b>	Crew - None	Passengers - None
<b>Injuries:</b>	Crew - N/A	Passengers - N/A
<b>Nature of Damage:</b>	None	
<b>Commander's Licence:</b>	Other	
<b>Commander's Age:</b>	53 years	
<b>Commander's Flying Experience:</b>	6,000 hours (of which 2,000 were on type) Last 90 days - 12 hours Last 28 days - 6 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB	

**Synopsis**

During a film shoot involving a large group of actors performing in close proximity to an Unmanned Aircraft (UA), an actor deviated from the briefed path and ran into one of the UA's propellers. The propeller struck him on the back of the neck, but the injuries were superficial.

The CAA's CAP722 document provides guidance for operating Unmanned Aircraft Systems (UAS) in UK airspace but is ambiguous about the UAS operator gaining explicit consent from involved third parties for operating in close proximity to a UA. The CAA has taken action to review and amend the guidance.

The UAS operator and film director have put additional safety measures in place to prevent a recurrence.

**History of the flight**

Prior to the start of the day's filming, the remote pilot gathered the operating crew, film crew, production staff and actors together to conduct a safety briefing. After two "shoots" were completed successfully there was a quick transition to a third shoot. The task was to conduct a front tracking shot of actors and horses running past the UA which was to hover at low head height. The UA was to be flown slowly backwards as the group of actors ran towards it, before the group split into two streams to avoid the aircraft. The remote pilot plus

the payload operator and observer positioned the UA where its presence was acknowledged by the assistant director. The remote pilot had decided there would be no sudden or erratic movement of the UA because he believed this would enable the actors to see the UA as it flew slowly backwards. As filming started, up to 50 actors and horses appeared on scene and ran towards the UA before splitting into the two streams around the aircraft. As one of the actors moved to the side and drew level with the UA, he suddenly cut across its flight path towards the other stream of actors. The actor ran into one of the UA's propellers which hit the back of his neck causing superficial injuries. The UA was immediately flown out of harm's way and filming was stopped while the actor received medical treatment.

### **CAA CAP722 guidance<sup>1</sup>**

The CAA guidance for this type of activity was, at the time, contained in CAP722 (edition 8) Section 2.1.3 '*Protection of 3<sup>rd</sup> parties*', which provides guidance on the measures to be taken whilst flying UA close to third parties, particularly should a loss of control of the aircraft occur. Section 2.1.3.1 defines a further third-party category of an 'involved person' as follows:

*'A person may be considered involved if they:*

- *have given explicit consent to the UAS operator or to the remote pilot to be part of the UAS operation (even indirectly as a spectator or just accepting to be overflown by the UAS); and*
- *have received from the UAS operator or from the remote pilot clear instructions and safety precautions to follow in case the UAS exhibits any unplanned behaviour. Such persons could include building-site or other industrial workers, film and TV production staff and any other pre-briefed, nominated individuals with an essential task to perform in relation to the event.*

*In principle, this means that an involved person must:*

- *be able to decide whether or not to participate in the UAS operation;*
- *broadly understand the risks involved;*
- *have reasonable safeguards introduced for them, introduced by the site manager, the UAS operator or the remote pilot during any UAS operation; and*
- *be expected to follow the directions and safety precautions provided.*

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#### **Footnote**

<sup>1</sup> The CAA has published a new Acceptable Means of Compliance and Guidance Material (AMC&GM) for Regulation (EU) 2019/947 as retained (and amended in UK domestic law) Under the European (Withdrawal) Act 2018. Its publication aims to provide the regulated community with greater clarity on what is required of them in meeting the regulations and gives this guidance a legal basis. The CAP 722 series documents now reflect this AMC&GM.

*The UAS operator or remote pilot should check by asking simple questions to make sure that the directions and safety precautions have been properly understood.*

*In order to be considered an 'involved person', each person should be asked for their explicit permission and be made aware of the possible risk(s).'*

### **Operator's risk assessment**

Whilst the UAS operator's risk assessment documented many of the hazards and risks that were likely to exist during filming, the possibility of actors diverting from agreed routes and running into the path of the UA was unexpected and, therefore, had not been considered. One of the factors in the incident was the speed at which filming transitioned from one shoot to the next which did not allow sufficient time to land the aircraft and fit safety bumpers to the propeller rotors. This would have prevented the blades from making contact with the actors or the horses. Given that each film scene was potentially different to the previous scene, the operator's safety brief could only cover the generic safety risks from flying the UA in close proximity to people during filming.

### **Safety Actions**

How a UAS operator obtains explicit consent or permission from a large group of involved persons, 50 plus in this event, is not defined in CAP722. Nor does it appear practicable to ask each involved person simple questions to check their understanding when such a large group is involved.

As a result of this serious incident the following Safety Actions have been taken:

The CAA has taken action to review and amend CAP722 guidance to clarify the definition of an uninvolved person.<sup>2</sup>

The UAS operator and film director have agreed to do complete walk throughs of each scene with the actors and film crew before filming starts. More time has now been allocated for set up prior to close proximity shots so those involved can understand the location and flight path of the UA. This also allows time to fit the propeller bumpers when necessary.

The operator has updated their risk assessment to include guidance and mitigation measures for future work of this nature.

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#### **Footnote**

<sup>2</sup> This Safety Action will be superseded by the publication of the new AMC&GM.