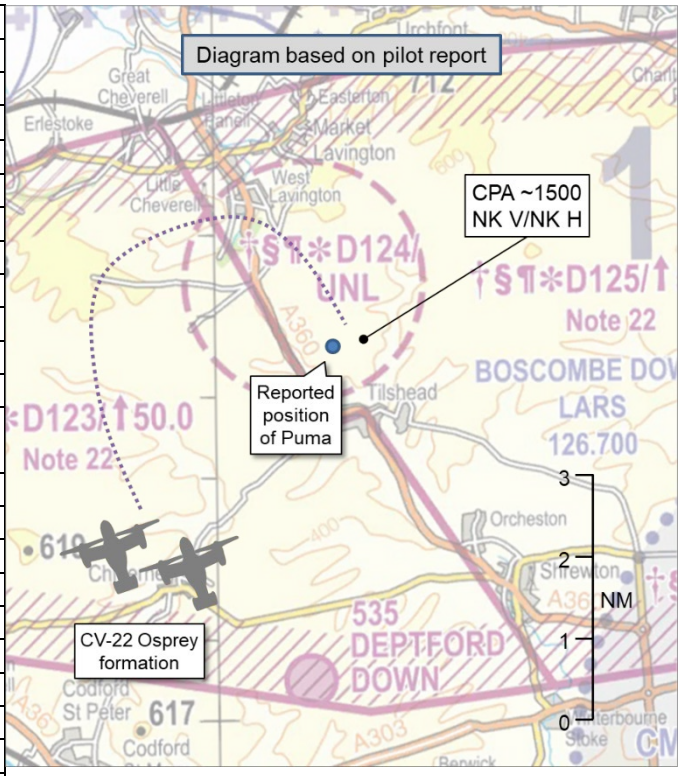
AIRPROX REPORT No 2022253

Date: 20 Oct 2022 Time: ~1500Z Position: 5115N 00158W Location: D125 Salisbury Plain

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Puma RPAS	CV-22 Osprey
Operator	Mil UAS	Foreign Mil
Airspace	D125[1]	D125[1]
Class	Danger Area	Danger Area
Rules	VLOS	VFR
Service	Listening out	NK
Provider	Salisbury Ops	NK
Altitude/FL	NK	NK
Transponder	Not fitted	A, C, S
Reported		
Colours	NR	Grey
Lighting	Red and green strobes	NR
Conditions	VMC	VMC
Visibility	NR	NR
Altitude/FL	400ft	NR
Altimeter	NR	NR
Heading	360°	NR
Speed	23kt	NR
ACAS/TAS	NR	NR
Alert	NR	NR
Separation at CPA		
Reported	200ft V/200m H	NR V/ NR H
Recorded	NK V/NK H	



THE PUMA RPAS PILOT reports that their detachment had been flying for 15min or so, at 500ft AGL, just to the south of the Ground Control Station (GCS) location. The [Puma RPAS] was kept close-by so any handling was completed within VLOS. Throughout this time it was observed that two CV-22 Ospreys were flying further to the west and south. There were five other individuals including [the Puma RPAS pilot] conducting ground training near to the GCS location when the two CV-22 Ospreys flew south to north, west of their position. They then conducted a right-hand turn and flew through the impact area to the north and in front of their position, then immediately turned right again and flew directly over their position, straddling the detachment location at approximately 300ft AGL. Within a few seconds, they had flown past [the Puma RPAS pilot's position] and the [Puma RPAS's] position at which point [it was decided to] recover [the Puma RPAS] as quickly and safely as possible. No avoiding action was taken at the time of the incident due to the altitude of the CV-22 being perceived as being below the Puma RPAS. At this point, [the pilot of the Puma RPAS] raised Salisbury Plain Training Area (SPTA) Air Ops on the Airwave radio and told them that there had been an airspace incursion with the two CV-22s and that [the Puma RPAS] was being recovered immediately. Once the [Puma RPAS] had been recovered, [the pilot of the Puma RPAS] informed SPTA Air Ops who, in-turn, informed them that the CV-22s were now [at their destination] and on the ground. At this point, [the pilot of the Puma RPAS] decided that they would not fly again and closed the airspace and recovered back to camp. This was all acknowledged by the DFS (Deployed Flying Supervisor) who had heard the Airwave conversation and the plan was confirmed over the phone to cease flying for the day.

The pilot assessed the risk of collision as 'High'.

THE CV-22 OSPREY PILOTS did not submit reports.

[1] D124 was not active at the time of the incident, D125 was active.

THE SALISBURY AIR OPERATIONS RANGE OPERATOR reports that they had been the on-duty Air Deputy Training Safety Officer (DTSO). There were two CV-22 Osprey aircraft that had pre-booked into Danger Area D123 and Deptford Down. The [CV-22 crews] had been informed that Warminster small-arms range (WDA) and D125 were 'live' during a pre-range brief that morning. The aircraft arrived separately, with [the pilot of CV-22(1)] arriving at 1352. Again, the pilot was briefed on the WDA and D125, and commenced operations within D123 departing the range to the south 30min later.

At 1423, [the pilot of CV-22(2)] called Salisbury Ops to ask for clearance to operate at Deptford Down. This was granted and [the pilot of CV-22(1)] joined at 1440. They were to operate at Deptford Down before routing back in D123.

At 1459, [the pilot of CV-22(1)] asked if D124 was cold. Two CV-22s then passed to the north of Westdown Camp [which is situated within D125] within 200m. This was followed by a frantic radio call by a ground unit stating that they had just been overflown by two CV-22s. [The Salisbury Air Operations Range Operator] immediately instructed the two CV-22 [pilots] to route to Deptford Down and call back. This they did, and [they were] asked to vacate the range to the south and call on return to their base.

At the time of the incident, there had been [a variety of live-firing artillery and aircraft] operating within D125. Salisbury Air Operations has a Secondary Surveillance Radar feed from Boscombe Down, but at the time of the incident it had been unserviceable and had been reported as such.

The controller perceived the severity of the incident as 'High'.

THE SALISBURY AIR OPERATIONS RANGE SUPERVISOR reports that they did not witness the Airprox event. They explained that the SSR feed, that is in use for SA, has previously provided an alert to any navigational errors by flight-crew. On this occasion, the SSR was not working and, without the ability to track the aircraft, the DTSO could not have intervened to stop the crew entering a 'live firing' area.

Factual Background

The weather at Boscombe Down was recorded as follows:

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EGDM 201450Z 21006KT 9999 FEW018 17/10 Q1005 TEMPO SCT018 RMK BLU TEMPO WHT
EGDM 201520Z 21009KT 9999 FEW024 17/12 Q1005 TEMPO SCT024 RMK BLU TEMPO WHT
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Analysis and Investigation

352 Special Operations Wing Safety Office

On 20th October 2022, a formation of two CV-22 Ospreys ([callsigns redacted]) from the [squadron redacted] were conducting practice approach training in the SPTA at Deptford Downs Helicopter Landing Zone (HLZ). During setup for an approach, the formation flew into D125 that was conducting a live fire exercise. The crew immediately self-identified that they had flown into D125 and manoeuvred to expeditiously exit the airspace.

The formation did fly within the vicinity of a [GCS] operating a [Puma RPAS]. Investigative analysis of the flight profile determined that the CV-22s did not fly into Impact Area 15 and were 0.75NM or greater from their closest point of flight. The crews subsequently complied with the SPTA Training Safety Officer's request to depart the training area and immediately contacted the range controller to debrief the infringement.

Following the incident, a safety investigation was conducted to identify root cause analysis and implement safety measures to address the incident and prevent reoccurrences. The crews were debriefed and provided supplementary airspace training. The unit published a special interest item directing all crews to conduct added mandatory reviews of all UK training areas prior to use. Additionally, chart overlay draw files are being updated to the cockpit chart display database to enhance SPTA airspace.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken. The Puma RPAS was not observed on radar. Neither of the CV-22 Ospreys were observed on radar until approximately 10min after CPA when they had been 10NM southwest of the Puma RPAS's reported position. The diagram was constructed from the Puma RPAS pilot's report. The separation at CPA could not be determined.

The Puma RPAS and CV-22 Osprey pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[2] During the flight, the remote pilot shall keep the unmanned aircraft in VLOS and maintain a thorough visual scan of the airspace surrounding the unmanned aircraft in order to avoid any risk of collision with any manned aircraft. The remote pilot shall discontinue the flight if the operation poses a risk to other aircraft, people, animals, environment or property.[3]

Comments

JHC

The Puma [RPAS] pilot ensured the UAS maintained VLOS and their visual scan of the surroundings was evidently very strong. They spotted the conflicting traffic and, although did not issue an avoiding action, their actions following the event were correct and safe. Unfortunately this incident occurred with foreign military personnel training in unfamiliar and congested airspace. It was further exacerbated by the SSR feed from Boscombe Down being unserviceable, although this isn't a reliable mitigation as this is no longer supported in Salisbury Air Ops HQ. The actions by the Puma RPAS pilot and team were in line with issued procedures and, fortunately, incidents like these remain rare.

USAFE

Unfortunately, the details from the crews are limited on this occasion. The United States Country Rep UK - ATC Specialist has since been working closely with the [CV-22 Osprey operator's] leadership and safety teams to inform them of the safety review processes that are utilised in the UK. We have also been carrying out work to ensure all United States Visiting Forces (USVF) operators understand the airspace structures and notifications procedures available in the UK.

Summary

An Airprox was reported when a Puma RPAS and a formation of two CV-22 Ospreys flew into proximity in Danger Area D125 at approximately 1500Z on Thursday 20th October 2022. The Puma RPAS pilot had been operating under VLOS in VMC and listening out on the Salisbury Ops frequency. The CV-22 Osprey pilots had been operating under VFR in VMC and listening out on the Salisbury Ops frequency.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of a report from the Puma RPAS pilot, radar photographs/video recordings, reports from Salisbury Air Operations and from the appropriate operating authorities. Relevant contributory factors mentioned during the Board's discussions are highlighted within the text in bold, with the numbers referring to the Contributory Factors table displayed in Part C.

The Board first considered the actions of the pilot of the Puma RPAS. Members noted that they had generic situational awareness that the CV-22 Osprey pilots had been operating to the south and west of their position (**CF5**). Having seen that the CV-22 Osprey pilots had turned onto a conflicting track, members praised the pilot of the Puma RPAS for having maintained an effective lookout which had allowed enough time for them to have assessed a suitable course of action. Acknowledging that the proximity of the CV22 Ospreys had caused the pilot of the Puma RPAS concern (**CF7**), members noted

[2] (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.
[3] EASA Part UAS.OPEN.060 Responsibilities of the remote pilot (2)(b).

that the decision to maintain the altitude of the Puma RPAS meant that the CV-22 Ospreys had passed underneath without collision. The pilot of the Puma RPAS had informed the Salisbury Air Operations Range Operator of the incident promptly and members believed that that may have helped the avoidance of other potential conflicts.

Suggesting that there had been little else that the pilot of the Puma RPAS could have done to have ameliorated the situation further, members next turned their attention to the actions of the CV-22 Osprey pilots. Members noted that the pilots had received a briefing regarding the live-firing activity and the airspace restrictions. Some members wondered how there had been an apparent misunderstanding around the status of Danger Areas D124 and D125. Members observed that D124 is depicted on civilian VFR charts as a circle with a dashed line and D125 is depicted with a solid line. The solid line represents a permanent restriction and the legend provides a description of the dashed line as being an area activated by NOTAM.

Members were disappointed that the CV-22 Osprey pilots had not submitted reports to the UKAB Secretariat. Notwithstanding, some members suggested a possible explanation for the apparent misunderstanding of the airspace structure. It was proffered that D124 had been considered as separate and distinct airspace to D123 and D125 and, consequently, having been told that D124 was 'cold', the pilots of the CV-22 Ospreys had believed that they could route through D124. However, it is the case that, if D124 is not active, the circle on the VFR chart depicting D124 should be disregarded and that D123 and D125 abut insomuch as the eastern boundary of D123 and the western boundary of D125 share a single solid line on the VFR chart. Therefore, members agreed that it was most plausible that the pilots of the CV-22 Ospreys had believed that they had flown through the 'inactive airspace' of D124 but had actually, inadvertently crossed the boundary from D123 into D125.

With that assessment, members were in agreement that there had been an error in the navigation of the CV-22 Ospreys (**CF2**) in that the pilots had entered a restricted area, namely D125, without permission to have done so (**CF3**) and that they had deviated from their cleared routing (**CF1**). Given that the Salisbury Air Operations Range Operator reported that the pilots of the CV-22 Ospreys had been briefed on the restricted areas, members suggested that either a lack of clarity or assimilation of information during the pre-flight briefing had been a contributory factor in the incident (**CF5**). The pilots of the CV-22 Ospreys had not had situational awareness of the presence of the Puma RPAS (**CF5**) and it had not been visually acquired (**CF6**).

In determining risk, members concluded it had been the early sighting of the CV-22 Ospreys by the Puma RPAS pilot, and their decision to have maintained altitude, that had meant that the separation between the aircraft had not been less. Safety had been degraded but there had been no risk of collision. As such, the Board assigned Risk Category C to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

2022253			
Factor	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
Flight Elements			
• Regulations, Processes, Procedures and Compliance			
Human Factors	• Flight Crew ATC Clearance Deviation	An event involving a deviation from an air traffic control clearance.	
• Tactical Planning and Execution			
Human Factors	• Action Performed Incorrectly	Events involving flight crew performing the selected action incorrectly	Incorrect or ineffective execution
Human Factors	• Airspace Infringement	An event involving an infringement / unauthorized penetration of a controlled or restricted airspace.	E.g. ATZ or Controlled Airspace
Human Factors	• Pre-flight briefing and flight preparation	An event involving incorrect, poor or insufficient pre-flight briefing	
• Situational Awareness of the Conflicting Aircraft and Action			

Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late, inaccurate or only generic, Situational Awareness
• See and Avoid			
Human Factors	• Monitoring of Other Aircraft	Events involving flight crew not fully monitoring another aircraft	Non-sighting or effectively a non-sighting by one or both pilots
Human Factors	• Perception of Visual Information	Events involving flight crew incorrectly perceiving a situation visually and then taking the wrong course of action or path of movement	Pilot was concerned by the proximity of the other aircraft

Degree of Risk: C

Safety Barrier Assessment[4]

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

Ground Elements:

Situational Awareness of the Confliction and Action were assessed as **not used** because the Salisbury Air Operations Range Operator had not been required to have monitored the flights.

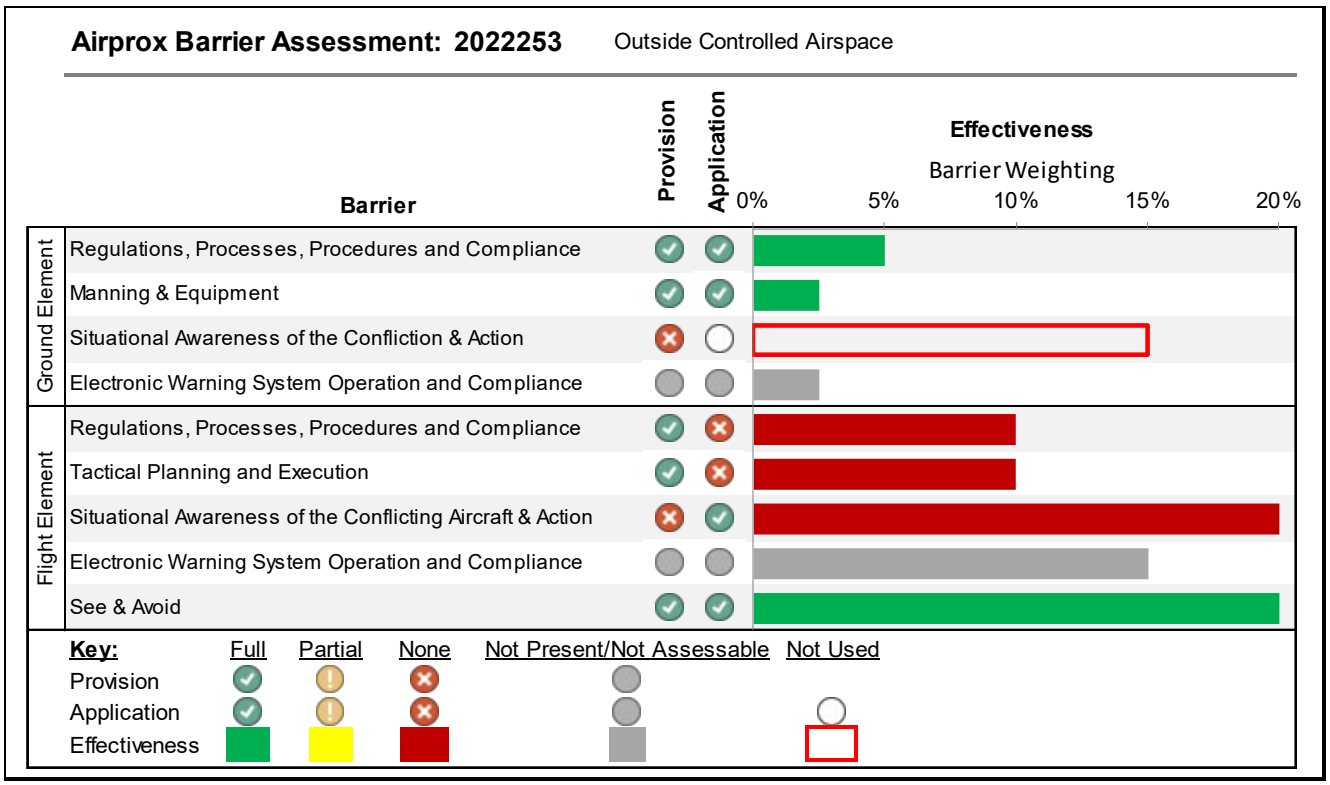
Flight Elements:

Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because the pilots of the CV22 Ospreys had operated beyond the limit of their issued clearance.

Tactical Planning and Execution was assessed as **ineffective** because the pilots of the CV22 Ospreys had entered the airspace within D125 without a clearance to have done so.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the pilots of the CV22 Ospreys had no situational awareness of the presence of the Puma RPAS.

[4] The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the UKAB Website.


Airprox Barrier Assessment: 2022253
Outside Controlled Airspace
Barrier
Provision
Application
Effectiveness
Barrier Weighting
0%
5%
10%
15%
20%
Ground Element
Regulations, Processes, Procedures and Compliance
Manning & Equipment
Situational Awareness of the Confliction & Action
Electronic Warning System Operation and Compliance
Flight Element
Regulations, Processes, Procedures and Compliance
Tactical Planning and Execution
Situational Awareness of the Conflicting Aircraft & Action
Electronic Warning System Operation and Compliance
See & Avoid
Key:
Full
Partial
None
Not Present/Not Assessable
Not Used
Provision
Application
Effectiveness