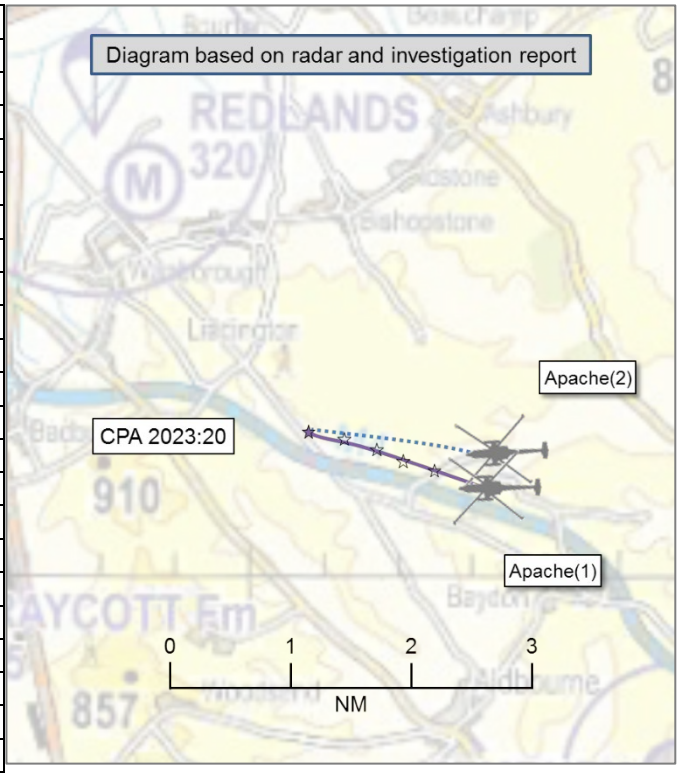
AIRPROX REPORT No 2020035

Date: 11 Feb 2020 Time: 2023Z Position: 5131N 00140W Location: 5NM SE Swindon

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Apache(2)	Apache(1)
Operator	HQ JHC	HQ JHC
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Basic	Basic
Provider	Brize Norton	Brize Norton
Altitude/FL	NK	NK
Transponder	Standby	A, C, S
Reported		
Colours	Green	Green
Lighting	Strobes, nav	Strobes, nav
Conditions	VMC	VMC
Visibility	>10km	30km
Altitude/FL	250ft	300ft
Altimeter	agl	agl
Heading	270°	285°
Speed	120kt	110kt
ACAS/TAS	Not fitted	Not fitted
Separation		
Reported	0ft V/29-44m[1] H	0ft V/29-44m[1] H
Recorded	NK	



THE APACHE(2) CO-PILOT/GUNNER (CPG) reports that he was acting as aircraft commander in the front seat as No2 of a formation pair at night at 250ft agl. Both aircraft were operating in a heavy fit. When 15-20km from the target, the formation lead delivered orders for a simulated strike on Wroughton disused airfield. Both Apache CPGs were eyes in 'weaponeering'. At about 4km from the target, the No2 [rear-seat] handling pilot (HP) noticed convergence of the two aircraft and started to roll right (~15-20° AoB) to adjust heading. Feeling the roll, the CPG looked up and saw the convergence continuing at an uncomfortable rate through his left (unaided) eye. As they were still converging, the HP positively increased AoB to about 80° right wing low, to turn hard away from the lead aircraft and avoid collision. The CPG noted that they experienced rapid and unexpected closure leading to their aircraft being unpleasantly close to the lead (estimated as 2-3 rotors by both Apache crews). This was possibly due to the orientation of the attack and the closure not being observed immediately due to the monocular nature of the Pilot Night Vision System.

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

THE APACHE(1) REAR-SEAT HANDLING PILOT reports leading a pair of Apaches, conducting Combat Ready (CR) training in the south and east of England, planning to conduct a simulated strike on a pre-planned target. During transit manoeuvring to establish at the Initial Point for the target he noticed the unexpected close proximity of the No2 aircraft, immediately followed by it turning hard away. After this the No2 called "knock it off". At the time and immediately subsequently he did not interpret the incident as an Airprox as it occurred within a formation.

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

[1] 2-3 rotor disc diameters.

THE BRIZE NORTON CONTROLLER reports that the Airprox occurred 2 months previously, was not declared on frequency and that he had no recollection of the event.

THE BRIZE NORTON SUPERVISOR reports that he was ATCO IC at the time of the event. He took over the control position because the Apache formation had requested to divert with a technical 'snag'. They did not declare an emergency, or state that they would require any further assistance at the time.

Factual Background

The weather at Brize Norton was recorded as follows:

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METAR EGVN 112020Z 25007KT CAVOK 03/M00 Q1011 NOSIG RMK BLU BLU=
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Analysis and Investigation

UKAB Secretariat

Both Apache 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]. Sunset at Brize Norton occurred at 1713Z.

Apache Squadron OSI

The OSI identified the following sequence of events prior to the mission:

Two weeks prior to this event, the Sqn OC directed that some sorties should be generated to prepare a Limited Combat Ready (LCR) crew for their upcoming CR check. The Sqn had a few prepared sorties in Norfolk that could be utilised. One of those was used for the first part of this mission with additional training objectives planned to be achieved in the vicinity of Swindon, Southampton, Gatwick, through London Heli-Lanes Stansted and home to MOB Wattisham. This mission was planned to be 5 hours flying duration with a refuel planned at RAF Benson.

Prior to mission planning, [Apache(1) CPG/NHP] had spent the weekend in a Lincolnshire field supervising an isolated aircraft that had made a precautionary landing on Saturday due to a technical fault. Returning to MOB Wattisham Monday lunchtime, [Apache(1) CPG/NHP] was detailed with mission lead; the sortie was to be flown the following evening. [Apache(1) CPG/NHP] felt the planning time was compressed as the into work time the following day could not be before 1200hrs due to the crew duty period. All 4 aircrew however, were involved in the sortie preparation and planning. [Apache(1) CPG/NHP] had not been sleep deprived during the weekend and was not assessed as being fatigued; he was to be supervised throughout by [Apache(1) HP].

The cause was found to be that the crew of Apache(2) allowed a rate of closure to develop which when identified required a high energy evasive manoeuvre to prevent collision.

Causal Factors were identified as follows:

It is perceived [Apache(2) HP] was distracted for the short period of time it took for a rate of closure to develop within the patrol. [Apache(2) CPG] was working hard to resolve a radio issue and was also in attack mode with his attention on the target. This may have been enough of a distraction to [Apache(2) HP] to reduce his lateral scan.

[Apache(2)] aircraft track was 263° which was coincident with target 2 immediately prior to the loss of safe separation. Concurrently, [Apache(1)] was tracking 273° towards the IP. [Apache(2) HP] perceived [Apache(1)] had turned onto target heading due to its aspect however, [Apache(1)] was in fact offset for wind which was 20° to the left of heading.

[2] SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

The IP was briefed as part of the Direct Fire Battle Plan which factored as a de-confliction measure but was not uploaded to the aircraft as a control measure or part of the route. [Apache(2) HP] cueing was to the target and not the IP. The patrol approached the IP from the south east which was almost a 90° shift from the image displayed during mission orders. [Apache(2) HP] knew the IP was along the M4 but had no cues to its distance. As [Apache(2) CPG/NHP] had entered attack mode and had the TADS slaved to target 2, and [Apache(1)] appeared to have turned onto its attack heading, it is suggested that [Apache(2) HP] shifted his attention to the target thinking he had passed the IP.

The planning line gave the appearance of a simple plan where, following [pre-target brief], the patrol would float into battle with no heading changes required for the final attack run. The planning line however, ran straight through a 1000ft cattle avoid and was never going to be flown. This led to an expectation of simplicity with the actual track lacking detail on how the patrol was going to de-conflict in battle whilst almost 90° off the final attack heading.

A norm has developed where AHF FL crews are conducting minimal planning on the MPS in favour of using the CSAT. Additionally, it appears to have become acceptable for the non-handling pilot to direct the handling pilot by reference to the CSAT. By planning and flying with reference to the CSAT and not the TSD / HDU symbology, critical safety information and control measures are not loaded to the aircraft and therefore not available to the pilot for cueing during flight.

The flight authorisation was completed by the authoriser with [Apache(1) HP] & [Apache(2) CPG] in attendance. Due to the nature of the sortie, [Apache(1) CPG/NHP] & [Apache(2) HP] were not involved as diversion training was being discussed. The authoriser did not attend the mission orders as he felt the experience within the patrol was sufficient to ensure the sortie was well planned, safe and met its training objectives.

This sortie, in particular the phase from Benson onwards was hastily assembled. It was evident from the lack of loaded avoids and hazard data that the bare minimum was loaded for an out of area LCR training sortie designed to challenge prospective CR aircrew.

The wind was forecast to be 250/14 which was on the nose for the plan. However, as the wind was much stronger than forecast, 250/20+, and the patrol approached the IP from the south east there was a considerable crosswind. This had 2 consequences:

(1) The aircraft were drifting south to north
(2) [Apache(1)] heading was left of its track, changing the aspect to [Apache(2)].

Further causal factors were identified with respect to the subsequent near CFIT and double engine over-torque.

The following Airprox related recommendations were made:

Training to be Received by [Apache(2) HP].
Human Factors Based Case Study to be Delivered to Apache Aircrew
Review [of] the Outbrief Authorisation Process
Supervision of CR Training Delivery.
Apache Units are to Implement a 6 monthly authorisation mentorship workshop.

The ORG concluded and agreed with the OSI that the main cause of the event was the loss of SA by [Apache(2) HP] flying as wing to [Apache(1)]. Whilst the ORG agreed and accepted that there were numerous contributory factors as to why [Apache(2) HP] lost SA, the main cause remained [Apache(2) HP] performance and his inconsistent and infrequent lookout to maintain separation from [Apache(1)]. HUMS data showed that for long periods of the ingress towards the target [Apache(2) HP] head position remained fixed forward and not scanning to the left enough to maintain separation from [Apache(1)]. Additionally, [Apache(2) HP] cueing was to the [target] 263° at 15km, the IP was 275° at 4.5km. It is assessed [Apache(2) HP] had no idea where the IP was both in azimuth or distance and converged with [Apache(1)] as no cues were directing him to the IP.

Comments

JHC

The seriousness of this Airprox cannot be overestimated. Apache aircrew receive the highest level of training to operate what is an incredibly complex system and this incident serves to remind us that errors can occur at all levels of experience and expertise. The Air Safety Team at 1AvnX ATTACK have carried out a very in depth and thorough investigation and the recommendations that fell out have already been implemented locally. Analysis of this incident through the UKAB process will now enable the lessons identified to reach an even wider audience.

Summary

An Airprox was reported when an Apache formation pair flew into proximity at night near Swindon at 2023Z on Tuesday 11th February 2020. Both pilots were operating under VFR in VMC using night vision aids, both in receipt of a Basic Service from Brize Norton.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, reports from the air traffic controllers involved and reports 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.

Due to the exceptional circumstances presented by the coronavirus pandemic, this incident was assessed as part of a 'virtual' UK Airprox Board meeting where members provided a combination of written contributions and dial-in/VTC comments. Although not all Board members were present for the entirety of the meeting and, as a result, the usual wide-ranging discussions involving all Board members were more limited, sufficient engagement was achieved to enable a formal assessment to be agreed along with the following associated comments.

The Board first commended the Apache Investigation Team for their thorough and comprehensive report. Without restating the findings already made, members summarised their analysis of the incident with their opinion of the contributory factors. The Apache formation established a Basic Service with Brize Norton after some effort, which is not required to be monitored (**CF1**) and with which the controller will not have specific SA (**CF2**). This was not to suggest that a surveillance based service would have provided collision mitigation; it would not. Rather that the Apache formation was required to operate iaw comms regulations concerning night low-level operations in LFA1, which was to operate on the LL Common Frequency (**CF9**). Considering the Apache crews, the use of CSAT rather than MPS was not iaw SOP (**CF3**) and contributed to the Airprox in denying the crews valuable steering information. The Board agreed with the investigation that the lack of supervisory oversight was contributory (**CF4**), which manifested itself as inadequate preparation, supervision and authorisation (**CF5**, **CF6**, **CF13**). Members questioned whether the Apache(2) CPG had been given sufficient time in which properly to prepare for the complex training mission. The JHC advisor stated that sufficient time had been allowed but that the briefing and authorisation aspects of the planning cycle had not caught inadequacies in the plan. The crews had landed at Benson to re-fuel, at which point the planned track to fly directly towards the target set at Wroughton had to be changed to the south to accommodate low-level avoids, resulting in an off-axis approach to the IP from the southeast. The SOP battle formation lateral separation was also compressed by the avoids. Crucially the lack of steering information because of reliance on CAST rather than MPS resulted in missing or incorrect SA in the Apache crews and created the conditions for the Apache(2) crew to lose formation integrity (**CF7**, **CF8**, **CF10**, **CF11**, **CF12**). The Apache(2) crew were not aware of their closing track due to the demands of the target run (**CF14**, **CF15**) but the Apache(2) HP did become aware of the proximity of Apache(1) at a late stage and took effective avoiding action (**CF17**). Nevertheless, it was apparent that the aircraft were in close proximity (**CF16**), evidenced by the Apache(2) HP's subsequent near CFIT after taking avoiding action and consequent double-engine over-torque. Members quickly agreed that whatever the potential outcome, in the even the Apache(2)

HP had taken avoiding action, albeit at a late stage, and that the outcome was not simply due to providence but rather that safety had been much reduced.

Members agreed that all the Apache personnel involved had commendably been striving to achieve the 'organisational objective' of completing the CR training. This Airprox serves as an object lesson in potential outcomes when task completion is prioritised over full awareness of the safety considerations.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2020035		
CF	**Factor**	**Description**	**Amplification**
	Ground Elements		
	• Situational Awareness and Action		
1	Contextual	• ANS Flight Information Provision	Not required to monitor the aircraft under the agreed service
2	Contextual	• Situational Awareness and Sensory Events	The controller had only generic, late or no Situational Awareness
	Flight Elements		
	• Regulations, Processes, Procedures and Compliance		
3	Human Factors	• Flight Operations Documentation and Publications	Regulations and/or procedures not complied with
	• Tactical Planning and Execution		
4		• Any other event	**Inadequate supervisory oversight**
5	Human Factors	• Pre-flight briefing and flight preparation	
6	Human Factors	• Flight Planning and Preparation	
7	Human Factors	• Insufficient Decision/Plan	Inadequate plan adaption
8	Human Factors	• Action Performed Incorrectly	Incorrect or ineffective execution
9	Human Factors	• Communications by Flight Crew with ANS	Pilot did not communicate with appropriate ATS provider
	• Situational Awareness of the Conflicting Aircraft and Action		
10		• Any other event	**Lack of sufficient tactical symbology**
11	Contextual	• Situational Awareness and Sensory Events	Pilot had no, late or only generic, Situational Awareness
12	Human Factors	• Understanding/Comprehension	Pilot did not assimilate conflict information
13	Human Factors	• Mentoring	
14	Human Factors	• Distraction - Job Related	Pilot engaged in other tasks
	• See and Avoid		
15	Human Factors	• Distraction - Job Related	Pilot looking elsewhere
16	Contextual	• Near Airborne Collision with Aircraft, Balloon, Dirigible or Other Piloted Air Vehicle	Piloted air vehicle
17	Human Factors	• Monitoring of Other Aircraft	Late-sighting by one or both pilots

Degree of Risk: B.

Recommendation: Nil.

Safety Barrier Assessment[3]

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 Apache formation was not under a service that required ATC monitoring.

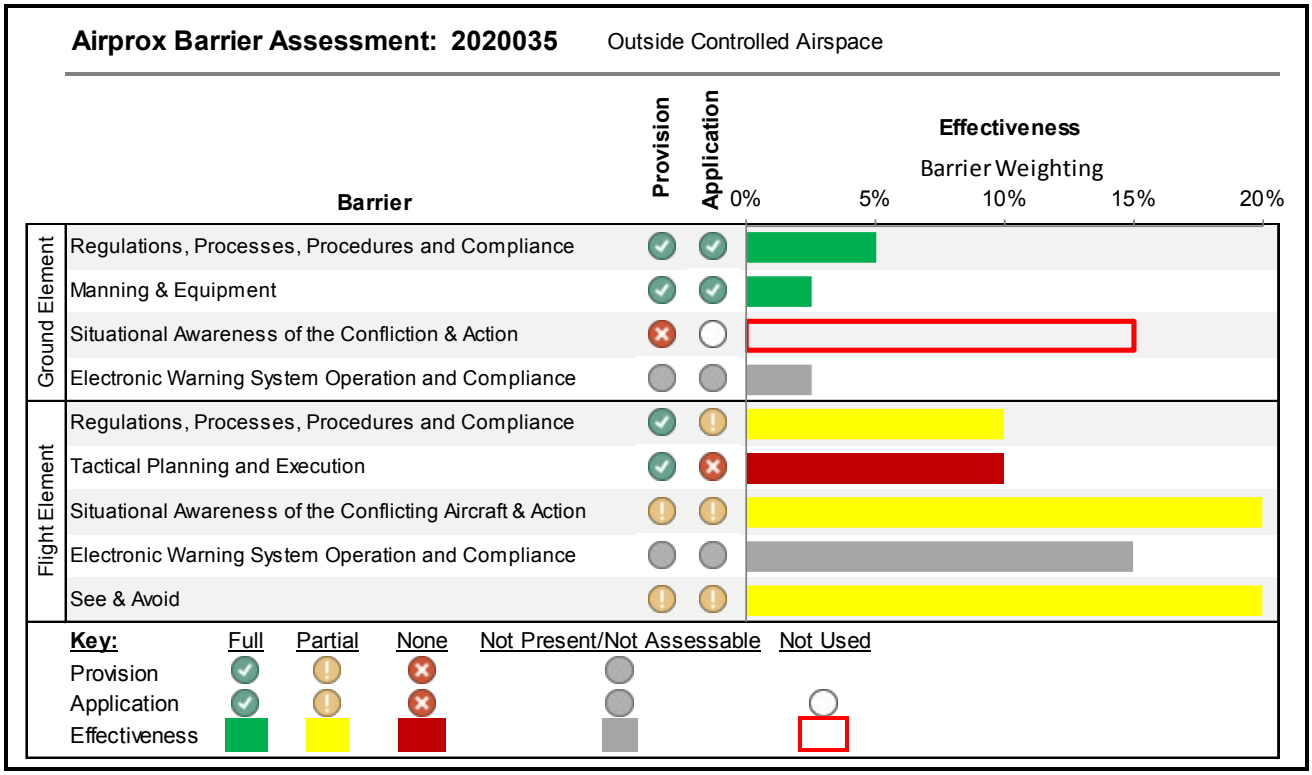
Flight Elements:

Regulations, Processes, Procedures and Compliance were assessed as **partially effective** because the Apache formation did not use the MPS as required and instead relied to a large extent on CAST.

Tactical Planning and Execution was assessed as **ineffective** because Apache(2) did not maintain separation on Apache(1) as they approached the IP.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because both crews were aware of the proximity of the other aircraft in the generic sense, but did not have sufficient SA to maintain formation integrity.

See and Avoid were assessed as **partially effective** because Apache(2) HP saw Apache(1) in time to take avoiding action, albeit at a late stage.



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