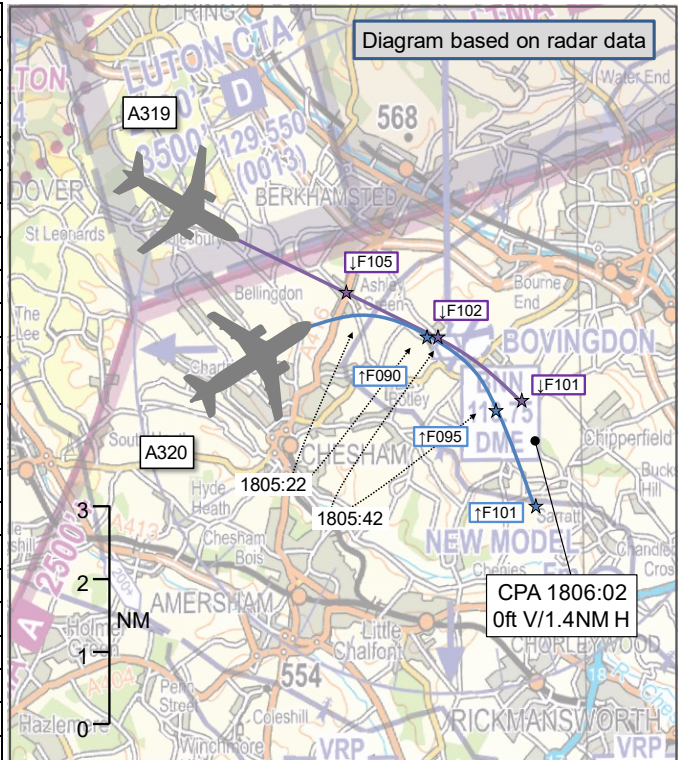


**AIRPROX REPORT No 2023141**

Date: 25 Jun 2023 Time: 1806Z Position: 5143N 00033W Location: Bovingdon Hold

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

Recorded	Aircraft 1	Aircraft 2
Aircraft	A320	A319
Operator	CAT	CAT
Airspace	London TMA	London TMA
Class	A	A
Rules	IFR	IFR
Service	Radar Control	Radar Control
Provider	London Control	London Control
Altitude/FL	FL101	FL101
Transponder	A, C, S+	A, C, S+
<b>Reported</b>		
Colours	Company	Company
Lighting	'Standard'	Nav, Strobes, Beacon
Conditions	IMC	IMC
Visibility	<5km	<5km
Altitude/FL	FL090	FL100
Altimeter	1013hPa	1013hPa
Heading	165°	116°
Speed	225kt	220kt
ACAS/TAS	TCAS II	TCAS II
Alert	TA	TA
<b>Separation at CPA</b>		
Reported	Not Seen	0ft V/2NM H
Recorded	0ft V/1.4NM H <sup>1</sup>	



**THE HEATHROW INT N CONTROLLER** reports that the A320 [pilot] checked in on frequency and was told to enter the hold at BNN. The pilot said they were in the clouds and asked for extended vectors rather than go around the hold. They [the controller] couldn't do it due to traffic and informed the pilot that their Radar Manoeuvring Area (RMA) was full. The A320 pilot was given a right turn back to BNN to leave heading 120° [they recalled]. The A320 maintained FL90 until they got back to BNN. The controller noticed that the level was reading FL91 but didn't think too much of it. They started the hand-over then both they and the incoming controller noticed that the A320's level was now FL97, and the [A319 C/S] was almost on top of it at FL100. They gave an avoiding action turn to [the A320 C/S] and then to [A319 C/S] to whom they also passed Traffic Information. The A320 continued to climb to FL102 and they told the pilot to descend FL80. When asked why they climbed, the pilot said that they had told [the controller] that the hold was unmanageable. The controller opined that to the best of their recollection those were not the words the pilot used. If they had, the controller would have done their best to accommodate them.

**THE A320 PILOT** reports when arriving from BHD via the NUGRA 1H, they were asked to enter the BNN hold at FL090, at 220kts. Although there were no weather returns present on the weather radar, both pilots agreed that holding at BNN was unwise due to the significant cumulus building in the vicinity of BNN. A request for extended vectors was made with London Control but was denied and they were instructed to take up the hold as "London was full". Despite no weather returns on a functioning weather radar system, the decision was made to secure the cabin early and increase the speed to 225kts to increase stall margin. The aircraft entered the hold and despite uncomfortable flight conditions the autopilot was initially able to maintain the cleared level and speed. Before completing the full pattern ATC instructed them to return to BNN and leave heading 165°. On exiting the hold, the aircraft started a uncommanded climb, initially at 1000fpm and peaking at 3600fpm, gaining in excess of 1000ft. During

<sup>1</sup> Horizontal separation is not required within the hold, therefore CPA is recorded as the minimum vertical separation only.

the incident, the autopilot disconnected. After several attempts to re-engage the autopilot, PF took manual control to regain the assigned flight path. Almost simultaneously, a TCAS Caution sounded and PF completed the initial actions. ATC then issued a deconfliction vector for them, and also company traffic above. This was initially flown manually until it was possible to reengage the autopilot. The aircraft was established in a descent and turned onto the ATC requested heading. This was a unique situation of a significant cloud formation without any radar returns combined with ATC unable to offer vectors to avoid weather. There is no doubt that had the situation involved icing conditions or any form of weather return, the crew would have been more assertive in their request to avoid holding in an area of convective activity. Post flight debrief completed.

The pilot assessed the risk of collision as 'None'.

**THE A319 PILOT** reports that they were following their ATC clearance to descend to FL100 inbound BNN holding pattern and then proceed to orbit once at BNN before departing on a heading of 120°. They levelled at FL100 on reaching the BNN overhead and on turning over the fix a TCAS Traffic Advisory caution alerted them to another aircraft ahead; concurrently ATC gave them avoiding action of an immediate turn to head 230°. ATC also gave the other traffic a turn and descent and questioned why they had not followed a previous instruction. The avoiding action was followed and they estimated the 2 aircraft passed at approximately 2NM distance co-altitude whilst IMC.

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

## Factual Background

The weather at Heathrow was recorded as follows:

```
METAR COR EGLL 251750Z AUTO 22014KT 9999 FEW038 25/16 Q1012 NOSIG=  
TAF EGLL 251653Z 2518/2624 22015KT 9999 FEW045 BECMG 2518/2520 28012KT PROB30 TEMPO  
2518/2520 25015G25KT 7000 SHRA=
```

## Analysis and Investigation

### NATS Investigation

The pilot of [A320 C/S] reported onto frequency with the Heathrow Intermediate Director North (INT N) and was instructed to take up the hold at Bovingdon (BNN) where the delay would be five minutes. [The A320] passed over BNN to enter the hold and levelled at FL90 at 1801:42 (all times UTC). At 1801:52 the A320 pilot requested "*could we have extended vectors rather than the hold, we are in err we are holding in the cloud here and it's pretty bumpy*"? The controller responded, "*I can't give you extended vectors, the RMA is full I'm afraid, enter the hold*".

The INT N controller subsequently instructed the A320 pilot to turn right to BNN and leave on a heading of 165° at 220kts, which was read back correctly by the pilot. The pilot of [A319 C/S] then called on frequency and reported descending to FL100 and was instructed to hold at BNN where the delay would be five minutes. Prior to [the A319] arriving at BNN the LL INT N controller instructed the pilot "*at Bovingdon make a right-hand orbit then leave on a heading of One Two Zero degrees at Two Twenty knots*".

[A320 C/S] reached BNN at 1805:26 with Mode C indicating FL90, [A319 C/S] was 1.3NM behind passing FL104 for FL100. The next radar update showed [A320 C/S] had initiated a climb and was now indicating FL91 with an indicated rate of climb of 700fpm. A Low-Level Short Term Conflict Alert (STCA) was generated at 1805:31. The Mode C of the A320 had now increased to FL95 with an associated 4400fpm rate of climb at 1805:34, at which time [A319 C/S] was passing FL103 in the descent for FL100, and separation minima was eroded (Figure 1).



Figure 1 - Separation minima were eroded at 1805:34

The INT N controller issued the pilot of [A320 C/S] an avoiding action turn onto a heading of 090° at 1805:41, followed by an avoiding action right turn onto a heading of 230° and Traffic Information to the pilot of the A319. As the INT N controller was passing the avoiding action instructions the A320 was climbing and turned past the assigned heading of 165°.

Following the avoiding action instructions, the INT N controller transmitted to the pilot of A320 “*you should be descending now, descend now flight level eight zero*”, which was read back by the pilot. During this RT exchange the A320 reached the maximum indicated flight level of FL102 at 1805:58. This was read back correctly by the pilot of the A320, the Mode S Selected Flight Level (SFL) briefly changed (one radar update) to indicate 60, prior to the correct level being displayed.

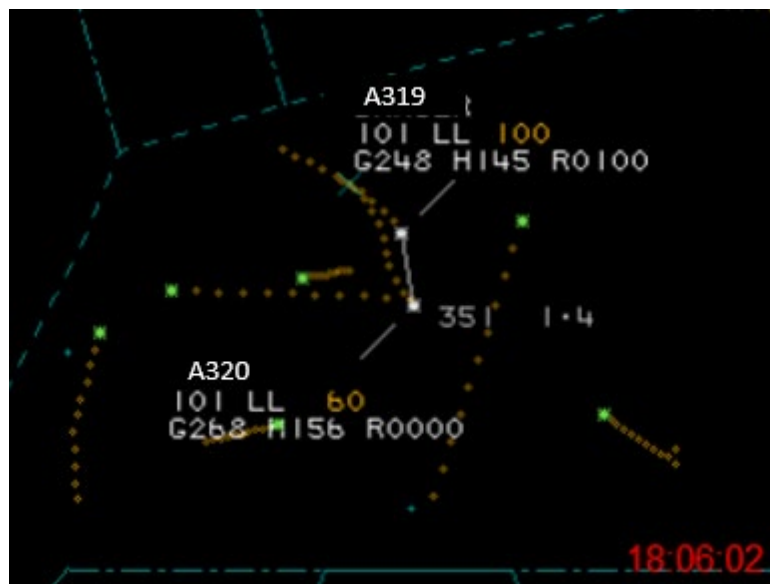


Figure 2

Minimum separation occurred at 1806:02 and was recorded on the Multi Track radar as 0 feet. Note: lateral separation of 1.4NM was not applicable as both aircraft were assessed to be still within the same holding area.

The INT N controller passed updated Traffic Information to the pilot of the A319 at 1806:06; the pilot responded that they were in cloud, the controller then instructed the pilot of the A320 to expedite their descent.

Separation minima was regained at 1806:42 as the instructed avoiding action turns re-established lateral separation.

### Investigation

Although both pilots had been issued with heading instructions, neither heading had yet taken effect at the time of the Loss of Separation, as such both aircraft were considered to still be in the BNN holding pattern.

The Radar Manoeuvring Area (RMA) is a defined area for use by LL INT Directors, TC MATS Pt. 2, Heathrow 5.2 stated: "Aircraft released at BNN, LAM, BIG and OCK which have left the release point under the control of the LL INT DIRs must remain within the RMA."

The [report] from the INT N controller stated that "A320 checked in on frequency and was told to enter the hold at BNN. [They] said they were in the clouds and asked for extended vectors rather than go around the hold. I couldn't do it due traffic and informed [them] my RMA was full." At the time of the request there was traffic at FL90, FL80 and FL66 descending to 5000ft, as such [the] A320 could not be released into the INT N controller's RMA.

Following the resolution of the event and the issuance of further clearances, the INT N controller asked the A320 pilot for the reason behind the climb, the pilot responded "*as advised the hold conditions at Bovingdon were unmanageable, that was induced by the convective cloud, ah we, the auto-pilot kicked out, we did the best we could*". The INT N controller stated in their [report] that had the pilot of A320 stated that the hold was unmanageable when requesting vectors, they "would have done my best to accommodate them".

A snapshot of the Coremet system showed that there was a small area of precipitation bearing clouds over BNN timed at 1805 (Figure 3).

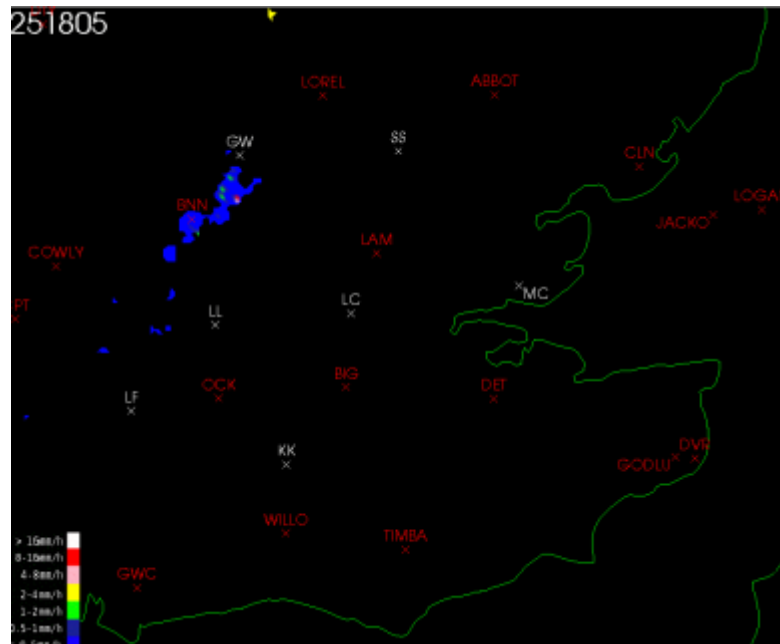


Figure 3

Analysis of downlinked TCAS data showed that no TCAS RA was generated on board either the A320 or the A319.

### Conclusions

- The pilot of A320 requested radar vectors instead of holding at BNN, without conveying their inability to hold in the area due to the significant build-up of cumulus formations.

- [The] A320 experienced an un-commanded climb, of in excess of 1000ft, due to a convective cloud formation, eroding separation with [the] A319.
- The INT N controller issued prompt and effective avoiding action to the pilots of both aircraft to restore separation.

Separation minima were eroded at 1805:34. Minimum separation occurred at 1806:02 and was recorded on the Multi-Track radar as 0 feet. As both aircraft were in the BNN hold lateral separation of 1.4NM was not applicable.

### UKAB Secretariat

The A320 and A319 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.<sup>2</sup>

### Summary

An Airprox was reported when an A320 and an A319 flew into proximity within the BNN hold at 1806Z on Sunday 25<sup>th</sup> June 2023. Both pilots were operating under IFR in IMC, both were in receipt of a Radar Control Service from Heathrow INT N.

### **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available consisted of reports from both pilots, radar photographs, a report from the air traffic controller 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.

The Board first looked at the actions of the A320 pilot. Members with experience of flying this type of aircraft were perplexed as to why the A320 crew encountered the rapid uncommanded climb, noting that normally, even in fairly turbulent weather conditions, it would be unusual for the auto-pilot to disengage. Furthermore, the A319 crew had not encountered the same problems in the same vicinity. Some members wondered whether something else had been at play, such as an incorrect input, however, without the information from the FDR, the Board did not have that data available to them. Nevertheless, members opined that in this situation, the crew may have been better served to have immediately switched to manually flying the aircraft, rather than spending time trying to re-connect to the auto-pilot whilst all the time climbing above the cleared flight level (**CF2**). Members also thought that in such circumstances, knowing that the aircraft had been climbing away from their cleared level in the hold, the crew could have issued an emergency 'Pan' call on the radio to alert ATC of the unfolding situation; this may also have alerted other pilots in the vicinity. The TCAS had alerted the crew to the A319 (**CF3**), but at the same time the controller had taken control of the situation and had issued avoiding action to both pilots. Both pilots reported that they had been in IMC so neither had seen the other aircraft (**CF4**), however, the controller had issued effective avoiding action to increase the separation.

Turning to the actions of the A319 pilot, they had received the TCAS indication (**CF3**) and the controller's avoiding action at more or less the same time and so the Board thought that there had been little more the pilot could have done in the circumstances.

This Airprox had been reported by the controller, who had obviously been concerned by the incident. Members noted that there had been other aircraft in the hold but there had been no other reports of bad weather by other pilots in that vicinity. The Board was told by members with experience of working in the Terminal Control environment that the Coremet, weather radar, was not situated in a place where the controller could have seen it, but had been monitored by the Supervisor, but that the weather picture given to the Board in the NATS investigation (see Figure 3) would not normally have been considered to have been a problem. Therefore, the controller would not have expected the A320 to have been affected by the weather so severely. It was also pointed out to the Board that the radar screenshots in

<sup>2</sup> (UK) SERA.3205 Proximity.

the NATS investigation were not the same as that seen by the controller at the time and it was likely that the data blocks of the two aircraft would have been overlapping and therefore garbling, making it difficult for the controller to have seen that the A320 had been unexpectedly climbing. The sector had been split, but the controller had been conducting a handover to another controller when the STCA had alerted (**CF1**). Nevertheless, the Board agreed that the controller had been quick to react, it had taken the A320 only 8sec to leave FL090 and reach FL100 and avoiding action had been issued 10sec after the A320 had left the cleared flight level.

When determining the risk of the Airprox the Board considered the reports from both pilots, that of the controller, the radar screenshots and the NATS investigation. Although neither pilot had become visual with the other aircraft, because they were both in IMC, the TCAS had provided both with information, and the geometry had not become close enough to trigger a TCAS RA. Furthermore, the controller had issued timely and accurate avoiding action to both pilots. The Board therefore agreed that, whilst safety had been degraded, there had been no risk of collision; Risk Category C.

## **PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK**

### Contributory Factors:

2023141				
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
<b>Ground Elements</b>				
<b>• Electronic Warning System Operation and Compliance</b>				
1	Technical	• STCA Warning	An event involving the triggering of a Short Term Conflict Alert (STCA) Warning	
<b>Flight Elements</b>				
<b>• Tactical Planning and Execution</b>				
2	Human Factors	• Action Performed Incorrectly	Events involving flight crew performing the selected action incorrectly	Incorrect or ineffective execution
<b>• Electronic Warning System Operation and Compliance</b>				
3	Contextual	• ACAS/TCAS TA	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system traffic advisory warning triggered	
<b>• See and Avoid</b>				
4	Contextual	• Visual Impairment	Events involving impairment due to an inability to see properly	One or both aircraft were obscured from the other

Degree of Risk: C.

### Safety Barrier Assessment<sup>3</sup>

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

#### **Flight Elements:**

**Tactical Planning and Execution** was assessed as **ineffective** because the A320 pilot left their cleared level in the hold and was not able to inform ATC in time for them to stop the descent of the A319.

**See and Avoid** were assessed as **not used** because both aircraft were in IMC.

<sup>3</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).

<b>Airprox Barrier Assessment: 2023141</b>		Within Controlled Airspace						
<b>Barrier</b>		<b>Provision</b>	<b>Application</b>	<b>Effectiveness</b>				
				<b>Barrier Weighting</b>				
				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	✗	○					
<b>Key:</b>		<u>Full</u>	<u>Partial</u>	<u>None</u>	<u>Not Present/Not Assessable</u>	<u>Not Used</u>		
Provision	✓	⚠	✗	●	○			
Application	✓	⚠	✗	●	○			
Effectiveness								