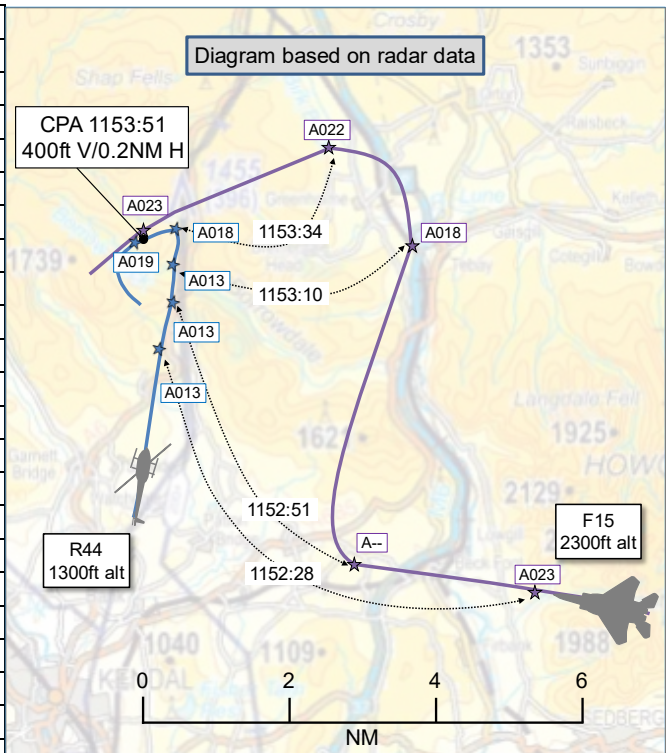


AIRPROX REPORT No 2023115

Date: 14 Jun 2023 Time: 1154Z Position: 5426N 00242W Location: 4NM west of Tebay

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	R44	F15
Operator	Civ Comm	Foreign Mil
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Unknown	None
Provider	LL Common	LL Common
Altitude/FL	1900ft	2300ft
Transponder	A, C, S	A, C, S
Reported		
Colours	Blue/white	Grey
Lighting	Strobes/landing/nav	Nav.
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	500ft AGL	1500ft
Altimeter	QNH (1021hPa)	RPS
Heading	000°	270°
Speed	100kt	NK
ACAS/TAS	TCAS I	Not fitted
Alert	TA	None
Separation at CPA		
Reported	200ft V/400m H	NK V/NK H
Recorded	400ft V/0.2NM H	



THE R44 PILOT reports they were conducting a gas pipeline survey in a Robinson R44 at approximately 500ft AGL. Their operations team had alerted them that there was potentially conflicting fast jet traffic identified via the Centralised Aviation Data Service (CADS), specifically 4 Typhoons and a Hawk, so they were monitoring the low level common frequency. They had communicated earlier with the Hawk [pilot] on that frequency. They were also in receipt of a Basic Service from London Information. At approximately 1152 they were 5NM north of Kendal, heading roughly north along the A6 at approximately 100kt, when they had heard a transmission on the low level common frequency. The quality of the transmission was not high and they had not clearly heard the entire message, but had heard words to the effect of “2 miles north of Kendal, northbound”. They immediately replied along the lines of “Low level common, Pipeline 83 is a Robinson R44 helicopter on a pipeline survey 5 miles north of Kendal, also northbound, approximately 500 feet AGL”. They heard no response to this transmission, and when they reached the top of a ridge (approximately 30sec later) they decided to perform a left orbit to try and visually acquire the traffic which, based on the transmission, was 3 miles behind them and travelling in the same direction. They had heard a similar voice report that they were travelling at 500kt a few minutes earlier.

Approximately 90° into the turn (i.e. heading approximately west) they heard a TCAS alert for traffic less than one mile away. Almost immediately they saw an F15, slightly higher than them, at about their 2 o'clock position (southwest of their aircraft). [The F15] was southbound and already south of their aircraft. They exclaimed loudly to their observer (a former military pilot) and heard a second TCAS alert, which they believed was for the aircraft they could see. They continued their turn as that took them away from the aircraft, which was already diverging. Their observer then pointed out a second F15 in trail to the first. By the time they saw the second F15 it was almost past them and they did not have time to take evasive action. Their observer saw it bank slightly towards them, suggesting they were unaware of their proximity. Shortly afterwards they heard another transmission from the F15 [pilot] stating that they were approaching Windermere from the east. They believe the minimum separation

was (conservatively) less than a quarter of a mile and 200ft vertically. They thought they were closer to the first F15 than the second, and that they did not acquire it visually until after the closest point of approach. They were seriously concerned that the wake turbulence or jet blast would affect them, although fortunately it did not. They observed no indications and heard no transmissions to suggest [the pilots of] either aircraft were ever aware of their presence. They believed there were 3 factors which exacerbated the situation. Firstly, the reported location of the flight of F15s was inaccurate, they encountered them approximately 6 miles north of Kendal about a minute after they had reported being 2 miles north of Kendal. Secondly, the direction of travel reported was completely wrong, the F15s were southbound and reported northbound and, finally, the [F15 pilot] made no reply to their transmission of their location.

They opined that these 3 factors caused them to make an orbit to try and visually acquire them, the effect of which was to both reduce the separation and delay their ability to see them, and had they continued on their course, without the orbit, [the F15s] would probably have passed about half a mile to the west of them. Their observer discussed this with their operations team who stated that CADS showed the F15s operating in the general area but did not generate a warning for a potential conflict with their planned flight. They were flying with all lights switched on (white high intensity strobe light, nav lights, landing light).

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

THE F15 PILOT reports [flying in a] formation [of 2] operating 500ft AGL in a 2NM trail. They had climbed in response to [the R44 pilot's] call (reported at 400-500ft AGL) on the low level common frequency. The F15 lead crew had recognised that the formation was potentially at the same level as [the R44] so they decided to create vertical separation with a formation climb to 1500ft AGL. The lead [pilot] had then sighted the [R44] traffic, and called the position of this to the second pilot on their intra-flight radio followed by 'no factor'. The second F15 pilot ([which the reporter] believed to be the aircraft [and pilot] involved in this Airprox) did not make visual contact with [the R44]. [The second F15 pilot] was carrying and using [an electronic flight bag (EFB)] coupled with a [flight data recorder] satellite navigation (GPS) and automatic dependant surveillance device (ADS-B In). This electronic conspicuity system showed a contact in the relevant location at 200ft below prior to the climb. [The second F15 pilot] continued their climb above 1500ft AGL when [the R44] traffic was not sighted by either crew, to approximately 3000ft. When [the F15 formation] was clear of conflict the flight lead called a new altitude on the low level common frequency and continued on their route. The crew were surprised to hear [the R44 pilot] make a radio call 'you just missed us!' as all the information that [the F15 crew] had from above indicated that they should have been well above.

The pressure setting was the regional pressure as given by RAF Leeming during let down. The F15 operating low level utilises radio altimeters (RADALT) [and they were also] using weapons system radar to scan for primary targets and [SSR] Mode 3 to aid with situational awareness in addition to [an EFB] with 'ADS-B In' electronic conspicuity equipment. [They were] briefed and noted all conflicts on CADS prior to their sortie.

The lead pilot assessed the risk of collision as 'Low'.

Factual Background

The weather at Blackpool was recorded as follows:

METAR EGNH 141150Z 13015KT CAVOK 25/06 Q1019

The relevant pipeline survey was recorded as follows:

H3171/23 NOTAMR H3158/23
 Q) EGXX/QWYLW/IV/M /W /000/065/5504N00500W999
 A) EGTG EGPX B) 2306120630 C) 2306161600
 E) PIPELINE INSPECTION NOTIFICATION PROCEDURE SYSTEM (PINS) WILL
 TAKE PLACE IN THE FOLLOWING LOW FLYING AREAS - 1,2,3,4,5,6,7N,
 7S,8,9,10,11N,11S,12,13,14E,14W,16,17,18,20T AND THE THAMES VALLEY

AVOIDANCE AREA MAX HEIGHT 2000FT AGL. UK AIP ENR 6 (PINS AREAS AND UK DAY LOW FLYING SYSTEM (DLFS)) REFERS. 23/06/061/LFC
F) SFC G) 6500FT AMSL

Analysis and Investigation

CAA ATSI

It was noted that the investigation team was unable to confirm whether London Flight Information Service (FIS) had issued the R44 pilot with a service or not. Due to the date of the event and the time elapsed since notification, in line with CAP670, they no longer possessed [recordings of] the Flight Information Service frequencies for that day.

The pilot of [the R44] had reported receiving a Basic Service from London FIS while operating in the vicinity of Kendal. The radar indicated that the [R44] transponder displayed Mode-A code 0036, which is detailed in the UK Aeronautical Information Publication (AIP) as 'helicopter pipeline/powerline inspection flights.'

They noted that the aircraft was not displaying the London FIS transponder Mode-A code of 1177, further making [ATSI] unable to confirm whether [the R44 pilot] was in receipt of a Basic Service from London FIS.

Two F15 aircraft were operating in the vicinity, displaying transponder Mode-A code 7001, which is detailed in the UK AIP as 'military fixed-wing low level conspicuity/climb-out'.

London FIS provides only a Basic Service or alerting service to aircraft and there is no reference to radar data while providing this service. As such, the operation and flight profile of the F15s would have been unknown to London FIS.

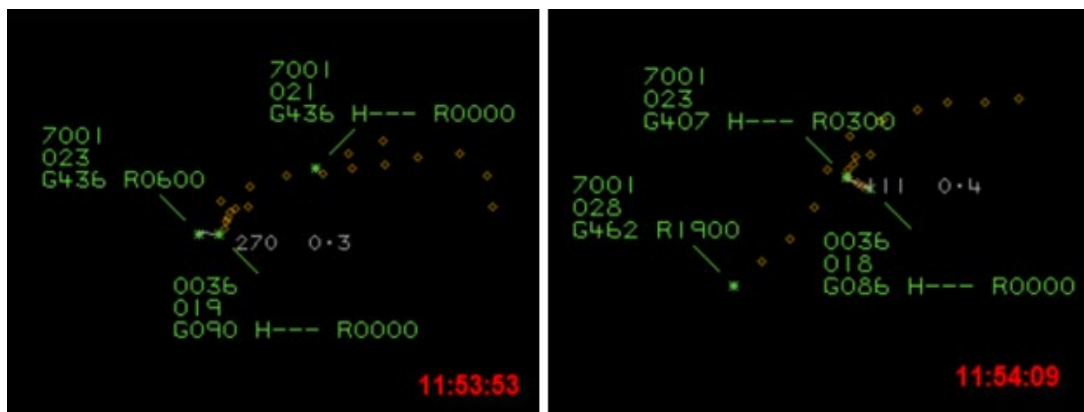


Figure 1

Figure 2

The closest point of approach between [the R44] and the first [F15] occurred at 1153:53 measured on multi-track radar as 0.3NM and 400ft (Figure 1). The closest point of approach between [the R44] and the second [F15] occurred at 1154:09, measured on multi-track radar as 0.4NM and 500ft (Figure 2). The incident was resolved by the existing tracks of the aircraft diverging.

UKAB Secretariat

An analysis of the radar replay showed that at time 1153:10 two F15s and an R44 were north of Kendal, all heading approximately north, which concurs with the narrative provided in both pilot reports (Figure 3). At this time, the R44 and first F15 had a 3.3NM and 500ft separation (Figure 3). The R44 pilot and F15 formation pilots were operating at low level with surrounding high terrain and each unsighted on the other.

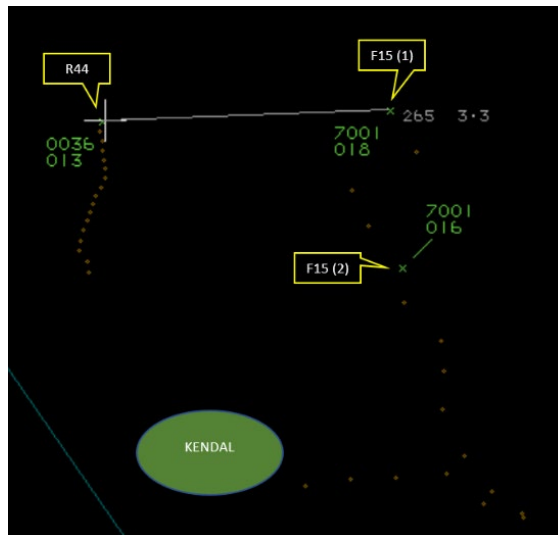


Figure 3 (1153:10) all aircraft heading north.

At time 1153:34 the first F15 altered course to the west, with the R44 to the west-southwest, still heading north. Both aircraft were indicating higher altitudes than before, with the R44 pilot in an implied climb from their report narrative ‘when they reached the top of a ridge’ and the F15 pilot’s reported climb initiative. The F15 was heading toward the R44 with separation reduced to 2.2NM and 400ft (Figure 4).

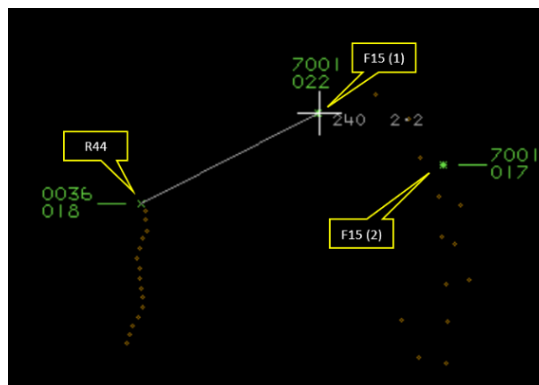


Figure 4 (1153:34) F15 formation altered heading.

At time 1153:47 the R44 was depicted in the left turn, as reported, and the F15s were both heading approximately west. The separation between the R44 and first F15 was further reduced to 0.6NM and 300ft (Figure 5) with the F15s approaching the R44 from behind.

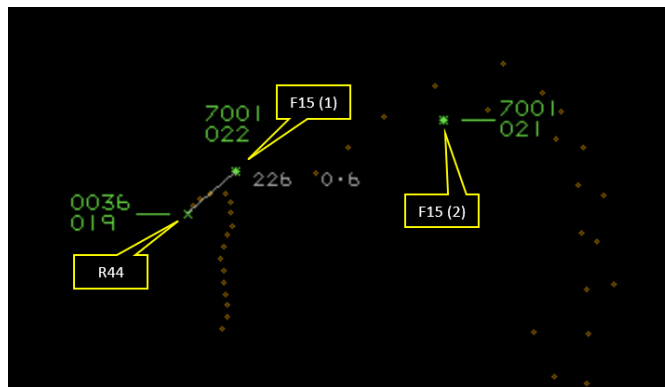


Figure 5 (1153:47) The R44 orbiting left with F15s behind.

The first F15 was indicated at the closest point of approach at 1153:51 with a separation from the R44 of 0.2NM and 400ft (Figure 6) and the second F15 followed 20sec later with a separation of 0.4NM and 400ft (Figure 7).

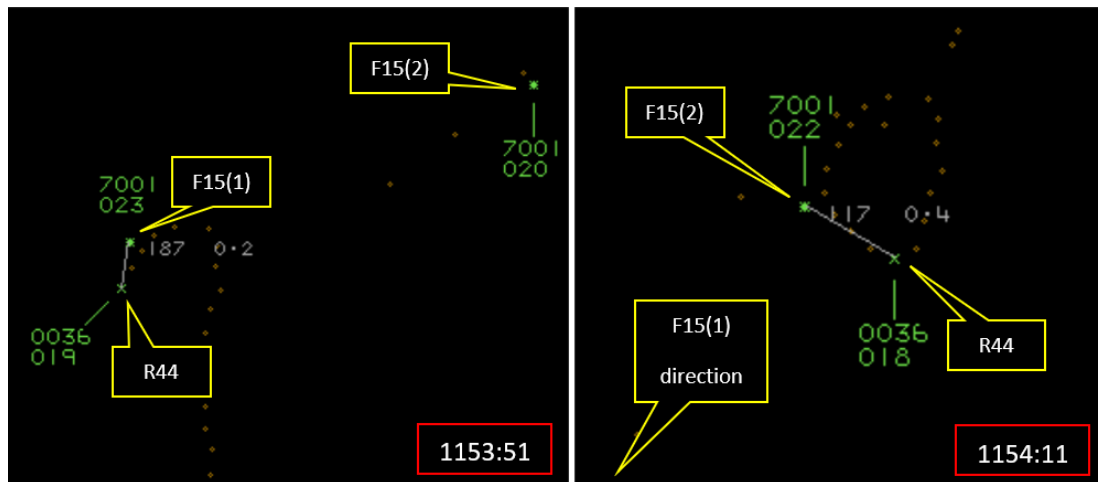


Figure 6- closest point for the first F15.

Figure 7 - closest point for the second F15

It was noted that the F15s were booked into low level on CADS at 0648 of the same day, operating in low flying area (LFA) 17 with no other F15s operating in that area.

The R44 and F15 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.¹ If the incident geometry is considered as overtaking then the R44 pilot had right of way and the F15 pilots were required to keep out of the way of the other aircraft by altering course to the right.²

Comments

USAFE

This occurrence shows the benefits of the use of the low level common [frequency] for civil aircraft that operate in areas frequented by military low level traffic. The F15 flight had been planned into the Centralised Aviation Data Service (CADS) and included a route entry point just southwest of the location [of the closest point of approach]. It appears there had been a delay to the timing of the flight and the flight occurred shortly after the time input into CADS. This is a recognised limitation of the system as it does not update real-time. The F15 crew had let down for the low level flight shortly before this occurrence and were making position calls on the low level common frequency as noted by the [R44] pilot. The F15 crew had selected a large landmark to make their position and direction call, which was broadly correct (2NM north Kendal, northbound) but in hindsight north-northeast may have been more accurate and enabled the [R44] crew to visually acquire the F15 earlier. This may have reduced the 'startle' effect and assisted the [R44 pilot] to take a different course of action. As soon as [the R44 pilot had] made the position call on the low level common frequency the F15 lead crew called on the inter flight radio instructing a formation climb to deconflict against the reported level of the [R44]. The lead then saw [the R44] and considered there was no risk of collision or a need to diverge further from the planned course. The lead notified the second F15 [pilot] that traffic was no factor and continued. Despite this call, the second F15 [pilot] had not seen [the R44] and continued to climb. The crew of the second F15 had utilised their EFB software and 'ADS-B In' device to correlate the radio position report with an information indication on the screen. Once the F15 crew had established on their new track and level they updated their position report on the low level common frequency and continued the flight. There is no doubt that the position calls improved the situational awareness of both crews which provided information on which the crews could base their decisions.

¹ (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

² (UK) SERA.3210 Right-of-way (c)(3) Overtaking. MAA RA 2307 paragraph 14.

Summary

An Airprox was reported when an R44 and an F15 flew into proximity 4NM west of Tebay at 1154Z on Wednesday 14th June 2023. Both pilots were operating under VFR in VMC, the R44 pilot was reportedly in receipt of a Basic Service from London Information and monitoring the low level common frequency, and the F15 pilot operating on the low level common frequency with no other service.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings 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 considered the actions of the R44 pilot and had agreed that their sortie had been conducted in accordance with extant permissions and procedures. Members were heartened by the R44 pilot's use of the low level common frequency, as the communications on that frequency had afforded them generic situational awareness of the F15 traffic (**CF1**). It was, however, deemed unfortunate that the R44 pilot had orbited their helicopter to sight the traffic, as this had brought them closer to the F15s. The Board noted that, during the orbit, the R44 pilot had had two TCAS alerts, one for each F15 as they had passed behind (**CF2**), and agreed that the first of these alerts had possibly startled them, causing them concern of the proximity of that first F15 in particular (**CF4**).

Moving their attention to the F15 pilots, members spent some time questioning the application of CADS as a briefing tool and had ascertained that the F15 crew had received a full briefing on all conflicts prior to their sortie. Members discussions turned to the F15s' EFB and Mode 3 system and agreed that this had helped the F15 pilots to gain generic situational awareness of the presence of the R44, in combination with the R44 pilot's call on the low level common frequency (**CF1**). The Board further opined that the existence of the VHF low level (LL) common frequency³ is perhaps not widely known outside military usage and thought that many GA pilots may be unaware of its existence and utility.

On deliberating their conclusion, the Board agreed that an F15 had flown close enough to cause concern to the R44 pilot (**CF3**) but, although safety had been degraded, the separation created by the actions of the F15 pilots had been sufficiently effective to have removed any risk of collision. Therefore, the Board assigned Risk Category C to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

2023115				
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
Flight Elements				
• Situational Awareness of the Conflicting Aircraft and Action				
1	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
• Electronic Warning System Operation and Compliance				
2	Contextual	• ACAS/TCAS TA	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system traffic advisory warning triggered	
• See and Avoid				
3	Human Factors	• Lack of Individual Risk Perception	Events involving flight crew not fully appreciating the risk of a particular course of action	Pilot flew close enough to cause concern

³ VHF Low Level (LL) Common Frequency: [EG Circ 2023 P 047 en.pdf \(ead-it.com\)](https://www.eg-circ-2023-p-047-en.pdf)

4	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
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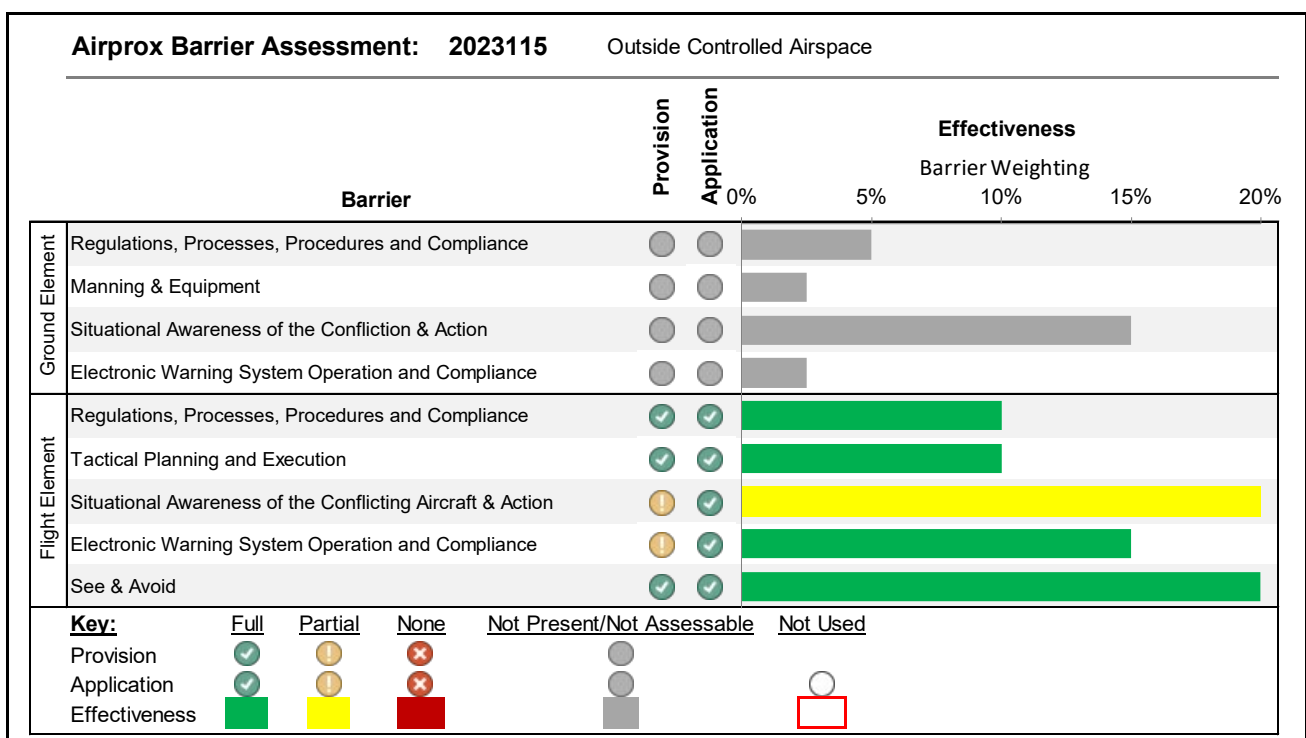
Degree of Risk: C.

Safety Barrier Assessment⁴

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

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the R44 pilot and F15 crews only had generic situational awareness of each other based on use of the low level common frequency, and additionally by the systems equipment carried by the F15 pilots.



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