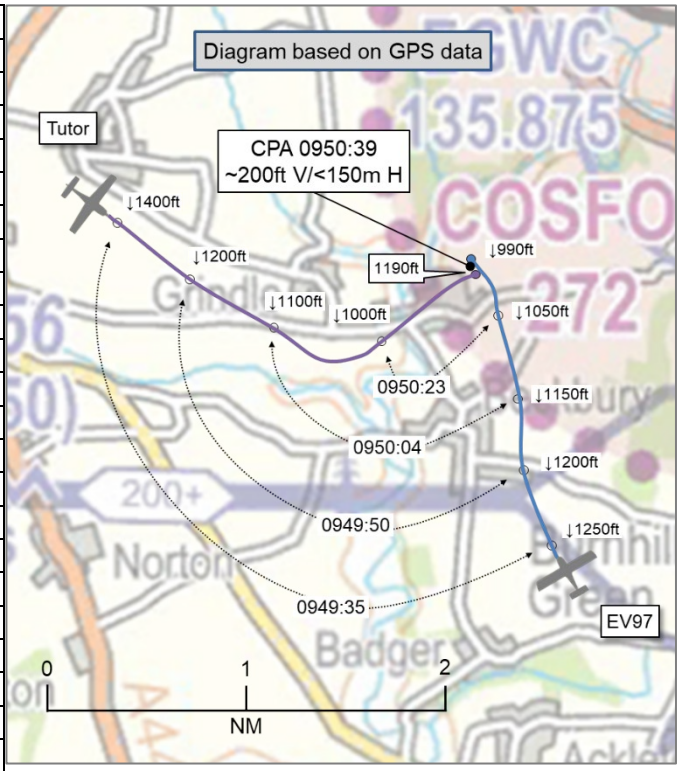
AIRPROX REPORT No 2022091

Date: 29 May 2022 Time: 0951Z Position: 5238N 00221W Location: 1.5NM WSW Cosford

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	EV97	Tutor
Operator	Civ FW	HQ Air (Trg)
Airspace	Cosford ATZ	Cosford ATZ
Class	G	G
Rules	VFR	VFR
Service	None[1]	Basic
Provider	N/A	Cosford Tower
Altitude/FL	990ft	1190ft
Transponder	Not fitted	A, C, S
Reported		
Colours	Silver/Alloy	White
Lighting	NR	Strobes
Conditions	VMC	VMC
Visibility	5-10km	5-10km
Altitude/FL	NR	1300ft
Altimeter	QNH (1021hPa)	NK (NR hPa)
Heading	340°	060°
Speed	80kt	120kt
ACAS/TAS	PilotAware	TAS
Alert	Information	None
Separation at CPA		
Reported	3ft V/500m H	100ft V/200ft H
Recorded	~200ft V/<150m H	



THE EV97 PILOT reports that the pilots of [the EV97] and [the C42] were on a cross country flight and the Airprox took place to the west of Cosford Airfield. The weather on the day was marginal with cloudbase at 2000ft max QNH around the Airprox site. They were flying VFR. They were traveling in a group of two aircraft but not in formation. They had good vertical and horizontal separation from the ground and clouds were within limits. [They were the pilot of] the second aircraft, following behind in [the C42's] 5 o'clock position. They have a single radio channel and no transponder but were equipped with [EC equipment]. They were dialled into [a pre-agreed frequency] and were in constant communication with [the pilot of the C42]. [The C42] is equipped with both dual-watch radio and ADS-B transponder. Upon reaching between Badger and Burnhill Green they were made aware, on their SkyDemon via [their EC equipment], of another aircraft on a similar heading. They and [the pilot of the C42] diverted slightly to the right to maintain separation with the converging traffic. [Both themselves and the pilot of the C42] were constantly reviewing [their EC equipment] and it became very apparent that the converging traffic had not diverted but had started a turn back onto their amended path. As the aircraft seemed to be still heading straight toward them, they descended from 1500ft. They could not climb due to cloud as this would have placed both [aircraft] into IMC. The converging traffic, at this point, was not visible to either [themselves or the pilot of the C42] and [they opine they they] must have been flying IFR at this time due to cloud base. As they were north-northwest of Ryton, the converging traffic then turned 90° heading northeast directly into their path, at this point giving no more than 3ft vertical and 500m separation from themselves. [Both themselves and the pilot of the C42] were monitoring [their EC equipment] and were aware of the converging traffic's position at all times. [Both themselves and the pilot of the C42] were therefore forced to make evasive manoeuvres to the right. [The pilot of the C42] accelerated and they put in a rapid descent from 1128ft down to 984ft at the lowest point, but climbed back up as soon as the converging traffic had passed overhead. The converging traffic passed overhead at 1198ft, they were at 980ft, and the converging traffic was still descending at this point

[1] Although not in receipt of a service the EV97 pilot was in constant 2-way VHF communication with the C42 pilot.

dropping to as low as 897ft. [The pilot of the C42] contacted Cosford and heard the controller telling the other pilot that there were 2, possibly 3 aircraft and informing them of their location. The pilot of the converging aircraft was heard by [the C42 pilot] to say that they had visual contact with one aircraft only. As soon as possible post-event [the C42 pilot], on examination [of their EC equipment playback facility], found that after the converging traffic had passed overhead, they then made an orbit to the left placing themselves directly behind [the EV97] passing behind at no more than 0.2NM at an altitude at 1222ft. They [the EV97 pilot] were at this point climbing out and were at 1180ft and unaware of [the other aircraft's] manoeuvre.

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

THE TUTOR PILOT reports that they had called for a visual recovery and had made contact with Cosford Tower, at 1300ft and 120kts heading approximately 060° towards the initial point. Visibility was 8-10km and cloudbase around 3000ft. Tower called a possible contact crossing right-to-left heading north. While maintaining height, a more intensive lookout in the contact direction identified it as a high wing white enclosed microlight aircraft at approximately 1400ft. [They assessed that they] would pass well behind this contact and assessed no further conflict; at the same time Tower informed them that there was a second contact trailing the first. Continuing lookout while maintaining heading and height the contact was spotted in approximately their 8 o'clock position, slightly low, by their cadet passenger. They manoeuvred, rolling left to get good eyes-on the second contact and confirmed a white low wing light aircraft with red stripes on its outer wings approximately 100ft below their height, and estimated that it had passed not less than 200ft behind them. At this point, they continued the left-hand orbit towards the field and resumed their approach towards Cosford.

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

THE C42 PILOT reports [that they witnessed the incident which] happened to the west of Cosford. The weather on the day was marginal with cloudbase at 2000ft. VFR was still possible as vertical and horizontal separation from the ground and clouds was within limits. They were traveling in a group of two aircraft but not in formation. They were pilot of the lead aircraft with [the EV97 following behind] in their 5 o'clock position. They had a dual-watch radio which was tuned to [a pre-agreed frequency] for the pilots of the two aircraft to chat, and tuned to [the frequency for their destination airfield]. Upon reaching Badger (or thereabouts) they were made aware, on their [EC equipment], of another aircraft on a [reciprocal] heading on a similar path. They diverted slightly to the right to maintain separation. As the other aircraft seemed to be heading still straight at them, they descended from 1500ft by 300ft – they could not climb due to cloud. The other aircraft had deviated from its path at this point and was heading at them. They diverted right again and descended another 200ft (now at 1100ft). Just south of Ryton, they entered Cosford airspace – they had the frequency by this point and so changed to it. The Air Traffic Controller had told the other pilot [the Tutor] that there were two maybe three aircraft in their path. The other [Tutor] pilot had replied that they could only see one. As soon as they could, they informed ATC that they were in their airspace – the ATCO confirmed that they had entered it. At Ryton the other aircraft [the Tutor] had turned directly into their path and they [the C42 pilot] had accelerated away at full power and descended to minimums. When the other aircraft passed behind them, at one point there was a vertical separation of 3ft, with a horizontal separation of maybe a few hundred metres at the most. The other aircraft then circled left and flew directly at them again.

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

THE COSFORD TOWER CONTROLLER reports that at approximately 0950 the Tutor pilot called complete in the local area on Cosford Approach UHF frequency and switched to Cosford Tower VHF for re-join into the visual circuit. Cosford VCR has no Air Traffic Monitor or 'STAR NG' feed but retains, (to aide controller SA), a tablet with [an aircraft EC data] app open. On inspection, they observed what appeared to be 3 contacts tracking south-to-north on a course which would take them just inside the Cosford ATZ (presented on the display). The data blocks attached to those represented aircraft were garbled but appeared to be at a similar level to the approaching [Tutor] or slightly below (less than 300ft difference). They asked the assistant to get the binoculars and look for the unknown traffic, possibly 3 aircraft. When [the Tutor pilot] called on the Tower frequency, they issued joining clearance, stating

"circuit clear", then linked a Traffic Information call, something like: *"Traffic believed to be you has traffic 12 o'clock 1 mile right-left indicating slightly below inside the ATZ – unknown".* Following that, events moved quickly with the assistant spotting a single light aircraft and [the Tutor pilot] calling visual with one, stating *"that traffic is at 1100ft".* They then interjected that there could be a second as the assistant then called visual with a second aircraft lower and in trail of the first. [The Tutor pilot] stated on frequency that they believed the [pilot of the] second aircraft had not seen them as they had just flown beneath them (meaning the Tutor had passed above the second aircraft). They then witnessed an aircraft, (they could not identify which but presumed [it to be the Tutor], manoeuvring into an orbit. At this time aircraft [C42 callsign] called VHF Tower and informed them that they were in the ATZ, at which point they informed them that they had flown through the ATZ at 1100ft and conflicted with traffic at initials. The pilot struggled to hear them and commented on the weather stating that they were struggling with cloud and wind conditions. [The Tutor pilot] resumed inbound and completed a visual circuit and landing. They asked the pilot of [the C42], now routing away to the northwest, to call on the landline when complete. At no point did they have communication with the second aircraft.

The Cosford controller was also acting as supervisor on the day and added that they therefore carried out the subsequent actions of informing the Duty Pilot and, after calling in the off-duty controller for relief, contacted the pilots of both aircraft. It subsequently appears that [the C42] was suffering with a rough running engine and struggling with wind and low cloud conditions which the pilot felt was pushing them closer to Cosford ATZ. The second aircraft (a friend of the pilot of the first) was 'in flight' but not 'in formation' with [the C42] and was doing so as both appeared to have doubts about the serviceability of the C42 and therefore could effectively 'keep an eye' on their friend. The reason given for not initiating R/T contact with ATC was pilot workload at the time and both aircraft had some form of electronic flightbag aide. Both pilots seemed not to be aware of the Cosford task or that weekends are often the busiest flying period for Air Experience Flying at the unit.

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

Factual Background

The weather at Cosford was recorded as follows:

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METAR EGWC 290950Z 05001KT 9999 -DZ FEW012 BKN030 10/06 Q1022 RMK BLU
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Analysis and Investigation

Cosford ATC Unit Investigation

Cosford completed a unit investigation and produced findings which have been summarised below:

The Tutor was recovering through initial for a standard join when ATC informed them of conflicting traffic inside the Cosford ATZ without clearance crossing right-to-left. This information was obtained from an [aircraft EC information display] app used by Cosford ATC for Situational Awareness since their radar feed from Shawbury was removed under project Marshall. While this app can be used for Situational Awareness, it cannot be used to give any avoiding action. The Tutor pilot visually acquired the crossing contact, which had passed ahead. It is likely that while the Tutor pilot was acquiring the first contact and assessing their relevant flight paths, the second contact (which the Tutor pilot had not yet been informed of, low in the Tutor's 1 or 2 o'clock) passed into the blind spot below the Tutor's nose. ATC then informed the Tutor pilot that there was a second contact in trail of the first ([which was] the aircraft now in the blind spot below the Tutor's nose). The Tutor then passed over the second contact which was not seen until it emerged in the Tutor's low 7-8 o'clock, where it was spotted by the cadet sat in the left hand seat. The Tutor pilot banked left to visually acquire the second contact and assess the proximity of their flight paths. Spotting the contact they continued around the turn maintaining visual contact and safe separation and allowing the aircraft to reposition for a standard recovery into Cosford.

Given the information ATC had available to them, there is nothing more they could have done and without the [aircraft EC information display] app, they would have been unaware of the 2 aircraft within their ATZ.

The Tutor pilot reacted to the information they had as soon as they received it but the time available and the position of the second microlight meant that they were unable to get visual contact with it until after the collision risk had passed. At no point did the Tutor TAS show either of the aircraft and this could have been due to airframe blanking below the nose.

Findings:

- Whilst the aircraft were within the Cosford ATZ without clearance, the incident could just as easily have occurred a mile to the west outside the ATZ. This is busy class G airspace and safe separation relies a lot on see and avoid. The [aircraft EC information display] app was a useful Situational Awareness tool but the warnings from ATC were too late to enable the Tutor pilot to acquire the 2 threats in close proximity visually and take avoiding action.

- Because the microlights were flying in trail but with enough separation so as to not be classed as in formation, ATC had to pass 2 traffic reports and the Tutor pilot had 2 separate contacts to acquire and assess in a very short period of time.

- The microlights were in the Cosford ATZ without clearance. While it could be argued that this incident could just as easily have occurred outside of the ATZ rather than inside, and acknowledging that it is legal to skirt close to the edge of an ATZ without contacting the ATC unit, it is not good airmanship to do so. ATZs are there because air activity is likely to be greatest close to an airfield so informing the local ATC unit of your flightpath is the best way of keeping everyone safe.

- One of the microlight pilots had had engine problems and was possibly still having difficulties. This is a possible reason why they didn't contact Cosford ATC.

Military ATM

The Cosford ADC controller received a call from the Tutor pilot on the Cosford Approach frequency requesting a visual join into the visual circuit following which the controller advised them to switch to the Cosford Tower frequency. In the absence of an Air Traffic Monitor, RAF Cosford has no radar provision, the ADC controller checked their [aircraft EC information display] and observed 3 contacts, routing south-to-north, and noted that their course would take them inside the Cosford ATZ. The ADC controller instructed the VCR Air and Space Operations Specialist (ASOS) to conduct a visual check utilising binoculars. When the Tutor pilot called on the Tower frequency a joining clearance was issued stating that the circuit was clear which was immediately followed by Traffic Information based on the [aircraft EC information display] data. The Tutor pilot reported that they were visual with the traffic and a short time later reported at initials, informing the ADC controller that the traffic was at 1100ft. This was acknowledged by the ADC controller who advised the Tutor pilot that they believed that there were two contacts, and advised the Tutor pilot that the lead aircraft was higher. After the Tutor pilot reported visual with the second aircraft, the pilot of an aircraft flying with the EV97 freecalled the ADC controller to report that they had passed the western side of the airfield inside the ATZ, to avoid an aircraft that was converging with them. They were advised of their confliction with the Tutor pilot and asked if they had tried to contact ATC however the communication appeared to be poor.

The EV97 was not detected on the NATS radars and no screenshots could be taken to show the progression of the scenario.

In the absence of an assured radar feed, the Cosford ADC controller utilised their [aircraft EC information display] app to provide a level of Situational Awareness for both themselves and the

Tutor pilot. Although the controller referred to seeing three contacts on the [aircraft EC information display] app in their report, one of which was likely to be the Tutor, initial Traffic Information only referenced a single conflicting track. The unit investigation identified that the track labels were garbled which made it difficult to properly assess how many contacts were potentially in confliction with the Tutor. It can be assumed that the Traffic Information that was passed was as accurate as the limited equipment would allow owing to the fact the Tutor pilot became visual. The lack of communication from the EV97 pilot, or the accompanying C42, added complexity to the situation and had Cosford ATC been contacted they could have potentially enhanced the situational awareness of all parties.

UKAB Secretariat

An analysis of the NATS radar replay was carried out and the EV97 was not visible; however, the UKAB Secretariat was able to obtain GPS data which displayed the routings of both the EV97 and the Tutor and, in the interests of utilising a single source of data, this was used to measure the CPA, however, some interpolation was needed between data points and so the separation at CPA is recorded as an approximation.

The EV97 and Tutor 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] If the incident geometry is considered as converging then the Tutor pilot was required to give way to the EV97.[3] If an aerodrome has an air traffic control unit, the commander of an aircraft must not fly, take-off or land within the aerodrome traffic zone unless they have first obtained the permission of that unit to enable the flight to be conducted safely within the aerodrome traffic zone.[4] Nothing in (UK) SERA regulation shall relieve the pilot-in-command of an aircraft from the responsibility of taking such action, including collision avoidance manoeuvres based on resolution advisories provided by ACAS equipment, as will best avert collision.[5]

Comments

HQ Air Command

This Airprox was subject to a Local Investigation. Cosford VCR has no Air Traffic Monitor or 'STAR NG' feed but retains, (to aide controller SA), a tablet with [an aircraft EC data] app open, which alerted them to the GA aircraft's presence. The controller passed information on one aircraft (believed to be the C42 in lead) to the Tutor pilot followed by an acknowledgement and visual call by the Tutor pilot. The controller then passed information on the second: "believe we've got 2 contacts, transit right-left". The Tutor pilot spotted the second aircraft after it had flown under them. Because ATC passed two traffic reports, the Tutor pilot had two separate contacts to acquire and assess in a very short period of time. As it was, the Tutor pilot did not acquire the second aircraft visually in time to increase separation. Given the unusual nature of the flying arrangement of the GA traffic, and their proximity to the Cosford ATZ, it would have been wise for the pilots to have informed Cosford of their routing, altitude and of both aircraft – this would have better enabled Cosford ATC to warn the Tutor pilot on their initial call of both aircraft. The GA aircraft were effectively invisible to both the Tutor TAS and Cosford ATC, although the [aircraft EC data app] provided, albeit unassured, information to the controller and therefore the Tutor pilot. Visual acquisition by the Tutor pilot assisted them in maintaining safe separation from the C42; the Tutor pilot was unsighted with the EV97 until after CPA and, it appears from the EV97 pilot's narrative, that they were not visual with the Tutor either. It is good to see that the GA pilots were carrying [EC equipment] and acted on the information presented via the system in good time; it is unfortunate that their route amendment was such that it brought them and the Tutor into confliction.

[2] (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.
[3] (UK) SERA.3210 Right-of-way (c)(2) Converging. MAA RA 2307 paragraph 12.
[4] The Rules of the Air Regulations 2015, Section 3, Article 11(3).
[5] (UK) SERA.3201 General.

AOPA

Whilst flying, lookout is the primary method for avoidance of a MAC, where radar is available it should be used to an appropriate level for the conditions in which pilots are flying, and backed-up by EC. In this case the EC worked for the EV97 pilot and a late call from ATC to the Tutor pilot alerted them to the conflict, allowing the pilots to take action. It is heartening to note the EV97 pilot aviated, navigated and communicated, although entry to the ATZ occurred, it avoided a potential MAC.

Summary

An Airprox was reported when an EV97 and a Tutor flew into proximity 1.5NM west-southwest of Cosford at 0951Z on Sunday 29th May 2022. Both pilots were operating under VFR in VMC, the Tutor pilot in receipt of a Basic Service from Cosford Tower and the EV97 pilot not in receipt of an ATS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, GPS position data, 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.

The Board first discussed the actions of the EV97 pilot and members noted that, as they had not been in formation, they would have had full individual responsibility for their own planning, navigation and execution of their flight. Members considered the routing flown and agreed that it is good practice to follow the advice contained within the Skyway Code and, when able, plan to allow 2NM from the edge of airspace, including ATZs (**CF2**) and also, when practical, make contact with the ATSU of the airspace (**CF4**). A GA pilot member stated that lookout is the primary barrier for MAC avoidance, however, the Board had been encouraged that the EV97 pilot had made effective use of their EC equipment, which had detected the presence of the Tutor (**CF8**). The Board went on to agree that the EV97 pilot had not become visual with the Tutor until after the Tutor had overflown the EV97 and that this had occurred after the CPA (**CF9**). Members agreed that it had been unfortunate that the descent and the turn that the EV97 pilot had made to provide separation from the Tutor had not prevented the aircraft from coming into proximity. Members also discussed the direction of the early turn that the EV97 pilot had made when they first detected the presence of the Tutor on their EC device, and wondered whether a turn to the left may have been a better option. It was unclear to the Board how much time the EV97 pilot had had to assess the geometry of the encounter but, as the aircraft converged, the effectiveness of a left turn in improving the situation had diminished and so the EV97 pilot had elected to turn to the right. The right turn made by the EV97 pilot had taken them into the Cosford ATZ and members noted that they had not contacted Cosford Tower first to obtain the necessary information to enter (**CF2, CF3**); however, the Board agreed that the pilot had been correct in prioritising collision avoidance.

Next, members discussed the actions of the Tutor pilot and noted that their EC equipment had been incompatible with the equipment carried by the EV97 pilot and, as such, they had not received any alert (**CF7**). Members agreed that, as the first piece of Traffic Information they received had not related to the EV97, they had not had any awareness of its presence (**CF6**), and they had not become visual with it until after they had overflown it (**CF9**).

The Board then considered the actions of Cosford ATSU and agreed that the Tower controller had been able to build generic situational awareness of the traffic (**CF1**) by utilising the aircraft EC data app and working with their ASOS, who had visually acquired the aircraft using their binoculars. Members discussed that the Traffic Information that they had passed had been delivered in two separate transmissions, however, agreed that the controller had passed-on the best information that they had available at the time.

Finally, the Board considered the risk involved in this Airprox. Members noted that the pilot of the Tutor had not had any awareness of the presence of the EV97, nor had they become visual with it. The EV97 pilot had Situational Awareness of the Tutor and, although they had made a turn to avoid it based on

this, they had not been visual with at and separation had continued to decrease. The Board discussed the separation that had existed at the CPA and, although members agreed that safety had been degraded, they were satisfied that the separation that had existed had meant that there had been no risk of collision. Consequently, the Board assigned a Risk Category C to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2022091			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Situational Awareness and Action			
1	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late, no or inaccurate Situational Awareness
	Flight Elements			
	• Regulations, Processes, Procedures and Compliance			
2	Human Factors	• Use of policy/Procedures	Events involving the use of the relevant policy or procedures by flight crew	Regulations and/or procedures not complied with
	• Tactical Planning and Execution			
3	Human Factors	• Airspace Infringement	An event involving an infringement / unauthorized penetration of a controlled or restricted airspace.	E.g. ATZ or Controlled Airspace
4	Human Factors	• Communications by Flight Crew with ANS	An event related to the communications between the flight crew and the air navigation service.	Pilot did not request appropriate ATS service or communicate with appropriate provider
5	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			
6	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			
7	Technical	• ACAS/TCAS System Failure	An event involving the system which provides information to determine aircraft position and is primarily independent of ground installations	Incompatible CWS equipment
8	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
	• See and Avoid			
9	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

Degree of Risk: C

Safety Barrier Assessment[6]

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

Flight Elements:

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

Regulations, Processes, Procedures and Compliance were assessed as **partially effective** because the EV97 pilot had not gained permission from the Cosford Tower controller prior to entering the ATZ.

Tactical Planning and Execution was assessed as **ineffective** because the route taken by the EV97 pilot had taken them into close proximity to Cosford ATZ and they had not made contact with the ATSU, also, their plan adaption after they had become aware of the Tutor had been insufficient to avoid the conflict.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the Tutor pilot had not had any awareness of the presence of the EV97 prior to the Airprox as the Traffic Information they received had been passed after CPA.

See and Avoid were assessed as **ineffective** because neither pilot visually acquired the other aircraft before the CPA.