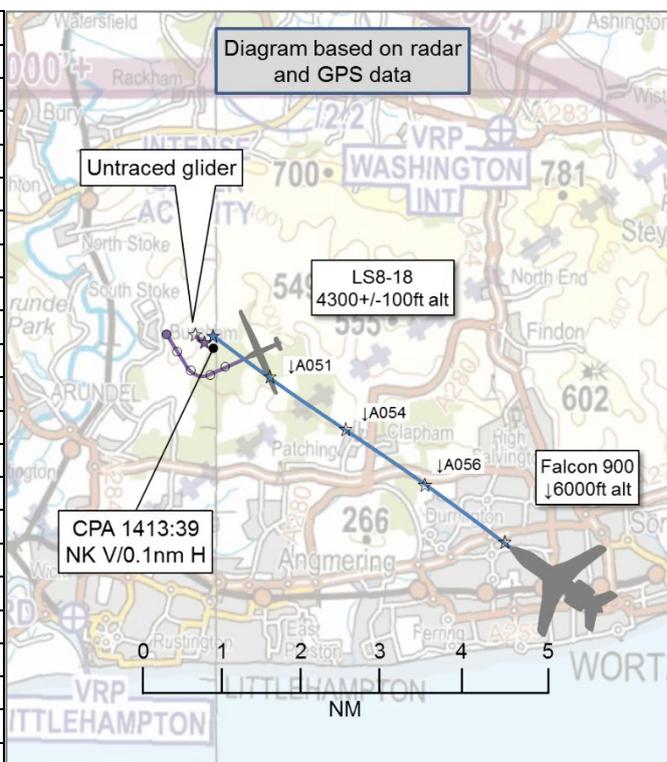


AIRPROX REPORT No 2019291

Date: 02 Oct 2019 Time: 1414Z Position: 5053N 00037W Location: 6nm NW of Littlehampton

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Falcon 900EX	Unknown glider
Operator	Civ Comm	Unknown
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	Radar Control ¹	None
Provider	London TCC	
Altitude/FL	5000ft	
Transponder	A, C, S	
Reported		
Colours	White/blue	
Lighting		
Conditions	VMC	NK
Visibility		
Altitude/FL	5000ft	
Altimeter	QNH (1020hPa)	NK
Heading	330°	
Speed	230kt	
ACAS/TAS	TCAS II	Unknown
Alert	Unknown	Unknown
Separation		
Reported	200ft V/~1000m H	NK
Recorded	NK V/0.1nm H	



THE FALCON 900EX PILOT reports that he was in the descent to his destination and had been cleared to descend to 5000ft by the London controller. Shortly after levelling at his cleared altitude, he spotted a white glider, possibly with a high tail, 800-1000m away. He did not take any avoiding action but reported the Airprox to ATC.

The pilot did not make an assessment of the collision risk.

THE GLIDER PILOT could not be traced.

AN LS8 GLIDER PILOT who was flying in the vicinity at the time of the Airprox reports that he was conducting a task from his start and finish point via waypoints at Eastbourne, Harting and Membury Airfield. For the most part, the flight was conducted in company with two other gliders from the same airfield. At the time of the report, the other two gliders had taken a more northerly route, to the north of the South Downs Ridge, and were approximately 8-10km WNW of his position. He does not recall anything unusual occurring during the flight; it is possible that he saw the reporting aircraft but considered there to be no risk – he cannot recall with certainty. He does recall seeing another glider in the vicinity at around the same time, 2-3km to the SSE of his position. In reviewing his flight trace he established that, at the reported time of the encounter, he made a 90° turn to the right (from a heading of approximately 230°). It is possible that this was in response to sighting another aircraft converging from his left, but he cannot say for certain that this was the case. It is possible that he made the turn to increase his conspicuity to the other aircraft and deconflict. Because he does not recall anything untoward occurring during the flight, he can only assume that, if his was the glider in question, it would seem that he must have assessed it to be a very low risk and consequently dismissed it as a non-event.

¹ At the time of the Airprox, the Falcon had descended out of Controlled Airspace but no change of Service had been agreed between the pilot and the controller. An aircraft cannot be under Radar Control in Class G airspace.

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

THE TC WILLO SECTOR CONTROLLER reports she was controlling during a very complex session with many Farnborough inbounds and outbounds. She descended the [Falcon C/S] to 5000ft in an area where the base of CAS is 5500ft and intended to change the Service as she saw the aircraft leave controlled airspace. Unfortunately, due to being very busy with several other aircraft, as well as responding to a garbled transmission, she didn't get to do this in time and the aircraft subsequently reported being in close proximity to a glider whilst outside controlled airspace.

The controller did not make an assessment of the collision risk.

Factual Background

The weather at Brighton City Airport was recorded as follows:

METAR EGKA 021420Z 33010KT CAVOK 13/03 Q1019=

Analysis and Investigation

NATS ATSI

The TC WILLO controller issued a descent to the [Falcon C/S], a Farnborough inbound aircraft, to altitude 5000ft. This descent positioned the [Falcon C/S] outside Controlled Airspace without an associated change in Flight Service, placing the [Falcon C/S] into close proximity with a glider. The pilot of the [Falcon C/S] submitted an Airprox report reference the confliction with the glider. The [Falcon C/S] was inbound to Farnborough from the south-east. The aircraft was established on the TC WILLO frequency in the descent to FL90 to be level by position NOTGI on radar heading 310°. The [Falcon C/S] was sequenced behind another aircraft that was inbound to Farnborough.

At 14:09:45, the WILLO controller instructed the pilot of the [Falcon C/S] to descend to FL70.

A sporadic primary radar return displayed approximately 5nm west of Shoreham airfield. This return was subsequently identified by the pilot of the [Falcon C/S] as a glider.

At 14:11:45, the WILLO controller instructed the pilot of the [Falcon C/S] to “*descend altitude five thousand feet, London QNH one-zero-two-zero.*” See Figure 1 for the relative positions of the aircraft and the airspace boundary with the base of Controlled Airspace of 5500ft highlighted in yellow. The primary return associated with the glider is circled in red.

The [Falcon C/S] proceeded to vacate Controlled Airspace in the descent at 14:13:07, with no associated change in Flight Service or discussion with the WILLO controller.



Figure 1



Figure 2

Coincident with this, deconfliction minima were eroded between the [Falcon C/S] and the glider, see Figure 2.

ATSI Note: Because no change in Service was agreed with the pilot of the [Falcon C/S] prior to the aircraft vacating Controlled Airspace, for investigative purposes the aircraft was assessed to be in receipt of a Deconfliction Service.

The Closest Point of Approach between the [Falcon C/S] and the glider occurred at 14:13:39 and was recorded on the LTCC Multi-Track Radar as 0.1nm and 200 feet (altitude was subsequent pilot estimate), see Figure 3.



Figure 3

At 14:13:50, the WILLO controller issued the pilot of an unrelated aircraft with a heading instruction and received a garbled response. At the end of that subsequent R/T exchange the following excerpt was audible “do have crewmember...Falcon C/S”. The WILLO controller instructed the pilot of the [Falcon C/S] to say again, and at 14:14:13 the pilot of the [Falcon C/S] stated “just had an airmiss with a glider, down our left side, about forty seconds ago, same level.” The WILLO controller replied “thanks for the information, you can route now direct to ROVUS.”

Deconfliction minima between the [Falcon C/S] and the glider was assessed to be restored at 14:14:59 when the [Falcon C/S] re-entered controlled Airspace and was subsequently issued descent to altitude 4000ft prior to transfer to Farnborough Radar. In later telephone calls between LTC supervisory staff and Farnborough reference the [Falcon C/S], Farnborough stated that it was the pilot’s intention to submit an Airprox regarding the confliction with the glider.

Information available to the investigation included:

- CA4114 from the TC WILLO controller.
- NATS 4118.
- Radar and R/T recordings.
- ATSI and Human Performance Interview with TC WILLO Controller.

The WILLO controller was an experienced controller who operated on a full-time watch pattern i.e. mornings, afternoons and nightshifts. They operated predominantly as a controller on TC South; however, they did carry out other watch-based duties. This event occurred on their second afternoon shift (1300-2100) and the WILLO controller in interview reported that they were well rested and had a ‘normal’ morning prior to the afternoon duty.

The previous day, the WILLO controller had operated as the South West Departures/Ockham controller (SW Deps/OCK) in a weather avoidance scenario and they had submitted an Overload report for this session. They stated that, during the overload, it had been a “real battle to get Gatwick NOVMA departures up against the Farnborough inbounds” as the Gatwick departures had been turning left, resulting in the then WILLO controller expediting descent of the Farnborough inbound aircraft and the SW Deps/OCK controller expediting climb of the Gatwick departures. The WILLO controller’s initial reaction from the overload the previous day was that they had not “known what they were doing”, although viewing the overload replay gave them confidence that they had handled the situation well. They had been offered Critical Incident Stress Management (CISM) following the overload but had not accepted the offer.

The Airprox occurred on the second radar session of the shift. The WILLO controller had a quiet first session on SW Deps and had a normal break prior to returning to take over the WILLO position. They received a full handover as per the ‘PRAWNS’ methodology,² stating that the outgoing controller was involved in discussions with two Farnborough inbound aircraft reference their speeds (one of which was the [Falcon C/S]). The previous controller had carried out the relevant coordination for these aircraft and, as a result, there were few immediate tasks that the WILLO controller had to undertake. The WILLO controller made their first transmission in response to a question from the pilot of the [Falcon C/S] at 14:05:30.

The WILLO controller recalled that there were initially very few WILLO inbounds but the MID departure bay began to ‘ramp up’. The WILLO controller reported that they felt that the ExCDS³ environment demanded more of their attention, in that they needed to look at the electronic strips to write on them as opposed to the previous paper strips where they could continue to radar monitor whilst manipulating the strips. The WILLO controller stated that they turned to their colleague and suggested that traffic levels were about to increase significantly. They stated that they perceived the traffic build-up to be quick and that the traffic was high in complexity due to lots of crossing tracks with inbound and outbound Farnborough traffic. Following the overload the previous day, it is highly probable that the WILLO controller felt stressed with an expectation bias that an overload could happen again. At this point, they classified workload as moderate-to-high for both workload and complexity, and they felt really busy. The WILLO controller was working through the strips. The expectation bias of a potential overload may have impacted their performance, affecting their planning and decision making with potential tunnel vision as to the sector priorities.

An R/T occupancy assessment was produced for the WILLO frequency as used throughout the event (Figure 4).⁴ This R/T diagram indicated a period of significant R/T loading between 14:10-14:17, corresponding with the WILLO controller’s narrative of the busy traffic period.

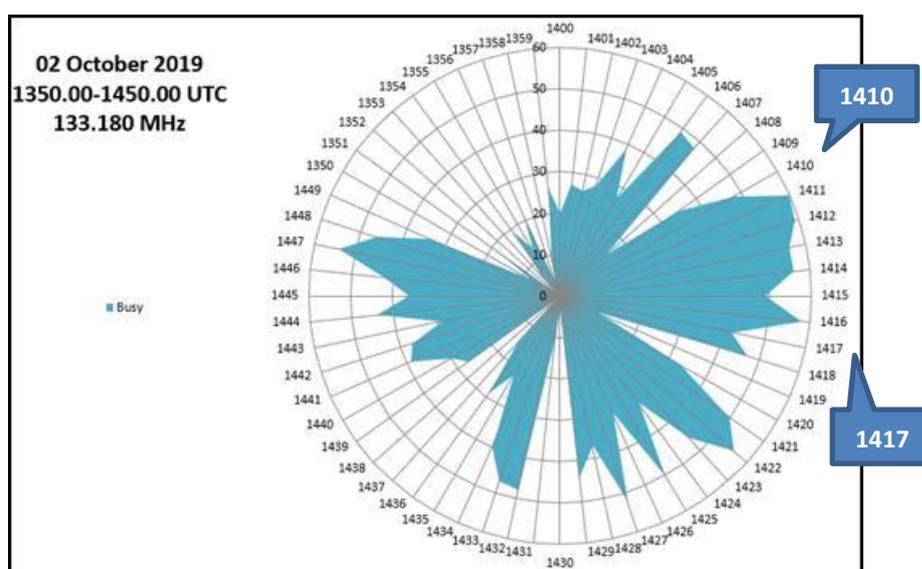


Figure 4

² A NATS mnemonic for controller handover/takeover of position – Pressure, Radar used/Runway in use, Airspace, Weather, Non-standard elements, Situation.

³ The London TC Electronic Flight Progress Strips system.

⁴ Each segment represents one minute within the 1-hour time period. Radiating out from the centre, each circle of increasing size represents 10secs, ultimately totalling the 60secs in each minute. The greater the blue area, the busier the RTF and telephone combined.

A sporadic primary radar return displayed approximately 5nm west of Shoreham airfield. This return was subsequently identified by the pilot of the [Falcon C/S] as a glider. At 14:13:19, the glider return was briefly displayed as two separate returns, see Figure 5 for the final update with two returns highlighted in red. There was only one glider reported by the pilot of the [Falcon C/S]. [UKAB note: subsequent analysis of the radar tracks indicates that there were 2 independent tracks – that of the LS8-18 heading north and an untraced glider heading south.]

The [Falcon C/S] was being sequenced behind another Farnborough inbound aircraft. The flight-planned route for the aircraft was toward GWC; however, the controller stated that the base of Controlled Airspace there was FL65 and that it is important to descend the Farnborough inbounds to avoid conflicts with Gatwick outbound aircraft. Therefore, these inbound aircraft are customarily positioned to the east of GWC where the base of Controlled Airspace is 5000ft.

At 14:11:45, the controller instructed the pilot of the [Falcon C/S] to “descend altitude five thousand feet, London QNH one-zero-two-zero.” see Figure 6.



Figure 5

At the issuance of this descent clearance, the aircraft was 13.2nm from the boundary of Controlled Airspace where the base was 5000ft.



Figure 6

The WILLO controller reported in interview that they would never normally issue descent to a Farnborough inbound there. The WILLO controller, in hindsight, was surprised that they had issued descent to the [Falcon C/S] in that position. This would correlate with a visual search failure due to the pressure of the traffic scenario and the controller not fully assimilating the information on the radar. The WILLO controller further elaborated that there was no intention for the [Falcon C/S] to leave Controlled Airspace in that location. There can be rare occasions when Farnborough inbound aircraft may leave Controlled Airspace in this location (due traffic scenarios or pilot requests); however, in this event, it was wholly their intention for the [Falcon C/S] to remain within Controlled Airspace. On such occasions where it is intended for aircraft to leave Controlled Airspace, the

WILLO controller will usually advise the pilot that they are going to leave Controlled Airspace as part of the associated descent clearance and, as this was absent in this case, this reinforced their belief that it was never their intention for the [Falcon C/S] to descend outside Controlled Airspace.

Due to the previous day's overload, where the positioning of high Farnborough inbounds had created potential conflicts with Gatwick departures, the WILLO controller may have had an association bias as they were cognisant of the problems that scenario had caused.

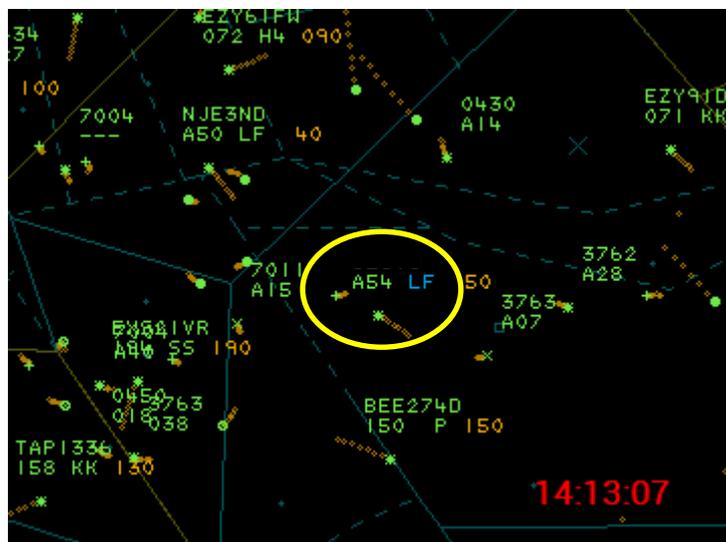


Figure 7

As the [Falcon C/S] vacated Controlled Airspace at 14:13:07, the outside Controlled Airspace Tool (oCAT) activated. oCAT displayed as a blue indication on the route field of the Track Data Block (TDB) of the [Falcon C/S], see Figure 7 for portion of WILLO slave radar replay. The WILLO controller reported that they did not see the oCAT alert on the radar display.

At 14:14:13, the pilot of the [Falcon C/S] stated *“just had an airmiss with a glider, down our left side, about forty seconds ago, same level.”* The WILLO controller replied *“thanks for the information, you can route now direct to ROVUS.”*

The WILLO controller initially assumed the conflict was an error on the glider's part and that the glider had entered Controlled Airspace. The WILLO controller had an inaccurate mental model and was not expecting the [Falcon C/S] to be outside Controlled Airspace. The WILLO controller then glanced at the radar position and processed that the [Falcon C/S] had vacated Controlled Airspace. The WILLO controller promptly called for help and attempted to maintain focus to carry on controlling before they were relieved from position. The pilot of another aircraft inbound to Farnborough enquired as to the location of the glider and this exchange confused the controller, further exacerbating their perception of the event. The WILLO controller was relieved from the sector and discussed the event with the Group Supervisor.

ATSI had a telephone conversation with the pilot of the [Falcon C/S], where it was stated that the pilot was not cognisant that the aircraft had vacated Controlled Airspace. They were expecting to be transferred from London Control to Farnborough, and only then to be issued descent outside Controlled Airspace. The pilot stated that the flight in the descent to 5000ft was operating 70-80% in cloud and the aircraft was in IMC and just skirting the cloud-base. The pilot was in the process of reducing speed as they had been experiencing a little turbulence and therefore the aircraft was slower than they would have been in clean air. They reported that they had the glider as a momentary vision, with the glider going straight under the wing, possibly 200 feet underneath the aircraft and 800 feet laterally away. The pilot of the [Falcon C/S] stated that the WILLO controller was busy, like *“a machine gun”*, and it took them a little while to put the call in reference the glider sighting.

UKAB Secretariat

The Falcon 900EX and untraced glider pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.⁵ If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right.⁶

⁵ SERA.3205 Proximity.

⁶ SERA.3210 Right-of-way (c)(1) Approaching head-on.

Comments

BGA

The South Downs are often busy with gliders in a northerly wind. We commend the Falcon pilot for his lookout.

Summary

An Airprox was reported when a Falcon 900EX and an unknown glider flew into proximity about 6nm NE of Goodwood at 1414hrs on Wednesday 2nd October 2019. The Falcon pilot was operating under IFR in VMC and the glider pilot was operating under VFR in VMC; the Falcon pilot was technically not in receipt of a Service (an aircraft cannot be under Radar Control outside controlled airspace) from the WILLO sector controller and the glider pilot was not in receipt of an Air Traffic Service.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of the Falcon and a nearby glider, transcripts of the relevant RT frequencies, radar photographs/video recordings, a report from the air traffic controller involved and a report from the appropriate ATC operating authority. 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 considered the actions of the Falcon pilot. An airline pilot member wondered if the Falcon pilot had placed too much reliance on ATC regarding the aircraft's navigation because he had, in fact, been unaware that the controller's instructions had descended his aircraft outside controlled airspace. It is incumbent on aircraft commanders to monitor both the vertical and lateral navigation of the aircraft throughout the flight, whether the aircraft is operated under IFR or VFR. Members agreed that, without any Traffic Information from the controller or warning from the TCAS, the Falcon pilot had no way of knowing about the presence of the glider (**CF9, CF10**). Furthermore, the Board considered that the Falcon pilot's flight conditions had hindered his ability to see the glider sooner because his descent had been conducted for the most part in IMC and he had levelled just below the base of the prevailing cloud (**CF11**); this had led to the Falcon pilot only spotting the glider as it passed abeam and under his left wing (**CF12**).

Members then discussed the actions of the WILLO sector controller. An area radar controller member, familiar with the sectors, suggested that the controller's mental model was that the Falcon was still inside controlled airspace (which had been their intention at that time) and they had therefore probably mentally discounted the primary return, deeming it to be outside controlled airspace because it had no SSR return. The Board heard from a controller advisor that controllers are used to seeing primary returns in this area but have to operate on the premise that they are outside controlled airspace unless there is any specific information to indicate otherwise. It is likely that the controller in this case did not even assimilate the presence of the primary return (**CF2**), particularly in view of the high workload at the time. Notwithstanding, the Board agreed that, although inadvertent, the fact of the matter was that the controller had instructed the Falcon pilot to descend outside controlled airspace (**CF3**). Due to this being an unintentional action, they had therefore not been cognisant of the conflict occurring outside controlled airspace and so had not changed the ATS nor issued Traffic Information on the primary return (**CF1, CF4**) (an aircraft cannot be under Radar Control outside controlled airspace and the Service had not been changed). Members then discussed the implications of both the pilot and controller believing that the aircraft was inside controlled airspace and therefore thinking it was in receipt of Radar Control. After much discussion, members felt that both the controller and the pilot had therefore held the view

that the controller had been responsible for safe separation from other aircraft, and that this had not been achieved (**CF5**) because the controller had effectively cleared the Falcon pilot to descend outside controlled airspace and into conflict with the glider (**CF3**). In mitigation, the Board unanimously agreed that the controller had been experiencing an extremely high-workload session (**CF6**), particularly around the time of the Airprox, and that this had reduced the likelihood of the controller noticing anything abnormal. A controller member also pointed out that, until the recent changes to the airspace around Farnborough, it had been commonplace for the oCAT to alert at some point for aircraft inbound to Farnborough, so it was unsurprising that the WILLO controller had neither spotted nor reacted to the oCAT alerting for the Falcon (**CF7, CF8**).

When considering the risk, the Board discussed whether the Falcon pilot had, in fact, seen the untraced glider or if he was reporting having sighted the LS8. Members noted some incoherence in reported separation distances between the Falcon pilot's written report to the UKAB and his verbal account to the NATS investigation. However, after much discussion, which included reference to the recorded radar and GPS data, members were in agreement that, on the balance of probability, the Falcon pilot had seen the nearer of the 2 gliders – the untraced glider. The Board expressed its gratitude to the pilot of the LS8 for providing a report and a GPS track log, because the inclusion of this data had enabled members to reach this conclusion. Taking into account that the Falcon pilot had been in IMC for the majority of his descent, and that he had only seen the glider as it passed under his wing, the Board agreed that safety had been much reduced below the norm and that a degree of collision risk had been present; Risk Category B.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2019291		
CF	Factor	Description	Amplification
	Ground Elements		
	• Regulations, Processes, Procedures and Compliance		
1	Human Factors	• ATM Regulatory Deviation	Regulations and/or procedures not complied with
	• Situational Awareness and Action		
2	Contextual	• Situational Awareness and Sensory Events	Generic, late, no or incorrect Situational Awareness
3	Human Factors	• Inappropriate Clearance	Controller instructions contributed to the conflict
4	Human Factors	• Traffic Management Information Provision	Not provided, inaccurate, inadequate, or late
5	Human Factors	• Separation Provision	Not Achieved
6	Human Factors	• Distraction - Job Related	
7	Human Factors	• Monitoring of Equipment/Instruments	Equipment misinterpreted
	• Electronic Warning System Operation and Compliance		
8	Human Factors	• Conflict Alert System Failure	Controller did not adequately act on the conflict alert
	Flight Elements		
	• Situational Awareness of the Conflicting Aircraft and Action		
9	Contextual	• Situational Awareness and Sensory Events	Generic, late, no or incorrect Situational Awareness
	• Electronic Warning System Operation and Compliance		
10	Technical	• ACAS/TCAS System Failure	Incompatible CWS equipment
	• See and Avoid		
11	Contextual	• Poor Visibility Encounter	One or both aircraft were obscured from the other
12	Human Factors	• Monitoring of Other Aircraft	Late-sighting by one or both pilots

Degree of Risk: B

Safety Barrier Assessment⁷

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

Ground Elements:

Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because the WILLO controller inadvertently descended the Falcon below the base of Controlled Airspace without changing Service and without issuing Traffic Information to the Falcon pilot on the primary contact.

Situational Awareness of the Confliction and Action were assessed as **ineffective** because the primary contact was displayed on the radar screen but the controller had not assimilated its significance with the Falcon now outside Controlled Airspace and effectively descended the Falcon into conflict with the glider.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because STCA will not alert on a target that is not transponding. Additionally, the controller did not notice the oCAT warning attached to the Falcon's Track Data Block.

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot had received any indication or prior warning of the presence of the other aircraft.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the TCAS II fitted to the Falcon cannot detect non-transponding traffic.

See and Avoid were assessed as **ineffective** because, although the Falcon pilot saw the glider, it was too late to materially affect CPA.

⁷ 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: 2019291		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								