The RAF Safety Magazine

Issue 51

AirClues



Authority Gradients
I Learnt About Flying From That ...
Personal Protective Equipment

ROYAL AIR FORCE
Safety Centre













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Foreword

By Air Commodore David Cooper, Inspector of Safety (RAF)


Air Commodore David Cooper

Welcome to Issue 51 of Air Clues. This magazine continues to provide superb articles, updates and thought-provoking material for you. I commend in particular the work by Dr Simon Bennett of Leicester University on Authority Gradients.

I think the article by Rob Holliday (UK Flight Safety Committee) is a must-read. It is a very comprehensive narrative about a Bell 206 helicopter accident with clear aviation takeaways, especially if you are vulnerable to loss-of-situational-awareness and visual references.

You will also read with interest a piece from the Director Support team on Personal Protective Equipment, known as PPE. In the environments in which we work, where hazards seem to be hiding everywhere, PPE is a firm barrier against injury, or worse. PPE is designed to keep you and your colleagues safe. Wear PPE on every occasion. Use buddy-buddy checks as the norm, reminding each other to use the right kit. We rely on your feedback to keep improving PPE. I encourage you to report when PPE is not working, or does not protect against the hazards you face, or could be configured to allow you to do a more effective job. Keep us informed!

As I write I can feel winter approaching. As you read, it is here. The onset of cold and wet weather brings challenges that seemed to be so far away when we were basking in the record-breaking summer. Think through how Safe Place, Safe Person, Safe Practice and Safe Plant (Equipment) are affected by these conditions. Have you revised your Risk Assessments accordingly? Are you prepared for the first 2-3 months of 2027? What can you do now, before it is too late?

Lastly, how many people in your environment have moved on? How many new faces are around you? How much knowledge and experience of your safety environment has left the building? Make sure that you include a comprehensive safety brief in your handovers. New team-members need to be up-to-speed with safety on Day One.

I wish you a pleasant and safe break, and an enjoyable New Year.
Keep reporting!!

> “We need your 'I learned about flying/ engineering / air traffic from that' articles. Please write to Wg Cdr Spry with your open and honest stories.”

Safety Awards



Flight Lieutenant Stohrer – RAF Lossiemouth – Distinction

Flight Lieutenant Stohrer was flying a Typhoon FGR4 aircraft during an Operational Mission. During this mission, his aircraft suffered a critical and irreversible failure of the Head-Up Display (HUD). Approximately five hours into an eight-hour sortie, and at significant distance from base, the HUD system failed completely, resulting in the total loss of projected symbology. Despite calmly diagnosing the fault and conducting appropriate airborne recovery actions, including power cycling and selection of alternative system modes, the failure proved irrecoverable. Crucially, he was required to conduct multiple air-to-air refuelling (AAR) procedures with one in near-dark conditions without access to standard HUD references. Wearing the Helmet Mounted Symbology System (which precluded the use of Night Vision Goggles), he relied solely on limited external visual cues. With disciplined decision-making, he took additional time to stabilise in the pre-contact position, carefully verifying spatial awareness before committing to contact. Using subtle visual references and applying effective crew coordination with the supporting tanker, he successfully completed refuelling and enabled the safe recovery of the aircraft.



Air Specialist (Class 1) Fletcher – RAF Coningsby – Merit

Air Specialist (Class 1) Fletcher was conducting Air Traffic Control Runway Caravan duties during routine night flying operations at RAF Coningsby. When conducting last-look checks prior to an aircraft departure, he identified abnormal sparking originating from a Typhoon engine during take-off. Recognising the potential severity of the situation, he acted promptly, informing the pilot via the tower controller. The timely detection and accurate reporting of the developing hazard enabled the aircrew to conduct an informed assessment of the aircraft's condition whilst airborne. Subsequent investigations revealed an engine malfunction that resulted in visible sparks on an increase of power and abnormal engine indications. The pilot of the affected aircraft elected to return to base and recover the aircraft safely, preventing the situation from escalating into a potentially serious in-flight emergency.



Mr Mobin Mahmood – RAF Northolt – Merit

During a routine refuelling task at RAF Northolt, Mr Mahmood, a Babcock Aircraft Handler, was assigned to refuel an aircraft positioned on the Southern ASP. Upon approaching the aircraft, he identified a suspected puncture on the starboard outer main wheel. Recognising the potential safety implications, he immediately informed the aircraft captain. The refuel was subsequently cancelled, and the aircraft was declared unserviceable.



Air Specialist (Class 1) Jeff – RAF Coningsby – Merit

Air Specialist (Class 1) Jeff was conducting a 'Hot-Pit' training refuelling operation on a Typhoon aircraft at RAF Coningsby. He identified a leak originating from the nose leg oleo and immediately brought it to the attention of his superior. Upon conducting an initial inspection, the leak appeared to be minor, and the affected area was cleaned before the refuelling process resumed. However, approximately five minutes later, AS1 Jeff raised further concerns, stating that he was not satisfied with the condition of the leak and requested a second inspection. A re-evaluation was ordered which revealed that the leak rate had increased. A thorough inspection was carried out, determining that the leak posed a significant risk to the safety of the operation. As a result, a decision was made to cancel the sortie.



Corporal Poulton – RAF Coningsby – Merit

Corporal Poulton was conducting a scheduled configuration audit on a Typhoon aircraft at RAF Coningsby. While conducting the audit, he identified that an essential engine lifing inspection account had been incorrectly marked as obsolete. Upon further investigation and confirmation from the contractor, it was established that the inspection was still mandated and had been overflown by a significant number of hours. Corporal Poulton's meticulous attention to detail prevented the continued oversight of this inspection, which could have resulted in a serious incident.



Corporal Pope – RAF Coningsby – Merit

Whilst on deployed operations, Corporal Pope identified an anomaly at the outboard flaperon mounting point of a Typhoon aircraft. He immediately paused the task and conducted a closer inspection rather than accepting the condition as serviceable. This investigation led to the discovery of significant scoring to the flaperon bracket, a defect presenting a serious and previously undetected threat to flight safety. Corporal Pope escalated his concerns through the chain of command, enabling timely action to be taken while protecting the mission outputs. The aircraft was declared unserviceable, and a full mechanical trade investigation initiated.



Corporal Riley – RAF Coningsby – Merit (x2!)

Group Captain Podmore is seen here presenting Corporal Riley of RAF Coningsby with two Merit awards! On the first occasion, Corporal Riley was simultaneously guiding two trainees through aircraft servicing procedures. Despite this, he identified a significant defect: a 162mm crack on the upper surface of the left-hand wing of a Typhoon aircraft. On a separate occasion, a Typhoon aircraft had returned following a failed brake chute deployment. During a subsequent supervisory check of trainee activity in the cockpit, Corporal Riley identified that the brake chute handle remained in the deployed position (indicated by the exposed coloured band), despite the chute not having deployed. He acted decisively to ensure all personnel, particularly trainees, remained clear of the chute area until a safety pin had been installed.



Mr Jonathan Larrad – RAF Cranwell – Merit

Mr Jonathan Larrad was carrying out a 150-hour Scheduled Maintenance Inspection on a Grob Prefect aircraft at RAF Cranwell. Mr Larrad was conducting an inspection of the brake hoses within the cockpit area, an activity not directly related to the rudder pedal assembly. During this inspection, he identified that the inboard rudder pedal lever lower bolt on the right-hand seat rudder pedal assembly had migrated, with the bolt not sitting flush against the face of the pedal lever. This defect was extremely difficult to detect due to the restrictive working area, with limited access and visibility around the rudder pedal assembly.

Meet the New Inspector of Flight Safety (RAF):

Gp Capt Steve Courtnadge BEng MA RAF



Following the departure of Group Captain Andrew 'Boomer' Keith, Group Captain Steve Courtnadge joined the RAF Safety Centre earlier this year as the new Inspector of Flight Safety.

Group Captain Steve brings a broad blend of operational, instructional and staff experience to the role.
Much of his career was spent in Air Mobility, flying in the Communications role and transporting senior military leaders, government officials and VIPs in support of diplomatic and operational missions around the world, including multiple deployments to Iraq and Afghanistan.
He has also held operational appointments overseeing fast jet, rotary-wing and multi-engine aviation activity across a range of complex mission sets.

He spent several years as an instructor within Elementary Flying Training, helping to develop the next generation of RAF pilots, and has led a number of capability and transformation programmes supporting the Air Mobility, Special Forces and Parachuting communities.

This experience provides him with a broad appreciation of the operational, organisational and human factors that underpin aviation safety. He joined the RAF Safety Centre from Cyber and Specialist Operations Command (CSOC), where he served as Chief of Staff.

IFS Says: *"The aviation environment is clearly becoming more complex. Emerging threats, new technologies and evolving ways of operating mean our ability to understand and manage risk is more important than ever. Whether operating on the Air Base, in the Air Wing, on exercise or on operations, safety and operational effectiveness are not competing priorities; together they provide the foundation upon which resilient, agile and battle-winning air power is delivered. By continuing to learn, adapt and share lessons, we can protect our people, safeguard our operational capability and ensure that Flight Safety continues to enable success."*





Authority Gradients – A Latent Error?

By Dr Simon A Bennett FHEA AMRAeS FICDDS, University of Leicester (External Author)



According to aviation safety advocate James Albright, the term authority gradient *"refers to the perceived or actual difference in power, status or authority between individuals in a hierarchy. This gradient influences how the team members communicate and how decisions are made"*.

Following a spate of high-profile human-factors-related aviation accidents in the 1970s (see below), the airline industry, encouraged and supported by academia, created the flight-deck teamworking standard cockpit resource management, that, over time, was elaborated to include cabin crew. The current iteration is known as crew resource management (CRM). A proven success, the non-technical skills standard has been migrated to other industries, such as marine engineering, where it is known as Maritime Crew Resource Management – Engineering (MCRM-E). Efforts to introduce it into healthcare have been largely unsuccessful, reflecting the challenge of overcoming established hierarchies and ensuring that staff feel able to raise concerns without fear of adverse consequences. A number of high-profile healthcare scandals have demonstrated the consequences when effective challenge and speaking-up cultures are absent.

Cognisant of the link between steep authority gradients and poor decision-making, the architects of crew resource management advocate a relatively flat flight-deck authority gradient to facilitate communication between captains and first officers and ensure that decision-making draws on all available data, knowledge, experience and opinion.
It is regrettable that the aviation industry took time to appreciate the safety and productivity benefits of relatively flat authority gradients. In the years following the Second World War lessons could have been learned from other industries. They were not. To borrow Professor Brian Toft's term, there was no active learning. Specifically, there was no isomorphic learning. The flight deck remained a locus for authoritarian behaviour.

Japanese manufacturing – pregnant with lessons
Following Japan's defeat at the hands of the Grand Alliance – Britain, Russia and the United States – the West set about rehabilitating the Japanese politically and economically. Broken and starving by war's end, the Japanese commenced rebuilding their economy. In this endeavour they were aided by a culture that lauded collective effort. Japanese culture has it that the individual citizen is subordinate to the collective, the measure of an individual being how much he or she contributes to the collective rather than how much he or she achieves as a singleton.

This cultural norm encouraged corporations such as Mitsubishi to organise production around teams that worked horizontally, rather than hierarchies that worked vertically. Industrial performance improved. Japan's post-war economic miracle had begun.

Sociologist Robin Theobald posits: "[T]he group in the Japanese corporation predominates over the individual: collective consensus over individual needs and ambitions. This ethos is a reflection of Japanese culture … with its Confucian emphasis on the collectivity". Theobald's hypothesis finds expression in management expert William Ouichi's Theory-Z approach to industrial organisation that emphasises:

- collective decision-making
- collective responsibility
- concern for the wellbeing of work colleagues.

Japanese industry's enthusiastic adoption of Ouichi's Theory-Z model of shop-floor organisation has delivered success. By the 1970s, Japan had transformed itself from an irradiated wasteland into an economic powerhouse. In contrast, British industry's eschewing of Ouichi's Theory-Z model had, in concert with trade union militancy and strained industrial relations, brought the country to its knees, earning Britain the epithet The Sick Man of Europe. By 1974, gratis industrial action by 300,000 miners and government intransigence, the nation that in 1940 had defeated Nazi Germany in the air was suffering the indignities of a three-day working week, rolling power cuts and a 22:30 curfew on television broadcasts. The government implemented a State of Emergency, signalling to the world that Britain was in grave danger. The author remembers doing his homework by candlelight. Journalist Ronald Allison recalls how the crisis, compounded by the 1973 oil shock that saw the price of crude rise to unprecedented levels, morphed into a fiery debate about who governed Britain.

Reading Japan's rise and Britain's fall
Japan's post-war success and Britain's post-war decline held important lessons for industrial managers, including airline managers. Japan's rise and Britain's decline showed:

- that workplace authoritarianism expressed in hierarchical management styles alienated workers, had a chilling effect on discourse and impacted organisational performance negatively

- that teamwork, supported by relatively flat authority gradients, impacted organisational performance positively.

The airline industry could have learned from the Japanese experience. It chose not to, paying a heavy price in consequence. As we now appreciate, tolerance of flight-deck authoritarianism contributed to numerous near-misses, incidents and accidents and inflicted significant reputational damage on the airline industry.

Case study
The case study presented below demonstrates the risks associated with steep flight-deck authority gradients. For example, the alienation of colleagues and the stymying of discussion and critique. The analysis accepts aviation safety website Code 7700's assertion that an authority gradient that is dialled "just a little clockwise of flat" is optimal. The analysis also accepts that most adverse events have organisational or systemic components. That is, most accidents are rooted in organisational or systemic factors such as outdated equipment, inadequate training, ineffective monitoring of operating standards, inadequate health monitoring, passive learning (where lessons are left unactioned), organisational deafness, mindlessness or groupthink.

Given that most accidents are rooted in organisational or systemic factors, it is vital that these factors are investigated and documented. The investigating authority, for example, the Air Accidents Investigation Branch (AAIB) or Defence Accident Investigation Branch (DAIB) must document not only the bare facts of an adverse event, but also its social, economic, political and organisational roots (Figure 1). That is, the investigating authority must reveal the back-story. If the back-story is documented and the associated lessons actioned, the chances of a repeat will be minimised. However, as the author notes in his 2026 book Aviation Safety and Security: The Importance of Teamwork, Leadership, Creative Thinking and Active Learning,

Level of analysis	Question	Understanding	Effort required	Explanatory power	Chances of a repeat
Facts	What happened?	Superficial	Significant	Low	High
Reasons	Why did it happen?	Nuanced	Very significant	Medium	Medium
Origins	Where did it originate?	Total	Maximal	High	Low

Figure 1: When investigating near-misses, incidents and accidents, every contributory factor must be considered, however unconnected it may seem on first inspection to the event in question.

2nd Edition, if the back-story is left undocumented, the account will be incomplete and latent errors – the precursors to near-misses, incidents and accidents – will be left in situ.

Iceberg morphology provides a useful back-story metaphor. Some 90% of an iceberg lies hidden beneath the waves. Similarly, most of the factors that contribute to a near-miss, incident or accident lie hidden from sight, embedded in contemporary and historic organisational processes and the wider social, economic and political environment. Identifying these factors demands of investigators effort, integrity and resilience, with investigators likely to encounter reticence, mendacity and, occasionally, hostility (Figure 2). Those who have erred are unlikely to willingly co-operate, especially if they are comfortably off. Why jeopardise wealth and reputation by co-operating with an investigation? The temptation to reply "No comment" to investigators' questions is strong. Why acquiesce? Why risk self-incrimination?



Figure 2: What lies beneath. Like the 90% of an iceberg's mass that lurks threateningly below the surface, the back-story to a disaster is invariably hidden, voluminous and unsettling (if not, on occasion, nerve-shredding). (Image courtesy Wikimedia Commons 2005)

Case study: The 1972 Staines British European Airways (BEA) Trident disaster

Introduction

The matrix described at Figure 1 will be applied to ensure that every causal factor is identified. The first section will describe the facts of the disaster (the flight data recorder was recovered). The second will explain the acts of commission and omission that invited disaster. The third will describe the social, economic, political and organisational back-story to the disaster.

Facts

British European Airways Trident 1C G-ARPI was mechanically sound when it rotated behind schedule from London Heathrow (LHR) en route to Brussels (Figure 3).



Figure 3: G-ARPI, a Trident 1C manufactured in 1964, was mechanically sound. Non-technical factors contributed significantly to its demise on 18 June, 1972. Note the T-tail. The advanced wing design permitted the Trident to achieve high subsonic cruise speeds. A third pilot – the P3 – was carried to monitor the aircraft's advanced systems. (Image courtesy Wikimedia Commons 1969)

The captain was the pilot flying (PF or P1). The autopilot was engaged at below target speed for autopilot activation. A bank to port caused the speed to decay further (Figure 4)

The captain's radio telephony (RT) messages were uncharacteristically abbreviated and terse (RT conversations were recorded. Intra-crew conversations were not). Visual cues were lost at 1,000ft when the aircraft entered cloud. The first officer (PM or P2) initiated the LHR noise abatement procedure (that involved retracting the flaps and throttling-back) despite the aircraft's speed being circa 20kts

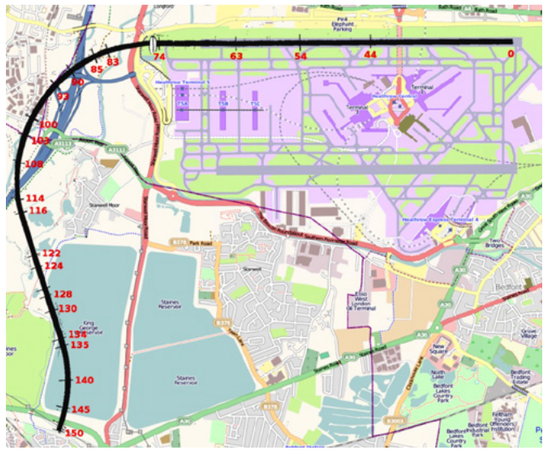


Figure 4: G-ARPI pancaked into a field circa 150 seconds after rotating from LHR R27R. As can be seen, the aircraft limped across the King George VI Reservoir and busy A30 road (that soon became choked with spectators' automobiles). (Image courtesy Wikimedia Commons 2010)

below the target noise-abatement climb speed. Air Traffic Control cleared G-ARPI to 6,000ft. Two minutes after rotation a crewmember selected the droops fully up despite the aircraft's speed being 63kts below the target speed for droops retraction. The low-speed droops retraction caused a change-of-configuration stall. The autopilot disengaged. An alarm sounded. The stick-shaker and stick-pusher activated simultaneously. Another alarm sounded. The shaker and pusher safety devices activated three times during the emergency. A crewmember disengaged the safety devices. The aircraft entered an unrecoverable deep stall (that rendered the elevator ineffective). The Trident pancaked in, dropping almost vertically onto open ground (the dense, concentrated debris field suggested an almost vertical descent). All on board were killed. It was Britain's worst-ever civilian air crash. The A30 jammed with spectators. Indignant, the Daily Mirror ran the headline "'*Vultures' swarm to air crash*".

Reasons

A key non-technical aspect to the disaster was the pronounced P1-P2 authority gradient. This was grounded in a significant experiential and generational divide, in the P1's manner and his habit of robustly expressing his opinions.

The P1, 51-year-old Stanley Key, had accumulated 15,000 hours as P1 and P2. The P2, 22-year-old Jeremy Keighley had been on the line for circa six weeks, accumulating 29 hours as P2. Keighley was yet to qualify as a P3. The accident flight P3, Simon Ticehurst, was older and more experienced than Keighley.

Another non-technical aspect was the generational divide between the P1 and his P2 and P3 (the pilot who monitored the Trident's advanced systems). Key had flown in the Second World War. He was, therefore, one of the few, rightly celebrated by the public and politicians. It is likely Key considered flying a vocation. Key's P2 was 22. His P3 was 24. It was not unknown for time-served pilots to frame young and relatively inexperienced colleagues as careerist – a derogatory term in aviation circles.

Other non-technical aspects included the P2's confidence level and capacity to quickly assimilate information. Comments in the P2's training record suggested slowness and under-confidence. For example, "He [Keighley] will need careful watching" and "[Keighley is] slower than average and will call for patient, rather than pressure, handling" and "[Keighley is] slow to react to an emergency". In contrast, Key was confident in his own abilities. A tad over-confident and over-demonstrative, perhaps, for a 1970s flight-deck.

The age, experience and character differences between the P1 and P2, coupled with the P2's under-confidence and slowness, created a pronounced authority gradient between the P1 and P2 – a latent error.

The fact that the P2 had, just prior to the accident flight, witnessed a violent verbal confrontation between the P1 and another BEA pilot in the LHR crew room may have led the P2 to conclude that the P1 was intolerant of challenge. The crew room confrontation revolved around Key's views on industrial action, and his efforts, in association with others, to prevent an all-out strike at BEA. Witnessing the confrontation would not have helped the P2's confidence level which, as explained, was low. He may have been unnerved by it.

The P1's mood and demeanour would likely have been further impacted by a campaign of anonymous bullying directed at those BEA pilots who opposed industrial action. Gratis the absence of fire on impact, investigators were able to salvage much of the fabric of the aircraft, including one of G-ARPI's flight-deck tray tables. The tray table bore graffiti critical of pilots opposed to industrial action, Captain Key being one of those named (Figure 5). Similar graffiti had been found in other BEA aircraft.

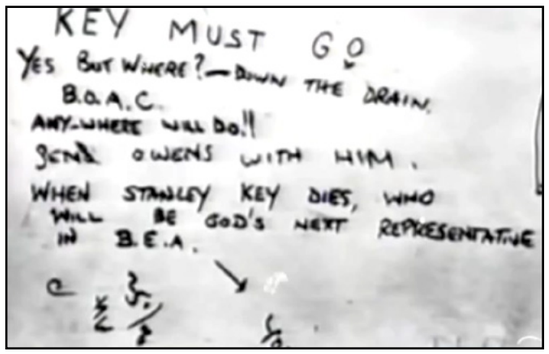


Figure 5: The graffiti campaign directed against those pilots opposed to industrial action would have divided BEA's pilot community, creating mistrust and, possibly, anger in those who were anonymously and publicly attacked in the airline-wide graffiti campaign. Today such bullying would be done via social media.

The aircraft failed to meet its target speeds for much of the climb, the speed decaying so badly that when the droops were retracted, G-ARPI effectively fell out of the sky. As reported in the Daily Express, eye-witness Paul Burke said: *"It just dropped like a stone".* Eye-witness John Blunt said: "*It just fell out of the sky. It hit the ground with an enormous bang".*

The change-of-configuration stall provoked a confused and inappropriate response from the P1, P2 and P3. Premature retraction of the droops had caused the stick-shaker and stick-pusher to activate simultaneously. Expecting a lag between activation of the two safety devices, it is likely the pilots were startled and confused. The airline's training programmes did not address the possibility of simultaneous activation – a latent error.

Startled, and unable to understand the aircraft's behaviour due to shortcomings in training, the flight-deck responded inappropriately. The stick-shaker and stick-pusher were immobilised. The European Aviation Safety Agency notes: " [I]t has been observed that pilots may react inappropriately to unexpected in-flight situations …. Startle reaction played a key role in a substantial number of Loss-of-Control In-flight events".

The stick-shaker and stick-pusher devices were mistrusted by some pilots, with activations sometimes being interpreted as a false positive. It is possible that this model of the safety devices as unreliable influenced the actions of G-ARPI's pilots when confronted by multiple activations while in the climb. The unremediated model was a latent error (see below).

A post-mortem examination of Captain Key revealed he was suffering from chronic heart disease, with fatty deposits having narrowed some of his major arteries by up to 70%. It is possible that high blood pressure on the day of the accident, combined with Key's chronic heart disease, may have caused:

- general discomfort
- chest pain
- internal bleeding
- oxygen starvation to the brain
- cognitive impairment
- motor impairment.

As to whether any of these symptoms manifested on the day of the accident, Key's uncharacteristically terse RT exchanges with ATC suggest he was experiencing, at a minimum, discomfort. Events that may have increased his blood-pressure on the day include:

- being rostered to fly on days off
- the crew room confrontation
- reading the graffiti on the flight-deck tray table
- the push-back delay caused by the late boarding of a BEA crew dead-heading to Brussels. One of the crew occupied the fourth flight-deck seat

Accepting the hypothesis that Key, the PF, was experiencing, at the very least, discomfort helps explain why a pilot known for the accuracy of his flying consistently failed to hit his speed targets during the climb.

Finally, while BEA trained its pilots to scan for signs of major health-related impairment in flight-deck colleagues, the airline (like most others) did not train its pilots to scan for signs of minor health-related impairment in colleagues. This weakness in praxis was a latent error.

Origins

The fact that Key's chronic heart disease went undiagnosed suggests that the CAA's mandated medical checks were insufficiently rigorous.

Of course, it is possible that Key suspected his health was deteriorating but felt unable to discuss it for fear of being removed from the line or pensioned off. Employees who feel secure and valued are more likely to voice concerns than employees who feel insecure and under-valued.

As mentioned, BEA pilots were not trained to look for signs of minor impairment, even though a minor impairment – such as not being able to comprehend a simple instruction, hitting the wrong switch or pulling the wrong lever – could signal the genesis of a more serious health condition. Not training pilots to look for signs of minor impairment suggests organisational mindlessness.

Pilots are generally reluctant to make adverse reports – verbal or written – on other pilots. Nevertheless, had those who witnessed the confrontation between Key and another pilot in the LHR crew room immediately reported the episode to the Duty Pilot, it is possible Key (and the other pilot) would have been immediately stood down pending investigation. Pilots' general reluctance to formally report colleagues' anomalous behaviour creates within the aviation system latent errors – accidents pending.

The fact that BEA staff who happened upon hostile flight-deck graffiti were not removing it immediately suggests that the airline:

- failed to appreciate the impact on pilots' morale and performance of anonymous bullying
- had a lax safety culture.

Aircraft operators – civilian and military – must take bullying seriously. Anti-bullying policies must be broadcast and enforced. Everyone must understand that bullying will not, under any circumstances, be tolerated and that culprits will be held to account. Key was entitled to express his opinion about the mooted strike action without being anonymously and tastelessly libelled (Figure 5). In a free society people should feel able to express an opinion without fearing attack.

It is undoubtedly the case that the pronounced authority gradient between the P1 and P2 equated to a latent error – an accident pending. The problematic gradient was a latent error of the airline's own making. The pairing was no accident. It was a conscious decision. The fact that the airline could pair a highly confident, time-served captain with a military background and strong views on the new generation of pilots with an underconfident new recruit who, according to his trainers, required "patient, rather than pressure, handling" (see above) suggests at best mindlessness and at worst incompetence on the part of the airline's rostering department. In mitigation, it is possible that the work-to-rule at the airline had served to limit the rostering department's options in respect of pairings.

Given that, at the time of the accident, 1972, the airline industry had yet to recognise the value of training flight and cabin crew in crew resource management, those on the flight deck of Papa India lacked the knowledge and skills required to mitigate the worst aspects of the steep authority gradient.

The Trident was lauded by its manufacturer, BEA and the press as a world-beater – a technological marvel. Certainly, the Trident, designed by de Havilland, was cutting-edge, sporting:

- a quiet cabin gratis the rear-mounted low-bypass turbofans
- a high-performance wing that permitted the aircraft to cruise at high subsonic speeds
- a moving map display (electro-mechanical rather than solid-state)
- a blind landing system.

Unsurprisingly, such innovations served to increase the interactive complexity of the aircraft – at both the technical and human levels. In a 1962 monochrome advertisement, de Havilland said of its new aircraft: "Best economics. Most advanced design by most experienced team". Because of the aircraft's complexity, a third pilot – the P3 – was shipped to monitor the systems. Pilots were trained to operate as P3s. Some BEA pilots resented P3 duties, as they reduced stick-time and salary.

To achieve adequate lift from the high-performance wing at low speeds, de Havilland fitted flaps and droops, the lift devices being controlled by two levers located side-by-side on the right-hand side of the binnacle. While easily reached by the P2 they were a stretch for the P1. It was specified that the devices be operated sequentially, with the flaps being retracted before the droops. Retraction of the droops below target speed would cause the aircraft to stall. While the stick-shaker and stick-pusher – if allowed to function unimpeded – could recover the aircraft, they could be overridden. Too high an angle of attack would cause the aircraft to enter a deep stall from which recovery was all but impossible. Deep stall is an inherent weakness of the T-tail configuration – a latent error or, as Professor James Reason would put it, a resident pathogen. Designers – of aircraft, ships, automobiles, Formula 1 grand prix cars, nuclear power stations, spacecraft and myriad other technological artefacts – routinely trade performance and efficiency against risk and hazard.

As mentioned, the Trident was a complex aircraft, both technologically and in terms of how it was operated. As Professor Charles Perrow has established, there is a positive relationship between complexity and failure: the more complex a system, the more interfaces there are (between sub-systems and between sub-systems and operators); the more interfaces there are, the greater the likelihood of malfunction. In interactively complex systems, claims Perrow, accidents are normal, partly because they overtax operators. Usually, operators' mistakes are inconsequential, being trapped by the operators themselves and/or one or more safety devices. Sometimes, however, they are consequential, the mistake overwhelming the system's defences – technological and human – to produce a near-miss, incident or accident.

Safety devices must be trusted if they are to be effective. A safety device that is not trusted may be overridden or disabled. De Havilland included an override switch for the stick-shaker and stick-pusher. Seemingly unnecessary activations of these devices (apparent false positives) persuaded a good number of pilots that they were unreliable. It is possible that one or more of the pilots on Papa India subscribed to this opinion, and that one of them, convinced the aircraft was not in jeopardy, disabled the devices. The accident report noted: "We heard some criticism of the reliability of the stall warning and recovery systems and … suggestions that pilots as a whole regarded the two systems as unreliable and were apt to regard their operation as more likely to be spurious than genuine [my emphasis]". Post-disaster it was claimed that approximately 50% of Trident stick-pusher activations were unnecessary.

One BEA captain was so concerned that some pilots believed the stick-shaker and stick-pusher to be unreliable that he asked the airline to investigate. The airline failed to follow-up his recommendation. This suggests a lax safety culture at the airline, more of which later. Had BEA been what sociologists Karl Weick, Kathleen Sutcliffe, Todd La Porte and Gene Rochlin call a high-reliability organisation (HRO), the airline would have immediately actioned the captain's request and implemented whatever lessons emerged from the investigation within a reasonable timeframe.

On 2 October 1971, a BEA Vickers Vanguard crashed in Belgium, killing all on board. This tragedy should have pushed safety to the top of the airline's agenda. With reference to the ignored request to investigate pilots' mental model of the stick-shaker and stick-pusher (see above), it seems that, in respect of the Trident fleet, it did not. Evidence of a lax

safety culture at BEA is there for anyone who cares to mine the archives.

As designed by de Havilland, the droops control lever did not look very different to the flaps control lever, the similarity creating a latent error – an accident pending (Figure 6). In 1970, the P1 of Trident Foxtrot Hotel retracted the droops in error. The P1 repeated the mistake on another Trident. On each occasion, the P2 trapped the error. On the second occasion, however, the P2 failed to make a written report – a safety lapse. The airline's Director of Flight Operations, concerned about the control levers latent error, advocated reopening the investigation into the Foxtrot Hotel incident. The airline failed to follow-up his recommendation: further evidence of a lax safety culture at BEA and of the airline's failure to achieve the HRO standard. The airline disappeared in 1974, merging with BOAC to form British Airways.



Figure 6: The droops lever was located adjacent to the flaps lever (both visible in the yellow circle). Occasionally, the droops lever was operated in error. Psychological or physiological stress, generated, perhaps, by cognitive overload or an acute health problem, may induce error. De Havilland might have produced a safer design had the airframer been able to draw on a better understanding of flight-deck human factors and ergonomics. (Image courtesy Wikimedia Commons 2008)

On occasion, the P3 would operate the droops lever. Inconsistency in operating procedure, while not inherently dangerous, suggests a lack of rigour. Real-time, in situ variations in procedure create space for uncertainty. Uncertainty may produce errors of omission or commission.

The noise abatement procedure required that the engines be throttled back in the climb. Viewed through a public relations lens, this procedure served LHR's corporate interests. However, viewed through a flight-safety lens, this procedure was problematic. It added complexity during a busy phase of flight (the pilot monitoring was expected to manage the process using a stopwatch) and robbed the aircraft of thrust. Heathrow's noise abatement policy examples how politics – local and national – intrudes into commercial aviation, sometimes acting to reduce safety margins. Given that LHR's noise-averse neighbours would no doubt use their local airport for business or pleasure, this outcome – doubtless unknown to the majority of LHR's neighbours – is ironic.

As described above, aviation has a symbiotic relationship with politics. Members of Parliament make the laws that govern how commercial aviation operates. Governments set standards. The Staines investigation was frustrated by the absence of a cockpit voice recording. At the time of the disaster, UK-registered passenger aircraft were not required to carry a cockpit voice recorder (CVR). In contrast, CVRs were a standard fit on the air fleets of the United States and Australia. Aviation safety is a product of decisions made on the flight-decks of passenger aircraft, in control towers, in airline boardrooms, in airframers' design and manufacturing shops and in national legislatures. Westminster's failure to mandate CVRs on UK-registered aircraft impacted aviation safety negatively.

Had British lawmakers mandated CVRs on UK-registered passenger aircraft, the human factors and cockpit ergonomics origins of the below-target-speed droop retraction incidents that occurred prior to the Papa India accident (see above) could have been investigated more thoroughly. Had British lawmakers learned lessons from Australia and the United States – that is, had they engaged in what Professor Brian Toft calls cross-organisational isomorphic learning – the Papa India accident might have been prevented. As stated by Karl Weick, Kathleen Sutcliffe, Todd La Porte and Gene Rochlin, active learning is one of the hallmarks of high-reliability organising. In respect of CVRs, British lawmakers eschewed active learning.



Figure 7: The photograph shows the plaque on Staines Moor that memorialises those who died in the disaster and the public servants and residents who attended the scene.
(Image courtesy Wikimedia Commons 2008)

Conclusions

The 1972 Staines Trident disaster was an organisational accident. That is, the disaster originated in multiple latent errors, from a steep cockpit gradient and tolerance of flight-deck authoritarianism to British lawmakers' failure to learn safety lessons from other countries and the design of the Trident's airframe, systems and controls. Some vulnerabilities were immediately obvious. Some were not. Consequential vulnerabilities, rendered invisible by routine and habit, went unquestioned and unaddressed. They were effectively normalised. The cost of this normalisation? One hundred and eighteen lives lost and reputational damage to an important industry (Figure 7). Despite its failure to mandate CVRs, Britain's political class emerged from the disaster unscathed.

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The Author
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I Learnt About Flying From That...

A 17-Yr-Old Inexperienced PPL Pilot – A Day To Draw Lessons From

By Sqn Ldr Andrew Smith



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Having been in the RAF for 18 years, I've been fortunate to fly many aircraft – each of which has added to my overall experience base. Now I seek to draw upon my experience and knowledge to add to the safety of those flying today, via my 22 Gp safety role. My flying experience started prior to the RAF, as a very keen but inexperienced private pilot, flying a Cessna 172 from the grass of Redhill aerodrome, near Gatwick. I'd completed my PPL in the minimum hours and now wanted to take my family flying (given this is a safety "dit" – you can likely already sense that some cheese-holes are shortly to align!) I was 17 and had decided to take my Mum, Dad and Sister for a lunch-away to Bembridge, on the Isle of Wight.

With four of us and the requisite fuel, my take-off weight would be far greater than I'd experienced before. Recognising this, I chatted with the instructor who'd trained me – I also asked them to check my weight and balance calculations, especially given my own had identified that I would be operating the aircraft within (or so I thought) but close to the limits of the aircraft operating envelope. They checked and confirmed all was good (or so they thought). They also chatted me through flying the aircraft at heavier weights.

In what to experienced RAF professionals reading this may seem noddy stuff, at 17 years old and with very limited experience, any advice was gratefully received! They recommended I use every inch of the grass runway and hold the aircraft against the toe brakes on full power for a few seconds before release, to help with acceleration. They described how the aircraft would feel slower to accelerate but that that was normal and to be expected at those weights and that it would of course take more of the runway to get up to take-off speed (we'd performed take-off distance available calculations and all appeared fine). All simple stuff but a picture was building in my mind – for it to seem different to what I had previously experienced and my goodness it was!

Sat right at the top of the runway, take-off clearance received, full power set against the toe brakes – all was ok so far. Brakes off and I started bounding down the runway, gently bouncing up and down with small undulations from the grass runway bumps – feeling a bit like what you see on a Second World War Spitfire film for the take-off roll; though in a distinctly less cool aircraft! The speed was building, though not rapidly – my initial thoughts; that's ok, it's in line with what I expected and had been briefed and all the calculations proved it was close to limits but within and therefore "ok".

There was no formal V1 point of rejection for the take-off etc - not then for my Cessna PPL flight. I was using up available runway, but my acceleration was not great – I just didn't have the experience to fully appreciate it at that split second, though I would learn a lot about flying within the minute that followed! Soon after, despite my inexperience, it became apparent that I didn't have enough speed to take-off, nor enough runway left to stop (not a scenario I recommend you ever find yourself in!). I had two choices; try and stop, (without enough runway left to fully stop, the aircraft fully fuelled and thus heavy, high aircraft momentum, less than amazing braking performance on grass and a large hedge at the airfield boundary) or make something work and continue.

Whilst inexperienced, the instant outside visual picture meant I knew I'd impact the hedge before stopping if I tried – yes, it would be slower but a crash for certain (with risk of fire, being trapped etc). The other option, which I took, was to make the take-off work, somehow! I was willing the speed to increase but to a degree, at this point, I had temporarily become an unwilling passenger! I had to visually assess when to rotate, prior to the correct rotate speed or I'd hit the hedge at high speed, with my family onboard also. I made my assessment of the last credible point to attempt rotating and limped the aircraft into the air - but it wasn't over yet! The stall warner started to go, then the aircraft started turning left (not from any control input of mine though).

I balanced the below optimum (my polite understatement) airspeed; not pulling back on the control column to the degree I'd cause a full stall – balancing it all so that I had enough speed to stay airborne (just – not in the position I'd want to be on the drag curve!) but not going for optimum speed or I'd impact the obstructions/ground. As the aircraft



Runway at Redhill – N Chadwick - Creative Commons Attribution-Share Alike 2.0

started to gently turn to the left of its own accord, I remembered a mere passing comment my instructor had mentioned – if you ever get the aircraft turning close to the ground and it's not you doing it, it may be the incipient stall – don't turn out of it or you'll likely deepen it towards or to the full stall. I instantly remembered this gem of a comment and just kept with the (very) low level gentle turn!

Gradually, the situation improved. I built the aircraft speed to normal parameters and climbed away. I had a quiet think – I didn't know exactly why it had happened, but it certainly was not good. But now what? With the aircraft now flying normally, I decided that to then return to Redhill would only mean me landing whilst heavy on a short grass strip, compounding the less than optimum flight so far with an unnecessary risk…so, to Bembridge we went. On the plus side, our lunch was lovely! I spoke to Redhill by phone from Bembridge – it had certainly raised the attention of ATC at Redhill, who criticised themselves for not pre-emptively pushing their crash alarm, as they described that from what they saw on take-off, they were very surprised it didn't end in a crash.

I also spoke with the flying school – it took a good while to ascertain what had happened; especially as I'd checked all the figures during the planning process with my previous instructor and the Chief Flying Instructor. They retrieved the documents and re-ran calculations – then a startling admission from the Operations personnel; they'd realised that they'd incorrectly labelled several of another aircraft type's weight and balance / performance graphs as the Cessna 172, I'd planned the trip against and flew! There had been no way of either me or the two instructors realising that during the planning process, as the information was presented in an identical fashion - the only way of knowing was the aircraft label on the top, which Ops had applied with a ticker tape strip, stating the registration for the aircraft I was flying, when it wasn't. Something so simple nearly had fatal consequences. Had I not been operating the aircraft close to the limits, that error wouldn't likely have mattered for my or other flights for a long time beyond to come.

For me, there were several obvious takeaways; Ops had made a genuine, honest mistake and could certainly tighten that labelling process but had that not occurred, the aircraft wouldn't have ended up in that position, as the fact the weight and balance was not in limits would have been apparent at the planning phase (had the graphs in fact been those for the Cessna 172!). Had my instructor not said that if low to the ground and the aircraft turns and you're not doing it, don't try and level the turn - then I may well have, with disastrous consequences. Had I decided earlier that the aircraft acceleration on the ground was insufficient, I would have aborted the take-off before being faced with the option of hitting a hedge or limping into the air with my fingers crossed, using every bit of flying ability I could muster – though my experience then was low.

With many people reading this being military aviation professionals, it is easy to apply our collective thought processes and training to this. At 17, I was a keen PPL pilot, not a highly trained military pilot. So, why have I chosen to write about this from before my military flying career? Because there are still useful takeaways from it for trained military professionals. I'll list my own immediate thoughts below but it's far from an exhaustive list:

1. If it feels wrong, it may well be – use your training but also trust your instincts and experience. It's better to be on the ground wishing you are in the air than in the air wishing you are on the ground.

2. Talk about your experiences and the expertise you have, especially to those less experienced. A "dit" spun to people whilst having a coffee, a presentation, or a passing comment of useful information about something you've previously learnt from could be critical to someone in their future, without you or them realising it at that time.

3. Be willing to learn from others' experiences – so much of policy, rules and regulations are borne out of previous incidents and accidents. You may not know the full background as to why a rule exists, but they're not put in for the fun of it.

4. Something may seem small, but errors can have disastrous consequences – if you notice something wrong, speak up. It may seem something small, but the effect otherwise later on may be large.

5. If it does start to go wrong, remember the basics – Aviate, Navigate, Communicate; fly the aircraft safely first as the priority.

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The MySafety Reporting Hubs:
Everything You Need, All in One Place

By the MySafety Reporting Team



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From **Defence Connect** search the **Groups** for **MySafety**
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Together, we can make safety reporting simpler, more accessible, and more effective for everyone.

From 2 Pence to £3 Million:

RAF Lossiemouth ASTRA Improving Safety Through Innovation

By Sgt Nathan Nichols-Elton, LOS Safety Centre – Astra Improve Team



The Lossiemouth ASTRA Team (L-R): Sgt Gray, Cpl Hall, Cpl Williams, FS Hewitt, Cpl Cookson, Sgt Nichols-Elton, Sgt Cox

At RAF Lossiemouth (LOS), ASTRA personnel and their network of volunteers are demonstrating how frontline innovation can improve safety, enhance operational capability and generate significant savings across Defence. ASTRA's three pillars, Innovation, Challenge and Improvement, provide a framework for turning good ideas into practical improvements. Whether you have identified a problem, spotted an opportunity, or already have a solution in mind, the ASTRA Hub is open to all LOS personnel. After all, the best ideas usually come from the people delivering the process day in, day out, because they know better than anyone where change can make a difference.

Projects progress from problem identification to design, prototyping, testing and stakeholder approval, before entering service. The team have access to 3D printers, which have been fundamental in the creation of physical solutions for front line problems. RAF Lossiemouth is home to one of the RAF's largest dedicated ASTRA teams, with successful ideas shared across Defence through the Defence Ideas network.

One recent project supported the local medical team after blood pressure monitoring devices became unserviceable due to missing battery covers. Where original replacement covers were unavailable through existing procurement arrangements, using additive manufacturing, ASTRA produced replacement covers for just 2 pence each, restoring the devices to service within hours and ensuring vital healthcare equipment remained available to personnel across RAF Lossiemouth and Kinloss Barracks. Beyond the financial saving, the project preserved a critical clinical capability, helping to ensure that routine health monitoring and medical assessments could continue without interruption. By preventing a reduction in available diagnostic equipment, ASTRA's intervention contributed directly to the safety and wellbeing of Service personnel.

The team also addressed a recurring issue affecting RAF Mountain Rescue Team vehicles. Communications equipment stored beneath passenger seats was suffering regular cable damage, creating additional maintenance requirements and posing a risk to the availability of safety-critical



Medical Device Cover

communications systems. Recognising the potential impact on operational effectiveness and personnel safety, ASTRA designed and manufactured bespoke protective housings that eliminated the root cause of the problem. Since their introduction, no further damage has been reported.
By proactively addressing a recurring hazard before it resulted in equipment failure, the project improved system resilience, safeguarded a critical operational capability, and strengthened the safety margin for personnel operating in challenging and time-critical environments.

ASTRA has also delivered significant benefits to aircraft safety and availability through the introduction of the Gastops ChipCheck system within RAF Lossiemouth's Early Failure Detection Centre. The capability enables rapid analysis of engine wear debris, reducing investigation times from up to 14 days to typically less than 48 hours. By providing faster and more accurate identification of wear materials, the system helps engineers identify normal wear trends and assess potential maintenance requirements at an earlier stage. As a result, Aircraft on Ground delays have been reduced, aircraft availability improved, and approximately £32,900 in courier costs avoided over the past 12 months.



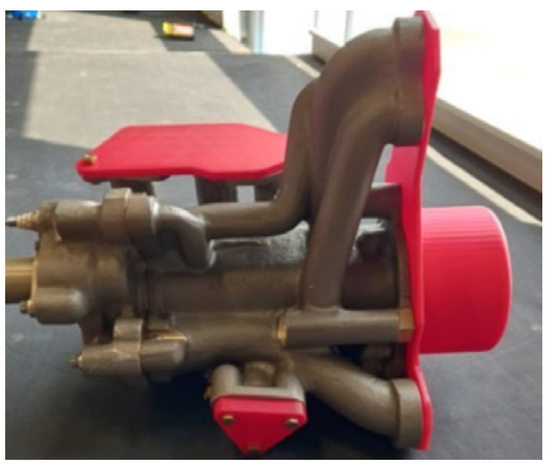
Radio Case

At the strategic level, ASTRA has supported the Typhoon Force through the design and manufacture of EJ200 engine blanking plates. This innovation has enabled the recovery of components that previously had no approved recovery method, delivering immediate savings of £341,000 and identifying a potential further saving of £3 million over the next 12 months. Beyond the financial benefit, the project has increased the availability of critical spares, improving engineering resilience and reducing supply chain pressures. By sustaining the availability of essential components, ASTRA has helped maintain aircraft readiness and support front-line operations, demonstrating how innovative thinking can deliver both capability and safety benefits across Defence.

These projects highlight the value of empowering personnel to identify challenges and develop practical solutions. Whether restoring essential medical equipment, improving the reliability of specialist communications systems, accelerating critical airworthiness decisions, or recovering high-value aircraft components, ASTRA personnel and volunteers continue to demonstrate how frontline innovation can deliver significant benefits. By identifying hazards, addressing root causes, and enhancing the reliability of critical equipment and processes, ASTRA not only improves safety outcomes but also delivers tangible operational, capability and financial gains across Defence.

Every member of the RAF has a role to play in improving safety. If you have identified a hazard, recognised an inefficient process, or have an idea that could reduce risk and improve the way we operate, consider how ASTRA could help turn that idea into reality. Those closest to the task are often best placed to spot emerging risks and opportunities for improvement. Through its Innovation, Challenge and Improvement pillars, ASTRA provides a means to transform frontline insight into practical solutions that enhance safety, strengthen operational effectiveness, and deliver lasting benefits across Defence.

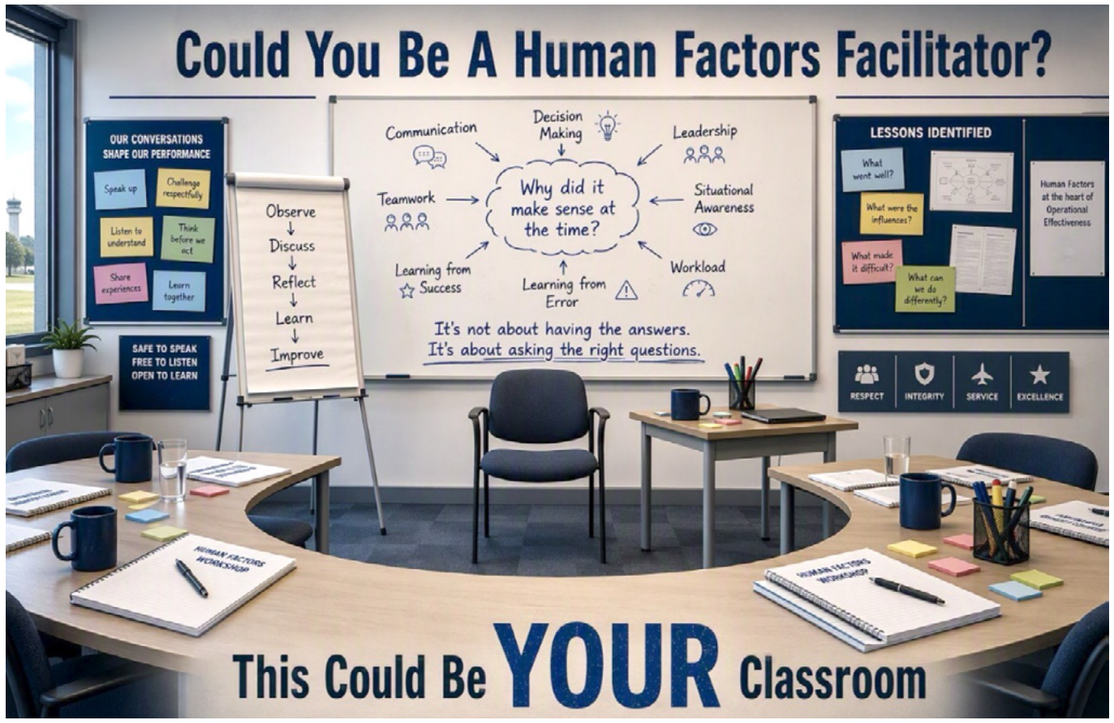
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EJ200 engine blanking plates

Influencing Performance When It Matters Most:
Could You Be A Human Factors Facilitator?

By Sqn Ldr Ian James - SO2 Human Factors Strategy



AI-Generated Image

The RAF world is complex. Every day we make hundreds of decisions that influence our war-fighting readiness, safety and even our own happiness in work! Understanding how people interact with equipment, procedures, organisations and each other is therefore vital. When we understand these interactions, we can improve performance, and those improvements deliver greater lethality, safety and perhaps even extra happiness on the way!

If you've ever sat through a biennial Human Factors (HF) continuation training session and questioned what value it added, I understand. I felt much the same about chemistry lessons at school until the day an explosives chemist came to visit. A little smoke, the unmistakable smell of cordite, and suddenly the formulas on the blackboard became relevant. That visitor brought chemistry to life.

HF works in much the same way. Following the tragic loss of 14 personnel in an aircraft accident over Afghanistan in 2010, Defence began a renewed focus on HF education. The aim was simple: to help personnel understand how human performance affects operational outcomes. However, meaningful learning does not come from PowerPoint slides or a one-size-fits-all video. It comes from skilled facilitators who can bring Human Factors to life, creating opportunities for discussion, encourage reflection on local challenges, and help teams learn from both successes and setbacks. Most importantly, they help people see themselves, their teams and their organisations differently, enabling safer and more effective performance.

Who Can Become an HF Facilitator?
The vast majority are volunteers who want to make a positive difference within their units. Some have been shaped by previous incidents and recognise the value of sharing experience and lessons learned. Others have witnessed first-hand how HF principles can improve operational performance and team effectiveness. Occasionally, of course, people are simply told they are going to become facilitators! Whatever their motivation, the strongest facilitators share a genuine desire to help others think, learn and improve.

What makes a good facilitator?
Good listeners! This is perhaps the most important quality. A facilitator helps individuals and groups progress towards a learning outcome, but the audience should be doing most of the talking. Being comfortable with silence, asking thoughtful questions and genuinely listening to others are essential skills. The facilitator training course introduces a range of techniques that allow individuals to develop an approach that feels authentic to them, while remaining effective within their own operational context.

Warmth and credibility. Most facilitators tend to be in the Corporal to Flight Lieutenant range, but we regularly see excellent AS1s, civil servants and personnel from a wide variety of backgrounds. The role is not about being the best technician, engineer or operator in the room. It is about being relatable and credible to the audience in front of you. Personality is often a key part of that. While relevant experience can help, a facilitator is there to foster the group's own discussion; the facilitator's own experience is not important. A good facilitator could run a credible session completely outside of Defence with NHS medics, bus drivers, and cruise liner captains!

> "The effectiveness of our people remains one of Defence's greatest operational advantages"

Do I need a specific profession? Facilitators come from across Defence (even if the school's intended role and branding is 'aviation'), and many courses include people who do not occupy traditional aviation roles. In fact, I would welcome more participants from professions where rapid decision-making under pressure is routine, such as Counter-UAS operations, healthcare and cyber. That diversity enriches discussion and helps ensure HF remains focused not only on safety, but also on performance, resilience and operational effectiveness in challenging environments.

What training do I get as a facilitator?
As a prospective facilitator, you would attend a five-day course at RAF Cranwell. For some, the prospect of spending a week in civilian clothes, in an air-conditioned classroom, with good biscuits, is an attractive bonus feature!

The course provides a refresher on HF concepts and develops the practical skills required to become a facilitator. Before attending, we strongly encourage candidates to observe a HF session delivered by a facilitator at their own unit. Watching an experienced facilitator in action provides valuable context, offers insight into why particular techniques are used, and helps prepare students for the course itself. It also gets you higher on the priority list for places. The learning does not stop at the end of the week.

The Defence HF community places significant emphasis on continuing professional development, and so you would be supported through workshops, conferences and engagement with the Defence Aviation HF Training School and wider professional networks. These activities provide opportunities to discuss emerging research, exchange ideas, share best practice and remain informed about developments. They also help sustain a vibrant community of practitioners distributed across Defence.

Could I Be the Next HF Facilitator?
The Defence HF community is always looking for enthusiastic individuals who can bring fresh perspectives and experience into the classroom. If you are interested in improving the performance of people, teams and organisations, then becoming an HF Facilitator could be an excellent opportunity for you! You do not need to be a specialist; you just need a willingness to learn, engage with others and help foster a culture of continuous improvement.

How do I apply?
The best facilitators are those who have enough curiosity, drive and initiative to reach out to other facilitators and find out what it's like to do this for real. Contact your local safety team or Training and Development Flight and ask to speak to an experienced facilitator. Understanding what the role involves is the best way to determine whether it is right for you. If you have the determination to make that first phone call, there's a good chance you already possess the mindset we're looking for. If required, Wing Commander Spry can provide my contact details and I would be happy to put you in touch with facilitators in your area.

Some Final Thoughts…
The effectiveness of our people remains one of Defence's greatest operational advantages. Aircraft, technology and procedures are all important, but people ultimately determine success or failure. Human Factors is not a niche aviation subject; it is about understanding the realities of how people perform when the stakes are high.

Defence does not need more people who can recite Human Factors theory. It needs people who can start meaningful conversations, challenge assumptions and create environments where others can learn. If that sounds like something you would enjoy doing, then perhaps you should become a HF Facilitator.

The next conversation that improves safety, enhances performance or prevents an accident has to start somewhere. Why not with you?

Personal Protective Equipment: Protecting People, Preserving Capability

By Daniel Whittaker, Air Support Safety Team



A missing pair of ear defenders might not sound like an operational risk, but on an RAF Station, it could be the difference between a firefighter responding to an emergency and being unable to deploy. Across Air, personal protective equipment (PPE) does far more than satisfy safety regulations. It protects our people, preserves operational capability, and enables critical tasks to be carried out safely every day. This article explores how seemingly routine equipment, from hearing protection to bump caps, can have a direct impact on both individual safety and mission success, and why PPE deserves far more attention than many of us give it.

While PPE covers a wide range of equipment and activities, its importance continues to be highlighted across Air as we strive to maintain the highest standards of safety. Recent observations and assurance activities have reinforced the need for continued focus on the correct selection, use and maintenance of essential PPE, including hearing protection, bump caps, gloves and eye protection.

As work environments, equipment and tasks evolve, it is important that our understanding and application of PPE requirements evolve with them. This article explores some of the factors influencing PPE use and highlights opportunities to further strengthen our safety culture. By ensuring PPE is appropriately selected, correctly worn and well maintained, we can continue to protect our most valuable asset, our people, and support a safe and effective working environment where safety is everyone's responsibility.

The best way to convey this issue is by giving examples, starting with RAF Marham, home to the UK's F-35 Lightning Force. Firefighters arriving at the unit following completion



of their training had been put through the process to get hearing protection moulded for them. The general process is for ear moulds to be taken during training, allowing fitted hearing protection to be manufactured and distributed to the unit before the individual's arrival. Having appropriate hearing protection available on arrival ensures firefighters can immediately participate in operational activities, training and emergency response duties, supporting both individual safety and the maintenance of operational capability.

Noise-induced hearing loss is taken very seriously across the Armed Forces, and nowhere more than at Marham where the risk is heightened further by the increased noise output from the F-35. The loss of any operational firefighters could have potential to affect crew resilience and availability, while also hindering the progression and development of the firefighters themselves during their ongoing period of non-operational status - ultimately leading to a situation where there may not be enough firefighters available to tackle an incident on station. For Firefighters, mitigations are always rolled out at Marham and beyond, with a series of thorough investigations and assurance checks, conducted by both the Marham Flight Safety Management (FSM) Team, and by Defence Fire and Rescue (DFR). Once as much detail as possible had been collated by the latter, they worked with the FSMs at Marham and other stations to mitigate any emerging risk to personnel safety.

Meantime, at for example RAF Waddington, for individuals conducting ground operations on equipment such as the RC-135W Rivet Joint, are required to wear 'bump caps' to protect themselves from head injuries. To ensure full awareness of this importance, individuals are constantly briefed on the Squadron's risk assessment on safe practices. Other mitigations put in place are personnel constantly being re-briefed on the importance of wearing the correct PPE when working on aircraft, and promotional newsletters being distributed on topics such as PPE requirements and the relevant risk assessments.

A strong safety culture is a core component of the RAF's capability to fly and fight on behalf of our nation, and as such it is important to learn the importance of PPE, and apply any lessons learnt to everything we do. Air reinforces the importance of adhering to established safety protocols, and to learn from what went wrong, and what went right. The correct use of PPE is a vital part of keeping our workforce safe, and it is therefore essential that the lessons identified are shared across the organisation, thereby ensuring that all personnel understand the risks involved, the controls designed to mitigate them, and the steps to take when things go wrong. Awareness of this going forwards will help strengthen our safety culture, reduce the likelihood of incidents occurring in the future, and ultimately contribute to the continued maintenance of Air's operational capability.

We all have a role to play in improving the culture around PPE, as safety is everybody's concern. For those on the ground working in potentially hazardous environments, it is not only key to understand the importance of wearing PPE correctly and how to do so, but also to ensure that these standards are consistently maintained. For those who do not work in such environments and may not consider the importance of wearing PPE in their day-to-day role, there are still actions to take to help combat this issue. When we get sight of incidents and lessons identified, whether directly through reports or through other means, it is important to promulgate this information across

our Business Area. Sharing experiences and learning from others helps to raise awareness throughout the organisation, reinforce good practice, and prevent the repetition of avoidable incidents. By reporting openly, engaging with safety communications, and encouraging our colleagues to do the same, every individual contributes to a stronger safety culture, enabling the organisation to continually improve and safeguard both its personnel and operational capability.



PPE remains a vital element of our safety management arrangements and plays a key role in protecting personnel across Air. As work environments, equipment and tasks continue to evolve, recent reviews, assurance activities and discussions have provided valuable insight into the use of essential PPE, including hearing protection, bump caps, gloves and eye protection, across a variety of settings. These observations provide an opportunity to reinforce good practice, strengthen awareness of PPE requirements, and share valuable lessons across the organisation. This article explores some of the factors influencing PPE use and highlights opportunities to further enhance our safety culture. By ensuring that PPE is appropriately selected, correctly worn and properly maintained, we can continue to protect our most valuable asset, our people, while reinforcing a culture in which safety is understood, valued and embedded in everything we do.



Look out, See, and avoid



Radio Utilisation:
Listen to ATC frequencies to build a mental picture of nearby traffic, even if the aircraft is not yet visible.

ROYAL AIR FORCE Safety Centre

SC233

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Insights from the UK Flight Safety Committee

When the Horizon Disappears: 56 Seconds to Lose Control

By Rob Holliday FRAeS, Chief Executive UK Flight Safety Committee (External Author)

On 12 February 2024, a Bell 206L was returning to Fort Chipewyan Airport in Alberta after a day of geo-survey flying over Lake Athabasca. The pilot was well within reach of home, less than half a mile from the runway threshold, when blowing snow swallowed his visual references. He turned away, tried again from a different direction, and eventually pointed the helicopter out over the frozen, featureless lake in the hope of finding something to look at. Two minutes later he told the second pilot, who was listening on the phone from the ground, that the helicopter was spinning and out of control. Moments after that, it struck the ice. He did not survive.

The Transportation Safety Board of Canada's investigation into that accident (A24W0016) was released this year, and it reads as an almost exact echo of an earlier fatal crash the TSB investigated on Griffith Island, Nunavut (A21C0038). Different company, different aircraft, same story: a VFR-only pilot, minimal recent instrument experience, and a snow-covered landscape that offered no horizon, no contrast, and no way to judge height, speed or distance once the light went flat. The TSB has a name for this combination of conditions, flat light and whiteout, and the effect it produces is one of the most under-discussed killers in helicopter operations.

Why 'Inadvertent' Doesn't Mean 'Unavoidable'

Current regulation in Canada and the philosophy that underpins a great deal of VFR helicopter operating culture more broadly, treats inadvertent instrument meteorological conditions (IIMC) as something to be avoided at all costs, full stop. The logic is straightforward enough: if a pilot never enters cloud or loses visual reference, they never need to fly on instruments they may not be current on. The trouble is baked into the name. IIMC is, by definition, unintended. A strategy that relies entirely on a pilot successfully avoiding something unintentional is not really a strategy at all, it's a hope.

TSB research bears this out starkly. Helicopters are now more than twice as likely as airplanes to be involved in loss-of-visual-reference accidents, and in the years since 2021 that gap has widened further. Since 2010 alone, loss of spatial awareness has featured in 14 TSB investigations into commercial helicopter flights, accounting for 24 lives.

What Actually Happens in the Cockpit

The Fort Chipewyan report is unusually detailed about the human side of this failure mode, and it's worth sitting with. The occurrence pilot had roughly 2,500 hours total, but his instrument training amounted to the bare minimum required for licensing, 10 hours, completed back in 2015. He had barely 16 hours of winter helicopter flying since then, none of it "in the white," and had joined the company only weeks before the accident.

As the weather deteriorated that afternoon, the pilot didn't ignore it, he discussed it, adjusted his plan, and communicated regularly with a second pilot on the ground.



Image Source: TSB Canada

But each individual decision made sense at the time it was made. Finish the current survey line, the weather's still fine here; the visibility looks acceptable for the transit home; try the approach from a slightly different angle. This is what the TSB calls plan continuation bias, a well-documented tendency for pilots to stick with an original plan even as the cues supporting it grow weaker and the cues against it grow stronger, especially the closer they get to their destination. Investigators describe the final approach attempt as the point where the pilot experienced, or came close to experiencing, spatial disorientation before he ever announced a problem at all.

Once genuine loss of control began, the numbers are brutal. A separate US study of 31 fatal IIMC helicopter accidents found a median time of just 56 seconds between entering IMC and losing control. There is no time in that window to work out a plan from first principles. Whatever the pilot has practised is what the pilot will do.

The Triad: Training, Technology, Procedures

Neither the Fort Chipewyan operator nor the Griffith Island operator were doing anything against the rules. Recurrent instrument training isn't required for VFR helicopter pilots in Canada. Standard operating procedures aren't required for single-pilot operations. Technology like radar altimeters, terrain awareness systems, or synthetic vision isn't mandated either. Regulation sets a floor, not a target, and in both of these accidents, the floor turned out to be well below what the operating environment actually demanded.

Following the Griffith Island investigation, the TSB issued four recommendations aimed squarely at closing that



gap: mandatory training for IIMC avoidance and recovery, technology to support pilots in avoiding and recovering from IIMC, standard operating procedures for single-pilot commercial operations, and enhanced requirements for reduced-visibility helicopter operations in uncontrolled airspace. All four remain active. None has yet been assessed as fully satisfactory to close.

What's striking is how many operators have already worked out, independently, that this triad, training, technology and SOPs, is the answer, without waiting for a regulator to tell them so. Some have built in annual simulator or in-aircraft instrument recovery training. Some dispatch aircraft with instrumentation beyond the VFR minimum, including radar altimeters. Some have written explicit SOPs for flat light and whiteout conditions or built a selection and monitoring process that keeps pressure off pilots who are inclined to push into deteriorating conditions rather than turn back. None of this requires new regulation. It requires an operator deciding that the regulatory minimum isn't the same thing as an acceptable level of safety.

A Sobering Coincidence

There's a detail in the Fort Chipewyan report worth flagging on its own. The Griffith Island report was released just three days after this accident happened. Months later, when investigators spoke to the company's pilots, none of them knew that report existed, let alone what it said about the dangers of the avoid-at-all-costs approach. That's not a criticism of any individual — it's a reminder that safety lessons don't spread themselves. An investigation report sitting on the TSB website only does its job if operators are actively looking for it, reading it, and asking whether it applies to them.

That's really the invitation behind both of these documents: don't wait to be the next case study. If your operation flies VFR in areas where flat light or whiteout is a realistic possibility, anywhere with snow cover, water, or featureless terrain under an overcast sky, it's worth asking honestly whether your pilots have the training, the instrumentation, and the documented procedures to survive the 56 seconds after visual reference disappears. The regulations may not require it yet. The accident record suggests you shouldn't wait for them to.

This article draws on the Transportation Safety Board of Canada's safety brochure "Inadvertent Instrument Meteorological Conditions: Improve Your Odds of Recovery" and Air Transportation Safety Investigation Report A24W0016 (Hanley Heli Service Inc., Fort Chipewyan Airport, 12 February 2024). Imagery by TSB Canada.



Bell 206 L. Image by: Alain Rioux (GFDL 1.2 or GFDL 1.2), via Wikimedia Commons

I Learnt About Flying from That....

Balanced on a Pin Head

By Trevor Brown (External Author)



Image: 45133374.jpg - Defence image Library

It was to be a routine night low-level training exercise with me as number 3 of a Buccaneer three-ship: We briefed for a close formation take-off then remaining close up to the Victor tanker towline from whence, topped up, we were to proceed independently along a lengthy low-level route into a level simulated attack using the Nav's radar.

I'd not done a great deal of night close formation recently and whilst we manoeuvred through several surprise layers of bumpy cloud I concentrated on forgetting about the real horizon and just remaining in the same plane as the leader's two blue trailing edge formation lights – which were now effectively my 'Artificial Horizon'- whilst I listened to the sing song of the cockpit airflow as it puffed and blew in reaction to my short sharp power adjustments required to keep fore and aft station and not to drop off the back and lose sight of the leader. Nevertheless, after continuing our climb for some time, we were soon above the cloud and closing the brightly lit underside of the tanker as we slowed down and then took up station in echelon.

That night we had to take turns using the single, much more rigid centreline hose. It still demanded a steady approach speed to lock into the refuelling basket, but it was really built to accommodate large transport aircraft and was much more rigid. Too slow and no good connection, too fast and it would snap off my refuelling probe. I was last on and yes, in the basket first time with a gentle bump then a continued smooth push on the hose until it retracted to the magic mark where fuel would start flowing.

In no time at all we were topped up, reversing gently along the line of the hose and then quietly slipping down and back away from the brightly lit tanker – now looking rather like the white underbelly of a manta ray (or nowadays, the slow overhead passage of the Starship Enterprise). We turned gently to port, levelled and instantly we were quiet and motionless in a gigantic dark sphere rather like the planetarium with only a few faint stars above and an unbelievably long drop to a dark carpet of cloud below. I suddenly felt motionless, finely balanced on a pin head and that if I made even one tiny control input, we would topple, plunging uncontrollably to our death. My Nav was telling me it was time to turn left and start descent, but I just couldn't move and just muttered something about 'in a minute'. The feeling that I was not moving defied logic but was truly terrifying. I started to scan the instruments and sure the

Mach Meter was showing a bit above Mach 0.7 which was ok and the Altimeter showed we were level but still why were we not moving?

Something had to be done, and I started to remember an incident on my weapons course. Rumour had it that Command was trying to see whether helicopter pilots would make good Harrier pilots. One of my fellow students was slightly older ex-helicopters and had suddenly hit problems with the solo high-altitude exercises – feeling giddy, uncertain and terrified up there. After several very brave attempts and a visit to Aviation Medical experts he was no better and returned to rotary flying. When I asked I was told that his problem had been diagnosed as Break-Off Phenomenon – basically the total absence of motion cues.

It slowly dawned on me that maybe this was it and despite great misgivings I decided I couldn't stay up here all day, lowered the nose and eased back the throttles. The sudden movement of the dials, the familiar change of the nose attitude and most importantly the reassuring pulse of the air conditioner gently put me back in familiar territory and I was back in operation.

I had flown after a cold and my ears had 'popped' and made me feel a bit giddy now and again, but this was different. Thinking back for probably at least the last year I had flown mostly visual low-level trips, usually in formation with lots of activity and the ground rushing by. Even on the odd higher-level segment I had been in close or wide formation with lots of movement relative to the other aircraft, the ground and the clouds.

It happened to me only once more many years later when in command of a passenger jet on a long night leg and that time I was able to recover my balance by just leaving the autopilot in and turning the cockpit lights down for a better view of the outside scene although the feeling when I stood at the edge of a rocky cliff and looked down at the beach on a windy day had similarities

I finally understood that it could happen to any pilot at any time and remain eternally grateful to my course colleague who had kindly shared his experience all those years ago and much later to the founder of the 'World Wide Web' where I found the article listed below.

Ref: *The Journal of Aviation Medicine. Volume 28 April 1957 Number 2 by Clark and Graybiel*

Trevor Brown is an ex-RAF pilot who flew the Canberra and Buccaneer before being selected for ETPS (38 Fixed Wing Course 1979). At the end of 1983 he had qualified on all front-line aircraft of the time bar the Phantom. Trevor rounded up almost exactly 20 years of RAF service as an instructor on the Tornado Tri-National Training Establishment in 1987 and then settled in Hong Kong flying Tristar, A330 and A340 for Cathay Pacific returning to UK in 2000 to fly the A320 with BMED and British Midland before being re-acquainted with the A330 on a summer contract with Thomas Cook.



Across Defence: The Safety Environment Assessment Tool (SEAT) – Turning Feedback into Action

By the RAF Safety Centre O&A Team



Every day, personnel across Defence identify opportunities to improve safety, efficiency and organisational effectiveness. However, many of these valuable insights may not always emerge through occurrence reporting, audits or formal assurance activities alone.

To address this gap, the Safety Environment Assessment Tool (SEAT) was introduced in 2013. SEAT provides personnel with an anonymous means of sharing their experiences and perspectives, helping commanders better understand the factors that influence safety, culture and performance within their units. By gathering feedback directly from the workforce, SEAT enables commanders to recognise strengths, identify areas warranting additional attention and make informed decisions that support organisational learning and continuous improvement.

SEAT is a proactive safety tool, not a response to a failure. The purpose of the analysis is to identify emerging issues early and support timely intervention to strengthen safety performance.

Is It Really Anonymous?
Yes.

Demographic information is collected solely to help identify broader trends and is never linked to individual responses. Furthermore, those responsible for distributing the survey cannot see who has completed it.

Once a survey has closed, the results can only be accessed using a secure code issued to the Unit Commander. While commanders can view survey results, they cannot see who submitted individual responses or link feedback to specific personnel. It is then entirely at the commander's discretion whether, and with whom, the overall findings are shared.

The purpose of SEAT is to provide personnel with a safe, confidential and trusted means of sharing honest feedback, whilst ensuring anonymity is protected throughout the process.

Why Complete a SEAT Survey?
The effectiveness of SEAT relies on participation. Every completed survey contributes to a more accurate picture of a unit's safety culture and climate, providing commanders with evidence they could use to drive meaningful change.

Your feedback helps to:

- Identify recurring issues and emerging trends.
- Highlight areas of good practice and organisational strengths.
- Support improvements to processes, procedures and ways of working.
- Inform command decision-making and prioritisation.
- Shape future organisational development initiatives.

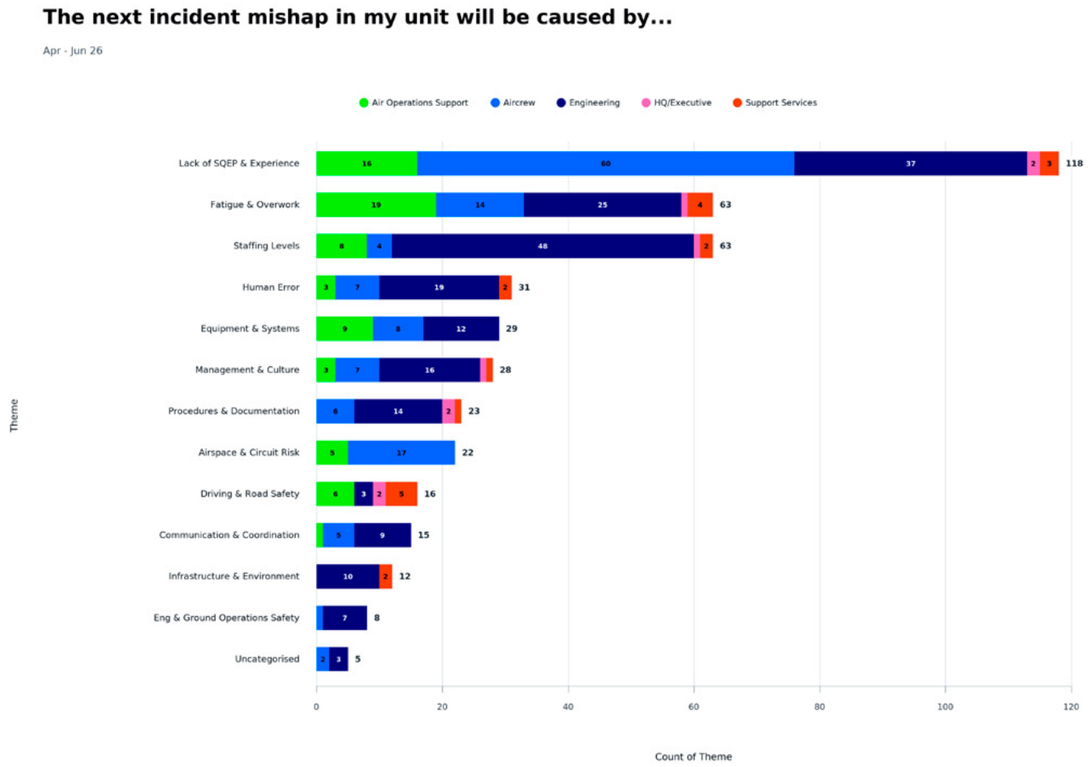
What Happens to My Feedback?
One of the most frequent questions asked is:

"Does anybody actually read my comments?"

The answer is yes.

Whilst survey scores indicate what personnel think about a particular aspect of their unit, free-text comments often explain why they hold those views. These comments provide valuable context, practical examples and suggestions that cannot always be captured through numerical data alone.

Individual comments rarely tell the whole story. However, when similar concerns are raised repeatedly, clear themes begin to emerge. By analysing comments across multiple surveys and grouping them into common themes, recurring issues can be identified and used to inform both local action and wider organisational learning across the Air TLB. This analysis has and will continue to inform discussions with the RAF Senior Leadership Team and other key stakeholders across Defence.



Understanding SEAT Results
SEAT results should be viewed as a starting point for discussion rather than a report card. The purpose is not to identify individuals or apportion blame, but to understand how personnel perceive their working environment and safety culture. Results should always be considered alongside local circumstances, organisational change, operational commitments and workforce pressures.

Positive Scores
High scores often indicate areas of strength where personnel feel supported, informed and confident in local processes. These areas can provide examples of good practice that may be shared more widely.

Areas for Improvement
Conversely, lower scores do not necessarily indicate poor performance. Instead, they highlight topics that may benefit from further investigation, discussion or intervention. In many cases, they may identify concerns that are shared across similar units or platforms.

Example of Theme-Based Analysis
The example below demonstrates how recurring themes can be identified from survey feedback and used to highlight concerns that warrant further consideration from a safety perspective.

Turning Feedback into Action
The RAF Safety Centre continues to enhance its reporting and dashboard capabilities, enabling trends to be examined and monitored across the Air TLB. Whilst not exhaustive, these developments will help identify recurring issues and emerging concerns that may support future decision-making by the RAF Senior Leadership Team.

The aim is simple: Through your participation, provide the evidence to drive meaningful and measurable improvements.

New in 2026: The Commander's Feedback Survey
To support the continued development of SEAT, the RAF Safety Centre has introduced a new five-question Commander's Feedback Survey. This provides commanders with an opportunity to share their experiences of using SEAT and to comment on the survey process, outputs and overall value of the tool. Their feedback will help identify what works well, where improvements can be made and how SEAT can continue to evolve to meet the needs of Defence.

Commanders are invited to provide feedback on the following:

- To what extent did the SEAT survey results influence command decision-making within your unit?
- What key issue or insight (positive or negative) did the survey reveal about your unit's safety or command climate?
- What actions or interventions did you implement as a result of the survey findings?
- Following those actions or interventions, how did they improve or degrade safety or performance within your unit? What worked and what did not?
- How valuable did you find the SEAT survey in supporting your command responsibilities?

This initiative will help the RAF Safety Centre better understand how survey findings are translated into real-world improvements and enable further enhancement of the tool.

The Future of SEAT
With the Commander's Feedback Survey now in place, SEAT will continue to evolve to meet the changing needs of Defence and planned developments include:

- Enhanced analytical capability and improved trend reporting.
- Dashboard-driven insights.
- Continued refinement of survey content and scope, with the potential to reduce the number of questions where appropriate.

The long-term vision is not simply to collect responses, but to help Unit Commanders identify the key issues and concerns that matter most to their personnel, enabling evidence-based action and continual improvement.

Need a Survey?
The RAF Safety Centre supports the delivery of SEAT surveys across the Royal Navy, Army, RAF and Cyber & Specialist Operations Command (CSOC). Units wishing to request one or more surveys can register via the SEAT Setup Unit Survey page which can be found on the RAF Safety Centre's Comms Site on SharePoint.

Using AI Safely and Effectively in the Workplace: A Practical Guide for RAF Personnel

By the RAF Safety Centre & RAF Digital



AI-Generated Image

Artificial Intelligence (AI) tools such as Microsoft Copilot are becoming increasingly common across Defence and wider government. Used correctly, they can help personnel draft documents, summarise information, improve written communications, analyse data and reduce the amount of time spent on routine administrative tasks.

Like any workplace tool, however, AI is most effective when used by trained and informed users. Copilot is designed to assist, accelerate and enhance human work, not replace human judgement. The quality of the output will often depend on the quality of the information and instructions provided by the user.

The RAF operates in a highly regulated environment where accuracy, security and compliance remain essential. AI can support these objectives by helping personnel work more efficiently, but responsibility for decisions and published outputs always remains with the individual using the tool.

Why AI Requires Human Oversight

AI systems generate responses by predicting likely words, images, or actions based on patterns learned during training and, where authorised, information available to the service at the time. This allows it to produce useful drafts, summaries and recommendations very quickly, but it does not possess human understanding, judgement or experience, even though it can often produce outputs that appear knowledgeable and well-reasoned. AI systems can occasionally generate information that appears credible but is entirely incorrect. This behaviour is commonly referred to as a 'hallucination'. Users should verify facts, references, quotations and technical information before relying upon them.
AI systems often present answers confidently regardless of how certain they are. A confident tone should not be regarded as evidence that information is correct.

As a result, AI-generated content may occasionally:

- Contain inaccuracies or outdated information.
- Misinterpret a poorly worded request.
- Omit important context.
- Present information confidently when further verification is required.

These issues can often be reduced through clear prompting, providing relevant source material and reviewing outputs before they are used. In practice, the greatest risk is often not the technology itself, but how it is used. Poor quality information, unclear instructions and a lack of review can lead to poor outcomes regardless of whether the work is produced by AI or a human assistant.



AI-Generated Image

Protecting Information

When using AI tools, personnel must continue to follow all existing MOD and RAF information handling policies. Information should only be entered into approved systems and users should always ensure they understand which AI service they are using before providing any data.

Examples of information that must always be handled appropriately include:

- Internal RAF documents.
- Personal data.
- Operational information.
- Sensitive or proprietary material.

As with any digital tool, users are responsible for ensuring information is handled correctly and in accordance with policy.

Understanding the Different Versions of Copilot

The RAF currently provides two versions of Microsoft Copilot: Copilot Chat, which is available to all MODNET users, and Microsoft 365 Copilot Premium, which offers additional capabilities through integration with Microsoft 365 applications such as Outlook, Teams, Word, Excel and PowerPoint.

Copilot Chat

Copilot Chat is available to all MODNET users and provides a secure AI-powered assistant that can help with everyday tasks such as researching topics, drafting emails, improving written communications, summarising information, brainstorming ideas and answering questions.

For many users, Copilot Chat is an excellent introduction to AI and can deliver immediate productivity benefits. Copilot Chat has fewer Microsoft 365 integration capabilities than Microsoft 365 Copilot. Access to organisational content depends on the configuration and permissions available within the MOD environment.

Microsoft 365 Copilot Premium

Microsoft 365 Copilot Premium includes all the capabilities of Copilot Chat but adds deep integration with the Microsoft 365 applications many personnel use every day, including Outlook, Teams, Word, Excel and PowerPoint.

This allows Copilot to help users work with their emails, meetings, documents, presentations and data, making it easier to draft content, prepare briefings, analyse information, create presentations and automate routine administrative tasks.

Rather than simply answering questions, Copilot Premium becomes part of your daily workflow, helping you make better use of the information you already have access to across Microsoft 365. However, although Copilot can assist with analysis, users remain responsible for verifying conclusions, recommendations and calculations.

A Word About Imagery

Before you use generative AI – Check the newly issued 2026DIN05-029 to avoid falling foul of MOD policy.

The DIN will tell you (amongst many other things):

- Only Use Defence-Approved AI Tools.
- Do Not Use AI To Generate Images Of Service Personnel Or Equipment.
- Defence Branding Rules Apply And This May Be Breached By AI Image Generation.
- Images Must Be Clearly Labelled As AI-Generated.

What Makes a Good Prompt?

One of the most important factors influencing AI performance is the prompt provided by the user. Good advice is to treat Copilot like a capable colleague newly posted in. It works fast, never tires and handles a wide range of tasks. But on arrival it does not know your intent, your unit or your regulations.

A clear prompt removes guesswork; an unclear prompt hands your decisions to the machine.

Well-written prompts generally describe:

- What you are trying to achieve.
- Who the output is for.
- Which information should be trusted.
- What format you require.
- What a human must check before it is used.

Examples of effective instructions include:

- "Use only the information provided below and clearly identify any gaps that prevent a complete response."
- "Highlight any information that is missing."
- "Produce a 200-word executive summary."
- "Identify any assumptions made."

When working with RAF material, users should provide the information required for the task and give clear guidance on how it should be used.

For example:

"Using only the RAF policy extract below, produce a summary. If information is missing, identify the gap rather than making assumptions."

Good prompting is a skill and, like any skill, improves with practice.



AI-Generated Image

Service Writing Considerations
Copilot can be extremely useful for drafting service correspondence, briefing notes and reports. It can help improve clarity, structure and readability.

However, all outputs should be checked against JSP requirements and local formats before publication. Users remain responsible for ensuring the final product meets the required standard.

Copilot should be viewed as a drafting assistant rather than the final approving authority.

Common AI Pitfalls

Poor Source Information
Scenario: A user provides incomplete or inaccurate information and asks Copilot to produce a briefing.

Impact: The resulting product reflects the weaknesses in the source material.

Data Handling Errors
Scenario: Information is entered into an unapproved service.

Impact: Information assurance and compliance risks may be created.



AI-Generated Image

AI Hallucinations

Scenario: Copilot generates a fact, quotation, reference, date or policy statement that appears convincing but cannot be verified.

Impact: Users may unknowingly include inaccurate information in reports, briefings or correspondence.

Over-Reliance on Automation

Scenario: A draft is accepted without review.

Impact: Errors that would otherwise be identified by a human may remain unnoticed.

Ambiguous Instructions

Scenario: A user submits a vague prompt and receives an unexpected response.

Impact: Time is lost refining outputs and correcting misunderstandings.

Training and Familiarity Gaps

Scenario: Users expect AI to replace official guidance or subject matter expertise.

Impact: Incorrect assumptions may influence decision-making.

Best Practice

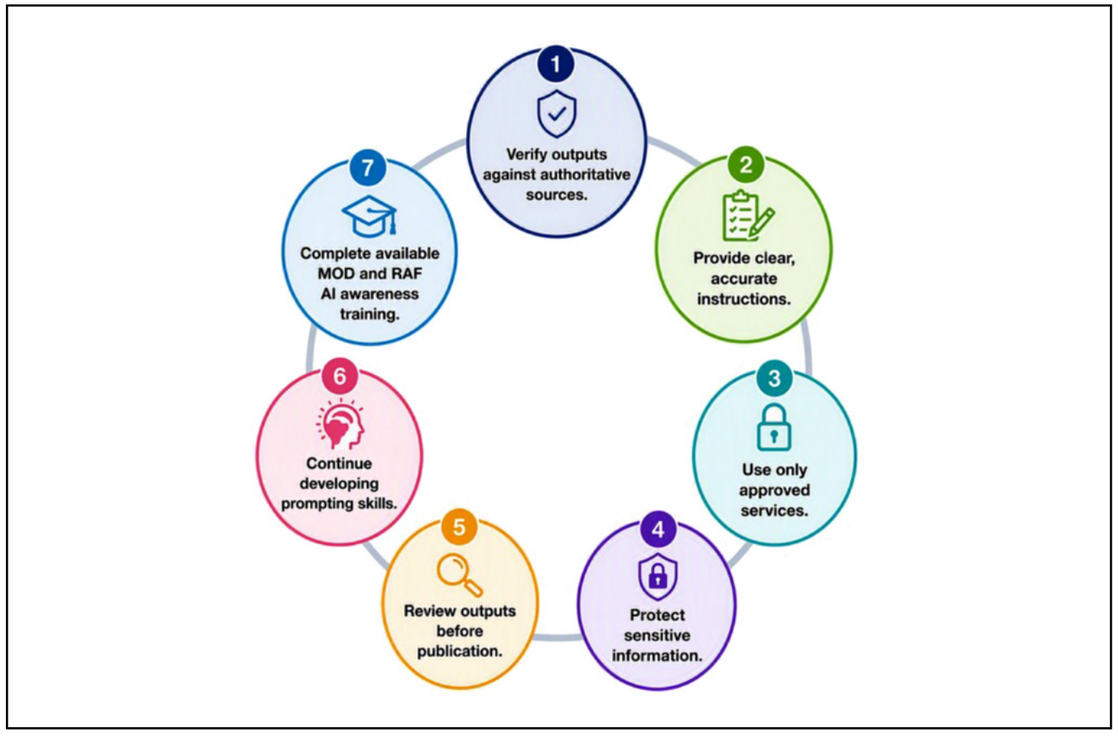
To achieve the greatest benefit from AI tools:

Used responsibly, AI can significantly improve productivity, reduce administrative burden and allow personnel to focus more time on higher-value activities.

Final Thought

Artificial Intelligence is a powerful digital assistant. It can help users write faster, analyse information more effectively and complete routine tasks more efficiently.
Like any tool, however, its effectiveness depends on the skill, judgement and professionalism of the person using it.

All AI outputs should be reviewed by a human before they are relied upon or published.



AI-Generated Image

It's called copilot, not autopilot

You Have One Job

By RCAF CP-140 Crew Member (External Author)



Have you ever had that feeling of excitement when returning home from a long deployment or operation? One of those events where your Unit and Wing are there to welcome you back and you've been looking forward to getting home for weeks? Where there is a large crowd of loved ones and reporters and it's really quite a spectacle? If you have, then you'll understand that little thrill you get when stepping off the aircraft and just how much of a distraction it can be and, if you're not careful, how it can lead to mistakes you'd otherwise not make, and in my case, a little bit of embarrassment also.

Our crew was flying home from an Operation where the CP-140 Aurora was doing overland surveillance in Iraq and Syria, it was still a big operation in the media at the time, the fight against ISIS, so it wasn't surprising that our return had drawn some attention. As we came into land, the pilot did a low overhead break as a show for those on the ground and a bit of a celebration for the crew which added to the atmosphere of excitement.

We landed and began to taxi – not over towards our hangar where we normally park, but towards the Air Movements Unit where the crowd was gathered. I was new to the crew, only just finishing my type course a few months before.
I was working my way through my OJT (On the Job Training) and my task for this flight was 4th crewman. That meant that upon landing, I would be the first and only one off the aircraft to install all the pins and make the aircraft safe before the remainder of the crew would step off.

I was sitting there with all the pins in my hand, three landing gear pins and one for the bomb bay, looking out at the crowd waiting for the engine props to stop spinning before opening the main cabin door and lowering the ladder down. Looking out, I could spot the WComd and WCWO as well as the Sqn CO and CWO all there to welcome us home. I was feeling very eager to get off the plane and a little proud of not only what we'd accomplished but also that I would be the first on the ground in front of the eyes of everyone.

I had done this task at least three dozen times before. I knew what I had to do, wait for the prop to stop, open the door, move the ladder into place and lower it down, open the sonobuoy disable door, install the bomb bay safety pin and then finally secure all the landing gear with pins. I ran the mental check through my head and then it was show time! Door opens, ladder down, the cameras start to flash, and the crowd starts to clap and cheer, there must be at least 100 people on the ramp. I see the WComd and the other higher ups start to approach closer, but I have a job to do.
As confidently as I can, I move forward, make eye contact with the pilot, give the hand signals to move up to secure the bomb bay then install all the gear pins.

Once complete, the command teams have moved forward and start shaking hands and congratulating me, as the rest of my crew start stepping off the plane. The next person off was my lead and he was just giving me this look. My ear-to-ear smile faded as his gaze turned to the sonobuoy disable door, which was still closed and locked, meaning the system wasn't made safe. He walked behind the ladder and popped the door open as I made my way over and he said to me in his sarcastic sense of humour *"You had one job, and in front of everybody too."*

"Do you think anyone noticed?" I asked embarrassed, *"Oh, the Sqn CWO definitely noticed!"* which didn't bode well for me. I thought it was my chance to stand out a little from the crowd, which I did achieve, just not in the way I had intended. The feeling was akin to that stereotypical dream of being a young kid at school standing in front of a crowd in your underwear. All eyes are on you, and you've made a huge mistake. I let the crowd and excitement distract me from my task. I was suitably embarrassed and could not believe I had forgotten such a simple thing that I had done dozens of times before. This is when you begin to realize that sometimes it is easy to get distracted, lose focus, skip steps, and do things out of sequence. All it takes is something as non-standard as someone waiting to greet you as you are coming off the plane to draw your attention away.

We will all make mistakes. There will be times we forget things, it is impossible to be perfect 100% of the time. The most important thing is that we learn from our mistakes, improve, and try not to let it happen again. The [Canadian] Flight Safety Program is vital to highlighting these types of events so that we can educate and learn from the mistakes of others. The "Just Culture" approach is there to show us errors so we can learn and although we may be a little embarrassed at our mistakes we learn from them and aren't punished.

Almost a decade down the road, I always remember this event every single time I am acting as the 4th Crewman *"You have one job"* and I've never forgotten to open the sonobuoy disable door since. Stay focused and stay safe!

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Speaking Up in Defence: **Your Voice Matters!**

By RAF Safety Centre

In September 2026, the 'Whistleblowing in Defence Review – Final Report' was released following a ministerial-led review of whistleblowing arrangements across Defence.

The report reinforces that whistleblowing is a vital mechanism for identifying wrongdoing, protecting personnel who raise concerns, and maintaining integrity, accountability and public trust across Defence. The review emphasises that personnel should normally raise concerns through their management or command chains in the first instance:

"Individuals are encouraged to speak with their commanding officer, line manager, or another trusted individual within their chain of command or management chain."

However, Defence also recognises that there may be occasions when an individual prefers to use a confidential route. The report highlights the Confidential Hotline, which provides impartial advice and guidance on whistleblowing policy and procedures and allows concerns to be raised confidentially. Concerns can be submitted through the online reporting forms available at:

https://modgovuk.sharepoint.com/teams/22370/SitePages/Home.aspx
or
confidential-hotline@mod.gov.uk

Whistleblowing or a complaint…?
It's easy to mix these up. Whistleblowing is about wrongdoing that affects other people, not just you – things like fraud, safety risks, or covering up mistakes. A complaint is usually about how you personally have been treated, such as bullying or an unfair decision. Knowing the difference helps you pick the right route.

A recent change worth noting is that: under certain circumstances sexual harassment can now be raised via a whistleblowing report too and does not always have to be raised as a personal complaint. This gives people an additional route to speak up if they see or experience this kind of behaviour.

The Review makes clear that raising concerns is not an act of disloyalty. Rather, it is a professional responsibility that helps Defence learn, improve and protect its people. Whether using the chain of command, the Confidential Hotline, or DCORS for air safety concerns, speaking up helps strengthen safety, integrity and trust across the whole of Defence.



For more information, search the MOD Sharepoint Site for *"Speaking up: the Whistleblowing Review explained".*

Speak Up. Protect Safety. Strengthen Defence.

DEFENCE CONFIDENTIAL OCCURRENCE REPORTING SCHEME *(DCORS) FORM*

RAF personnel should also be aware of a separate reporting mechanism for confidential air safety concerns. The Defence Confidential Occurrence Reporting Scheme (DCORS) form is available via the RAF Safety Centre Comms Page (https://mod.gov.uk.sharepoint.com/teams/23116) and provides a confidential route for reporting air safety occurrences. The DCORS form includes the following guarantee:

"COMMAND FLIGHT SAFETY OFFICERS AND THE MAA GUARANTEE THAT YOUR NAME AND ADDRESS WILL BE REMOVED. FROM THEN ON, YOUR REPORT WILL BE ANONYMOUS."

Doc's Corner:
Rising from the Ashes:
Nicotine, Still a Problem



By Wg Cdr Phil Lucas, CFMO, RAFCAM



We need to talk about nicotine in this issue; in particular, about the way it is taken as it's causing a problem which can affect your health, wellbeing, performance and flight safety.

So how did it all start?
The way we have taken nicotine has changed over the years. Used since ancient times in the Americas, where the tobacco leaf came from, it spread to Europe in the 16th century. It was introduced to France by a Jean Nicot (does the surname look familiar?). Sir Walter Raleigh popularised it in the UK in the mid-17th century. Originally smoked in pipes, it was in the late 19th century that cigarettes were made; low cost and mass produced. They became elegant and fashionable in society at the turn of the century.

Explosion in use
Post-First World War, there was a significant increase in cigarette smoking and the link between smoking and lung cancer began to be observed. It was a British epidemiologist, Richard Doll who was able to demonstrate that smoking caused serious health damage including the link between smoking and lung cancer.

Cigarettes are dead, long live nicotine
The clear harms of smoking and links between secondary (passive) smoking and harm have led to the increased regulation of smoking which has reduced its use. However, while the numbers of smokers have declined, nicotine is still very much with us.



Nicotine Pouches – Photo L.V. Olavi Rantala
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So what has changed?
The way we take nicotine is different. We are taking nicotine through e-cigarettes (vapes) and through tobacco pouches. These products have changed the way we have taken nicotine, but the consequence is that the dose of nicotine we have taken is different and can be much higher.

Now don't get me wrong. If you are a cigarette smoker, then taking vapes or pouches is better. However, not taking any nicotine products at all is by far the best situation. Put another way, I would advise a smoker to vape. I would never advise a non-smoker to vape.

The other nicotine product is pouches. They are placed between your gum and cheek. The nicotine has been altered to a nicotine salt which is faster-absorbing (quicker hit, also greater dependency) and the gum is an area of the body which absorbs chemicals into the bloodstream very quickly. In this country you can purchase nicotine pouches which have no tobacco; the nicotine is suspended in plant-based fibres with sweeteners and flavourings.

How much nicotine am I taking in?
This is the important question and the point of this article. If you smoked a standard cigarette, then you would be taking a dose of 1-2mg of nicotine. Vapes have different strengths – up to 20mg, or 20 cigarettes, which is the legal limit for sale in the UK and typically allows for 600 puffs. So, 600 puffs will be the same dose as a packet of cigarettes. Other nations can sell concentrations far higher than this. Although 600 sounds a lot, it is amazing how quickly some can get through this without realising. The worst case for high nicotine is a pressurised device using high-dose nicotine fluid.

Pouches have more nicotine. A 6mg pouch is equivalent to 1 cigarette. But some pouches have up to 20mg (3 cigarettes). The nicotine hit is not quite as fast as vapes, but the overall nicotine absorbed in the body is higher. The UK and EU have a voluntary code to cap nicotine at 20mg, but outside the UK, doses are far higher and some people are getting far more nicotine than they bargained for, even getting to toxic doses.

A controller with nicotine withdrawal:
A controller presented to the MO in BFSAI as acutely anxious, jittery, irritable and unable to sleep.
It was found they were suffering from acute nicotine withdrawal. They vaped, but BFSAI had run out of nicotine products. They were made temporarily unfit controlling and treated with maximum dose of patches and 'top up' nicotine lozenges. The worst symptoms resolved within a few days.

So what's the problem?
While stopping smoking is a very good thing (prevents cancer and respiratory disease), nicotine usage is still rife in the form of vaping and tobacco pouches. This is a problem and can affect flight safety. There are four potential problems.

1. Cardiovascular health.
2. Gum disease.
3. Addiction and overdose.
4. Loss of human performance when withdrawing.

Cardiovascular Health
Nicotine affects the heart, and not in a good way! A dose of nicotine increases heart rate. It constricts the blood vessels, so blood pressure increases. That increases the need for oxygen to the heart as it's working harder. Unfortunately, it's a struggle to get that extra oxygen as the vessels are narrower, thanks to the nicotine that was taken. In addition, blood vessel walls are irritated by the nicotine so there is a build-up of plaques that later cause strokes and heart attacks as nicotine also encourages blood clotting. When you are younger, the body can compensate, although your body can do without this. As you get older, the body will struggle with this a lot more.

Gum Disease
Dentists right now cannot fully link tobacco pouches with oral cancer. However, remember what I said about constricting blood vessels? It does that on the gum next to the pouch. That causes the gum to lose blood supply and that causes tissues to die. The changes dentists are seeing in gums are classic changes that are pre-cancerous.

Addiction and Overdose
The problem with nicotine is that you get dependent. Your body wants more of it. It starts complaining to you when it's not getting nicotine. The more you give, the more it asks. So, you have to keep feeding your body nicotine.

Too much nicotine can cause abnormal heart rhythms, tremors, sweating, diarrhoea and weakness. The question is, how much are you taking and when is it too much?

Groundcrew with nicotine toxicity:
A groundcrew member came into clinic with palpitations (a strong, fast and irregular heartbeat). This was causing them anxiety, and they didn't know what was happening. On questioning, the doctor realised that they had recently stopped smoking and converted to vapes. On calculating the amount of nicotine they were taking, it was the equivalent of several hundred cigarettes a day. The patient gradually reduced the number of vapes and started nicotine patches and sprays. Symptoms settled completely for several months. Then recurred as they started vaping again! A 24-hour heart trace showed that their heart was irregularly beating at the same time he was vaping. They had no idea how much nicotine was being taken.

Loss of Performance
So, what are we seeing right now in aviation? Anecdotally, we are getting reports of the following issues.

- Performance variability. As soon as your body starts craving nicotine (as low as 1 hour sometimes) you get distracted, you lose concentration and you can't sleep.
- Stomach and bowel effects with nicotine increase the chances of motion sickness.
- Aircrew taking pouches, including under oxygen masks while in flight to counteract withdrawal effects.
- Deployments and ships running short of tobacco pouches needing to replenish to prevent aircrew and groundcrew withdrawing.
- Phase 1 and 2 students taking tobacco pouches to promote alertness on exercise are becoming inadvertently addicted.

In Summary
- *Are you a smoker? Then change to nicotine replacement products, such as patches and sprays to help you quit completely. These are regulated and you know how much you are taking.*
- *Are you a non-smoker? Then don't start any nicotine products.*
- *Do you take nicotine products (vapes or pouches)? Ask yourself – "how much nicotine am I taking in?" Then be careful not to increase your nicotine intake and wean yourself down so it does not interfere with your duties. Think, how would you manage, should you suddenly find yourself with no nicotine? Pouches and vapes have removed the smoke in smoking, but risks remain. This is not just a military aviation problem. This will affect many people across multiple safety-critical industries, especially those where they are unable to take nicotine in the course of their duties (diving, radiation industries, emergency services etc.)*

A Flight Commander's Observation:
A trainee saw his Flight Commander because they were taking nicotine pouches regularly. They were directed towards the Med Centre to help reduce the dose. They later started taking them again, to the point of where they were taking them constantly, including in-flight. The trainee was directed towards the Med Centre who helped reduce the dose to a level that was manageable. The trainee was able to return to flying, largely through self-management with MO support.

Current regulatory guidance provides limited direction. RA2135 states that aircrew and supernumerary crew are not to use any non-UK sourced tobacco pouches. Compliance with the regulation does not necessarily remove the operational risks associated with their use.

A Flight Commander writes:
During a recent overseas deployment, it became apparent that a significant number of Service Personnel (SP), including both Aircraft Operating Crew and supporting personnel, were using nicotine pouches while carrying out their primary duties. While increasingly common, their use in an operational aviation environment raises questions regarding safety, human performance, and risk management.

My immediate concern was the presence of a foreign object in the mouth during critical tasks. Whilst the likelihood of an adverse event may be low, the potential consequences in a high-risk operating environment warrant consideration. I was also concerned for the physiological effects of nicotine. Many nicotine pouches contain levels of nicotine significantly higher than those delivered by traditional tobacco products. Regular use can rapidly lead to dependency, and users deprived of nicotine may experience withdrawal symptoms such as irritability, reduced concentration, restlessness, and impaired cognitive performance. These effects may be particularly relevant during extended operations, periods of high workload, or deployments where access to such products becomes restricted or unavailable.

As nicotine pouches become more widely available and socially accepted, aviation duty holders may wish to consider whether existing policy adequately addresses their use in the operating environment. Questions remain regarding their impact on human performance.

Finally
Do not use any nicotine products that have been sourced from outside the UK/EU. They may not be regulated, and you may not know how much nicotine you are taking.
In a future Air Clues, I may discuss energy drinks. It seems this CFMO is trying to restrict all pleasures in life. Perhaps the adage is true that if you live completely healthily, you reach 99, but it takes an awfully long time to get there!

AirClues Book Review

Aviation Safety and Security: The Importance of Teamwork, Leadership, Creative Thinking and Active Learning (2nd Edition)

By the RAF Safety Centre

Safety Beyond Technology
In an era where aviation discussions are often dominated by technology, automation and regulation, Dr Simon Ashley Bennett's Aviation Safety and Security provides a refreshing focus on the human and organisational dimensions of risk. This revised second edition builds upon the original 2015 publication with updated case studies and contemporary observations, demonstrating how aviation safety and security are shaped not only by machines and procedures, but by people, leadership, culture and learning.

Structure and Approach
The book adopts a concise monograph format, combining methodological discussion with practical case studies and contemporary appendices. Central case studies include the successful ditching of US Airways Flight 1549 in the Hudson River, lessons from significant aviation safety events, and security lapses at a major airport. The updated appendices extend the discussion to recent aviation accidents and the influence of politics and geopolitics on safety outcomes.

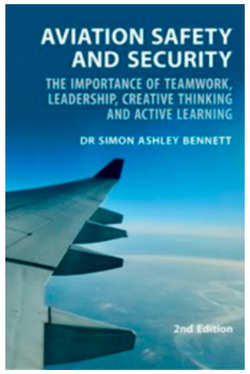
Teamwork as a Life-Saving Force
The most persuasive theme running throughout the book is the importance of teamwork. Dr Bennett repeatedly demonstrates that aviation safety is rarely the product of individual expertise alone. Instead, successful outcomes arise from coordinated effort across crews, organisations, regulators and emergency responders.

"Teamwork supports safe operation. Indeed, as demonstrated by Flight 1549, teamwork can save lives. While Sullenberger's innate skills played a big part in the successful ditching, it was teamwork that positioned the A320 over the Hudson. It could have ended up embedded in a building or strewn across a New York suburb. Instead, it floated down the Hudson River where it featured in a near-perfect multi-agency rescue."

Dr Simon Bennett

This passage succinctly captures the book's central argument. Public memory often focuses on Captain Sullenberger's exceptional flying skills, yet Dr Bennett broadens the narrative to include the collective actions of the co-pilot, air traffic controllers, rescue services and supporting agencies. The result is a compelling reminder that safety depends upon effective collaboration before, during and after an emergency.

The discussion is reinforced by other case studies, including a catastrophic United Airlines DC-10 engine failure at 37,000 feet.



Through such examples, Bennett illustrates how Crew Resource Management (CRM) transforms communication, leadership and shared decision-making into practical tools that can prevent loss of life during highly dynamic and stressful situations.

Assessment
One of the book's strengths is its accessibility. At only 85 pages, it avoids becoming an overly academic treatment while still encouraging readers to think critically about the organisational and sociological origins of risk. Rather than presenting safety solely through technical analysis, Dr Bennett explores how leadership behaviour, institutional learning and organisational culture influence operational outcomes.

The inclusion of recent appendices addressing contemporary accidents and policy issues adds currency and relevance. Readers looking for detailed engineering analysis may find the treatment necessarily selective, but practitioners interested in safety culture, CRM and organisational learning will find considerable value in the author's approach.

Reviewer's Summary
Dr Simon Ashley Bennett succeeds in reminding the reader that aviation safety is fundamentally a human endeavour. Technology, aircraft design and regulation remain essential, but the book argues convincingly that teamwork, leadership, creative thinking and active learning are equally critical to safe outcomes. The discussion of Flight 1549 is particularly memorable, showing how effective teamwork across multiple agencies turned a potentially catastrophic event into one of aviation's most celebrated survival stories. Concise, accessible and thought-provoking, this book will appeal to aviation professionals, military aircrew, safety managers, students and anyone with an interest in understanding the wider influences on aviation safety and security.

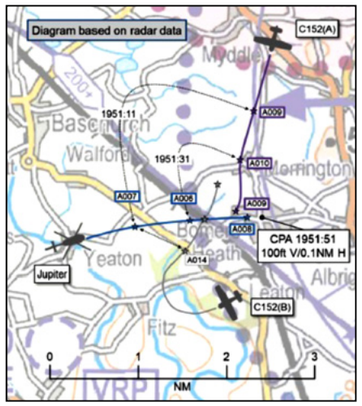
Verdict: A concise and engaging examination of the human factors that underpin aviation safety. Particularly recommended for those involved in safety leadership, Crew Resource Management and organisational learning.

Dr Simon Ashley Bennett, Libri Publishing | 2026 | 85 pages | £15 . ISBN 978-1-911451-53-2

Airprox Highlights



With Comments from Wing Commander Spry



Jupiter v Cessna 152A
5 Mar 26
Airprox No. 2026016

The Jupiter Pilot reported that, on completion of some approaches in the Nesscliffe Training Area, the aircraft was recovered to RAF Shawbury. Initially, a climb was completed to 1,000ft QNH but, because of the visible presence of lower cloud ahead, the altitude was reduced to 800ft. Operations from Sleap airfield had been notified at the Night Brief and activity had been seen earlier in the sortie. The Handling Pilot (HP) noted an ACAS contact in the 1 o'clock, indicating approximately 3 miles range and 400ft above; it appeared to be moving to their right-hand-side. This track seemed to change direction to cross from right-to-left and was indicating a descent. Although not visual with this traffic due to cloud, the HP was aware of strobe 'glow' from within the cloud in the right 1 o'clock using NVD and elected to descend to 400ft AGL. ATC provided Traffic Information on two contacts (one left, one right) while, at the same time, the ACAS provided an aural alert. The LHS pilot and two rear-crew members visually identified traffic in the 11 o'clock which commenced a left-hand turn and passed down the left of the aircraft. Meanwhile, the HP noted that the lights of the previous aircraft passed overhead before descending out of cloud and potentially presenting a confliction with the other fixed-wing aircraft. It was assessed that the vertical separation was 200-300ft from both fixed-wing aircraft. Lateral separation on the left-hand aircraft was possibly 200m. The crew completed the visual recovery to Shawbury and, following a discussion in dispersal amongst the crew, the Aircraft Commander informed ATC and Unit Operations of the intent to submit an Airprox report.

The pilot of the Jupiter commented that most internal tasks for the routine recovery had been completed. The workload was increased due to the threat. By comparison today, visibility was less good due to the night environment, field of view offered by NVD and cloud layers in proximity. The situational awareness offered by ACAS, ATC transmissions and the eyes of four crewmembers were all beneficial. However, the split threat degraded overall situational awareness. In addition, ACAS required a diversion from their external lookout.

The C152(A) Pilot reported that the weather was closing in. They had a solo student (in C152(B)), just to the south of the airfield, so they headed out that way to shepherd them home. They saw the Juno (they believe) at low level, with its distinctive strobe light, crossing right-to-left. They were talking to their student to find out where they were. They suggested that [the student] home to the overhead to find a gap. They were also talking to Sleap Radio because they were watching on ADS-B. With the weather closing in, they assumed that RAF Shawbury would have stopped flying. They suspect the [Jupiter] was just approaching the Harmer Hill gate. They did not feel there was an issue but, [later], received the [Airprox notification].

They call RAF Shawbury if they know that they are night flying, mostly so their controllers have situational awareness of their movements. Every time they call, they are told that they are NOTAM'd closed. It is not NOTAM'd, but it is notified. The pilot of C152(A) opined that, whenever they call the zone controller after 17.00, they say that they are not offering a service even though they are clearly there, watching on radar and listening to the radio. They only call them up to let them know of their movements, but they seem uninterested, so they have given up trying. It might have been helpful this night. The pilot of C152(A) reported that no avoiding action had been necessary as they had clearly seen [the Jupiter] moving right-to-left (sighted at a reported range of 400m in their 1 o'clock position).

The C152(B) Pilot (as a witness) reported that [this had been] a short local flight in VMC to complete the remaining 20min of their night rating. Upon tracking to Sleap, [they were] caught in inadvertent IMC and descended to remain VFR. When descending, [they were] visual with rotary traffic tracking east-to-west [west-to-east] approximately 500ft below, and visual with nav lights in the dark. The pilot of C152(B) commented that they did not take avoiding action as the path was not conflicting.

The Shawbury Controller reported that they were the ADC and ATCO in-charge for the shift when the Jupiter pilot stated they were going to file an Airprox after landing following their night sortie. When the pilot reported changing from Stud 4 to Stud 2, there were two Sleap aircraft roughly 4NM ahead. [The controller] had already made the decision to call the tracks once the pilot checked in on Stud 2. The two conflictors were called at roughly 2-3NM away on the first instance, and the pilot elected to descend by around 200ft to build in some vertical separation against the aircraft leaving the Sleap ATZ. They called the tracks again when separated by roughly 1NM. "Visual with both tracks" was the response from the pilot.

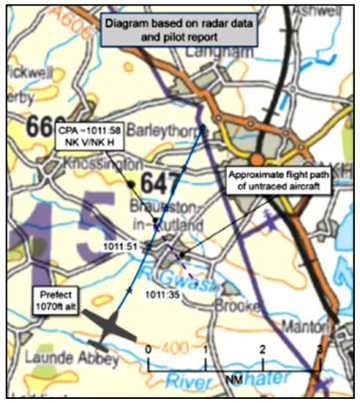
For the full report. See Airprox No. 2026016 on the Airprox Board website.



Spry's Comment:

This Airprox highlights the complexities of sharing airspace with other air users, especially at night and in deteriorating weather. What is a fairly routine experience for you may very quickly get beyond the experience and skill set of other air users, especially if they don't have the same equipment. It also highlights the value of the Duty Authoriser; had there been another person questioning the decision to send the pilot of C152 (B) on a night solo Nav Ex, and then the decision to shepherd them home, this Airprox might have potentially been avoided. The RAF Shawbury controller's proactive use of the ATM along with the Jupiter crew's use of ACAS allowed them to visually acquire both C152s and take avoiding action as required. ☐





Prefect v Unknown Aircraft
8 Apr 26
Airprox No. 2026038

The Prefect Pilot reported that, whilst conducting a low-level navigation exercise, they had been routing north past Oakham approaching a turning point for recovery to the destination airfield. At 650ft on the RADALT they looked to their 4 o'clock as part of the lookout, picture, instrument work cycle and spotted a small, single engine propeller aircraft at the same height, approximately 400m away. There had been no indication on their TAS display. The Prefect pilot rocked their wings to acknowledge presence, but the other aircraft pilot did not respond. The aircraft had then been clear of conflict at their 7 o'clock. The Prefect pilot put out a radio call on the Low-Level Common frequency (130.490MHz) to state their further intention to route northeast. No response was heard. Subsequently, the Prefect pilot reports having checked their (branded) EC equipment which indicated no aircraft. The sortie then continued as planned. The other aircraft was spotted only as part of a lookout scan. No internal indications or planning steps before departure highlighted the aircraft operating in the same area.

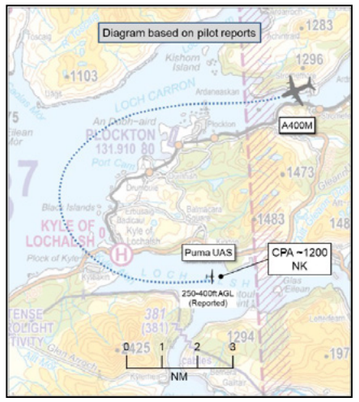
The Unknown Aircraft Pilot could not be traced.



For the full report, see Airprox No 2026038 on the Airprox Board website.

Spry's Comment:

This Airprox is a timely reminder that the Military is not the only air user in the Low Flying System. Civilian aircraft can fly to a minimum of 500ft from any person, vehicle or structure, but there are numerous exemptions to this rule. Among those exemptions are gliders hill soaring and aircraft take-off and landing, including at the plethora of farm strips scattered around the country. This Airprox is also a reminder that Electronic Conspicuity (EC) equipment and the use of the Low-Level Common (LL-Com) frequency are not fool proof and are reliant on other air users using compatible equipment and procedures. The UK Airprox Board and the CAA continue to promote the use of EC equipment and the LL-Com frequency and the safety benefits they provide to the civilian aviation community. ☐



A400M v Puma UAS
13 Nov 25
Airprox No. 2025235

The A400M Pilot reported that, approximately 3hr into the sortie, they encountered a UAV. It was tracking east at a similar altitude to their aircraft (250ft AGL). The location was south of Plockton and Balmacara. All three crew members saw the UAV, circa 100-200m off the port side. Estimates of its size were approximately 2-3m wingspan with winglets. Forward airspeed was significant based on the time to overtake the UAV. The closest airfield was Plockton. They continued en-route with nothing significant to report. There were no NOTAMs published for UAV activity. Communication had been attempted with Plockton airfield but with no success.

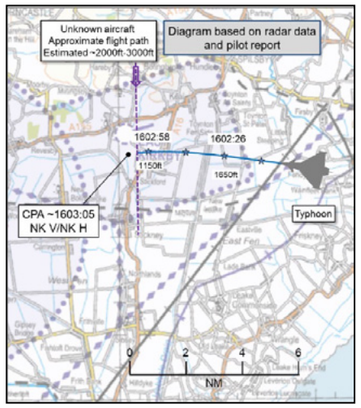
The Puma UAS Pilot reported that there was a loss of safe separation between the Puma UAS and an A400M Atlas. Their initial understanding suggests that the military Low Flying Booking Cell had not been informed of the Puma UAS operation, possibly due to a misunderstanding of LFA 14 boundaries. The loss of safe separation occurred when an A400M approached the Puma's operating area at a lower altitude, resulting in lateral separation of approximately 150m. The Puma was operating at 400ft AMSL, flying west-to-east in the Kyle of Lochalsh. The UAS team was focussed on the Puma throughout the flight under VLOS without distraction. The A400M was estimated to have been at 250ft AMSL and was observed approaching west-to-east over the Skye Bridge. Due to the short time available, and as it was assessed that the A400M was below the Puma, it was decided not to manoeuvre further away from the threat.



For the full report, see Airprox No 2025235 on the UK Airprox Board website.

Spry's Comment:

This Airprox highlights the fact that it's not just hobby flyers' drones that can pose a threat to military aircrews. The Atlas crew had carried out comprehensive route study and pre-flight planning and had not identified any RPAS activity to affect their planned route. They had entered their flight details into CADS and were monitoring the Low-Level Common frequency at the time of the Airprox. The investigation of the incident by the Brize Norton Air Safety Cell uncovered a potential misunderstanding on the part of the RPAS operators as to the responsibilities of the Low Flying Booking Cell; this meant that their exercise was not notified to other airspace users. The investigation also found that the RPAS operators do not routinely monitor the Low-Level Common frequency. Of note, a recent change to MAA RA 1600 means that these RPAS operations will now be entered on CADS which should aid deconfliction planning for military aircrews, while the improved relationship between the Brize Safety Cell and the RPAS operating agency should improve future communications and reduce the likelihood of unnotified RPAS activity. Let's keep talking and hopefully the risk of encountering unnotified RPAS activity should reduce! ☐



Typhoon v Unknown
14 Apr 26
Airprox No. 2026060

The Typhoon Pilot Reported that [Typhoon C/S] had been RTB (returning to base) from North Norfolk as a singleton on a visual recovery. When they had been at ~1,000ft QNH and 6NM on the extended centreline, a light aircraft was seen to pass directly overhead with an estimated separation of 1,000-2,000ft. The timeline of events below has been taken from the tape review:

1601:50 Typhoon calls *"field in sight"*, Coningsby Approach replied *"circuit clear, continue Cgy Twr stud "*. Typhoon had been at 083R/13NM from RW25 threshold, 2,500ft QNH, 300kt. Radar had been set at 70/70 and 20NM - no factor contacts detected.

1602:05 Typhoon cleared to join RW25. Typhoon was 081R/11NM, 2,000ft QNH, 300kt. No factor contacts detected on radar.

1603:11 Typhoon: *"Twr for Situational Awareness, light aircraft over the top of me now, heading south"*. Typhoon is 073R/6NM, 1,060ft QNH (1,120ft RADALT), 300kt, 20° AoB left.

1603:12-1603:45 Conversation between Typhoon pilot and Twr: Typhoon pilot stated *"Nothing passed by approach, don't think they have it"* and *"(the light aircraft is) assessed to be 2,000-3,000ft"*.

1605 Whilst downwind in the circuit, the Typhoon pilot attempted to acquire the light aircraft on radar but was unable. The light aircraft was only detected visually at short range, it appeared to be a high-wing design, possibly with a red stripe down the side. There would have been little opportunity to avoid MAC if height separation had been any less [they opine].

The Pilot of the unknown aircraft could not be traced.

The Coningsby Approach Controller reported that they had been the Approach controller when the Typhoon had made a visual recovery. The colour code had been BLU and they were controlling 4 speaking units. When the Typhoon was within 15NM of Coningsby, a single (uninvolved) Typhoon and a flight of 2 Typhoons were handed over from Swanwick(Mil) north of Coningsby by 25NM. Just after the flight of 2 had made contact, unexpectedly an additional uninvolved Typhoon pilot also called who had not previously been handed over by Swanwick(Mil). Relevant traffic working Waddington was called to the flight of 2 and they requested a heading change to avoid a track 1,000ft below their level. The heading change they requested had been to the southwest and had occurred at the same time as the aircraft working Waddington also turned to the northwest. During this time, the Typhoon pilot called visual with the aerodrome and changing to Tower. When joining the visual circuit at 1,000ft, the Typhoon pilot reported having seen a white aircraft with a red stripe approximately 2,000-3,000ft altitude routeing south.

The Coningsby Approach controller reported that their capacity was reduced dealing with the (uninvolved) Typhoon] having unexpectedly called and, dealing with the flight of 2 heading selection and the Coningsby Approach controller, subsequently gave a better heading. At the same time, the Waddington controller requested further information. This resulted in the Coningsby Approach controller not having noticed the very slow-moving primary contact (in the vicinity of East Kirkby airfield) that was 5NM away from the (involved) Typhoon. On review of the radar recording system, the primary contact was present.



For the full report, see Airprox No 2026060 on the UK Airprox Board website.

Spry's Comment:

This Airprox occurred in the 'stub' of a Military ATZ and the conflicting traffic did not appear to have attempted to contact Coningsby ATC to inform them of their intentions; although they are not required to, it would have been good airmanship for them to have called RAF Coningsby ATC when flying in the vicinity of their approach lanes! The Typhoon pilot had obtained an Air Traffic Service that was appropriate for their stage of flight and the aircraft's onboard sensors were configured correctly to maximise the chance of detection of stranger traffic. Nevertheless, no warning was passed by the Approach controller who was managing multiple concurrent tasks, and onboard systems did not detect the other aircraft. The conflicting aircraft was only acquired visually at a late stage, and this incident serves as a timely reminder that effective lookout must be continued at all stages of flight, as neither Air Traffic Control, nor onboard systems, or the good airmanship of other airspace users, can always be relied on as effective barriers to MAC. ■



Safety Contacts:

Group / Station / Unit	Flight Safety Contact	Health and Safety and Environmental Protection Advisors
1 Gp	Air-1Gp-Star	
2 Gp	Air-2Gp-Air Safety	
11 Gp	Air-11Gp-Safety	
22 Gp	22Gp-DFT	
Air Support	Air-Support	
BM	Air-11Gp-BM	
JAC	JAC-Safety	
Test and Evaluation (ASWC)	ASWC-TEAirWg Air Safety	
2 FTS	SYE-2FTS-DASOR	SYE-2FTS-HQ-SHSA
3 FTS	3FTS-HQ-ASM	3FTS-HQ-Platform Safety
4 FTS	4FTS-Air Safety	
6 FTS	6FTS-HQ-AST	
Air Cadets (RAFAC)	RAFAC-HQ-SafetyCtr	
Air Mobility HQ	Air-1Gp AM	
Boulmer Station	BOU-STN-SHSO	
Air C2 Force	BOU-Reserves-Group-BRG12	AirC2Force-AirSafety-Manager
Benson	Ben-Safety	
MOD Boscombe Down	ASWC-BSD	
Brize Norton	BZN-Air Safety	
Combat Air Force HQ	CAFHQ	
Coningsby	CON-OSW-SSC	
Cosford	COS-Stn Flt Safety	
Cranwell	CRN-TotalSafety	
Defence Geographic Centre	UKStratCom-DI-NCGI-DGC	
Fylingdales	FYL-Spt	
Halton	HAL-Ops-Airfield-Ops	HAL-SSHEA
Henlow	HLW-SHE	HLW-SHE Advisor
High Wycombe	HWY-Flight Safety	HWY-SSHEA
Honington	HON-Stn SHEA	
ISTAR Air Wing	Air-1Gp-ISTAR	
Leeming	LEE-ASMT-SFSO	
Leuchars	LOS-OSW-LEU SFSO	
Lossiemouth	LOS-SafetyCentre OC	LOS-P8ASafetyTeam
Marham	MRM-SAFETYANDASSURANCE	
No 1 AIDU	UKStratCom-DI-NCGI-AIDU-OpsCntr	
Northolt	NOR-Safety	
Odiham	ODI- AST	
Swanwick	SWK-78Sqn-Dep FSO	
Shawbury	SHY-ASMT-ASM	SHY-SHSA
Spadeadam	SPD-AirBase	SPD-AirBase-SHSO and EPO
St Mawgan	SMG-ENG-	SMG-SHEF
Syerston	SYE-2FTS-DASOR	
Tactical Supply Wing	TSW-Functional-Safety	
UK AWR	Air-2Gp-SUAM	
UK JFAC	Air-11Gp-JFAC	
Valley	VAL-OpsWg SFSO	
Waddington	WAD-SafetyCentre	
Wittering	WIT-GMB SHEA Dept (MULTIUSER)	
Woodvale	WDV-Aerodrome Manager	
Wyton	UKStratCom-DI-NCGI-Wyt-SHEA	
Overseas Flight Safety Contacts		
Al Udeid	83EAG-A3 Flight Safety	
Ascension	BFSAI-ASC Ops	
Akrotiri	BFC-AKI-Safety	
83 EAG	83EAG-FS	
Gibraltar	GIB-RAF-ASM	
MPA	BFSAI-AirOps	
Defence Safety Authority (DSA)	DSA -MAA	

Cold Injury

Know the basic guidance for prevention



Remember COLD FEET

Keep it	**C**lean	Ensure kit	**F**its correctly
Avoid	**O**verheating		**E**xercise extremities
Wear it	**L**oose		**E**at and drink plenty
Keep it	**D**ry		**T**ight boots are terrible

ROYAL AIR FORCE Safety Centre

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