



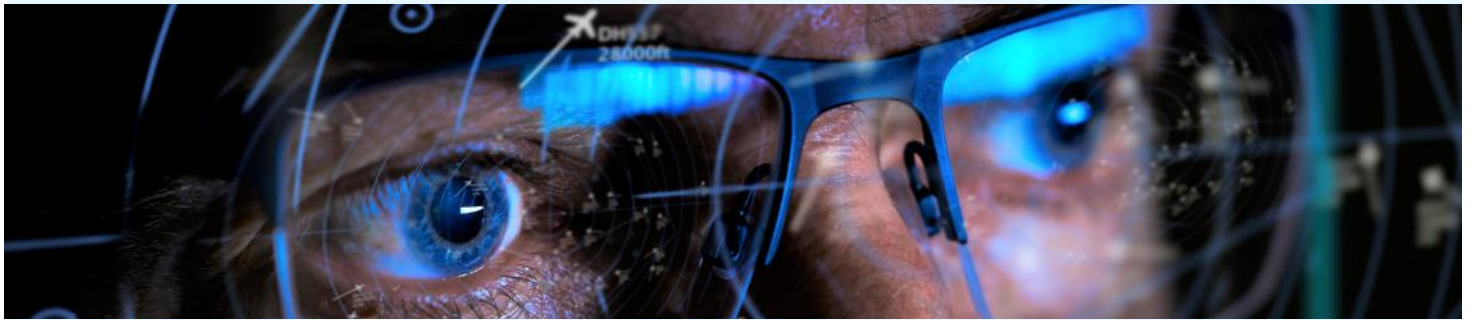
MANAGING DISTRACTIONS & MAINTAINING ATTENTION

Issue No: 01/22

Distractions and interruptions can severely compromise flight safety.

To help prevent this, the Isle of Man Civil Aviation Administration (IOMCAA) recommends ATCOs familiarise themselves with common sources of distraction in the operational environment and develop strategies to cope with them.

ATCOs working alone in an ops room can be particularly vulnerable as they do not have other team members to assist them.



What is distraction?

Distraction is a diversion of attention during the execution of a primary task and/or a response (either verbal, visual, or emotional) to a secondary task which may not necessarily be related to the primary task.

Distraction can make it difficult to maintain concentration, particularly when performing lengthy or complex procedures. ATCOs acknowledging that they may have control over some distractions but not others is the first step in developing prevention strategies.

ATCOs are increasingly required to monitor systems, as is common with other safety-critical jobs. Often automated tools and safety nets, such as STCA, add another layer of monitoring but increase the need for controller alertness.

The ATCO needs to be appropriately engaged in the core task, especially during low workload situations where distractions can be seen as way of preventing under stimulation, but at the same time they can decrease vigilance and alertness.

“Multitasking may seem efficient on the surface but may actually take more time in the end and involve more error.”

American Psychological Association [Multitasking: Switching Costs](#) (20 March 2006)

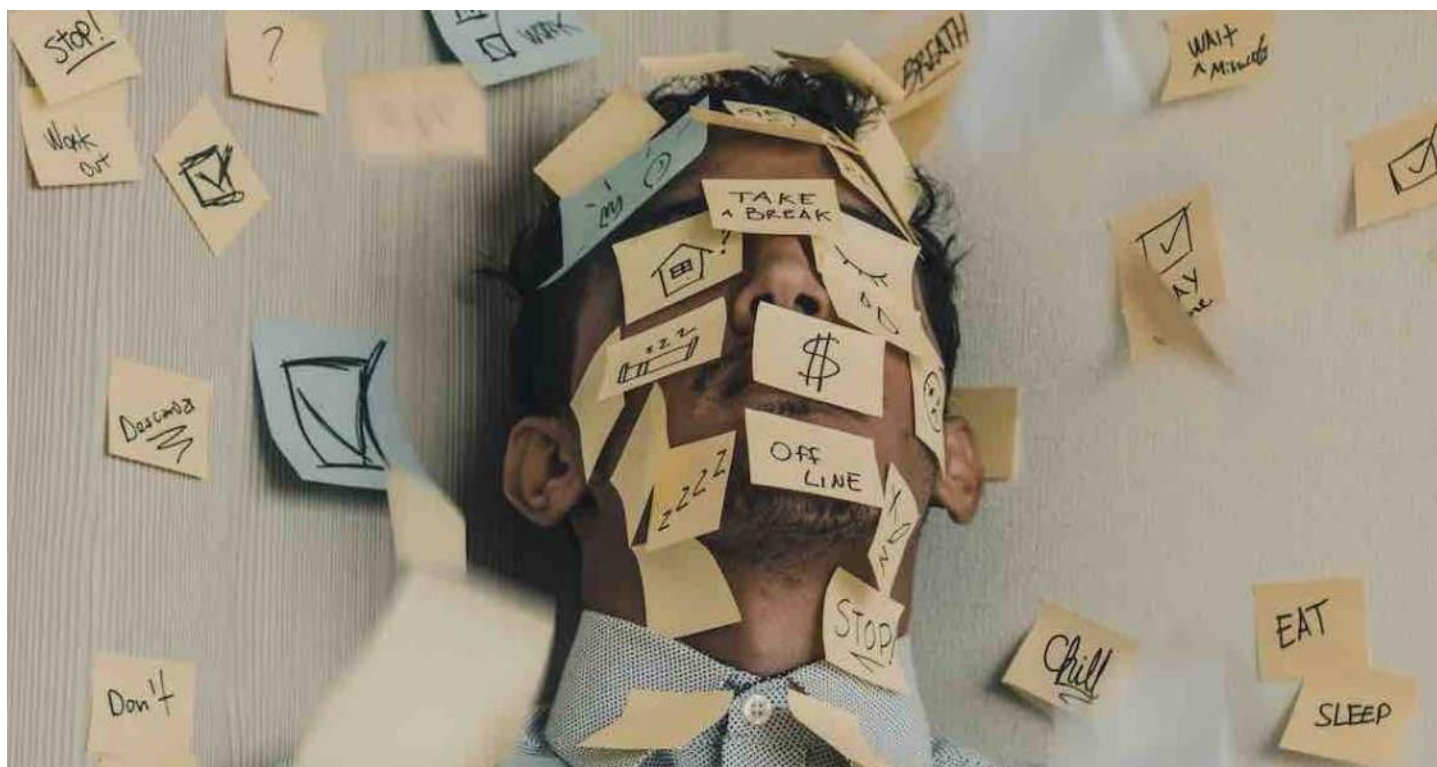
Types of distraction

Self-induced distractions

- Personal circumstances e.g. sick family member, childcare arrangements etc.
- Fatigue
- Hunger/dehydration
- Sickness
- Personal conduct e.g. non-operational conversations, use of personal electronic devices, reading etc.

Third-party distractions

- Non-essential conversation from other colleagues or third parties e.g. RT, intercom, telephone etc.
- Loud conversation between colleagues
- Messages or coordination from other ATCOs
- Queries or comments from external agencies/public etc.



Operating Environment

- Extraneous noise e.g. vacuum cleaner, doors opening/closing etc.
- Temperature of the room
- Lighting
- Glare on screens/blinds
- Reflections in windows

Equipment

- Uncomfortable or inconvenient working position
- Positioning of touchscreens etc.
- Poorly adjusted chair
- Headset/loudspeaker
- Equipment malfunctions, warnings, alerts

Dealing with distractions

Effects and consequences of distraction

Distractions may be subtle and momentary or intrusive, obvious and continuing, irrespective of their duration and intensity. All of these can be disruptive to ATCOs' performance and make it difficult to concentrate on the ATC task, causing a loss of focus which could potentially be catastrophic.

You may spot distractions quickly, or you may be drawn in and not realise until too late.

Frequent distractions can also have negative effect on ATCO's mind-set. They can prevent tasks being done on time and ATCOs may feel being swamped or rushed, which consequently makes them feel more frustrated at work. This in turn may lead to intensifying poor work practice and other issues that lead to poor performance. A negative spiral effect is created where poor performance leads to more stress which leads to more poor performance and so on, further compromising safety.

Unless mitigated by effective compensatory techniques, a disruption leading to a lapse of attention may result in failure to monitor the flight profile, missing or misinterpreting pilots' read-backs or requests, omitting an action, failing to detect and correct a mistake, failing to detect a confliction, lagging behind the traffic and feeling overloaded due to combination of unfinished tasks and diverted attention to distractions.

If distractions are not identified and then managed effectively, they can seriously impair the ATCO's ability to concentrate and may cause poor performance and judgment, potentially leading to serious or fatal mistakes.

ANSPs

Distraction cannot be completely eliminated from the operational environment. However, ANSPs can help to reduce them through infrastructure, policies and operational instructions. Prevention strategies can be developed to minimise their effects on the operation by identifying and recognising potential sources of distractions and understanding their effects.

Airspace, operating procedures and techniques can be designed to minimise the need for coordination with other ATCOs, sectors or units, which (combined with applying standard operating procedures) can greatly reduce distractions posed to ATCOs.

Reliable, well-maintained, user-friendly equipment is vital as failures can pose significant challenges. Nuisance alerts, e.g. from STCA, can be very distracting and lead to ATCOs missing real events.

The design of the CWP, ops room seating arrangement, ambient temperature, noise level and lighting could all affect the physical state of an ATCO and may induce distractions.

MANAGING DISTRACTIONS

Minimising and mitigating distractions

ATC staff

ATCOs' and ATSA's self-discipline, professionalism and conduct within the control room are vital to maintain their standards of performance.

Many self-induced distractions (e.g. emotions, stress, fatigue, personal electronic devices, and private phone calls/messages) can be avoided. ATCOs and ATSAs should avoid being a third-party distraction to other staff and pilots (e.g. by not taking part in non-operational conversations) especially during safety-critical periods such as handovers, final approach/landing etc. when there is high risk of occurrences.

Professionalism involves more than just what happens in the ops room. ATC staff must arrive at work ready for their shift both physically and emotionally, meaning that they must be well rested, medically fit and prepared for the task at hand.

One of the best defences against distraction is awareness so that appropriate recovery actions can be put in place:

- recognise the distraction
- identify what the primary task was
- remember where the primary task was interrupted



Re-establish situational awareness: what was I doing, where was I interrupted, and what action do I need to take to get back on track?

Minimising and mitigating distractions

Distraction while under-loaded

It is well known that underload can be as dangerous as overload, as a lack of stimulus can lead to boredom and a drop in performance.

Particularly as aviation is still recovering from the effects of the coronavirus pandemic, there can be drawn-out periods of low arousal. ATCOs will recognise the need to maintain alertness and will naturally want to avoid becoming bored during their operational duty. They may therefore seek out other activities to fill in the gaps; e.g. reading, responding to emails, using personal electronic devices (PEDs), watching TV (perhaps during major events) etc.

All of these can be stimulating, but come at the cost of distraction from the primary task of watch-keeping. Using a PED is itself a primary distraction from the operation, but can also introduce secondary distractions e.g. notifications from other apps which are designed to attract attention. Use of bright screens can also be visually fatiguing and may have a detrimental effect on dark-adapted vision.

In the case of an accident or serious incident, investigators may argue that reading or PED use impaired the ATCO's ability to detect an anomaly and therefore prevented them from intervening. ANSPs and ATCOs should develop strategies to fend off boredom during operational duties. Frequent breaks involving light exercise can increase arousal. Active visual scanning, combining sectors/positions, offering higher service levels and rotating through different tasks/roles can also help.

Top tips

- Use headsets appropriately
- Plan phone calls where possible to allow you to manage your attention
- Where possible, consider delegating certain actions or postponing them until time and conditions permit
- Avoid prolonged "head-down" tasks
- Avoid non-operational conversations with colleagues/flight crews etc. as far as possible
- Do not use personal electronic devices/laptops/TVs in the ops room
- Use checklists and standard operating procedures
- Ask for more time to complete tasks – "take time to make time"
- Ensure visitors to the ops room are briefed on avoiding distractions

Notable incidents

Mid-air collision over Überlingen, Germany – 1 July 2002

On the night of 1 July 2002 a Bashkirian Airlines Tupolev Tu-154 passenger jet, and DHL International Aviation Boeing 757 cargo jet, collided in mid-air over Überlingen, Germany. All 71 persons on board the aircraft were killed. The ATCO involved was working multiple sectors on different desks alone, whilst dealing with modified procedures, maintenance on the radar data processors and malfunctions with the communications system.



Mid-air collision over Hoboken, New Jersey – 8 August 2009

On 8 August 2009 nine people died when a Liberty Helicopter Sightseeing Tours Eurocopter AS350 Écureuil and a private Piper PA32-R Cherokee Lance collided over the Hudson River near Hoboken, New Jersey, US. The investigation found as a 'probable cause' that one of the ATCOs involved was distracted from the ATC task by a non-operational phone call.

Runway incursion at Gothenburg, Sweden – 8 September 2011

On 8 September 2011, an Avro RJ85 operated by Brussels Airlines on a scheduled passenger flight to Brussels with 85 occupants was taking off from runway 21 at Gothenburg in normal day visibility when a vehicle almost entered the same runway near to the rotation point. The investigation found that a non-operational conversation in the VCR contributed to both the OJTI and trainee tower controller being distracted and losing situational awareness. It further suggested that the private conversation may have impaired the OJTI's ability to intervene.

Notable incidents

Some recent EGNS occurrences reported via MOR

Missed approach due to incorrect ILS selection—27 November 2019

Saab 2000 vectored for Runway 26 when Runway 08 was declared runway in use and subsequently went around from short final as the ILS had not been switched over to I-RY. The investigation found that flight operations issues (cabin not secure in time, weather) probably led to distraction and the pilots not identifying the ILS coding correctly.

Pushback without clearance—15 December 2019

Saab 2000 pushed back without clearance having engaged in non-operational conversation with the ATCO. The investigation cited distraction on the part of the flight crew and ATCO as possible contributory factors.

AGL issues—2 September 2020

ATC experienced issues with the control of stop bars following engineering work in the AGL system. The investigation suggested that the unpredictability and extra workload involved in ground movement could have been distracting.

Visitor in ops room—5 November 2020

Distraction caused by visitor in the ops room engaging in non-operational conversation and removing key documents coincident with handover and engineering work.

Vehicle unable to contact Tower—14 June 2021

Vehicle engaged in work in progress on the airfield had difficulty establishing communications with Tower by RTF and telephone. The investigation cites the distraction of discussing procedures as potentially contributory.

Vehicle unable to contact Tower—5 July 2021

Vehicle on airfield had difficulty establishing communications with Tower. At the time, the ATCO had been engaged in a non-operational conversation with their headset removed/loudspeaker selected and this distraction was found to be potentially contributory.

Aircraft landed without clearance—26 July 2021

Aircraft landed without clearance whilst ATCO was reading briefing material related to work in progress on the aerodrome. It was thought this may have been contributory to the incident.

Aircraft taxied over unpaved surface—28 April 2022

A light aircraft taxied over the grass near area victor en-route to holding point B1. Whilst it subsequently departed without incident, the ATCO stated that they had become a little distracted from monitoring its progress by a potential confliction between a landing aircraft and several vehicles operating near its intended ground routing.

Airspace infringement—18 May 2022

Aircraft which had transited EGNS airspace subsequently infringed the EGAA CTR/P600 whilst still receiving a basic service from EGNS. The ATCO reported being distracted by a non-operational conversation with other staff in the ops room.

Further reading

FAA safety briefing on managing distractions:

https://www.faa.gov/news/safety_briefing/2020/media/SE_Topic_20-01_Distractions.pdf

IFATCA study on distraction in the workplace:

<https://ifatca.wiki/kb/wp-2015-162/>

Skybrary article on threat and error management in ATC:

<https://www.skybrary.aero/articles/threat-and-error-management-tem-atc>

Skybrary article on non-standard phraseology:

<https://www.skybrary.aero/articles/non-standard-phraseology>

Humanistic Systems blog post on human factors in ATC:

<https://humanisticsystems.com/2022/10/20/staying-in-control-five-suggestions-from-a-long-distance-psychologist-on-the-centenary-of-air-traffic-control/>

Humanistic Systems blog post on boredom and distraction while under-loaded:

<https://humanisticsystems.com/2012/07/17/reading-on-the-job-fatigue-boredom-and-distraction-while-underloaded/>

Isle of Man CAA comment

Distractions can and do occur frequently in everyday life, whether at home or at work. When they take place in a safety-critical environment, there is significant potential for them to lead to undesirable and unsafe outcomes. With knowledge of how and when distractions can occur, ATCOs are better placed to develop strategies to minimise their effect on safety.



Isle of Man
CIVIL AVIATION ADMINISTRATION