

# HOW ONE INCIDENT CHANGED MY APPROACH TO HANDLING THE UNEXPECTED

Reflecting of our own experience of handling surprise is essential to learn, and also to help others learn and be ready. **Glen Watson** explains what he learned from an incident as a controller.

## Introduction

Air traffic controllers are highly skilled and extensively trained professionals who take pride in delivering a safe and expeditious service to airline and airport partners. With much theoretical, simulator, and live on-the-job training, followed by continuous monitoring and assessment, the job involves continuous planning ahead, maintaining situational awareness and making split second decisions under pressure. Most of us even thrive on it. Yet behind all of this, no matter how experienced we are, how much planning we do, or how routine the shift may be, the controller is human, and humans are vulnerable. We experience visual and auditory misperceptions, memory distortions, biases of judgement and decision-making, and of course, we are affected by unexpected or threatening events.

Every controller will have, or will be, caught out by such events. These events can range from routine (e.g., an unexpected go around) to critical emergency situations. While there is much research about surprise and also the startle effect on the flight deck, it is less common in ATC circles. We all know it exists, but how proactive are we in being prepared or spotting the warning signals? We need to recognise that we cannot train for every eventuality, we cannot engineer this out of human systems, and we cannot expect to never be caught out by it.

## Incident

The incident occurred at night-time in good weather conditions, 25 minutes before the end of my shift. It had been a busy shift and I had been tasked with controlling the landing runway. Issuing landing clearances to the endless conveyer belt of arriving aircraft is something I had hundreds of hours of experience of doing. All was going well and nothing out of the ordinary was occurring.



The ground controller had instructed an aircraft to hold short of the runway, and upon making contact I reiterated the instruction to hold position. My attention was drawn back to the landing traffic which was now 30 seconds from touchdown. Nothing surprising here, this is a regular thing at my airport. As part of my scan out of the tower windows, the corner of my eye happened to notice the illuminated tail of the waiting aircraft to be moving very slowly forward. In darkness amongst the sea of aerodrome lighting I couldn't quite be sure what I was seeing. Was my brain playing tricks on me? The crew

have acknowledged to hold position, there is a red lit stop bar in front of them, and the bright landing lights of the Airbus shone down on them. It is impossible that they are moving, right? At that very moment, the feeling was overpowering. I was unable to comprehend the situation and for those few seconds I was merely a human; training and experience did not seem to enter the picture. I was both startled (because I experienced a rapid stress response in reaction to a sudden event, see Landman, et al., 2020), and surprised (because the observed information did not match my expectations).

### What is the startle effect?

The startle effect is the physical and mental response to a sudden intense, threatening, and usually unexpected stimulus. Most of us are familiar with the fight, flight or freeze physiological reaction. However, there is also an overwhelming automatic cognitive response in which the individuals' ability to perceive and process stimuli is considerably restricted. Higher order functions required for decision-making are significantly impaired and in the most extreme situations these functions are completely overwhelmed, known as cognitive incapacitation. Performance decrease can range from three to 10 seconds, and studies have shown that the recovery period for information processing can take up to one minute after the startling event (Martin et al., 2012).

Clearly in the ATC environment, full of incoming sensory information which requires accurate processing by the controller, any loss of cognitive processing ability – even for three seconds – increases risk. Put simply, our brains become overwhelmed. This can lead to inappropriate decisions, communications, and actions, or none at all. Perhaps most alarming is that the individual has little ability to realise the predicament they are in.

**“We need to *expect* to be surprised and develop ways to manage the situation before it becomes critical.”**

## What happened?

Going back to the situation, it's clear I was experiencing the startle effect. My cognitive functions were impaired, and I was unable to process the stimuli my eyes were receiving. The aircraft was rolling forward, it had crossed the stop bar and it was now moving towards the runway edge of an active runway (a runway incursion). I had not even considered this possibility and I was in the startle danger zone. It was only after the event that I recognised one simple action had a profound effect on the outcome: I verbalised what I thought I was seeing: "Is he rolling forward?!" was all it took. Drawing the attention of my colleagues, I was immediately met with shouts of "yes!" and "send it around!", snapping me from my state of reduced mental capacity and back into 'controller mode'. Training kicked in and actions were immediately taken to make the situation safe.

## What did I learn?

Any controller will tell you that when you have been involved in an incident, the first person you blame is yourself. *What did I do? Did I cause that? Why didn't the aircraft hold position? Did I miss a readback?* Yet we are lucky to work in a sector which places lesson learning high on the agenda. After reflecting on the incident, I learned these things:


1. No matter how well trained or experienced we are, things will

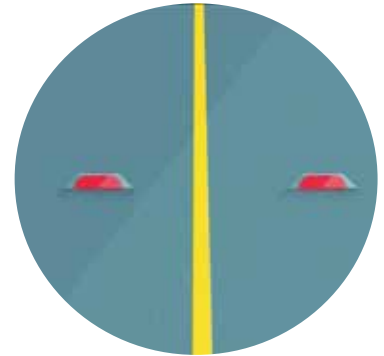
surprise us. We are human – we need to **expect** to be surprised and develop ways to manage the situation before it becomes critical.

2. **Verbalising** has the ability to break startle. This was the single action that reset my cognitive abilities. I now verbalise much more, even before a potential situation has been allowed to develop, to help make sense of what is developing and enable my team members with their extra perspective into my situation.

3. **"What if thinking"** allows us to consider potential threats and be on the lookout for when things go wrong. Questions such as *"What if the aircraft doesn't stop at the stop bar?"* prime our brains for those potential surprise moments and enable us to begin considering the action plan should the situation arise. This also helps us to avoid complacency and maintain situational awareness.

4. We need to **train proactively** for surprise. Simulator exercises including unexpected situations help to recognise how surprise situations may develop and build strategies to help mitigate the effects of surprise.

Talking about unexpected events and our strategies to handle them may also help others to be more ready for those times when they experience something similar. My incident changed my approach to handling the unexpected. 



## Reference

Landman, A., van Middelaar, S. H., Groen, E. L. van Paassen, M. M., Bronkhorst, A. W. & Mulder, M. (2020) The effectiveness of a mnemonic-type startle and surprise management procedure for pilots. *The International Journal of Aerospace Psychology*, 30:3-4, 104-118, DOI: 10.1080/24721840.2020.1763798

Martin, W., Murray, P. & Bates, P. (2012). The effects of startle on pilots during critical events: a case study analysis. *30th European Aviation Psychology Association Conference*, Villasimius, Sardinia, September 2012.



Glen Watson is an aerodrome air traffic controller and assessor at NATS London Heathrow LHR/EGLL. He is also studying an MSc in Human Factors in Aviation at Coventry University with research interests in training systems, ab-initio and continuation ATCO training, and how humans identify and learn from error.