

IS THAT THE FIRE ALARM? SURPRISE IN THE SIMULATOR



In your unit, how confident are you that controllers and others would act as imagined in the event of a fire alarm? In this article, **Lucy Kirkland** recounts what happened and what was learned when controllers participated in a full simulation of an ATC evacuation.

KEY POINTS

- People exhibit a variety of reactions to unusual and threatening situations such as an evacuation alarm.
- Our assumptions about what we and others know and how we and others would respond to an unusual situation can be unrealistic.
- Simulation of unusual situations can reveal much more than discussion.
- The wider system impact of a local unexpected situation should be considered.

Background

Early in my career, the fire alarm sounded while I was in the visual control room (VCR). I happened to be there in a non-operational capacity as I was not yet a valid ATCO. I watched as both ATCOs and the assistant looked at each other, rather than immediately reacting, for confirmation that what they were hearing and observing (a red flashing light) was an evacuation alarm. This internal questioning took a short but significant amount of time. Gradually, as the alarm continued, there was a conversation about whether the evacuation should commence. Someone made a decision, the evacuation checklists and action cards were obtained, and the process was started.

It was only then that I realised that, as a non-operational member of staff, I should already have left on hearing an alarm; I was not acting with immediacy either. I had joined in the initial lack of reaction. Despite thinking we should be evacuating, I was waiting for someone senior or operational to lead the decision and felt confused about why that was not happening. A long walk down the stairs followed. By the time I had reached the bottom, and luckily for the staff on duty that day, the fire alarm was declared a false alert and the evacuation stood down.

More recently, I observed human behaviour on hearing a fire alarm once again. This time it was during my child's primary school prize-giving at the end of the summer term. It is a very large school and there were many hundreds of people in the hall. The children were sitting with their teachers and my husband and I were sitting in the audience. All the heads of various departments had just arrived, and we were about to start, at which point the fire alarm sounded. Nothing happened. We questioned each other about whether it was a fire alarm. We looked around the room and observed what seemed to be confusion and disbelief from the teaching staff, who were also looking around the room. A growing sense of unease was building at our own inaction, but we were struggling to find validation of our belief that this must be a fire alarm. Surely if it was, others would have jumped up and started to leave?

Decision Making in Group Situations

The Smoky Room Experiment demonstrated how people can be influenced by those around them. Observation of passive behaviour in response to emergency stimulus drives further passive behaviour, despite obvious environmental indications which should drive action.

We talked some more and decided that, regardless of what everyone else was doing, we were going to leave. What else could it be apart from the fire alarm? A few other parents were beginning to stand up, which would have validated our thought process. As we neared the exit, I asked a teacher why they were still not evacuating, she stated that they were waiting for the headmaster to indicate it was an evacuation. This was similar to my reaction 20 years earlier. We continued to leave, noting finally that many other people were beginning to move. Later, after all had successfully evacuated, we spoke with the headmaster in the playground. He was horrified that the teachers had been waiting for his nod. He informed us the procedures were that they evacuate immediately with their allocated groups of children as practised, although he was still standing in the hall as we left.

What are the similarities between these two scenarios? Human behaviour is influenced by the behaviour of other people around them and people may require confirmation of an unusual situation prior to reacting. Various studies have shown that we are more likely to go with the majority, even when we think they might be wrong. Additionally, the feeling of surprise, which a fire alarm can elicit, drives both emotional and physical responses which can delay and impede decision-making.

One way of counteracting these natural reactions is to repeatedly train the correct action to take when experiencing unusual situations thus enabling embedded trained reactions to overcome more inbuilt natural tendencies.

Importance of Training for Unusual Situations

In air traffic control we train for the unusual to bring it closer to the routine. If we can make the unusual more routine, we can improve our reaction and adaptability to unusual situations. A unit training review indicated that whilst discussion and walk through of evacuation and the impact of such takes place on an annual basis, there had never been a full simulation of an ATC evacuation due to the impact on live traffic. Recently, the simulator had been significantly upgraded allowing for much more realistic training scenarios. A plan was put in place to run one-hour enhanced simulation sessions for all ATCOs in both tower and radar positions, incorporating an evacuation scenario. The aim was to refresh and embed existing knowledge, in line with EU340 requirements, and enable experience of the surprise element of the evacuation.

For maximum impact, as far as possible, the ATCOs were not aware of the plan for their simulated run. And for the most part, controllers did not tell others what to expect. This shows that those ATCOs involved in the simulation saw value in the learning experience. Even with those ATCOs who knew what was going to happen (due to their involvement in planning), the reactions were insightful.

The simulation commenced as a busy and fairly complex combined run, either as aerodrome control (air and GMC combined) or radar control (intermediate and final sectors combined). Once settled into the run the 'supervisor' at the back of the room played a loud recording of the unit first stage fire alarm (possible fire, investigations underway, get ready to evacuate). Five minutes later, a recording of the second stage fire alarm was played loudly (fire confirmed, all staff evacuate). Once 'evacuated' the ATCOs were given a few minutes to regroup (to reflect a real evacuation). They were then briefed on the second part of the exercise. This was to return and reopen the sector (now split due to traffic levels) and recommence the operation. The second part of the simulator run restarted 10 minutes later and reflected a busy sector split session reopening operations after airport closure.



Reactions to Evacuation

On the first stage alarm sounding, immediate reactions ranged from none (they continued as if it was not happening) to much more impacted situational awareness due to interrupted thought processes and a startle effect of short-term confusion. At the second stage alarm, any possible startle effect had subsided, but an element of disbelief and confusion remained for some which influenced some decision-making and reaction.

As well as the immediate emotional reaction to the situation, there was a more uncomfortable realisation, for some, that their embedded knowledge of procedures and checklist locations was not as they had anticipated. Some of this may have been attributable to the startle effect where, for a short time, there can be a feeling of confusion. However, comments such as “I need to go and read over that again” at the end of the simulation showed

recognition that their surprise was not just a response to the fire alarm, but a reflection on their own knowledge, which was not what they thought.

Startle Reaction

Whilst often mentioned in conjunction with pilots, this may also be observed in ATCOs in response to a threatening situation. Physiological responses, including adrenaline release, can lead to short-term confusion and impact task completion and situational awareness.

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Lessons Learned

As expected, all ATCOs managed to complete the ATC evacuation safely. The majority of the ATCOs felt that they had benefitted from simulated evacuation practice and that it was far superior to previous ‘round the table’ discussions. The focussed listening of the evacuation messages (two different voices for the two-stage alert) and experiencing the consequence of each message was more impactful than theoretical discussions. They reflected on the use of the checklists and how better knowledge of their location and content may have aided their response time and reduced the impact of the situation. Communication with, and implications for, other stakeholders involved in an ATC evacuation was recognised as a possible blindspot, requiring more understanding about the scenario.

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From a wider point of view, there was acknowledgement that many assumptions were made regarding the reaction to an ATC evacuation on a system-wide level. Subsequent discussion highlighted many clarification questions that the high-level procedures do not cover. An ATC evacuation impacts not just local aircraft on frequency but also the local airport stakeholders: fire service, terminal management, and airfield operations. How do they handle the surprise call informing them, "ATC are evacuating"? Additionally, it is important to understand subsequent impacts on traffic movements and staff resourcing when reopening the sectors. A working group is to be set up to take the lessons learned from the simulation sessions. It will bring together all stakeholders to ensure that, in the event of an actual evacuation, the most effective outcome is achieved with the least disruption to the system. The simulation will be repeated periodically to continue to embed further learning. 5

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