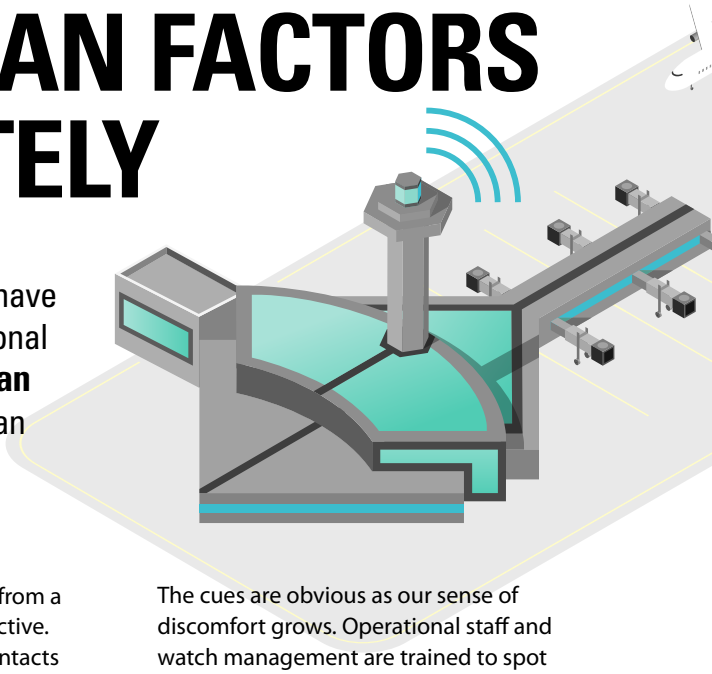
THE DAY THAT TURNED INTO A YEAR:
LESSONS LEARNT FROM PROVIDING HUMAN FACTORS SUPPORT REMOTELY



With changes to air traffic controller working patterns have come changes for those who support effective operational performance. In this article, **Courtney Jaeger** and **Rhian Williams-Skingley** give an insight into providing human factors support at NATS in the new reality.

After what started as a 'test day' to see if employees could work from home, a year later we find ourselves having adjusted to a 'new norm'. As the day turned into weeks and months, it soon became apparent that it was more than the IT that needed to be considered in remote working. As human factors specialists, we couldn't support the operation in the same way we always had. We felt set apart from the operation, both physically and psychologically. This is the story of how we learnt and adapted to ensure that we continued to provide support to the operation.

New Territory

We are all experiencing the pandemic in different ways, with uncertainties and unknowns dominating our thought processes. We placed a heavy reliance on our contacts and networks within the operation early on to build a picture of what we could do to help, all while managing our own worries and concerns.

Initially we found ourselves reacting to the new operational working environment, which was changing daily. We published safety notices and provided information by email and the intranet system, which highlighted emerging risks and how to effectively manage the traffic situation from a human performance perspective. However, our operational contacts soon started feeding us observations they had made of themselves and of their colleagues that we could not have anticipated. This meant we had to be creative and innovative in our thinking and communication. It even led to the creation of new terms and associated analogies to help describe and articulate these new potential risks.

For example, the term 'underload drift' was coined when talking about low task demand over long periods of time. A boat in a river heading towards a waterfall was the imagery used to explain how we may feel like we are drifting along in these low workload settings, and can be caught by surprise by a waterfall, or in operational terms, by an increase or sudden demand to react to the traffic situation. The ability to resist the drift of performance, or cognitive inertia, is supported when the operational staff can prepare for their work session adequately, and a sufficient break schedule is implemented.

Low Workload Effects

Many of us are well versed in the potential risks associated with high workload and overload situations. The cues are obvious as our sense of discomfort grows. Operational staff and watch management are trained to spot the signs in themselves or others, where action might be required to manage a high workload or overload scenario. These signs are unique to the individual and can be the misperception of elapsed time, getting frustrated at small mistakes, or missing calls – asking pilots to "say again" more frequently. For those supervising, they may notice controllers sitting more upright and closer to the radar screen, or a change in their conversational tone and volume.

But what about low workload or underload situations? There is no comparable feeling of discomfort and the cue is largely the absence of traffic or activity rather than the presence of it – silence rather than noise. And yet, internal trend analysis has shown that low workload or underload situations can result in impaired human performance in the same way that high workload or overload does. Underload can reduce alertness and impair how well our memory functions – we might be more likely to forget something we need to do or have just done. Visual scanning also tends to be less thorough or frequent – we are more likely to tunnel our attention in one place that attracts our attention, resulting in the neglect of other areas. We are more

susceptible to distraction from what is going on around us – especially conversations – and we are particularly vulnerable to the effects of fatigue and tiredness.

This phenomenon emerged in our operations room where controllers were socially distanced to reduce the risk of spreading COVID-19 and had to provide and receive remote telephone (sterile) handovers between watches at the beginning and end of duty. As a result of a joint activity with our operational safety colleagues, we discovered that controllers were using less effective strategies for the handover task. When considering this phenomenon, controllers are not purposely using these less effective strategies for the handover task because of laziness or lack of attention. In fact, that the state of being 'complacent' and 'disinterested' has been recognised as having a strong link to the neurophysiological aspects of adaption. Put simply, the brain is adapting to the task load it is faced with, and because of the lack of cognitive demand, it will slow down its activation.

A Problem Shared is a Problem Halved

In those first few months, we found risks we could anticipate (e.g., the effects of low workload or underload), and those we couldn't (e.g., handover quality), so that we had to adapt our normal methods of supporting the operation. During the early part of Summer 2020, it appeared that aviation was opening up a little more, so we sought to understand how we could help operational supervisors to identify and communicate potential threats in their new working environment. During those early summer months, we focused our activity on running team resource management (TRM) sessions with all group supervisors at our centre in Swanwick, England. As well as reflecting on how the working environment and the air traffic control job had changed for them, participants were reminded of the framework around threat and error management (TEM), and how that could be applied practically. Given that it's the most unpredictable time we've been in, the TEM technique was something we reminded supervisors to do, and to share any hints, tips or watch-outs they had already noticed in the operation.

These workshops not only provided benefits to our operational supervisors, but also allowed us to gain further insight into the operation. Examples include the development of different ways of working due to watches not mixing, the effects of giving direct routings on planning and conflict detection (i.e., different 'hot spots') and a shift in individuals' different workload thresholds. This allowed us to provide relevant and tailored support, rather than making assumptions about the impact the traffic and the pandemic was having on human performance. Following on from this, the concern about so-called 'skill fade' was raised, and a communication piece was developed to advise supervisors to consider this for controllers returning from long periods of time off work, or as traffic levels start to pick up again.

In order to understand the operation's state, we carried out a 'human performance measurement' survey remotely for our centres and airports where controllers completed short surveys about their workload, situation awareness and workload drivers after each live controlling session. This data-driven approach to understanding the human response to the shift in traffic levels allowed supervisors – with immediate access to the results of the survey – to manage operational workload of their staff in real time. We analysed the data to determine at what workload levels awareness of the traffic situation began to fall.

Today's Quicksilver World

Upon reflection, thinking of the work we've done concerning underload, threat and error management and measuring human performance, the context could not have been anticipated or predicted. We used our networks to share information, we discussed, we theorised, and we tested what we thought we knew. As always, collaboration (albeit now different) is key to understanding any potential risks and communicating our knowledge of the human response to help mitigate around this. Ultimately, we've learnt to work well under uncertainty and to be flexible when plans or the situation does change – a key skill for practitioners of all kinds, and for our personal lives.

Courtney Jaeger is a Senior Human Factors Specialist at NATS. She holds a Master's Degree in Cognitive Psychology from Leiden University (the Netherlands), during which she carried out biometric research to manage stress and high workload in pilots. Her professional interest in measuring human performance has continued at NATS, and she has carried out research projects across NATS' live operations at en-route centres and airports, mainly using eye-tracking equipment.

courtney.jaeger@nats.co.uk

Rhian Williams-Skingley is Principal Human Factors Specialist at NATS. She graduated from Glasgow University with an MA SocSci (1st Class) in Psychology, where she specialised in Cognitive Psychology carrying out eye tracking research examining visual and auditory processing in language comprehension. Her professional interests focus on the identification and mitigation of emergent human performance risks within the operation and the development of non-technical skills to enhance overall performance.