MOBILE DEVICE RISK IN RAIL OPERATIONS

UIC HUMAN AND ORGANISATIONAL FACTORS WORKING GROUP

WHAT ARE THE RISKS?

Divided attention and task switching

It is not possible for the human brain to direct attention to two different sources simultaneously. When using a mobile device during work, the best we can do is quickly move our attention back and forth between the device and the work tasks, called divided attention. This comes at a cost – research has found that dividing attention makes perception poorer (e.g. Harrison & Ling, 2022) and switching between tasks decreases performance on the tasks (e.g. Wylie & Allport, 2000). For safety critical tasks, using a mobile device can reduce the ability of an operator to perceive hazards and can make people more prone to potentially high consequence errors.

Preoccupation

A further risk source for mobile device use is the information that might come through during the device use. This could be upsetting or generate other strong emotional or cognitive responses which can then preoccupy thoughts and take attention away from the task at hand.

Compulsive device use

Although addiction to mobile devices is comparatively rare and experts are still discussing whether it can really be called addiction, there are elements of mobile devices design which trigger compulsive behaviours, like checking for messages when the device beeps, blinks or vibration.

UNDER-STANDING YOUR CONTEXT

Current professional use

While it may be tempting to instruct safety critical workers not to use private mobile devices, this may not be practical, particularly if some classes of workers are issued company mobile devices for professional use.
The first step is to understand what mobile devices are routinely used in your organisation and for what purposes. Assessing the credible risks and consequences that might arise from mobile device use across your different user groups can be helpful. You may then decide on a policy and more specific controls around their use that address your specific risk profile.

Future professional use

Mobile devices are increasingly being deployed for professional purposes, with specific apps to assist the workforce in their roles (perhaps as part of a paperless workplace initiative). Even if you have a current policy which does not permit any mobile device use during safety critical work, this may not be feasible in the future. When developing a policy, you should consider the organisation's ambitions for future deployment of mobile devices, and how the attentional risks associated with them can be controlled.

LAYERS OF DEFENCE APPROACH

Good mobile device risk management will incorporate multiple layers of defence against the risks.

Policy for use

A policy for use should specify when and where mobile devices should be used, and what state they should be in when not being used (e.g. silent, vibrate, off, flight mode). Some devices may have a professional mode which can be specified for use, and the policy should have a process for managing professional devices, including for app notifications, storage locations, and handsfree/Bluetooth usage.

Awareness raising and culture

Staff should know what the risks are and why following the policy is important so that they can take ownership of managing their risk exposure as part of a strong safety culture.

Monitoring & enforcement

It may be necessary to monitor the application of the policy, while being mindful of individual's right to privacy. Technical solutions around app restrictions and mobile device management software may help manage the risk.

Investigation

Investigations should consider whether distraction from a mobile device could have been a contributing factor, but from the point of view of improving the organisation's policy and processes on mobile device risk management rather than seeking to blame the individual.

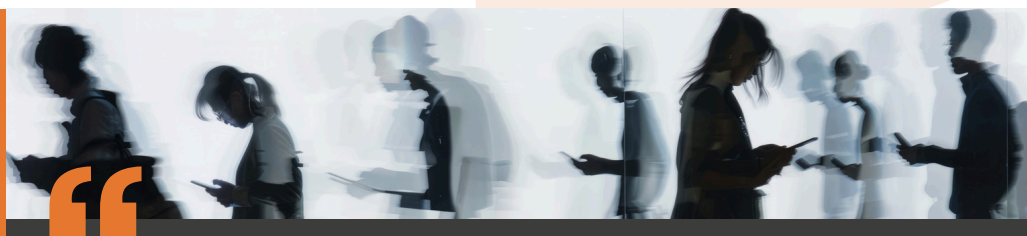
ACCIDENTS

Liverpool, UK (2021)

A train entered a platform at 66km/h and hit the buffer stop at 47km/h at Kirkby Station, UK. The driver was found to have sent a WhatsApp message on approach to the station and due to the distraction, he did not apply the brakes in time.

Bad Aibling, Germany (2016)

Two trains were mistakenly routed towards each other and involved in a head-on collision at Bad Aibling. The signaller was found to have been playing a game on his mobile device while on duty. This illustrates how switching between tasks can reduce human performance.



Scope/ Definition

A mobile device is any piece of portable electronic equipment that can connect to the internet, particularly a smartphone or tablet computer.

REFERENCES

Harrison, A. & Ling, S. 2022. The cost of divided attention for detection of simple visual features primarily reflects limits in post-perceptual processing. Attention Perception & Psychophysics, 85(4).

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