# London Underground

RELIABILITY AND SAFETY

Our plans are all about giving the Tube the tools it needs to deliver an even better service to Londoners and visitors to the Capital. We can be proud of what has been achieved on the Underground in the past few years, but with our city's population growing, now is the time to step things up a gear. The overhaul of the next set of four lines and i nstalling new signalling is a hugely important task and one that we must get right. By upgrading 40 per cent of t he Tube network we will create space for tens of thousands of extra passengers each hour. This will help to ensure London's position as the greatest global city, its continued economic success and cement its reputation as a fantastic place to live, work and visit.'
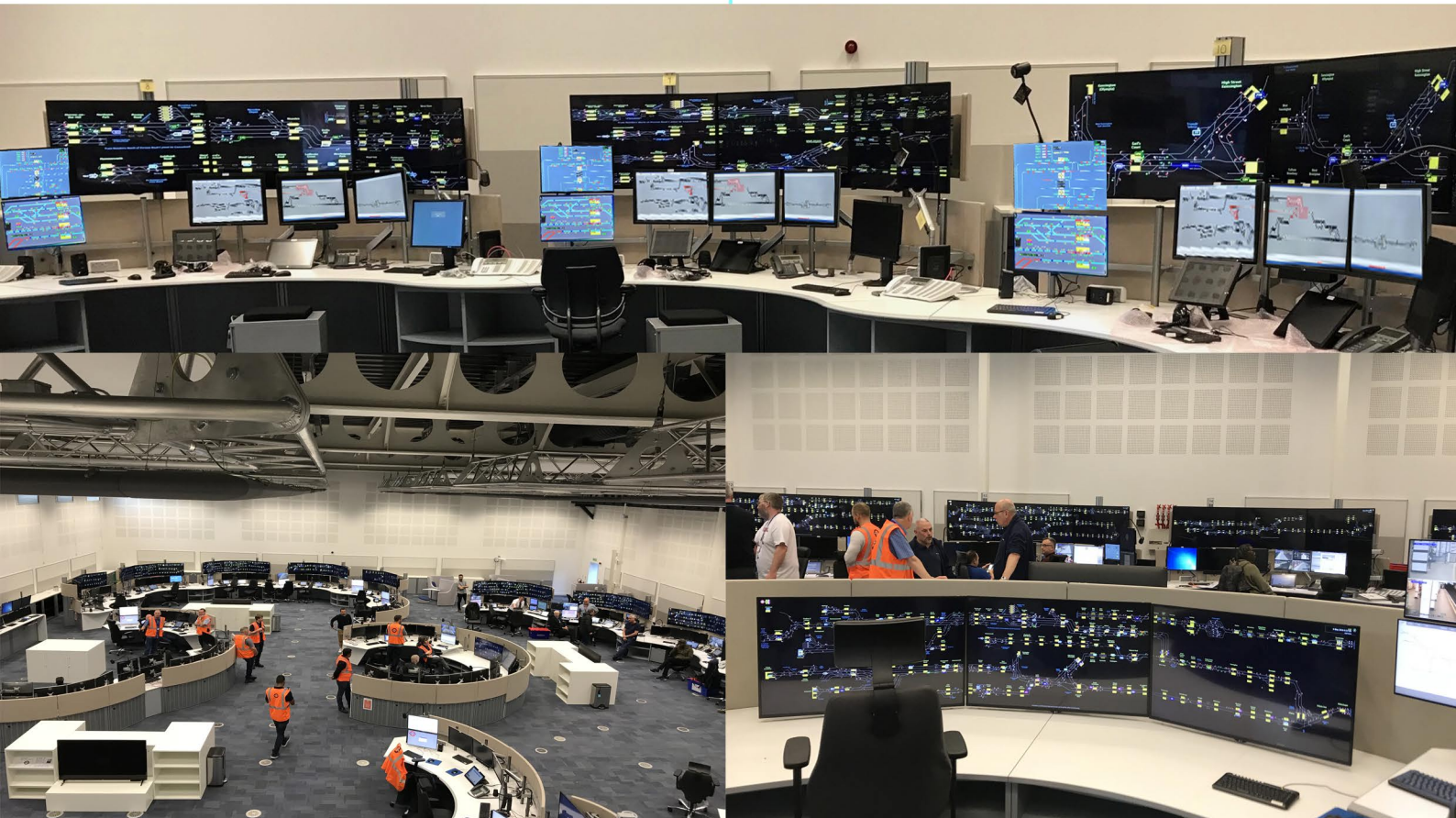
'It has been a pleasure working with you, I have insisted that we keep the same management team to close out, so Mary and Dia.

Please extend my thanks to your team, we are all very happy with the work you have done in supporting the 4LM programme.'

Kind regards

Chris Lyseight
Project Manager SCCi

C A S E   S T U D Y

Challenge

Harp was asked to tender for the overview screens at the new central control centre in Hammersmith that was to control the Circle, District, Metropolitan and Hammersmith & City lines. The original concept of a large video wall was ruled out because the distances from operator to screen was too great to discern train movements. Solutions were then sort to give the operators total visibility of the signal and track conditions. Up to 20 operators needed to see this information simultaneously, which would allow them to make critical decisions. All of the source screens were to run at 4K resolutions
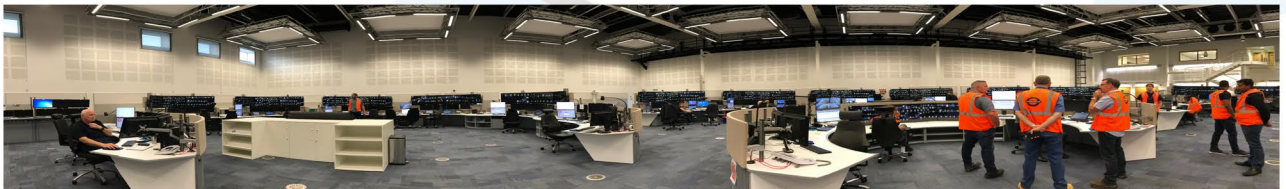
Strategy

The key was to collect all of the information screens at the video level and present them as required to the controllers. It would be essential that each operator could be able to drill down to anywhere under their realm of control to see precisely the status of the lines. Three options were available. The first was the traditional video switch solution where any image could be switched to any screen. Second, was a video wall arrangement for each operator where the video wall processor would be housed in an equipment room and each of the 20 processors would receive a copy of the core images via a massive video distribution process. The third solution was the most elegant, the images would be collected and encoded in H264 format and broadcast onto a network. Each operator would then, via their local desk-based video wall processor, collect and decode images that they wish to see to do their job. The final complexity was that all of the images were to run at 4K, which in turn required cables lengths to be kept short. No stale imagery was acceptable.

Solution

The solution that gave most flexibility was the H264 approach of distributing the images over a network such that each desk could select an image or parts of images they wished to monitor. It was key that no stale image be showed and that the update rate was as near real time as possible. The encoding of the twelve 4K HDMI /Display Port feeds was conducted in a rack in the equipment room, which broadcast these images in H264 format onto a fibre network. Each of the controllers' desks could then s how any part of the network or control information they required. The supervisor have pre-set templates stored that could be evoked at a moments notice allowing for different scenarios to be designed in advance.

Result

The result was that each controller had a 12K screen made up of three, 4K screens from which they could choose from a selection of two 12k sources and eight 4K sources. These provided signalling information from two sources and additional CCTV, incident clocks and other status information. In the event of loss of feed the screens would turn pink ensuring that controllers were not seeing stale information; the lag between source input and display was less than 0.7 seconds. The three screens allowed controllers to easily read all the information to perform their function.

HARP
VISUAL COMMUNICTION SOLUTIONS