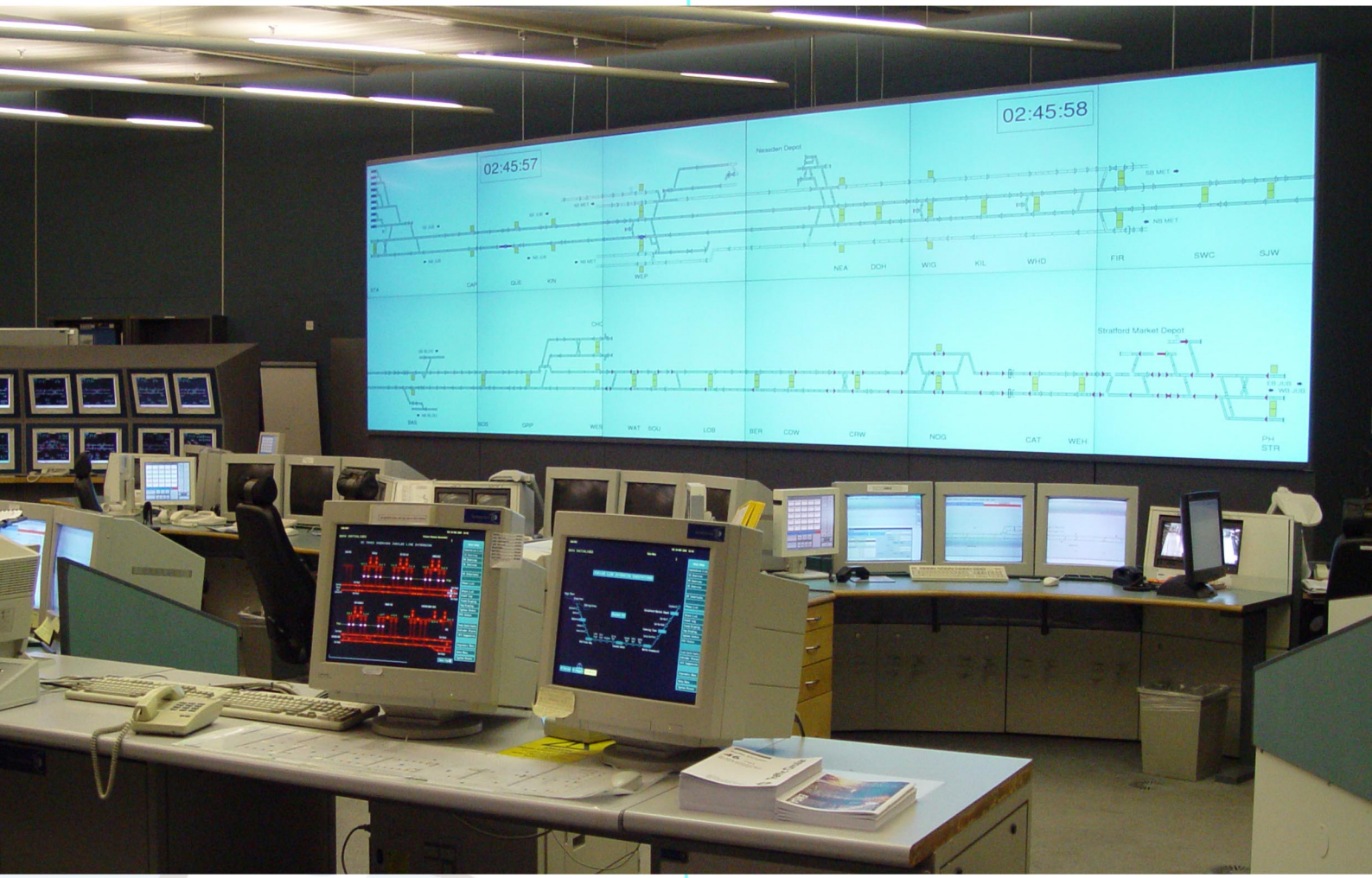
# London Underground

## RELIABILITY AND SAFETY

*London Underground Limited was formed in 1985, but its history dates back to 1863 when the world's first underground railway opened in London.*
*Today London Underground is a major business, with over 3 million passenger journeys a day, some 500 peak trains, 253 stations owned (275 served), over 12,000 staff and vast engineering assets.*

safety




reliability

*" In 1996 London Underground installed what was then a state of the art control room using a CRT based rear projection screen system. By 2004 this system was becoming unreliable and extremely expensive to maintain.*

*Harp devised a solution that would deliver a better quality display which is inhertently more stable using the latest dlp technology and could be run at a fifth of the cost of the original wall.*

*The old system was removed and the new video wall installed whilst the room remained operational. "*

*Martin Tshuma*
*Maintenance Manager*
*Tube Lines*

# CASE STUDY

*Before*

## Challenge

In 1996 London Underground had a CRT based video wall installed for the new Jubilee line extension. It served them well for the first 2 years of its life but soon became unreliable and expensive to maintain. Following our successfull video wall installation at Tube Lines head quarters in Canary Wharf Harp were approached to see how the reliability and maintenance costs could be reduced.

## Strategy

A review of the existing installation was completed in mid 2005 and a strategy was recommended. This was based on a further 10 year life of the control room before the next major refurbishment was planned. The existing system is based on old CRT technology. This becomes unreliable as time progresses as the high voltages used to drive the EHT on the tubes break down the insulation.

If and when a flash over occurs within the projector multiple components may be damaged. With the advent of DLP technology reliability of projectors has soared making it an obvious choice as a replacement technology. In terms of running costs the DLP system was a fifth of the CRT system. These two key elements were enough justification to upgrade the video wall. As part of the evaluation Harp took a trial unit to site to confirm that the projection cube would lock to the legacy video drive electronics. We found on connection it would not lock. Special timings for the projector would need to be developed to enable the projector to lock to these older type video parameters.

## Solution

Once the projector had been modified and proved to lock onto the existing drive electronics the business case was presented. It showed that the new system would pay for itself within 18 months and deliver a 10 fold increase in reliability. To under write the system Harp has undertaken a 5 year maintenance contract to ensure reliability and availability of the system.

By proving the projection system prior to any upgrade, all risk of the new install not working was removed. The only objective left was to install the new system in an operational control room and cause the minimum amount of disruption and distraction to line signal controllers. A temporary system was set up in front of the old video wall to show key areas of the network that still required overview information. The old system was then tented to reduce noise, visual distraction and to create an area in which construction was contained. The old system was then dismantled piece by piece and removed from the control room during less busy periods.

The new display wall was constructed using a structured aluminium frame for the base and the enclosure. All of the frame legs had adjustable feet to compensate for changes in floor height thus ensuring a level platform for the projection cubes. With the cubes loaded the enclosure could be completed. As per London Underground the enclosure was constructed from mild steel. Mild steel was used as it is non-flammable. The enclosure also had two other functions; to stop operators fiddling with the wall and to reduce fan noise from the projectors.

## Result

London Underground now have a state of the art display wall that not only costs them less to run but keeps working and working. One issue that the customer had with the display was that it was too bright and was too overwhelming for the operators. To compensate for this the brightness was wound back to 30% to allow the image to blend into the ambient lighting levels.

The crispness of image and clarity of picture ensures that the signal operators know which train is where at a glance. The new system is far superior to the one that was originally installed.

*After*

HARP

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