



## CASE STUDY – EMCC DERBY RESILIENCE WORKS UPS & POWER DISTRIBUTION INFRASTRUCTURE UPGRADES

CLIENT – NETWORK RAIL INFRASTRUCTURE LIMITED

LOCATION – EAST MIDLANDS CONTROL CENTRE DERBY

DURATION – 5 YEARS (INC EXTENDED SCOPE)



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## Project Overview

Kent PHK was appointed to support a major resilience improvement programme at Network Rail's East Midlands Control Centre (EMCC) in Derby following a series of critical infrastructure failures affecting operational continuity.

The project focused on improving the reliability, maintainability, and redundancy of the site's UPS and Power Distribution Unit (PDU) infrastructure — a critical component supporting signalling and operational railway systems.

The programme evolved from a straightforward UPS replacement into a wider resilience strategy after investigations identified multiple single points of failure throughout the existing electrical distribution architecture.



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## The Challenge

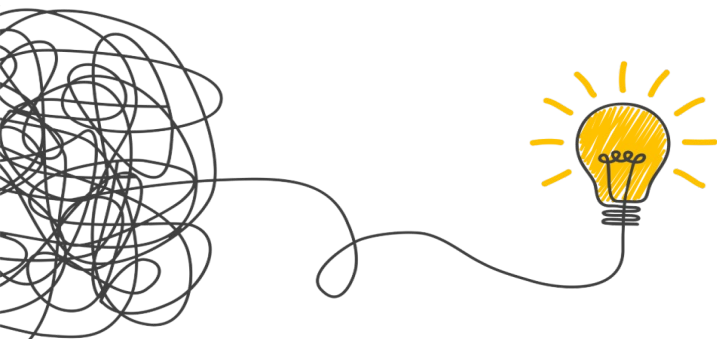
In 2019, a fault on one of the existing UPS systems caused delays exceeding 8,000 minutes across the railway network. During contingency operation on generator supply, additional failures and reliability concerns were identified, exposing significant risks within the EMCC power infrastructure.

Further complications emerged during planned Christmas 2021 works when a failure within the PDU7 static switch prevented the installation of a new bus-coupler arrangement. This halted the original UPS replacement strategy and triggered a full review of the downstream electrical distribution systems.

## Key challenges:

- Existing single points of failure within operational power supplies
- Inaccurate or missing cable identification and labelling
- Limited resilience between A and B power supplies
- Ageing and unreliable static transfer switch infrastructure
- Operationally critical signalling systems requiring continuous uptime
- Complex live-environment working constraints
- Maintaining railway operations throughout implementation

The project required a carefully staged engineering approach to improve resilience while minimising operational disruption.



# Our Approach

Kent PHK worked collaboratively with Network Rail and the signalling provider to develop a phased resilience improvement programme, focused on enabling future UPS replacement works safely and efficiently.

The strategy included:

## **Infrastructure Survey & Assessment**

Detailed investigation of existing PDU arrangements, cable identification, supply segregation, and operational dependencies.

## **Risk Reduction Engineering**

Implementation of: Cable tracing and re-labelling, Circuit rationalisation, Torque verification of live terminations, Updated distribution board schedules, Removal of redundant supplies, Supply segregation improvements

## **Resilience Reconfiguration**

Critical modifications were designed to: Eliminate single points of failure, Separate A and B supply arrangements, Improve redundancy across signalling systems, Enable future UPS replacement without widespread outages

## **Operational Coordination**

All works were carefully planned around: Night-time possessions, TS11 operational requirements, White-period working, Continuous stakeholder communication, Live operational risk controls





# PROJECT BY NUMBERS

2  
1

320KVA UPS SYSTEMS INSTALLED TO STRENGTHEN  
EMCC OPERATIONAL RESILIENCE

NEW BUS-COUPLER SYSTEM IMPLEMENTED  
TO ENABLE SAFER MAINTENANCE AND FUTURE-PROOFED REDUNDANCY



2  
2  
8  
2

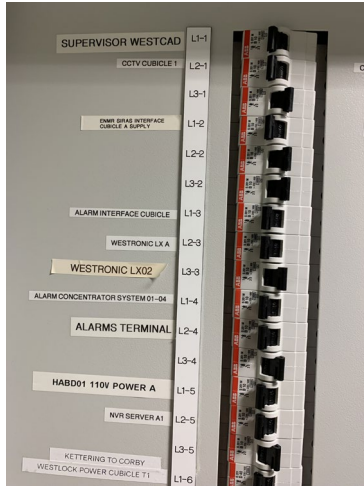
AUTOMATIC TRANSFER SWITCHES INSTALLED ACROSS SIGNALLING WORKSTATIONS  
TO MAINTAIN OPERATIONAL CONTINUITY

CRITICAL PDU STATIC TRANSFER SYSTEMS  
UPGRADED TO REMOVE MAJOR SINGLE POINTS OF FAILURE

EXISTING PDU SWITCHGEAR RECONFIGURED TO IMPROVE  
SEPARATION BETWEEN A & B SUPPLIES

DUAL SUPPLIES INTRODUCED  
TO IMPROVE RESILIENCE FOR CRITICAL OPERATIONAL EQUIPMENT

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## Programme Delivery

The resilience works were delivered through a phased implementation strategy across multiple planned possessions and night-shift access windows.

Key delivery phases included:

Phase	Scope	Delivery Window
PDU 1 & 2	Labelling, verification, resilience upgrades	February 2024
PDU 8 & 9	Infrastructure rationalisation and upgrades	March 2024
PDU 6 & 7	Supply segregation and switchgear modifications	April 2024
PDU 3 & 4	Supply redistribution and signalling resilience	Planned Phase

## Our Team

Our success is driven by a highly skilled workforce. We invest heavily in apprenticeships, professional development, and long-term career pathways to ensure we retain the expertise required to deliver complex infrastructure projects safely and efficiently.

This commitment ensures our clients benefit from experienced teams they can trust.

# OUTCOMES & BENEFITS

REDUCED CRITICAL SINGLE POINTS OF FAILURE ACROSS THE EMCC POWER INFRASTRUCTURE

IMPROVED RESILIENCE OF OPERATIONAL SIGNALLING AND CONTROL SYSTEMS

ENHANCED WORKSTATION RESILIENCE WITH IMPROVED SUPPLY ARCHITECTURE AND TRANSFER CAPABILITY

DELIVERED COMPLEX RESILIENCE UPGRADES WITHIN A LIVE OPERATIONAL RAILWAY ENVIRONMENT WITH MINIMAL DISRUPTION

ENABLED SAFER MAINTENANCE AND SYSTEM ISOLATION PROCEDURES FOR FUTURE WORKS

STRENGTHENED CONFIDENCE IN THE RELIABILITY AND RECOVERABILITY OF CRITICAL OPERATIONAL INFRASTRUCTURE



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## Why This Matters to Our Client

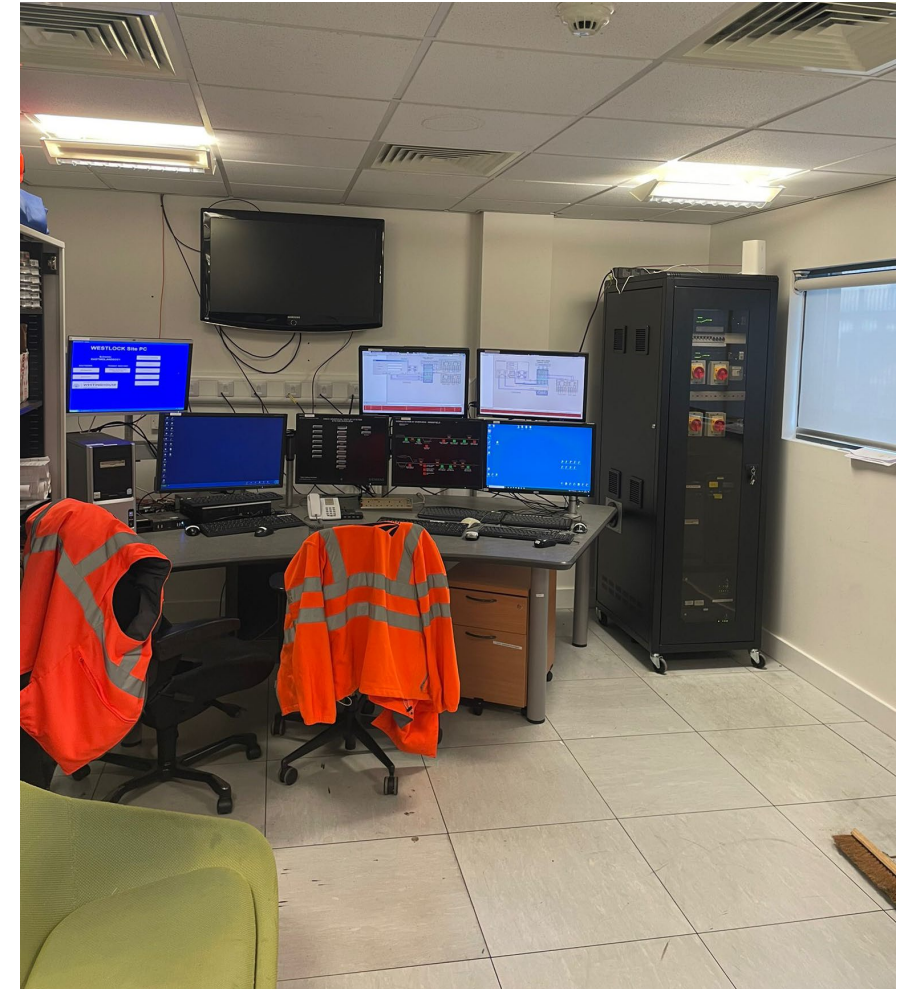


For Network Rail, operational resilience is critical. Any loss of power to signalling and control infrastructure can result in significant service disruption, operational delays, and increased risk across the railway network.

These works delivered more than just infrastructure upgrades — they provided greater confidence in the reliability, maintainability, and recoverability of the EMCC's critical power systems.

By reducing single points of failure, improving supply redundancy, and enabling safer future maintenance and UPS replacement activities, the project helped safeguard the continuous operation of one of Network Rail's key operational control environments.

**The outcome is a more resilient and future-ready infrastructure capable of supporting safer, more reliable railway operations for years to come.**





## CONTACT US

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