

# Case study: Transforming security and efficiency at British Airways' Engineering base

Comprehensive security upgrade with CEM Systems AC2000, American Dynamics victor and VideoEdge, Illustra cameras and integrated radar solutions.



British Airways' Maintenance Base, Heathrow Airport, London



Multimillion  
pound  
investment



60,000+  
card  
holders



1,000+  
card  
readers



200+  
cameras  
deployed

British Airways Engineering, part of International Airlines Group (IAG), partnered with Johnson Controls to deliver a comprehensive security upgrade at its Heathrow Maintenance Base in London.

Initially focused on enhancing CCTV and perimeter surveillance, the project evolved during the discovery phase into a full site-wide security transformation. Johnson Controls—chosen for its integrity, expertise, and holistic approach to complex projects—integrated AI-powered video surveillance, perimeter radar detection, and British Airways' existing CEM Systems airport access control system into a unified security platform.

Initiated in 2023 and completed in 2025, the two-year collaboration set a new benchmark for safety, resilience, and AI-enabled operational efficiency across one of the world's busiest aviation hubs.

## Vast site - the size of 109 football pitches

- 35 aircraft stands
- 10 hangars
- 2 office blocks
- World-class training facilities

## Featured solutions

- CEM Systems AC2000 Airport Access Control
- American Dynamics victor and VideoEdge VMS
- Illustra AI-Powered cameras and integrated perimeter radar solution
- Unified AI-enabled control room

The power behind **your mission**

British Airways, the UK's largest international airline, operates over 280 aircraft and serves nearly 40 million passengers annually.

Its London Heathrow maintenance base (spanning the size of 109 football pitches) features 35 aircraft stands, 10 hangars, and comprehensive engineering services, from routine inspections to major structural repairs. The vast site also houses two dedicated office blocks for security-cleared staff, along with a Global Learning Academy - a world-class centre of excellence for training pilots, cabin crew, and engineers.

### Project Challenges

- **Outdated analogue CCTV system**  
Resulted in limited coverage, poor image quality, manual reporting processes and reliance on physical perimeter patrols.
- **Rising threats**  
Increasing critical infrastructure risks and evolving Civil Aviation Authority (CAA) regulations.
- **Vast, complex site**  
The vast scale of this restricted airport environment posed challenges from tender to completion.
- **Cyber Security**  
Requirement for robust protection of connected devices, servers, credentials and platforms.

of perimeter boundaries, roads, aircraft stands, hangars and restricted buildings while replacing outdated technology with high resolution, future ready systems. Reducing reliance on labour intensive patrols and maintaining compliance with evolving Civil Aviation Authority (CAA) security requirements were also core priorities.

However, as the discovery phase progressed the scale and operational criticality of the engineering site highlighted the need for a far more transformational security approach. The project's remit expanded from a CCTV upgrade to the development of a fully integrated, AI enabled security ecosystem. A key ambition became the integration of multiple subsystems—British Airways' existing airport access control, new AI driven video analytics, radar based perimeter detection and automated PTZ camera tracking—into a single, data driven platform.

### Discovery Phase

The project began as a focused initiative to upgrade British Airways Engineering's legacy analogue CCTV system, with the primary aim of strengthening perimeter protection across its extensive Heathrow Maintenance Base. Early objectives centred on improving surveillance

Cybersecurity resilience also emerged as a major objective. With the site designated a high risk strategic aviation asset, ensuring the robust protection of connected devices, servers and platforms was essential to safeguard operational continuity and regulatory compliance.



## Key Johnson Controls Technologies Deployed



### Integrated platform

victor unified security management system & VideoEdge NVR's



### AI-Powered cameras

200+ Illustra high definition cameras



### Perimeter radar

Linked with PTZ camera integration for dynamic detection



### AI Control Room

Integrated AI data driven video wall for centralised monitoring



### Access control

CEM Systems AC2000 Airport System with 35+ years of trusted deployment

Johnson Controls deployed a fully integrated security ecosystem combining video, radar, access control, and AI analytics in a single intelligent platform.

The solution was built around the American Dynamics victor unified video management system and VideoEdge NVRs, supporting the installation of more than 200 Illustra high definition, AI powered cameras across airside, landside and perimeter areas.

#### AI-driven vision with radar precision

##### Illustra AI-powered cameras

- Over 200 high-definition cameras deployed
- AI-powered object recognition for vehicles, individuals, and threats.
- AI analytics enable real-time search, event tagging, and metadata monitoring
- Supports predictive security threat detection and faster incident response

##### Perimeter radar with integrated video

- Radar technology integrated with pan-tilt-zoom (PTZ) cameras reduces hardware requirements and enhances dynamic site monitoring.

- Static cameras at stands and gates ensure secure, authorised, audited access for security-cleared personnel
- Perimeter radar with a 500 m detection range automatically directs AI-enabled PTZ cameras for dynamic tracking, reducing false alarms and unnecessary patrols.

As part of the project, British Airways' long established CEM Systems airport access control solution—covering more than 1,000 smart card readers and over 60,000 cardholders—was upgraded to the latest software to strengthen cybersecurity and support enhanced airport specific functionality. Additional CEM Systems intelligent IP card readers and portable handheld readers were also deployed in hangars and extra airside zones, ensuring robust access control measures and reinforcing regulatory compliance.





## UK aviation's first AI-powered control room integrating radar, video & access

**A key highlight of the project was the creation of a state of the art, AI enabled engineering control room, relocated within the secure engineering base at Heathrow Airport.**

The first of its kind in UK aviation, the new control room marks one of the UK aviation sectors first fully integrated, AI-powered ecosystems. Designed and delivered by Johnson Controls, the new control room features a large integrated video wall and is powered by the unified victor platform. This advanced data-driven system brings together AI powered video analytics, radar detection, and access control into a single, intuitive interface, enabling real-time monitoring of airport boundary lines, aircraft stands, site roads, vehicles and staff activity. Advanced capabilities such as object recognition, event tagging, forensic search and proactive perimeter monitoring provide significantly enhanced situational awareness.

The new solution streamlines incident reporting, and supports proactive security measures. By consolidating Johnson Controls security technologies, British Airways Engineering now benefits from a more efficient, cost-effective, data driven approach to site-wide surveillance.

Implementation of the project was delivered in carefully phased stages to keep the existing Vanguard House control room fully operational throughout. Infrastructure works, cabling and system migrations were meticulously sequenced to avoid disruption to critical engineering operations.

### Trusted airport access control for over 35 years

For more than three decades, the CEM Systems AC2000 Airport Access Control System has been a trusted solution for British Airways, delivering scalable, resilient protection across key UK airport sites including Heathrow, Gatwick, and Glasgow.

Using CEM Systems intelligent IP card readers with advanced airport door modes, the system supports seamless smart card recognition across multiple locations via a multi-site airport link, enabling 24/7 offline card validation and safeguarding critical access points.

### Integrated security with intelligent staff verification

The integration of Illustra cameras with the AC2000 system provides full visibility of access points and real time staff visuals through a single, intuitive interface. Powered by AI-driven video analytics, this setup enables intelligent staff verification, reducing the need for manual ID checks and patrols. The result is streamlined operations and enhanced passenger flow across British Airways' sites.





### Results

**By integrating multiple security technologies into a unified, AI powered platform, British Airways Engineering has achieved measurable return on investment through enhanced situational awareness, improved operational efficiency, and strengthened regulatory compliance.**

The migration from analogue CCTV to a fully integrated, AI enabled ecosystem has transformed site wide visibility, enabling operators to leverage high definition video, radar driven perimeter detection, and real time analytics that automatically identify, classify, and track potential threats.

Combined video, radar, and access control data within a single platform accelerates decision making, while automated forensic search, intelligent staff verification, and real time metadata analysis have significantly shortened investigation times and improved auditability for CAA and GDPR compliance.

Strategically positioned cameras and intelligent card readers, supported by automated workflows, provide comprehensive monitoring of staff, vehicle, and aircraft activity.

Every operational detail—from device status to operator actions—is captured within the system, ensuring full accountability and alignment with ever evolving governance standards.

The introduction of innovative perimeter radar has further strengthened security. By automatically directing PTZ cameras and extending detection beyond traditional visual range, the system has reduced false alarms, lowered hardware requirements, and decreased reliance on manual patrols—shifting operations from a reactive to proactive model. This enhances protection of aircraft, hangars, personnel, and restricted zones while contributing to sustainability by reducing emissions, resource consumption, and overall site movements.





### Cyber security

British Airways Engineering chose Johnson Controls for our expertise in delivering complex, turnkey airport security solutions—from design consultation and specification, manufacturing, right through to installation and ongoing support.

The integrated system offers comprehensive protection against physical and cyber threats, with resilience from device to server level. A collaborative approach between all Johnson Controls divisions, networking partners and British Airways teams ensured seamless delivery across all phases.

### Summary

This landmark project has set a new industry benchmark for AI enabled aviation security. By shifting the security model from reactive to preventative, it establishes a future ready foundation for smarter, more autonomous airport operations.

This multi million pound investment now serves as a scalable model for British Airways, with expansion already underway at the British Airways Distribution Centre and further enhancements planned across other key sites in the future.

“Johnson Controls delivered a seamless CCTV transformation and integrated security solution across British Airways Engineering. Their expertise in complex deployments and smart security integration has boosted our operational efficiency. After 35 years of using their airport access control, we’re now pleased to have access, video, and radar powered by AI analytics — all from one trusted supplier.”

—**David Tubb**  
Security Manager, British Airways Engineering