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CASE STUDY · MARLUC SYNOPSIS

NATS AI runway monitoring trial at Heathrow

IMPLEMENTED 2019–2023 · TRANSPORT AND LOGISTICS · UK · BAND E · CLAIMED ONLY

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NATS has trialled an AI camera system at Heathrow since 2019 to tell controllers when a landed aircraft has left the runway in low cloud, aiming to recover lost landing capacity. It was still described as a trial in 2023, and no operational results are published.

ABOUT THIS SYNOPSIS

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Facts and figures are as reported by the sources listed below, which may be incomplete, self-reported or out of date. Check the original source before relying on any figure.

The impact band, proof marker and SEAM view are MarLuc's opinion. The organisation is not a MarLuc client and has not reviewed or endorsed this synopsis. Names and trademarks belong to their owners.

NOTICE WORDING LAST UPDATED 16 NOVEMBER 2026

AT A GLANCE

No measurable effect: no results reported.

AI used: Computer vision and machine learning platform (Searidge Aimee) tracking aircraft from airfield cameras.

Implemented: 2019–2023. Grade: band E, No measurable effect, Claimed only.

Headline result, as reported: Trial to recover landing capacity lost in low cloud began in 2019 with a goal of service that year; still described as a trial in October 2023

1 · The case

The facts, as reported by the 5 sources listed at the end. Where a source is silent, the field says "Not reported".

Organisation

NATS. UK air traffic control provider, handling over 2.5 million flights and 300 million passengers a year over the UK and the North Atlantic. Heathrow's 87-metre control tower is the tallest in the UK. Canvas block: 4. Operations and process. Also 6. Data and technology, 8. Governance and risk.

Business challenge

The challenge. Heathrow's control tower can disappear into low cloud while the runways below are clear. Controllers then rely on radar to know an aircraft has left the runway and leave extra time between landings, which loses 20% of landing capacity and causes delays, per NATS.

How it was addressed. In January 2019 NATS began non-operational trials in its £2.5m digital tower laboratory inside the Heathrow control tower. Twenty ultra HD cameras feed Aimee, an AI platform from Canada's Searidge Technologies, which tracks aircraft and tells the controller when one has cleared the runway; the controller decides whether to clear the next arrival. Aimee was to study more than 50,000 arrivals, with findings to go to the Civil Aviation Authority, and NATS said the technology could enter service as early as 2019. By January 2020 NATS, Searidge and the CAA had set up an innovation team to develop a regulatory framework and validate the initial test results, per Eurocontrol. In October 2023 a Searidge article in NATS's own publication still described Aimee as being trialled at Heathrow. [1] [2] [3] [4] [5]

Who implemented it

Searidge Technologies (Software vendor): Developed the Aimee AI platform; its engineers worked alongside controllers in the laboratory.
In-house (In-house): NATS: built and runs the digital tower laboratory at Heathrow.

Technology (SEAM pillar E)

SEAM types: T8 Predictive / ML models. Deployment: Not reported. Vendors and products: Searidge Technologies, Aimee.

Where it was built in: Twenty ultra HD 4K cameras around the airfield feed Aimee, which combines images with radar and multilateration tracking and prompts controllers on a video wall in the digital tower laboratory.

What changed

Before: in low cloud, controllers rely on radar and space landings further apart. After, in the laboratory: controllers see camera images with AI prompts when aircraft clear the runway. Change in live operations: Not reported. [1] [2] [3] [4] [5]

What it cost

£2.5m invested by NATS in the digital tower laboratory. Cost of the AI trial itself: Not reported.

What it saved

Not reported. NATS said in 2019 it believed the system would help reclaim all the lost capacity; Eurocontrol in 2020 said it could help reclaim up to 20% of lost capacity. [1] [2] [3] [4] [5]

Governance and control

Controllers remain the decision makers, NATS says; the AI informs and the controller clears the next arrival. Trial findings were to go to the Civil Aviation Authority, and an innovation team with the CAA was set up to develop a regulatory framework and validate results. Outcome of validation: Not reported.

S2 · Accountable owner · Not reported
Not reported.

A1 · Safe use · Not reported
Not reported.

A2 · Human in the loop · Claimed
The AI informs the controller when the runway is clear; the controller decides whether to clear the next arrival, and NATS says controllers remain the decision makers. [1] [4]

A3 · Monitoring and assurance · Claimed
Aimee was to study more than 50,000 arrivals to check accuracy, with findings to go to the Civil Aviation Authority; results not reported. [1] [2]

A4 · Vendor AI · Not reported
Not reported.

A5 · Agent controls · Not reported
No agents described.

A6 · Standards and regulation · Claimed
NATS, Searidge and the CAA set up an innovation team to develop a regulatory framework and validate initial results, per Eurocontrol; no CAA decision reported. [4]

What worked, what did not, what is unproven

WORKED

– Controllers' reaction to the laboratory was enthusiastic, by NATS's account.

– NATS said validation was showing the AI model performs equally well by day and night.

DID NOT

– The aim to bring the technology into service as early as 2019 is not reported as met; in October 2023 it was still described as a trial.

UNPROVEN

– Accuracy over the 50,000-arrival study.

– Any regulatory approval for operational use.

– Capacity actually recovered on low-cloud days.

Timeline

Jan 2019 NATS begins non-operational trials of the Aimee AI platform in its Heathrow digital tower laboratory [1]

Jan 2020 Eurocontrol reports an innovation team with the CAA to develop a regulatory framework and validate initial results [4]

Oct 2023 Searidge article in NATS's own publication still describes Aimee as being trialled at Heathrow [5]

2 · Grade and SEAM assessment

MarLuc's opinion, made on the evidence above. How cases are graded: marluc.co.uk/case-studies/how-we-rate

Level of change and impact

Claimed: Not applicable. Grade: E, No measurable effect. Proof: Claimed only. Level of change: Not graded.

No level assessed: band E, no results reported. A long-running trial with a stated capacity aim;

The SEAM view and lessons learnt

NATS kept controllers as decision makers and brought the regulator in early. The trial has run since 2019 without published results or a reported approval. For a larger organisation, the transferable point is to plan the assurance path and its timeline at the start, and to publish trial results so progress can be judged.

1. Plan the regulatory assurance path before the trial starts.
2. Keep the human decision point explicit in safety-critical uses.
3. Publish trial results and decisions so progress can be judged.

Evidence

Score 1 of 4. Self-reported: NATS statements, a Eurocontrol article drawing on NATS, and a supplier article; no published trial results.

Evaluation method. Self-reported: non-operational trial in a laboratory; no results published in sources opened.

Sources disagree. NATS said in 2019 the system would help reclaim all the lost capacity; Eurocontrol in 2020 said up to 20% of lost capacity, and the 2023 Searidge article an extra 20% landing capacity on low visibility days.

Status. Unclear: described as a trial at Heathrow in October 2023; no operational use or regulatory approval reported in sources opened.

3 · Original sources

Read these in full. To challenge a fact or a grade, use the contact form at marluc.co.uk or the link on https://marluc.co.uk/case-studies/nats-heathrow-ai-digital-tower-trial

[1] CANSO (NATS release): NATS trialling use of artificial intelligence at Heathrow Airport to cut delays (January 2019)
https://canso.org/?p=18178

[2] Vision Systems Design: Trials conducted in UK on AI platform designed to assist with air traffic control (January 2019)
https://www.vision-systems.com/articles/2019/01/trials-conducted-in-uk-on-ai-platform-designed-to-assist-with-air-traffic-control.html

[3] IT Pro: Heathrow trials AI-controlled runway with £2.5m 'digital tower laboratory' (January 2019)
https://www.itpro.co.uk/digital-transformation/32833/heathrow-trials-ai-controlled-runway-with-25m-digital-tower-laboratory

[4] Eurocontrol: Real safety and capacity gains at Heathrow from artificial intelligence initiatives (January 2020)
https://www.eurocontrol.int/article/real-safety-and-capacity-gains-heathrow-artificial-intelligence-initiatives

[5] NATS ELEVATE: The art of intelligence in digital towers, by Searidge Technologies (October 2023)
https://www.nats.aero/news/elevate/october-23/the-art-of-intelligence-in-digital-towers/

NATS website: https://www.nats.aero

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