Verification of Heathrow Noise and Track keeping Systems

Henk Veerbeek

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Introduction

1. Introduction

✓ NLR – Netherlands aerospace institute
✓ relevant experience

2. Meeting Forum sub-group on the verification activities

✓ flight (track) data
✓ data completeness
✓ historical changes
✓ noise models

3. Time schedule

4. Questions and answers
Where is NLR located?

The Netherlands

NLR Amsterdam

NLR Flevoland
Mission

**NLR** is the main knowledge enterprise for aerospace technology in the Netherlands. The overarching objective is to render aviation safer and more sustainable and efficient.
Organizational structure: market-driven

Board
- Strategy & Policy
- Personnel & Organisation
- Other Staff & Support Services

Aerospace Systems
- Avionics Technology
- Aircraft Systems
- Defence Systems
- Space Systems

Aircraft Operations
- Safety Institute
- Management & Airports
- Training, Simulation & Operator Performance
- Cockpit & Flight Operations
- Environment & Policy Support

Aerospace Vehicles
- Gas Turbines & Structural Integrity
- Flight Physics & Loads
- Helicopters & Aeroacoustics
- Collaborative Engineering Systems
- Structures Technology
- Engineering & Technical Services
- Structures Testing & Evaluation

German-Dutch Wind Tunnels (DNW)

650 employees
Scope of work (outline brief)

To enable community stakeholders to be confident that:
1. the aircraft are at the heights and locations that the Heathrow systems indicates and
2. that all operations from Heathrow are accounted for in the system.

Assess whether there has been any historical change in the past 5 years, to the ANOMS or Webtrak systems, which may have altered the accuracy of the systems.

Verify that the Noise Models used by Heathrow are
1. compliant with international standards and
2. provide an accurate assessment of the noise climate.
Verification of flight track data

To enable community stakeholders to be confident that:
1. the aircraft are at the heights and locations that the Heathrow systems indicates

Verify against “raw” radar data as well as ADS/B data: does ANOMS use correct input data?
i.e. do radar data match with what it should be?
Do include East and West operations
Also verify height profiles (up to 10,000 ft)

Does ANOMS produce the correct flight tracks based on these data?
Note: we define “correct” relative to the input data (radar) provided: quality of radar data is continuously monitored by NATS (safe flying).
Verification of flight track data (2 - tracks)

Radar data, flight tracks and height profiles:
Verification of flight track data (3 - WebTrak)

Are the flight tracks presented correctly in WebTrak:
- On the right place on the map
- Correct number of flights
Data completeness

To enable community stakeholders to be confident that:
2. all operations from Heathrow are accounted for in the system

Verify against flight data from airport’s charging system.
Assume: data in the charging system are correct (that is where the money comes from).

We will verify several weeks of data, sampled from the past year and compare:
 a) the number of flights
 b) flight parameters (e.g. aircraft type).
Verification of system changes

Assess whether there has been any historical change in the past 5 years, to the ANOMS or Webtrak systems, which may have altered the accuracy of the systems.

This will be based on interviews:
- Airport staff
- B&K staff (system provider).
Verification of Noise Models

Verify that the Noise Models used by Heathrow are
1. compliant with international standards and
2. provide an accurate assessment of the noise climate.
Noise models

1. Scenario
- numbers
- fleet mix
- ground tracks (dispersion)
- destinations
- etc.

2. Model settings
- profiles (height, speed, thrust)
- noise tables
- weather conditions
- etc.

(guidance by ECAC.Doc29 and ICAO.Doc.9911)

3. Calculation core
- Algorithms

(by ECAC.Doc29 and ICAO.Doc.9911)

4. Result
- contour algorithm
- counting of number of people exposed

Pre-defined

Result verification

Track monitoring

Verification (use of model)

Noise monitoring

NLR - Dedicated to innovation in aerospace
Verification with measurements (samples)

- 2 to 3 aircraft types
- For departures and arrivals
- We also include measurements at greater distance to the airport
Time schedule

1. Meeting with forum sub-group on August 11
   - followed by feedback / input from the group

2. Request for data send out
   - status: waiting for first data to arrive

3. Elapse time for analyses: 2 months
   - As soon as available, intermediate results will be released
   - Results available for next forum meeting in November.
Dedicated to innovation in aerospace

www.nlr.nl - info@nlr.nl