**WORLD METEOROLOGICAL ORGANIZATION**

CBS/OPAG-IOS/ET-ABO-1/3.1.10

**COMMISSION FOR BASIC SYSTEMS**
OPEN PROGRAMME AREA GROUP
ON INTEGRATED OBSERVING SYSTEMS

29.VIII.2013

**EXPERT TEAM ON AIRCRAFT-BASED OBSERVING SYSTEMS**

ITEM: 3.1

**FIRST SESSION**

Original: ENGLISH

Geneva, Switzerland, 10-13 September, 2013

# STATUS OF THE AIRCRAFT-BASED OBSERVATIONS PROGRAMS

## Reports of Operational National & Regional Programs

Regional UK AMDAR Programme Status Report
(*Submitted by Stewart Taylor, UK Met Office)*

## SUMMARY AND PURPOSE OF DOCUMENT

The Report provides a progress and activity report of AMDAR activities undertaken by Met Office in support of Regional UK AMDAR Programme.

## ACTION PROPOSED

The Session is invited to review and discuss the content of the document.

**Appendices**

1. Program Metadata

## PROGRESS AND ACTIVITY REPORT

### Current Status

The UK AMDAR Programme continues to utilise data provided by the E-AMDAR Programme. There are two United Kingdom based airlines participating in the E-AMDAR Programme – British Airways (BAW) and easyJet (EZY) – and these provide the majority of the data used in the UK AMDAR Programme.
Using the AMDAR data from these airlines, supplemented by Lufthansa (DLH), KLM and SAS, an example of typical daily network coverage can be seen in Fig 1 below.

Information on the BAW and EZY fleets are included in the Appendix. Full details of all the Airlines/Fleets providing data in the UK domain can be found in the E-AMDAR Report (CBS/OPAG-IOS/ET-ABO-1/3.1.4).

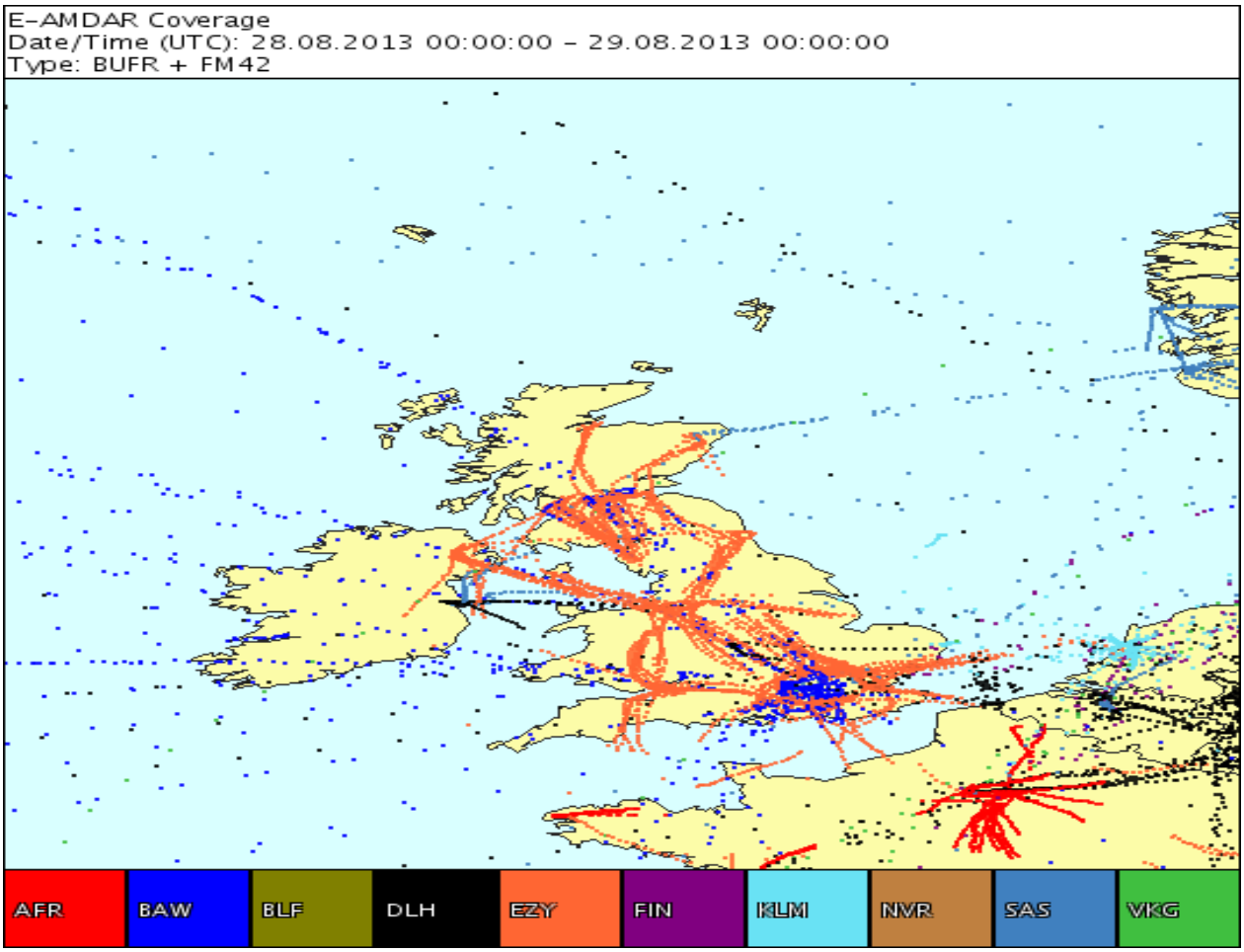


***Fig 1 – Typical daily AMDAR coverage over UK domain.***

The data provision for the UK AMDAR Programme is under agreement with the E-AMDAR Programme. The current objectives for E-AMDAR are 1 profile every 3 hours at airports to provide spatial and temporal coverage.
However, to meet the needs of regional NWP, additional data based on 1 profile every 1 hour at all major and regional airports is delivered.

Data volumes can be seen in Fig 2 and Fig 3 below. The “seasonal” dip over the Festive Season can be seen along with the increase to daily averages. This increase is related to two main factors;

- BAW and Met Office requesting additional data for airline and forecasting development purposes (resulting in increased profile production) and,
- increased data from the EZY fleets.

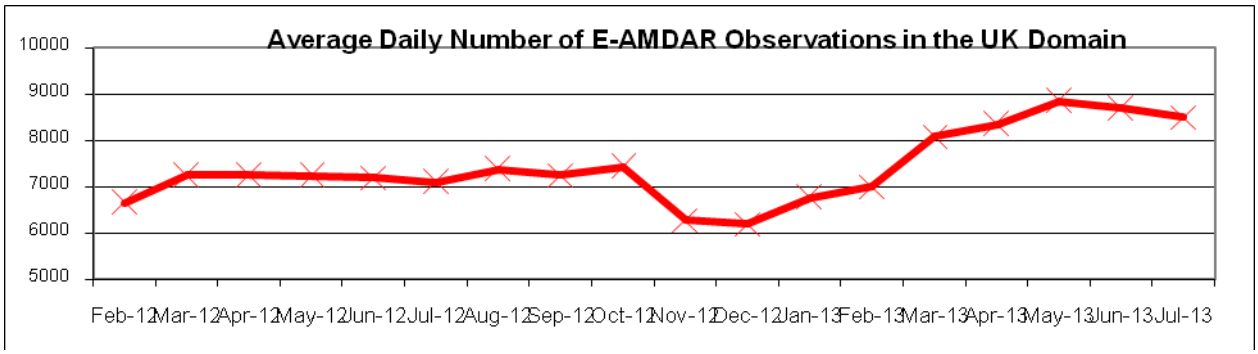


***Fig 2 – AMDAR observations. There were 263k observations received during July with a daily average of 8,505.***

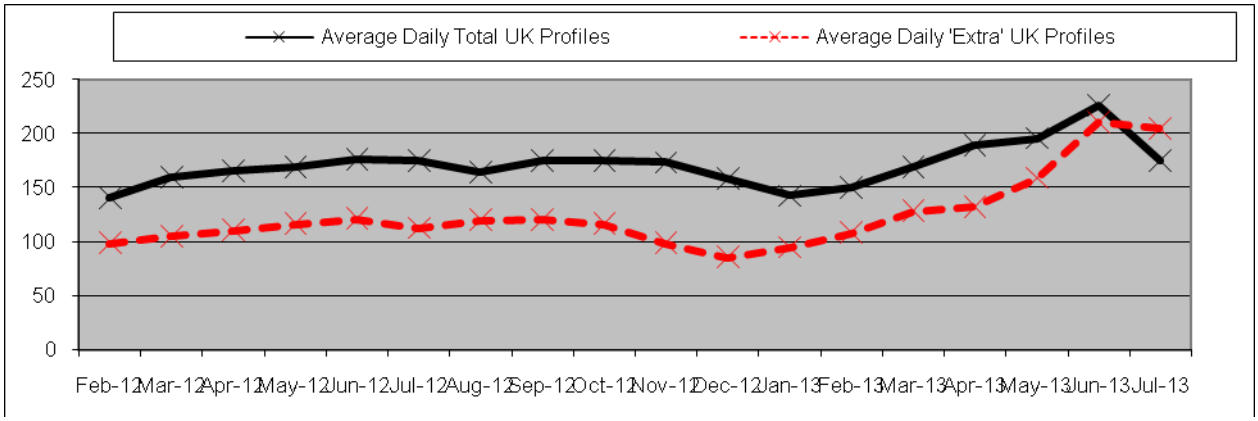


***Fig 3 – AMDAR Profiles in the UK domain. Note the increase in profile availability from May 2013.***

As well as good network coverage, the timeliness and quality of the data are of importance. Timeliness objectives within the UK AMDAR Programme have been set to T+15 and T+60 availability – shown in Fig 4 below.

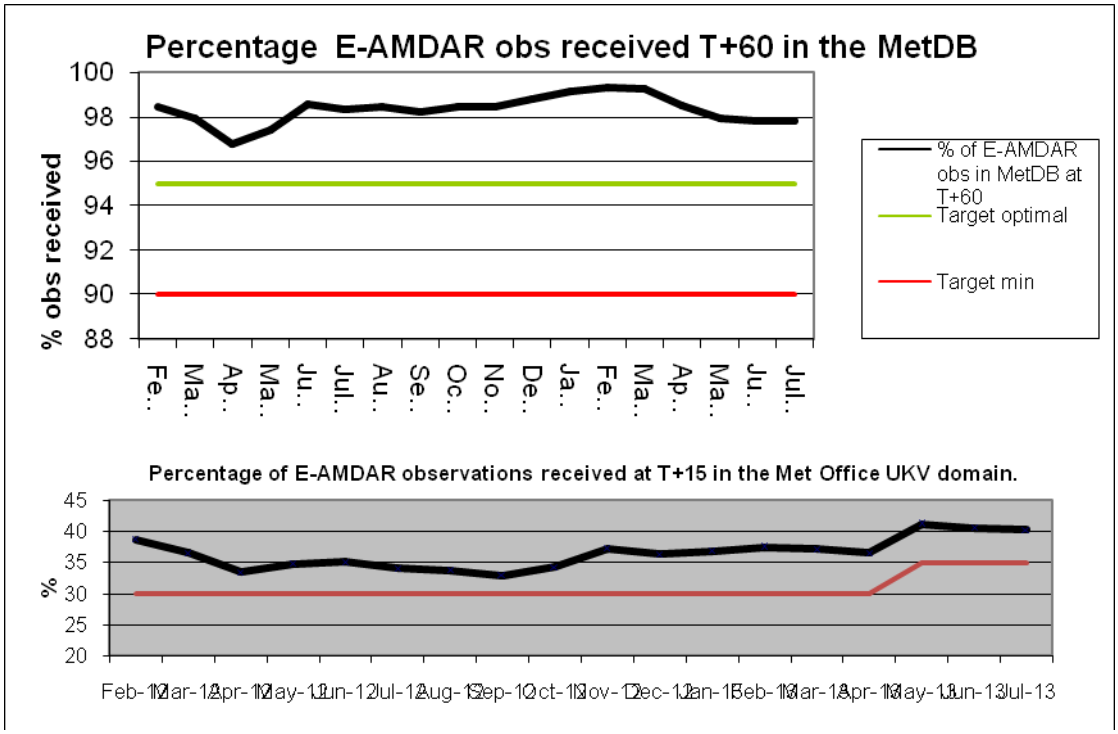


***Fig 4 – Data timeliness of data available in the UK domain (July 2013).***

**Development & Other Activities**

As well as benefiting from any E-AMDAR developments, the UK AMDAR Programme is also involved with a project with Met Office Aviation Teams and Heathrow Airport – mainly focussed on the improvements to fog forecasting.
The benefits of having improved fog forecasts is a major factor on Heathrow – and airline – operations and could result in large cost savings.

The Met Office provides an AMDAR back-up to the E-AMDAR Management Team. This involves monitoring of the operational network when the E-AMDAR Team is on travels or holiday.

**Future Plans**

The FAAM BAe-146 Research Aircraft continues to operate with the WVSS-II v3 installed on the sensor testing array.
It is hoped that a Panasonic Avionics (formerly AirDat) TAMDAR unit will be installed during 2013 to carry out further comparison testing of readily available humidity sensors.
(The results from these tests will provide valuable information on the performance of the humidity sensors in Europe).

Within E-AMDAR, discussions are ongoing with several airlines with FlyBe and Aer Lingus of interest to the UK AMDAR Programme.
With the addition of these two airlines to E-AMDAR, and possible development of current airline fleets, the potential coverage over the UK is shown below.

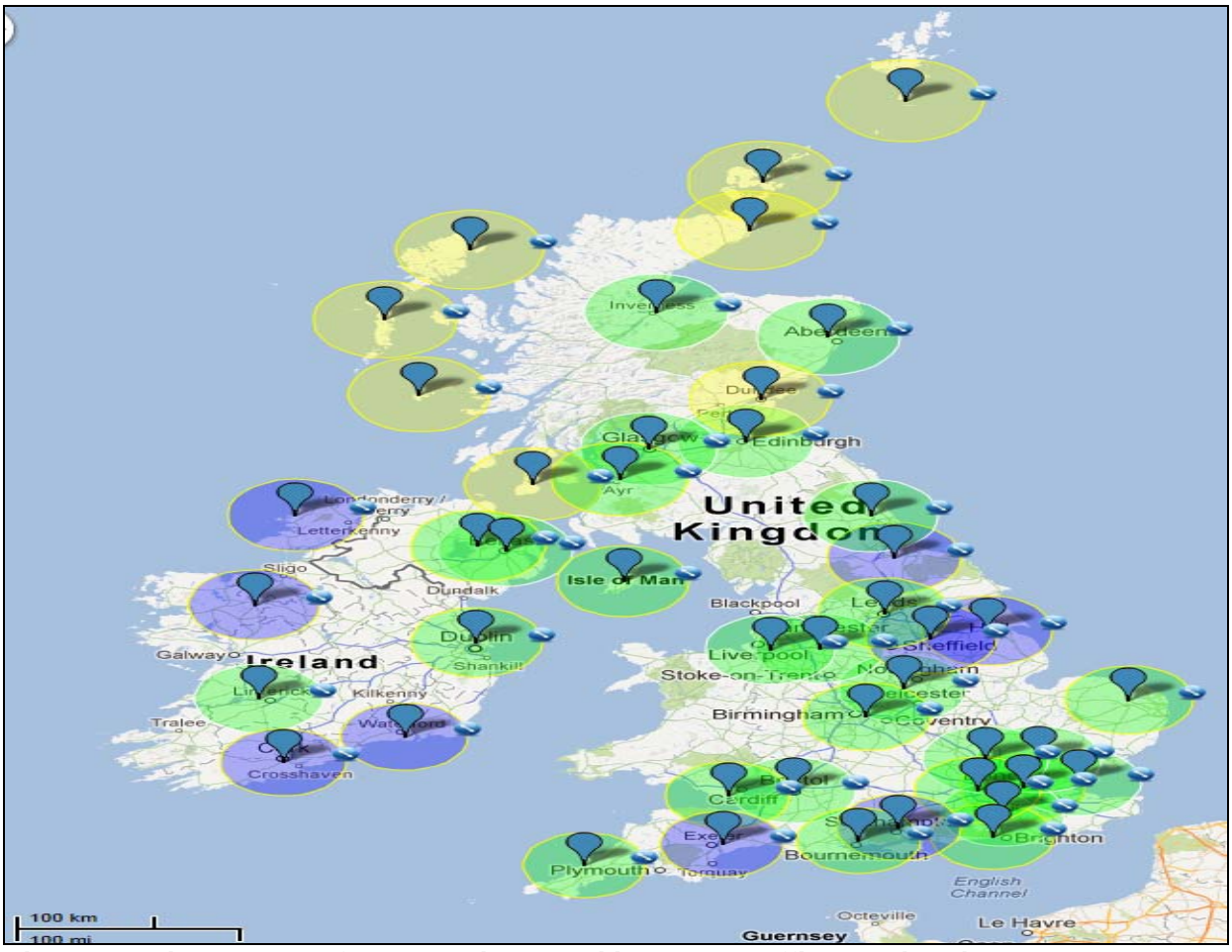


***Fig 5 – Land coverage of AMDAR data used in UK Met Office Regional NWP.***

Each Circle represents the approximate coverage of each AMDAR profile region.
The Radius of the circle is 50km.
Green = Current. Blue = Planned. Yellow = Future Development.

**APPENDIX 1**

**PROGRAM METADATA (BASED ON JULY 2013 INFORMATION).**

**Operational Fleet**

| Airline | Country of Airline | Aircraft Type (e.g. B737-400)[1] | Number of Aircraft | AMDAR Software | Format On GTS (BUFR / FM42) |
|---|---|---|---|---|---|
| British Airways (BAW) | UK | A318 | 2 | AAA v3 | FM42 |
| | | B737 | 19 | AAA v2 | FM42 |
| | | B747 | 52 | AAA v2 | FM42 |
| | | B767 | 21 | AAA v2 | FM42 |
| easyJet (EZY) | UK | A319 | 170 | A620 v2 | FM42 |
| | | A320 | 61 | A620 v2 | FM42 |
| | | A321 | 4 | A620 v2 | FM42 |

***Notes:***

1. *Due to the various Aircraft Type/Series in use, this information has been restricted to Type only. If further information required, this can be supplied.*

**Program Coverage**

The current UK AMDAR Programme Objectives are based on hourly profiles at all airports in the UK domain.

| Airport Country | Airport Name | Airport ID (IATA) | Average Profiles (per week) |
|---|---|---|---|
| United Kingdom | Aberdeen | ABZ | 31 |
| | Birmingham | BHX | 30 |
| | Belfast | BFS | 121 |
| | Bournemouth | BOH | 1 |
| | Bristol | BRS | 130 |
| | Cardiff | CWL | 1 |
| | Dublin | DUB | 41 |
| | Edinburgh | EDI | 148 |
| | Gatwick | LGW | 218 |
| | Glasgow | GLA | 123 |
| | Heathrow | LHR | 124 |
| | Inverness | INV | 21 |
| | Isle of Man | IOM | 10 |
| | Jersey | JER | 16 |
| | Liverpool | LPL | 103 |
| | London City | LCY | 11 |
| | Luton | LTN | 151 |
| | Manchester | MAN | 74 |
| | Newcastle | NCL | 76 |
| | Newquay | NQY | 5 |
| | Norwich | NWI | 1 |
| | Shannon | SNN | 11 |

| | | | |
|---|---|---|---|
| | Stansted | STN | 104 |
| | Southend | SEN | 48 |

***Notes***

a) Metadata information was obtained using the monitoring tools in place within the Met Office.

**Program Potential Coverage**

At this current time, any increase to Program Potential will be driven by E-AMDAR developments.

| Airport Country | Airport Name | Airport ID (IATA) | Profiles per day/week |
|---|---|---|---|
| N/A | | | |

**Program Potential International Coverage**

At this current time, any increase to Program Potential will be driven by E-AMDAR developments.

| Airport Country | Airport Name | Airport ID (IATA) | Airline & Fleet (Aircraft model) | Profiles per day/week |
|---|---|---|---|---|
| N/A | | | | |

**DRAFT TEXT FOR INCLUSION IN THE FINAL REPORT**

**Regional UK AMDAR**

1. As with the E-AMDAR Programme, no interruption to service levels with the transition from SMHI to Met Office as Co-ordinating Member for the E-AMDAR programme.
2. The current UK AMDAR objectives continue to be met.
3. Increased reporting at London Heathrow (LHR) in support of improvement to fog forecasting project between Met Office Aviation and LHR.
4. Addition of TAMDAR sensor package to UK FAAM Research Aircraft to provide comparison testing of available humidity sensors.