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STATUS & PROGRESS ON ET-ABO WORK PLAN TASKS 2013-14

Global and Regional ABO & AMDAR Program Development

Development of AMDAR Regional Implementation Plan for RA VI

(Submitted by Steve Stringer, E-AMDAR Programme Manager)

SUMMARY AND PURPOSE OF DOCUMENT

To propose and recommend key aspects and issues associated with the development of the AMDAR Regional Implementation Plan for Regional Association VI.

ACTION PROPOSED

The Session is invited to note and discuss the contents of the document.

DEVELOPMENT OF AMDAR REGIONAL IMPLEMENTATION PLAN FOR RA VI

1. Current status of AMDAR in the region.

The EUMETNET AMDAR programme (E-AMDAR) only represents approx 60% of RAVI countries, but with a geographical area of interest between 40E to 70W and between 10N to 90N, the vast majority of European (RAVI) area is covered.

The E-AMDAR programme, having initially been established by individual NMHSs, came together as a coordinated European programme in the late 1990's and has been one of the main EUMETNET observing programmes since 2002. Hence E-AMDAR is a relatively mature, stable programme which has always been coordinated by one of the Members of EUMETNET. – which, since 1st Jan 2013 has been the Met Office, UK but prior to this had been the responsibility of SMHI ever since 2002.

Currently there are 13 airlines participating in E-AMDAR generating approx 40,000 observation pairs (of wind & temp) on average, every day.

The requirements that drive the programme are primarily those of regional scale NWP – aiming at a horizontal spatial resolution of 250km and observing cycle of 3 hours. The current performance requirements demanded by EUMETNET Members can be seen below in Table 1.

Performance targets for E-AMDAR	Target 2012	Target 2013
Number of airports in EUCOS area observed daily	140	129
Number of 3 hourly observed airports	40	37
Total daily number of profiles within EUCOS area	780	718
WWW contribution	12%	11%
Annual number of E-AMDAR funded observations	12M	11M
Total number of E-AMDAR aircraft equipped with development WVSS-II units	3	3
Timeliness T + 50	90%	90%
Timeliness T + 100	95%	95%

Table 1. E-AMDAR Performance requirements for 2013.

Imposed budget cuts for 2013 have led to corresponding reduction in performance targets from those in 2012.

2. Key areas where coverage requires improvement.

Given the physical size of Europe there are a reasonable number of observations taken in time and space, i.e meets requirements, but there is an uneven distribution of profiles which is emphasised even more by the national programmes of Germany and UK. This can be seen in Fig.1. which shows the geographical distribution of E-AMDAR reporting airports for approx 200km x 200km 'boxes'.

Fig.1 also shows the areas where there are gaps in coverage, namely Iberian Peninsula, Eastern.Europe and the whole area west of mainland Europe.

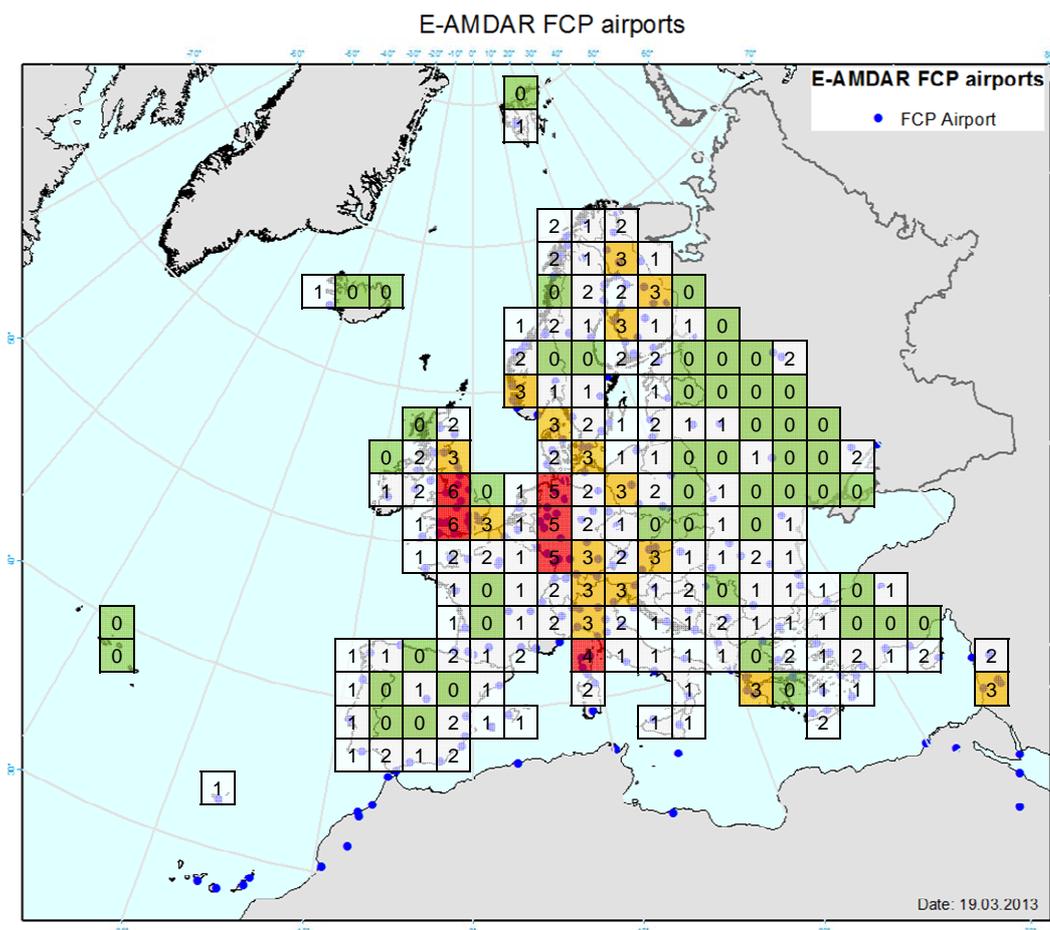


Fig.1: Distribution of E-AMDAR reporting airports.

At a recent EUMETNET scientific advisory meeting (OBS-SET) the need for more observations to the west of Europe was re-iterated but the NWP community also expressed desire for more E-AMDAR observations over N.Africa – in order to better monitor transport of moisture at high levels from the Tropics.

3. Technical issues for the particular Region.

The 13 airlines participating in E-AMDAR are optimised by 6 separate flight selection systems (FSS) which makes efficient optimisation impossible. Even though all but one of the FSS can be set-up remotely, the FSS do not interact with each other so duplication of observations frequently occurs. This wastes the limited budget.

There is a focus on the short haul routes and aircraft, A320/B737, as the greater percentage of observations (~65-70%) is for profiles. Nonetheless, continued en-route observations, especially over Ocean/remote areas is needed but many airlines are replacing their current long haul fleets with next generation aircraft – which will all need software developing.

While humidity observing is a major objective of the programme the new ARINC 620 version (that allows more accurate humidity/EDR/GNSS reporting) there is still software development and installation to be undertaken and funded. With only 9 potential WVSS-II sensors the relative costs is high.

4. How the results of the Study on Data Coverage and Targeting for Future Airline Recruitment might be utilised -

http://www.wmo.int/pages/prog/www/GOS/ABO/AMDAR/resources/AMDAR_Coverage_Recruitment_Study.html

The deficiencies in RAVI are not as great as other areas. Nonetheless the study is a good, valuable piece of work that can be used by RAVI, particularly when looking to expand coverage to the East of Europe where the airlines identified to improve coverage of RAVI could also add to RAVI. It would make sense to extend E-AMDAR eastwards – should funding be available!

The study makes mention of the E-AMDAR airlines that currently fly into other RA areas. We already provide some observations over RAI on behalf of the South African Weather Service but there is no reason why the use of European airlines cannot be expanded for additional cover – as long as funding is available. (Note the above software need for long haul aircraft.)

5. Possible aspects, ideas and approach for strategy for the A-RIP.

A number of issues/objectives have been identified (for the E-AMDAR programme) that will be driving the future plans and related developments over the next few years. These are:

- a. Performance Requirements – Review of requirements which were implemented 12-15 years ago, primarily to meet the needs of Regional NWP at the time. Advances in NWP over this period have changed significantly, resulting in much higher spatial & temporal resolution requirements. A T+15 timeliness target is envisaged for profiles. A measure is also to be developed for geographical distribution, along the lines shown in Fig.2.below where the number of 3-hourly reporting airports is distributed more evenly throughout Europe. This will drive the new airlines we look to participate in the programme.

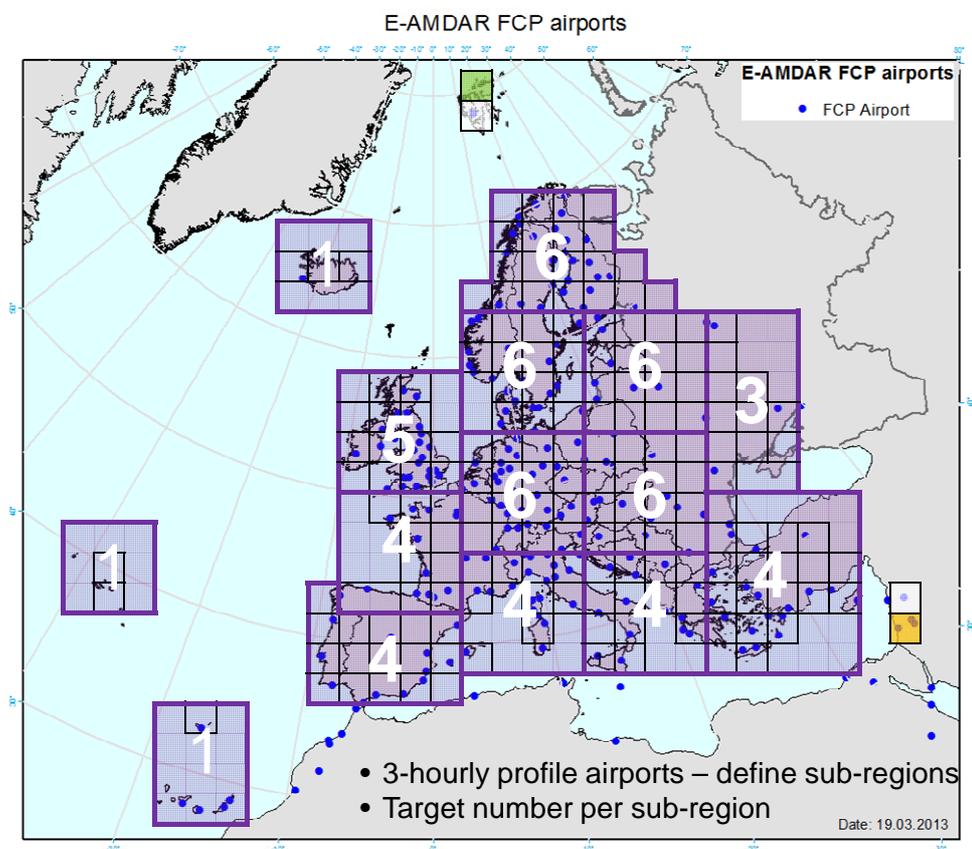


Fig.2. Objective for geographical distribution of 3-hourly reporting airports

b. Data Optimisation

The objective is use of just one optimisation system to control the whole E-AMDAR fleet, i.e through expanded use of E-ADOS.

Linked with this is potential to save money spent on duplicate data through closer cooperation over optimisation between AMDAR programmes of other Regional Associations.

c. Humidity Observations

Implementation of humidity observations is a key objective. Affordability is an issue for members and currently the value/benefit to services and to airline industry is not well documented. The business case for investment is yet to be made. The current trial of installing 9 humidity sensors on Lufthansa aircraft will be completed but discussions to engage airlines as partners to jointly fund the required investment will continue.

d. Future of Aircraft Based Observing with Mode-S/ ADS-B

The techniques demonstrated by KNMI for using aircraft ADS-B/Mode-S data to generate Wind (& temperature) data, are expected to develop into an operational service for certain parts of Europe over the coming years. A development plan is needed to assess quality and practicality of supplementing E-AMDAR data and the potential to save some E-AMDAR funding for investment in humidity observing.

e. Infrastructure Portability

The E-AMDAR infrastructure is mature, stable and has been working reliably for many years. Potential efficiencies and increased resilience might be gained through moving the E-AMDAR infrastructure to a Cloud IT architecture. Possibilities will be explored but could provide unrestricted expansion capability, operable from anywhere and provide increased resilience.

f. Monitoring

Consideration is to be given to simplifying and automating the day-to-day monitoring of performance and generation of programme statistics through increased utilisation of the new E-AMDAR Portal maintained by DWD.

6. Requirements for assistance and involvement of the WMO Regional Association (possible through the Regional WIGOS Implementation Plans -

see: <http://www.wmo.int/pages/prog/www/wigos/documents.html>) and ET-ABO.

E-AMDAR has been largely independent of RAVI involvement with programme requirements set, and implementation plans being agreed, by EUMETNET Members – which is a subset of RAVI.

To date there has been no discussion between E-AMDAR and RAVI regarding development of an AMDAR Regional Implementation Plan for RA VI. As such, the contents of this paper can only be considered as points for discussion in developing an A-RIP for RAVI.