



ICAO

**Twenty-Second Meeting of the AFI Planning and Implementation Regional Group
(APIRG/22)
(Accra, Ghana, 29 July – 2 August 2019)**

Agenda Item 4: Other Air Navigation Issues

4.5 Regional and Interregional Activities

WMO-IATA COLLABORATIVE AMDAR PROGRAMME (WICAP)

(Presented by South Africa in coordination with WMO)

SUMMARY	
This information paper highlights the opportunity for the expansion of AMDAR over the WMO Region I through the WMO-IATA Collaborative AMDAR Programme (WICAP)	
The meeting is invited to:	
<ul style="list-style-type: none"> a) Note the information contained in this paper; and b) Urge NMHS and Airlines to take advantage of the collaboration between WMO and IATA to work together in expanding the AMDAR Program within the region under the WICAP. 	
<i>Strategic Objectives</i>	This working paper relates to the Safety, Air Navigation Capacity and Efficiency.

1. INTRODUCTION

1.1 The Aircraft Meteorological Data Relay (AMDAR) and the Regional Implementation Plan (A-RIP) was developed for the WMO Regional Association I (RA I) by the WMO Commission for Basic Systems (CBS), Expert Team on Aircraft-based Observing Systems (ET-ABO) and was presented at the RA I session at Cape Verde in 2015, leading to the establishment of “African AMDAR” as a priority regional developmental activity. The A-RIP is aligned with the WMO Aircraft-Based Observations Programme Strategy and Implementation Plan (A-SIP) and the WMO Implementation Plan for the Evolution of the Global Observing System (EGOS-IP). The A-RIP of RA I currently focuses on the expansion of AMDAR in Africa through the development of new national AMDAR Programs with key African partner airlines.

1.2 The wider expansion of the AMDAR Program in Africa, which is currently limited to South Africa only, would help to address deficiencies in the existing upper air network caused by the continued diminishment of the radiosonde observations network leading to a lack of upper air data over the region. However, despite the current ongoing development of AMDAR programs in Kenya, under the United Kingdom, the Department for International Development (DFID) Weather and the Climate Information Services for Africa (WISER) Program, and the Moroccan collaboration with the EUMETNET E-ABO Program, the national approach to AMDAR program expansion has not met with great success. This is due to several reasons, including, the lack of available funding to support the initial AMDAR implementation and payment for ongoing costs for data communications, the lack of a coherent and well-promoted business case to convince airlines to

become AMDAR partners, and the lack of technical support for AMDAR data processing and provision on the WMO Information System.

1.3. At its recent eighteenth congress, WMO has approved a resolution to form a partnership with the International Air Transport Association (IATA) to establish the WMO-IATA Collaborative AMDAR Programme (WICAP), which will provide a new framework for future AMDAR development in data-sparse areas through a regional and international approach to the program's future implementation and operation. Such an approach aims to overcome the existing hurdles to AMDAR program expansion through the regional sharing of resources and funds necessary to support its expansion and operation and through the assistance of IATA to coordinate and encourage wider airline participation. National Meteorological and Hydrological Services (NMHSs) are therefore encouraged to work with the WMO and its Regional Association I and IATA under the WICAP to expand the AMDAR Program and increase the availability of high-quality upper air meteorological data.

2. DISCUSSION

2.1 AMDAR is based on the automated measurement and transmission of meteorological data from an aircraft's platform. Such data, primarily consists of high quality air temperature and wind measurements derived from existing aircraft sensors, makes an important contribution to the WMO Integrated Global Observing System (WIGOS) and are of high value to the global meteorological community. This is due in particular to their contribution to increase accuracy of numerical weather prediction, with downstream benefits to all users of weather forecasts, including aviation.

2.2 Whilst the AMDAR Program has been successfully growing and functioning in Europe, North America, Asia and Oceania, there remain significant areas, such as Northern and Central Africa, Eastern Europe, Western and Central Asia, the Southwest Pacific and the Middle East, where AMDAR coverage remains limited or non-existent. One of the reasons for this is the limited funding available in these regions for program expansion.

2.3 More information on the WMO AMDAR Program, including its current status, data coverage and its benefits and impact, can be found at:

<http://www.wmo.int/pages/prog/www/GOS/ABO/AMDAR/>

2.4. Hazardous weather remains a strong contributing factor to aviation accidents and incidents. Therefore, improving the quality and performance of aviation meteorological service provision could be seen as a key enabler for the future realization of the global Air Traffic Management (ATM) system. The Performance of Numerical Weather Prediction (NWP) model, which provides the primary basis for many aeronautical meteorological applications and services, is highly dependent on the availability of high-quality meteorological data, however WMO Region I is a largely data-sparse region, especially in terms of upper air meteorological data.

2.5. While AMDAR is not intended to replace the radiosonde network, it offers a source of high-quality upper air meteorological data at a relatively lower cost than traditional radiosonde program, and so has the potential to help alleviate data sparsity over this region. Furthermore, studies have indicated that the inclusion of AMDAR data into NWP models have significantly improved upper level wind and temperature forecasting accuracy, resulting in improved route planning by aviation operators. Although results from individual NWP centres vary, on average the combination of wind and temperature observations included in AMDAR reports now constitute one of the most important observational data sources for global NWP, comparable to radiosondes in their impact, and overall contribute an average reduction in the 24 hour forecast error of the order of ten percent

of total error reduction attributable to observational data. AMDAR data also has a very high level of utility across a range of different forecast and warning systems.

2.6 Even though it is acknowledged that AMDAR makes a very significant contribution to WIGOS, it is also recognised that the existing program still has a number of limitations. National AMDAR Programs have been operating in various parts of the world for more than twenty years and have generally operated independently of each other with their own differing requirements and methods of recruiting participating airlines and a necessity to establish and operate individual, national data reception and processing centers to support sharing of the data on the WMO Information System (WIS). While this national approach to AMDAR operation has seen the program expand and function in some parts of the globe, many other areas remain data-sparse or are yet to develop programs at all.

2.7. WMO-IATA COLLABORATIVE AMDAR PROGRAMME (WICAP)

2.7.1 In 2017, WMO and IATA entered into a Working Arrangement with the aim to explore the possibility for the two organizations to work together in the future on the expansion of the global AMDAR program over currently data-sparse areas. In addition, such a collaboration would also have the goals to lower overall implementation and operational costs to WMO members and leverage the reach of IATA into the global aviation industry to recruit new airlines. IATA would also represent the interests of the participating airlines in ensuring a uniform and effective data policy for use of AMDAR data by WMO Members and act as a focal point for commercialization of AMDAR data to private sector entities, thereby providing a possible source of revenue to fund further AMDAR expansion and its operation. This has led to the development of the concept of the WMO-IATA Collaborative AMDAR Programme (WICAP).

2.7.2 The proposed collaboration and the establishment of WICAP will leverage the regional structure of WMO and the WIGOS framework to coordinate planning, development and operation of AMDAR on a WMO regional basis, thereby reducing overall costs to individual, participating WMO members through the sharing of resources and the optimization of the program regionally and globally.

2.7.3 Under the WICAP programmatic structure, as shown in Figure 1, the various partners and participants would have clearly defined roles and responsibilities in order to establish and maintain the operational, governance and financial frameworks on which the WICAP would rely.

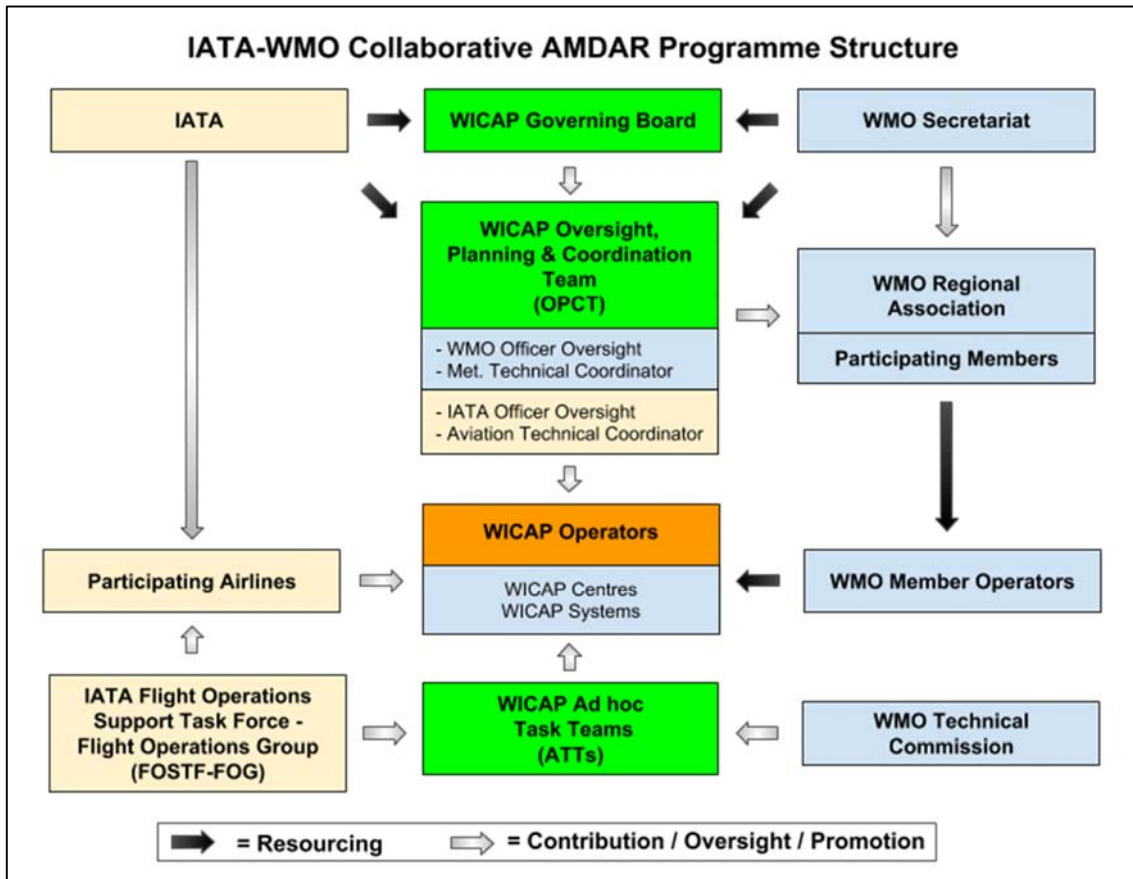


Figure 1 - Overview of the WICAP programmatic structure

2.7.4 WICAP would be underpinned by a partnership between WMO and IATA, with each partner playing complementary roles based on their organizational capabilities and responsibilities, coordinated and overseen by a WICAP Governing Board.

2.7.5 The Governing Board, comprising of managerial and technical expert representatives from both organizations, will be established by IATA and WMO to monitor and oversee the achievement of WICAP aims and ensure that participation is authorized, balanced, mutually beneficial and sustainable. The Governing Board will have the key responsibilities to develop and oversee the implementation of high-level policies, receive and approve routine, consolidated WICAP planning and budgetary documentation, resolve critical issues, report on program outcomes and promote the program both within and outside the collaborating organizations.

2.7.6 The WICAP Oversight Planning and Coordination Team (OPCT) comprised of at least one designated officer from each of IATA and WMO and resourced either directly by the respective organizations or by WICAP, would be responsible primarily for overseeing the developmental and operational functions and processes of WICAP.

2.7.7 Although not formally part of the governance structure, Ad hoc Task Teams (ATTs) would be formed as required with key experts from both organizations by the OPCT at the direction of the Governing Board to fulfill well-defined, temporary or ongoing programmatic activities in support of WICAP operation, development and/or implementation.

2.7.8 WMO Regional Associations will be responsible for agreeing on, developing and establishing the required operational and financial structures to be established in their region and for overseeing the performance of the program.

2.7.9 Through a formalised process coordinated by WICAP and implemented through the establishment of RA working groups and WICAP Operator Centres established by WMO Members under the authority of Regional Associations, the requirements for AMDAR data will be addressed through a regional planning and resource mobilisation process and the shared resourcing of regional data processing centres. Plans will be implemented with participating and newly recruited airlines in collaboration with IATA.

2.7.10 As is the case in the current AMDAR program, WMO Member NMHSs would continue to be responsible for the operational elements of the program, which primarily focus on the ground-based aspects of data management, including reception, quality control, transmission on the WMO Information System, longer-term archival and provision of data to users, as depicted below in Figure 2.

2.7.11 Under WICAP, it is expected that the role of partner airlines in entering and participating in the program will be simplified and more streamlined.

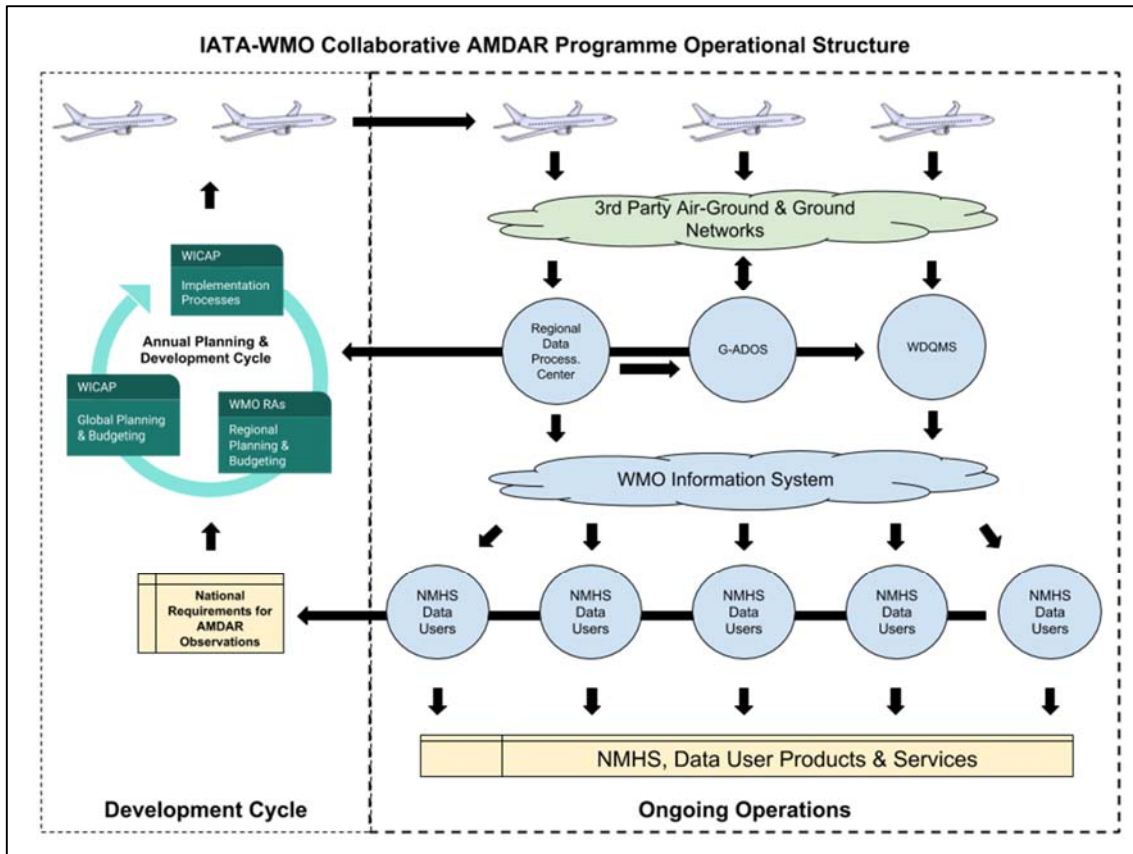


Figure 2 - Overview of WICAP operations. Arrows either indicate data flow (right panel) or process flow (left panel).

2.8 WICAP Data Policy and Legal Framework

2.8.1 The data policy and other necessary and agreed legal aspects of the WICAP will be established by the Governing Board under an agreement framework, based primarily on an updated Working Arrangement between IATA and WMO.

2.8.2 WICAP will establish the principles to support secure data management and a consistent data policy that will clearly establish the original data ownership by the airlines, while ensuring that products derived from the use of AMDAR data would be owned by the NMHSs, in accordance with their national policies and regulations. Data would continue to be available to all WMO Members on the WMO Information System in accordance with WMO Resolutions and Technical Regulations. The proposed data policy would further define limited data rights as they pertain to authorized third parties such as research entities, and to licensed third parties in the commercial sector.

2.8.3 Standardized agreement templates would have to be developed by WICAP in order to facilitate the legal arrangements between WMO Operators and partner airlines in the program, and between WMO Operators and participating NMHS's for its resourcing.

2.9 WICAP Benefits and Justification

2.9.1 It is anticipated that through advocacy on behalf of the program, IATA will make it easier for additional airlines to be recruited and, clearly, increasing airline participation is fundamental to expanding global AMDAR program data coverage. IATA can facilitate the provision of a much better and more widely understood business case and justification for participation of airlines in AMDAR, leaving WMO to concentrate its efforts and resources on data management and the provision of data to users, weather applications and service providers.

2.9.2 The global and regional approach of WICAP will allow AMDAR to grow much more rapidly and efficiently than under the current, largely national approach while at the same time enabling a significant reduction in overall operating costs. Improved visibility and understanding of the program, its operation and benefits is expected to lead to a greater willingness of both NMHSs and airline partners to contribute and participate in it.

2.9.3 The WICAP data policy will provide airlines with the necessary assurances that their data rights will be protected and used in their best interests. A formalised and agreed data policy, coupled with improved data management and security under the WICAP framework, will benefit all stakeholders in the program.

2.9.4 Improved and better coordinated data management and better quality assured data will also lead to improved access to AMDAR data, including to airlines and third party data users, meaning a greater positive impact on meteorological forecasting applications, improved forecast products and services and ultimately more efficient and safer flight operations.

3. ACTION BY THE MEETING

The meeting is invited to:

- a. Note the information contained in this paper; and
- b. Urge NMHS and Airlines to take advantage of the collaboration between WMO and IATA to work together in expanding the AMDAR program within the region under the WICAP.