INTERNATIONAL CIVIL AVIATION ORGANIZATION

AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP FOURTEENTH MEETING (APIRG/14)

(Yaoundé, Cameroon, 23-27 June 2003)

Agenda Item 4 : Air Navigation Issues

4.6: SUMMARY OF THE ACTIVITIES OF THE AFI TRAFFIC FORECASTING GROUP

(Presented by the Secretariat)

SUMMARY

This working paper provides a brief summary of the activities of the AFI Traffic Forecasting Group (AFI TFG).

1. **Historical Background**

1.1. The Africa Indian Ocean Traffic Forecasting Group (AFI TFG) had its inaugural meeting in Nairobi from 3 to 6 November 1998 during which the following terms of reference were adopted:

- Identify the data requirements and sources for the development of medium term and long-term forecasts of air traffic to, from and within the AFI Region;

- Develop medium and long-term passenger, freight and total aircraft movement forecasts for the AFI region, to support the air navigation systems planning including CNS/ATM implementation taking into consideration that:

  - The forecasts should be developed using a methodology which links passenger and freight demand with aircraft movement forecasts directly and in a consistent manner;
  - The forecasts should also cover traffic flows taking into account the area routings in the AFI CNS/ATM Implementation Plan (AFI Doc003) as well as other planning requirements of the region.

- Analyze the Data from selected flight information regions (FIRs) to establish peak period parameters required for planning purposes.

- Assist in the development of cost-benefit analysis for the implementation of CNS/ATM Systems components, as required.

1.2 The inaugural meeting discussed the Air Navigation Systems Planning requirements in general and specifically for the AFI Region as well as the relationship between various sub-groups of APIRG and Traffic Forecasting activities. Various factors affecting traffic demand in general and those particularly relevant to the AFI Region were debated. Forecasting methodologies and data requirements and sources were explored. The grouping of States was reviewed for forecasting purposes taking into account the Area Routings as identified in AFI CNS/ATM Implementation Plan.

1.3 The Group held its second meeting in Nairobi during the period from 12 to 16 March 2001. This meeting was, however, not attended by all the Group members. During this meeting, the Group agreed on the methodology to be used in the development of forecasts.

1.4 The Group also agreed that data from the following FIRs should be utilized for the analysis of peak-period parameters: Algiers, Cairo, Dakar, Nairobi, N'Djamena, Johannesburg. The following alternate FIRs were also selected: Brazzaville and Lagos. This work would be conducted in a progressive manner.

1.5 The third meeting of the Group was held in Dakar from 24 to 26 February 2003. The outcome of this meeting is provided in section 2 below.

2. Development of Forecasts for the Major Route Groups

2.1 The meeting examined the following major route groups to/ from and within the AFI region:

Africa - Europe
Africa – Middle East
Africa – Asia Pacific
Africa – North America
Africa – South America
Intra-Africa

2.2 The meeting agreed to develop the following forecasts for the major route groups mentioned above:

- Medium-term forecasts (2003-2008)
- Long-term forecasts (2008-2018)

2.3 A forecast time horizon of 15 years (2003-2018) was agreed upon based on the average life cycle of the air navigation systems equipment. Several modelling techniques including trend projection and regression analysis were applied to every major route group separately in order to identify the best applicable technique. The approach adopted for every route-group can be described as follows:

i) Analyze the historical trends of passenger air traffic evolution using trend analysis tools.
ii) Study the possibility of development of econometric models capable of explaining the growth of passenger air traffic.
iii) Develop aggregate passenger traffic forecasts for each of the major route groups using appropriate methodologies and judgement.

iv) Analyze the historical trends of the route-group: total seats offered, average aircraft capacity (seats/aircraft), average load factor, total passengers carried as well as aircraft movements using the traffic by flight stage data (TFS) compiled by ICAO, supplemented by data from IATA, Official Airline Guide (OAG) and other sources.

v) Derive aircraft movement forecasts based on assumptions about future trends in average aircraft capacity and load factors.

2.4 Using the approach described above, econometric models were developed for the following major route groups: Africa-Europe, Africa-Middle East, Intra-Africa and Africa-North America. Due to the unavailability of data on passenger traffic and also to the low traffic level (in terms of aircraft movements), it was not possible to develop any econometric model for the Africa-South America route group. With respect to the Africa-Asia/Pacific route group, many potential models were developed but were not retained due to the insignificance of the appropriate statistics. Based on the models developed and on certain assumptions made by the Group regarding mainly economic growth in the regions concerned, passenger traffic forecasts were developed.

2.5 For the development of aircraft movement forecasts, assumptions about the evolution of load factors and average aircraft seat size had to be made. For that purpose, it was assumed that the average load factor would increase by 0.5 per cent every year on the route groups Africa-Middle East and Intra-Africa and remain constant on the other route groups. It was also assumed that the average aircraft seat size will not change significantly over the forecast period for all route groups.

2.6 The forecast of the aircraft movement traffic for each route group have been developed accordingly. Both passenger and aircraft movement forecasts are provided in **the Appendix**.

2.7 The forecasts developed by the Group were presented to the fourth meeting of the CNS/ATM/IC Sub-Group and helped justify the decision to reduce the number of Areas of routings for the AFI region from 10 to 6.

3. Future work

The following action items have been included in the future work of the Group:

- Improve the models through the use of more comprehensive historical data.
- Expand the aircraft movements forecasts to cover the areas of routings included in Doc.003;
- Develop major city-pairs forecasts;
- Develop passenger non scheduled and freight traffic forecasts for the major route groups within, to and from the AFI region.
- Complete the analysis of the distribution of the aircraft fleet in the AFI region, including seat size and load factors.
- Analyze data from Dakar FIR in order to develop peak-period parameters.
- Collect data from Algiers, Cairo, Nairobi, N'Djamena, Johannesburg, Brazzaville and Lagos FIRs.

4. Cost Benefit Analysis and Business Case Development for the AFI Region

4.1 The importance of the development of business cases to justify funding for the implementation of CNS/ATM systems in the AFI region is well recognized. However, only a few studies have been conducted for specific service providers within the region.

4.2 The guidance material currently being prepared by the Secretariat, including the work carried out by the AFI TFG would allow for the further development of business cases for specific groupings within the AFI region.

4.3 In order to make efficient use of the resources available for the conduct of forecasts and economic analysis, close coordination among the various sub-groups of APIRG concerned and the AFI TFG is required.

5. Action by the Meeting

5.1 The meeting is invited to:

- note the content of this Working Paper;

- provide guidance regarding the future work of the AFI Traffic Forecasting Group.

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Table 1

Passenger Traffic Forecast By Major Flows - 2018

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2013	2018	Average Annual Growth (per cent) 1993 - 2001	1993 - 2000	2001 - 2018
NAM-AFR	745	810	867	928	993	1062	1137	1216	1301	1825	2560			
Growth (%)	4.3	8.8										10.4	12.7	7
EUR-AFR	22228	20517	21645	22835	24091	25416	26814	28289	29845	39006	50979			
Growth (%)	4.4	-7.7										4.2	4.7	5.5
MEA-AFR	4162	4275	4446	4623	4808	5001	5201	5409	5625	6844	8327			
Growth (%)	-0.4	2.7										3.7	3.4	4
ASP-AFR	1706	1744	1822	1904	1990	2080	2173	2271	2373	2957	3685			
Growth (%)	12.3	2.2										4.3	3.1	4.5
INTRA AFR	4629	4666	4992	5342	5716	6116	6544	7002	7492	10508	14738			
Growth (%)	10.6	0.8										8.8	8.8	7
TOTAL	33470	32011	33772	35633	37598	39675	41869	44187	46637	61140	80289			
Growth (%)	5	-4.4	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.6	5.6	4.9	5.1	5.6

Table 2

AIRCRAFT MOVEMENTS FORECAST TO 2018

	2002	2003	2004	2005	2006	2007	2008	2013	2018	Average Annual Growth (Per cent) 2002-2018
NAM-AFR	3144	3364	3600	3852	4121	4410	4718	6618	9282	7
EUR-AFR	155770	164337	173376	182912	192972	203585	214782	280712	366879	5.5
MEA-AFR	41046	42483	43970	45508	47101	48750	50456	59926	71173	3.5
ASP-AFR	6576	6872	7181	7504	7842	8195	8564	10672	13299	4.5
AFI-SAM	732	761	792	823	856	891	926	1127	1371	4
INTRA- AFR	140283	149401	159112	169455	180469	192200	204693	280447	384237	6.5
TOTAL	347551	367219	388030	410054	433362	458030	484139	639501	846241	5.4

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