



ATFM/TF/2
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**International Civil Aviation Organization
UNDP/ICAO Regional Project RLA/98/003
Transition to CNS/ATM Systems in the CAR and SAM Regions**

**SECOND MEETING OF THE GREPECAS ATM/CNS SUBGROUP ATM COMMITTEE AIR
TRAFFIC MANAGEMENT TASK FORCE – (ATFM/TF/2)**

(Bogotá, Colombia, 6 to 8 July 2006)

Agenda Item 3: ATFM Data Bank

**Electronic databases for Air traffic flow management (ATFM)
in the CAR/SAM Regions**

(Presented by the Secretariat)

SUMMARY

This Working paper presents electronic information aspects related to the Air Traffic Flow Management (ATFM) service for CAR/SAM Regions

References:

- Doc 9854 – Global ATM operational concept

1. Introduction

1.1 The Doc 9854, Global ATM operational concept, provides near and medium term vision on the knowledge and toolset of the ATFM service, which looks for complete analytical analysis of airspace, flight operations scenario, and basic electronic tools to achieve more efficient demand capacity balancing system.

2. Analysis

2.1 Integration of electronic data bases with surveillance and communication systems for the coordination of all demand capacity balancing activities provide automation tools and methods and improve ATM situational awareness for collaborative problem solving by airspace users and service providers permitting at same time full capacity operation in all weather condition.

2.2 Coordination requires utilizing verbal communication and automated methods to ensure complete exchange information; both methods provide common support analysis for situational awareness functions to the extent possible, such as collection of all available data pertains to traffic capacity, traffic flows, points of congestion, peak hours, etc.

2.3 Enhancement of communication capabilities improve information exchange, coordination activities, and increased collaboration and information sharing between airspace users and ATS providers giving a more realistic picture on demand and available capacity.

2.4 Telephone conferences (TELCON) should be initiated periodically and hosted by the ATFM when is needed to discuss, evaluate, or problem solve any issues. The TELCON capacity should include at minimum, operational supervisors within jurisdiction of appropriate FMUs, adjacent ACCs, TWR/APP facilities, and operators and users representatives for traffic flow management.

2.5 Traffic flow management position (FMP) is work station that supervises and manages air traffic flow analyzing and detecting when the demand has exceeded or is about to exceed ATS and/or airport capacity, traffic flows, congestion points, peak hours, etc., during hours ahead.

2.6 A monitor alert (MA) in FMP establishes a dynamic numerical trigger value to provide notification on which sector/airport efficiency may be degraded during specific period of time. The MA reflects functional airspace capabilities or airport to ATS provider about operational factors (i.e. NAVAIDs, meteorological conditions, communications capabilities, etc.) The FMU coordinators must monitor, assess and act with appropriate electronic information to ensure that these elements operate efficiently.

2.7 ATFM automated systems should consider the following:

- a) Data processing and display for traffic flow management
 - Flight planning and processing data (FPL, RPL, etc);
 - Airspace and airport structure;
 - Situational air traffic display;
 - CDM support (SLOTS, alternative routes. etc.)
 - Monitoring status of air navigation infrastructure;

- Airport capacity;
 - ATC capacity;
 - Traffic demand;
 - Airspace structure;
 - Air navigation aids;
 - Aircraft performance;
- b) Surveillance data (SSR, ADS, etc.)
- c) AIS
- d) MET
- e) Database for historical and statistical analysis
- f) Communication with:
- Other ATFM/C;
 - Other FMUs and/or FMPs and/or ATS units;
 - Users and operators (airlines, general aviation, State, etc.);
 - Airport authorities;
 - MET authorities;
 - AIS

Electronic databases required for ATFM system

2.8 Information management ensures that the information needs of ATM stakeholders satisfied in a much more flexible and cost-effective manner than previously; this. It is achieved by integrating of all information to assemble and continuously maintain the best possible scenario of the past, present and future traffic situation; this is common basis for decision making by all ATM stakeholders during their strategic, pre-tactical and tactical planning processes, including real-time operations and post-flight activities. The electronic databases required in evolutionary phases for the ATFM system are:

Strategic

2.9 Refers to long-term information for coordinated strategic plan of demand and capacity up to or, in some cases, more than one year in advance of a particular airspace activity. Whilst full schedule information might not be known until some months or weeks before a particular flight, certain data is available many years in advance, and aids in pre-planning.

2.10 This includes historic demand from scheduled and non-scheduled flights, airspace availability or constraints, available capacity of ATM resources and the impact of operational changes (new procedures, new standards, ATM and airport facilities availability, estimates on the weather conditions and estimations of other non-forecast airspace user's demands. This data can be used to aid airspace organization and management processes to get strategic demand and capacity balancing by adjusting capacity.

2.11 The main benefit through using electronic data in a strategic phase is processes improved, developing from a tactical or reactive system to one strategic or proactive, in which predictability is improved and allow the maximum flexibility and economy of operations for users in normal conditions.

2.12 Strategic ATFM database includes establish procedures and route structures to maintain or improve safety levels, capacity and efficiency in the use of airspace and of runways, and to best suit the traffic flows and to assist traffic separation in line with the different demands on airspace at different times of the day and night.

Pre-tactical

2.13 Implies modifications to the coordinated strategic plan. During the pre-tactical phase data received from all users and service providers such as confirmations, modifications, cancellations and additions that must be analyzed and incorporated. Those data should:

- be progressively refined and expanded, taking into account user preferences for flexibility, punctuality or service quality requirements;
- provide a framework that gives a good forecast of the traffic demand and the users' capabilities and resolves conflicts of interest between those parties and user groups that plan their activities up to years in advance;
- estimate the reserve capacity and airspace needed for those airspace users who, due to the tactical nature of their operations, cannot plan well in advance;
- set the rules and parameters, which broadly outline everyone's access to airspace, routes and airports; and
- provide estimates on the reserve capacity that may be needed for each day's traffic situation.

2.14 The pretactical data refers to statements of proposed flight plan, airspace regimes and reservations, route configuration and service provider limitations, capabilities and capacities. Normally data are promulgated in regionally basis necessities hour-by-hour at an agreed time before operation.

Tactical

2.15 Involves tactical final modifications. Prior to the flight, users determine the preferred flight trajectory that best address to their operations and submit the requested trajectory to the demand and capacity balancing service provider for assessment and agreement.

2.16 This phase examines a flight request to see if it is acceptable or if there are any potential resource, capacity or congestion problems of which the user was unaware. If there were problems, demand and capacity balancing identify user-preferred solutions, giving the freedom to choose the most optimum flight within the system constraints. In this phase real-time information is required such as;

- the weather forecasts;
- current traffic demand and airspace reservations;
- predictability on a continuous basis of airport and airspace capacity and traffic densities for all day long;
- updated information hour-by-hour on forecast of available capacity constraints throughout areas and/or routes; and,
- assess the impact on the complete flight trajectory, i.e. from gate-to-gate.

2.17 Other interested parties who need electronic information to improve the service that they supply to or receive, are customs and immigration authorities, meteorology departments, baggage handling, airport authorities and aircraft operators (refueling times, parking bays and so on, will benefit from more accurate arrival, departure or trajectory information.

Conclusion

2.18 The automated systems, dynamic programmes and respective management initiatives ensures the maximum efficiency of ATC demand/capacity balance, and it fosters a safe, orderly and timely traffic flow. The final objective of the ATFM system is to balance demand with ATS service capacity and airport acceptance regime (AAR).

3. Suggested action

3.1 Bearing in mind the foregoing background, the Meeting is invited to:

- a) note the information presented in this Working paper;
- b) recommend appropriate actions to improve electronic software and hardware related to the Air Traffic Flow Management (ATFM) service in the CAR/SAM Regions; y,
- c) recommend other actions as appropriate.