CAR/WG/1 - WP/07
08/06/07

International Civil Aviation Organization
North American, Central American and Caribbean Office
First Caribbean Working Group Meeting
(CAR/WG/1)
Port of Spain, Trinidad and Tobago, 21 to 23 June 2007

Agenda Item 2: ATM Developments
2.3 Follow-up on activities relating to air Traffic Flow Management implementation (ATFM)

ANALYSIS OF THE AIR TRAFFIC FLOW MANAGEMENT STRATEGY

(Presented by the Secretariat)

SUMMARY

This Working Paper presents the status of compliance of the ATFM implementation regional agreed tasks in the Caribbean, also additional guidelines on ATS capacity and for the establishment of ATFM procedures, through the Collaborative Decision Making. Additionally, CAEP guidelines are provided for the reduction of fuel emissions in air transport.

References:

- Annex 11 – Air Traffic Services.
- PANS ATM, Doc 4444.
- Global Air Traffic Management Operational Concept (Doc 9854).
- GREPECAS/14 Meeting.

Strategic Objectives:

C: Environmental Protection – *Minimize the adverse effect of global civil aviation on the environment.*
D: Efficiency – *Enhance the efficiency of aviation operations.*

1. Introduction

1.1 The GREPECAS through Conclusion 14/49 approved the ATFM CAR/SAM operational concept, which main objective is to guide the ATFM implementation in a homogeneous manner in the CAR/SAM Regions, taking into account that the system's implementation will be carried out according to each involved region needs. The CAR/SAM ATFM CONOPS is in the NACC Office webpage under "eDocuments".

1.2 The GREPECAS agreed that the ATFM implementation should be developed by phases, in order to allow a progressive evolution and obtain the system's desired capacities, applying the pre-tactical and tactical strategic phases, according to Doc. 4444, PANS, ATM and Doc 9854, *Global Air Traffic Management Operational Concept*. The Meeting considered that the States should develop their own work programme and in the short-term, they should update or establish, if it is the case, operational agreements between ATS units. (See WP/05).

1.3 Likewise, GREPECAS considered that inasmuch as possible, the airspace should be free of operational discontinuities and inconsistencies in terms of standards and procedures. Likewise, the alignment of airspace classifications should be encouraged, data link communications developed and used more extensively, flight plan processing improved, and ATFM message exchange capabilities developed.

1.4 Based on the strategy work programme approved by the GREPECAS/14 Meeting for the ATFM service implementation, the **Appendix A** to this Working Paper presents an action plan with updated information on the ATFM implementation work in the CAR Region.

2. Discussion

2.1 Among the main tasks of the ATFM implementation, are the tasks carried out between United States, Canada and Mexico, involving the users, airport authorities and ATC service providers for the evaluation on f air traffic flow, the meteorological conditions, balance in demand and capacity with a regional vision, developing flexible timetables for ATFM implementation different aspects.

2.2 Concerning Trinidad and Tobago in weekly teleconference coordination with the States and Territories of the Eastern Caribbean, initiated studies to establish the ATFM implementation in the Piarco FIR during the second half of 2006.

2.3 According to Annex 11, when ATS services are established, the States will ensure that this is provided with the adequate safety levels. This requires that ATS providers plan the sufficient personnel with the required competencies to provide the service in a safe, regular and efficient manner. In order that the staff complies with the required competencies, a suitable training programme should be developed for ATS specialized personnel and if required, to the airport operators.

2.4 According to Doc 4444, among the factors to determine the capacity is the type of service provided, the number of specialized personnel, its competencies and the relation that these have with the work load that impacts the service capacity. The ATS capacity analysis should mainly be focused in the work load studies caused by air operations, and the necessary measures to balance the demand of these operations and the service capacity provided.

2.5 The ATFM training should cover capacity and its airspace demand and international airports evaluation aspects, the ATFM planning in the strategic, pre-tactical and tactical phases, as well as the safety and collaborative decision making (CDM) methods, to enhance air navigation efficiency.

Collaborative Decision Making (CDM)

2.6 For ATFM Collaborative Decision Making (CDM) is the way working together with ATM stakeholders to improve and share information ensuring that better decisions are made by the right person with the right information and data and the right input from other parties concerned. CDM is the key to optimizing aerodrome and air operations examining the driving elements for each stakeholder and the interdependencies with adjacent stakeholders within their workflow process model.

2.7 Identifying the best sources of data and disseminating that data to key decision-makers according to a set of business rules, better decisions can be made, resulting in improved performance of the overall ATM system, including increased capacity, fewer delays, and increased operational efficiency.

2.8 With the exchange of information between different stakeholders in charge of the planning and operation of the aircraft flights, will enhance the capacity of all the system, which increases quality and stability of their operations.

2.9 This stability will provide reliability and predictability, which is critical particularly Demand and Capacity Balancing, Traffic Synchronization, and Airspace Organization and Management, which are components of the ATM system. The *Global Air Traffic Management Operational Concept*, Doc 9854, Appendix I describes CDM process.

2.10 For the Collaborative Decision Making, the stakeholders should use all means and electronic instruments that allow them analyze the various scenarios presented coordinating agreed initiatives to equilibrate demand and capacity. Teleconference has shown to be an excellent mean which guarantees the participation of all involved.

ATFM coordination procedures

2.11 The CDM / ATFM process initiates with the coordination between each one of the users previous to the teleconference, evaluating the conditions that will affect the safety and efficiency, the time and meteorological conditions, each route and destination airport, feasibility of routes and new flight routes requirement, traffic and saturation of airports.

2.12 Foreseen flight conditions should be also analyzed, such as the storm activity, high altitude turbulence and airport conditions like visibility, snow, thaw, winds and landing conditions. Other factors to be analyzed are the use of the military airspace, the temporary restrictions and other extraordinary such as volcanic ashes, hurricanes and storms and other factors that could affect ATS routes.

2.13 Once this stage is finalized, an operation plan is developed and shared with the users and all the relevant aspects related to it**. Appendix B** to this paper details the ATFM Operational Plan.

2.14 The operations plan should normally be disseminated through a teleconference, in order to provide the users the strategic information in respect to the volume of traffic, weather conditions and the airport limitations. The plan's objective is the following:

1) Redefine the air traffic routes and the weather adverse conditions in order to safe fuel as much as possible in its new routes.

2) Manage the air traffic in saturated airports, eliminating as possible, the ground delays for a timely landing in its destination airport, therefore preventing the unnecessary fuel consumption.

3) Manage the departures in a congested airport, coordinating the use of boarding doors and taxiing, in such a manner that fuel consumption is reduced, and reducing waiting time for aircrafts departures.

4) Coordinate the congested arrival terminals, in such manner that the flight distance between departures point and destination airport is optimized, therefore, reducing the fuel consumption.

2.15 GREPECAS recognized that the establishment of terms and common phrases is a key element to eliminate language barriers. The differences in the terminology of phraseology used in the air

traffic flow management, not yet regulated by ICAO, could be a potential source of confusion during the communications between international traffic management units. Therefore, it is necessary to analyze the ATFM future messages that will be applied in the CAR/SAM Regions. (See IP/09).

Air Transport Environmental Challenges

According the work of the ICAO Committee on civil aviation environmental protection (CAEP), the areas where operational ATFM improvements can be achieved are:

- develop uniform techniques and methodologies for airspace and international airports demand and operational capacity evaluation,
- improve the airspace and airports capacity, searching for the optimization of operational efficiency and provide more efficient aircrafts operations in respect to the fuel,
- improve the air navigation services efficiency, as well as its ATM global system integration; and
- reduce noise emission in airports, etc., where possible; procedures against noise impact should be designed to avoid flying closer than 600 m (2 000 ft) vertically over hospitals, educational institutions and similar noise-sensitive activities, e.g. zoological gardens.

3. Suggested actions

3.1 The Meeting is invited to:

a) take note of the information presented in this Working Paper;

b) analyze and agreed the ATFM procedures applicable to the Caribbean;

c) review and update the information presented in Appendix A to this Working Paper;

d) review the contents of Appendix B to be used as the ATFM Operational Plan in the CAR Region; and

e) take other actions as deem pertinent.

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APPENDIX A

ACTION PLAN FOR ATFM IMPLEMENTATION - CAR REGION

State/Organization: Date Jun-07

No.	Strategic Objective/	AN-Conf/11	Global Plan/ GPI	Regional Plan / FASID	GREPECAS No. Con/Dec/Pa	Target Activity	Follow-up Action	To be developed by	Deliverable	Target date	Remarks
1	2		3		4	5	6	7	8	9	10
						2008					
1	C, D		GPI-6		14/48	Develop a regional strategy and work programme for harmonized implementation of ATFM service.	Completed	E/T/OI	Work programme	2007	
2	D		GPI-6			Identify key stakeholders (ATC service providers and users, military authorities, airport authorities, aircraft operators and relevant international organisations) for purposes of coordination and cooperation, using a CDM process.	Completed	E/T/OI	CDM process	2007	CDM guidelines in WP/07.
3	D		GPI-7		13/2	Identify and analyse traffic flow problems and develop enhancements in current:	Completed	E/T/OI	Improvements to operational capacity	GRPCS/13	GREPECAS has defined main traffic flows and homogeneus CAR/SAM areas.
			GPI-7		14/48	airspace organization and management (AOM) and ATS routes structure (unidirectional routes) and SID and STARS;	Valid	E/T/OI	Airspace improvements		Guidelines are presented in WP/06.
			GPI-6			publication of the correspondant regulation;	Valid	OACI	Amendment to Doc 7030.	2008	Publish standards in AIPs.
			GPI-16		14/48	ATM automation;	Completed	E/T/OI	Action plan of E/T/OI	2007	Additional guidelines are presented in WP/15 from the ones approved by GREPECAS.

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1	2		3		4	5	6	7	8	9	10
			GPI-21-22			communication, navigation and surveillance systems;	Valid	E/T/OI	Define requirements	TBD	
			GPI-14			aerodrome capacity;	Completed	E/T/OI	Aerodrome Acceptance Rate (AAR)	2007	Guidelines in CAR/SAM ATFM CONOPS. Require to publish capacity.
			GPI-6			ATS capacity;	Valid	E/T/OI	ATS capacity	2008	Guidelines in the CAR/SAM ATFM CONOPS. Require to determine and publish the capacity.
			GPI-6		13/67	training for pilots and Controllers; and	Valid	E/T/OI	Training Programme	2008	Guidelines are presented in WP/07.
			GPI-6		14/48	ATS letters of agreement.	Valid	E/T/OI	ATS agreements	2008	ECAR completed.
4	D		GPI-9		14/48	Define common elements of situational awareness between FMUs;	Valid	E/T/OI	Enhance situational awareness	2008	Action plan of E/T/OI.
			GPI-9			common traffic displays;	Valid	E/T/OI	Define tools	2008	Analyze ETMS or similar applications.
			GPI-9			common weather displays (Internet);	Valid	E/T/OI	Define tools	2008	

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1	2		3		4	5	6	7	8	9	10
			GPI-9			communications (teleconferences, web); and,	Valid	E/T/OI	Define tools	2008	Weekly teleconferences carried out in Piarco FIR between January-April 2007.
	D		GPI-6			define daily teleconference/messages methodology advisories.	Completed	E/T/OI	Teleconferences methodology	2007	Guidelines in WP-07. Requires an agreement.
5	D		GPI-6			Develop methods to establish demand/capacity forecasting.	Valid	E/T/OI	Traffic forecast methodology	2008	Electronic tools are being analized.
						2010					
6	D		GPI-1			Develop a regional strategy for the implementation of flexible use of airspace (FUA); -assess use of airspace management processes; -improve current national airspace management to adjust dynamic changes in tactical stage to traffic flows; -introduce improvements in ground support systems and associated procedures for the extension of FUA with dynamic airspace management processes; and,	Valid	E/T/OI	FUA implementation	2010	Requires to analize RAN CAR/SAM/3 recommendations.
	D		GPI-6			implement dynamic ATC sectorization in order to provide the best balance between demand and capacity to respond in real-time to changing situations in traffic flows, and to accommodate in short-term the preferred routes of users.	Valid	E/T/OI	Dinamic Sectorization	2010	

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1	2		3		4	5	6	7	8	9	10
7			GPI-16			Define common electronic information and minimum databases required for decision support and alerting systems for interoperable situational awareness between Centralized ATFM units.	Valid	E/T/OI		2010	Analyze ETMS or similar applications.
8	D		GPI-6			Develop regional procedures for efficient and optimum use of aerodrome and runway capacity.	Valid	E/T/OI	Improve aerodrome capacity	2010	Requires development of methodology to optimize runway occupancy.
9	D		GPI-6			Develop a regional ATFM procedural manual to manage demand/capacity balancing.	Valid	E/T/OI	Regional ATFM Procedures	2010	Requires development of regional manual in accordance with SUPPS.
10	D		GPI-6		13/64	Develop a regional strategy and framework for the implementation of a Centralized ATFM unit.	Completed	E/T/OI	Centralized ATFM strategy	GRPCS/13	Regional guidelines in CAR/SAM ATFM CONOPS.
11	D		GPI-6			Develop operational agreements between Centralized ATFM units for interregional demand/capacity balancing.	Valid	E/T/OI	Agreements between Central ATFM units.	2010	

APPENDIX B

REGIONAL ATFM OPERATIONS PLAN (ATFM OPS Plan)

PURPOSE

Establish, through CDM process, structure, and responsibilities for developing, managing and implementing a daily regional operations plan for air traffic flow management (ATFM) operations in CAR/SAM regions.

CONTENT

1. The ATFM OPS Plan will be developed in collaboration between State air traffic flow managers, weather forecasters, and customer representatives. Other participants may be included in the process as necessary including military representatives, aerodrome representatives, and technical representatives.

    a) The ATFM OPS Plan will normally be developed:
        i. for one day at a time; and
        ii. for the twelve (24) hour period following the Planning Telephone Conference (Planning TELCON).
        iii. utilizing agreed weather tools/products.

2. The ATFM OPS Plan will specify:

    a) Aerodrome constraints. Where delays are expected to reach 15 minutes or greater.
    b) En route constraints. Where expanded miles-in-trail, expanded minutes-in-trail, en route deviations, or tactical rerouting that may be required.

3. Responsibilities.

    a) Each State's FMU / Air Traffic Flow Management Unit.
        i. Participate via a daily Planning TELCON in the formulation and development of the ATFM OPS Plan.
        ii. Provide input on:
            1. Aerodrome constraints. For example, include aerodrome acceptance rate (AAR) information when arrival delays are anticipated at a particular aerodrome.
            2. En route constraints. For example, include the impact of thunderstorm and hurricane activity and route closures.
            3. Equipment outages. For example, include radar and sector frequency outages that have an operational impact.
            4. Other issues that may have an impact on operations. Examples include: staffing, special events, volcanic activity.
            5. Anticipated traffic management initiatives that will be used to manage regional traffic.
        iii. Coordinate with and provide direction to their State ATS facilities on implementation of the ATFM OPS Plan.

b) FMU / Air Traffic Flow Management Unit.
   i. Maintain the Planning TELCON bridge.
   ii. Maintain a web page for publicizing the ATFM OPS Plan to aviation system customers.
   iii. Lead the Planning TELCON and facilitate the development of the ATFM OPS Plan.
   iv. Record the list of participants on the Planning TELCON.
   v. Post the ATFM OPS Plan on the web page and issue the plan as a numbered advisory.
   vi. Coordinate with and provide direction to ATS facilities on implementation of the ATFM OPS Plan.

4. Planning TELCON preparation checklist.

   i. Review the weather conditions (thunderstorms, hurricane activity, etc.)
   ii. Obtain input from ACCs/FMUs
      1. Constraints
      2. Anticipated traffic volume
      3. Anticipated traffic management initiatives
      4. Staffing capacity
      5. Equipment outages
      6. Other
   iii. Obtain input from Aerodromes
      1. Aerodrome acceptance rate (AAR)
      2. Constraints
      3. Anticipated traffic volume
      4. Anticipated traffic management initiatives
      5. Staffing capacity
      6. Equipment outages
      7. Other
   iv. Miscellaneous
      1. Special events
      2. Military activities
      3. Volcanic activity

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