Agenda Item 5:   **Implementation of the Air Traffic Flow Management (ATFM)**

Brazil`s measures for ATFM optimization during
the FIFA Brazil 2014 World Cup

(Presented by Brazil)

SUMMARY
This working paper aims to present a general view of measures held by DECEA so as to optimize the Air Traffic Flow Management, carried out during The FIFA Brazil 2014 World Cup, and to disseminate its main aspects perceived during the event.
REFERENCES: • SAM/IG/13 Meeting Report (Lima, Peru, April 20 to 25 of 2014)

ICAO Strategic Objectives:	*A – Safety* *B – Air navigation capacity and efficiency*

1   **Introduction**

1.1   After the World Cup end, the Brazilian State concluded successfully one of the most important events laid down in the Action Plan of DECEA. Despite of the high demand registered in the championship, the efficiency of the Air traffic Service was upheld by applying the right measures and strategic operational actions planned for the Air Traffic Flow Management (ATFM) during the event.

1.2   With the Olympic Games event proximity, the responsibility of Brazilian State remains to provide the ideal conditions of the Air Space to be prepared for the Air Traffic Flow increase predicted for the Olympic Games and Paraolympic Games of 2016.

1.3   Faced with this so close challenge, DECEA has confronted the actions planned in its Actions Plan for the FIFA 2014 World Cup, with the results obtained during the accomplishment of that event in order to use them as "lessons learned", aiming to enhance the ATFM for the next big event to be held in Brazil.

2   **Analysis**

2.1   The actions planned and implemented by DECEA for the World Cup period were of utmost importance to consolidate Brazilian capacity to host this kind of international events, in such a way that the air space and airport structure efficiently attended the Aerial Operations growth, in spite of the high complexity scenario and Air Traffic Flow increase faced during that period.

2.2   THE BIG EVENTS COORDINATION COMMITTEE has been created in order to plan and monitor the progress of the Action Plan of DECEA. This Committee followed the strategic and tactical actions applied during the championship so as to acquire the best ATFM outcomes.

2.3   The commitment of DECEA and its consequent success in the planning of the event were confirmed by analysing the statistics reached throughout the period of the World Cup as well as by the acknowledgement received from national and international media which covered the whole event in Brazil.

2.4   In order to leave a legacy to the other SAM countries in front of the international events to come, and to present to this audience a general report on the World Cup FIFA Brazil 2014, the **Appendix** this working paper covers the main aspects observed before, during and after the event, such as: *Topics of the plan; ATFM challenges for the event period; measures which optimized the ATFM; things to be improved and corrected; and the figures reached with the fulfilment of the World Cup FIFA Brazil 2014.*

3.   **Suggested actions:**

3.1   The Meeting is invited to:

   a)   take note of the actions held by DECEA during the World Cup and the results reached by DECEA planning as a mean to guarantee ATFM efficiency;

   b)   consider the results obtained by DECEA's planning, as a contributing factor to develop and guide ATFM actions in large events involving SAM countries.

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APPENDIX

PLAN OF ACTION FOR THE

2014 FIFA WORLD CUP BRAZIL

DEVELOPED BY DECEA

Planning for Implementation of the 2014 FIFA World Cup Brazil

ACTION PLAN FOR THE 2014 FIFA WORLD CUP BRAZIL

MODULES

- CAPACITY
- PROJECTION OF DEMAND
- MONITORING EQUIPAMENTS AND AIDS
- LEGISLATION
- AIR TRAFFIC FLOW MANAGEMENT
- MANAGEMENT OF OPERATIONAL SAFETY
- SECURITY AND DEFENSE
- CAPACITATIONS OF HUMAN RESOURCES
- AIRSPACE DESIGNE
- PROPAGANDA

Following the guidelines set out in Planning for Major Events, DECEA completed all modules of the Plan of Action for the World Cup Soccer FIFA 2014 which contributed directly to the positive results in the end of the event.

Assumptions prescribed by the Brazilian authority and considered in ATFM during the 2014 FIFA World Cup Brazil.

PRIORITY FOR SLOT ALLOCATION

Priority for slot allocation and order of priority for spacing of takeoffs and landings:

- ➤ World Soccer Teams;
- ➤ Heads of State and Government;
- ➤ Current Scheduled Commercial Flight;
- ➤ New Scheduled Commercial Flight;
- Non-scheduled Commercial Flight (included public charter flights and excluded air taxi flights);
- ➤ VIP Members of Olympic Committee, Brazilian government authorities and transport to the evento; and
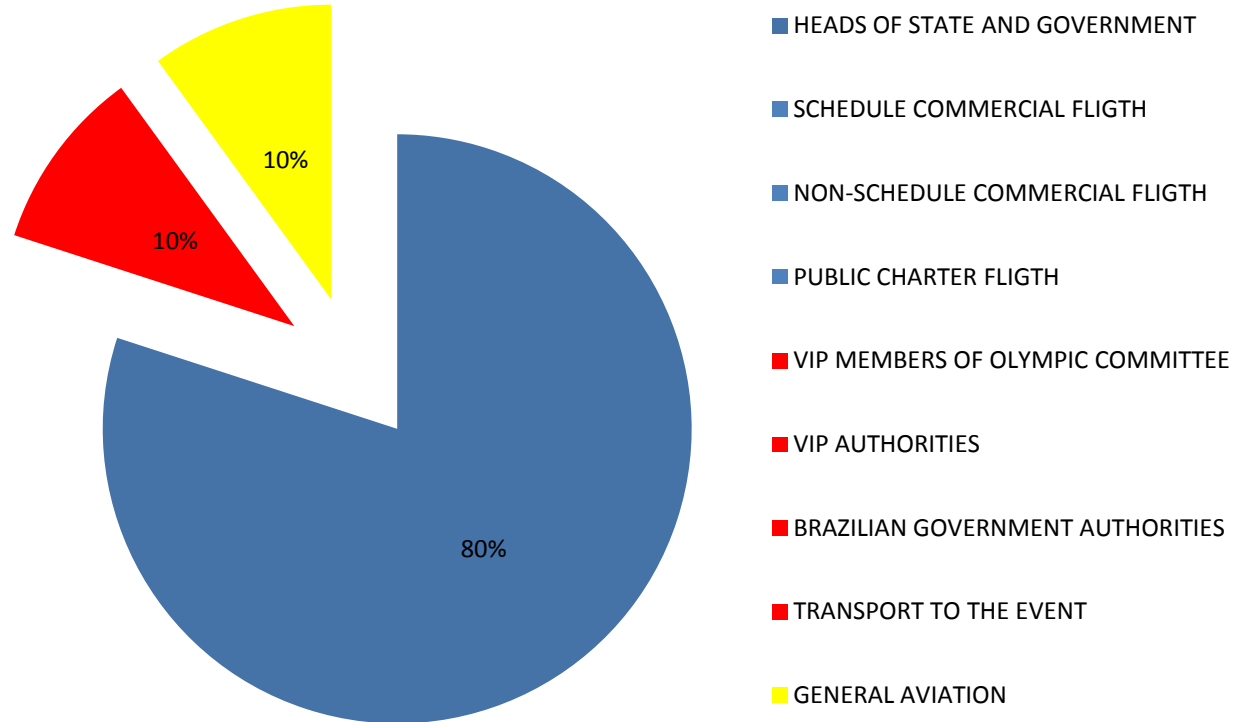- ➤ General Aviation, Air Taxi e charter flights .

Assumptions prescribed by the Brazilian authority and considered in ATFM during the 2014 FIFA World Cup Brazil

CRITERION FOR SLOT ALLOCATION

➢ Heads of State and Government

➢ Schedule Commercial Flight, Non- schedule Commercial flights and public charter flight (priority in rush hours) – 80% limit for daily slots ;

➢ VIP Members of Olympic Committee, Brazilian government authorities and transport to the event – 10% limit for daily slots; e

➢ General Aviation, air taxi e charter flights – 10% limit for daily slots.

Assumptions prescribed by the Brazilian authority and considered in ATFM during the 2014 FIFA World Cup Brazil.

SLOT ALLOCATION

- ■ HEADS OF STATE AND GOVERNMENT
- ■ SCHEDULE COMMERCIAL FLIGTH
- ■ NON-SCHEDULE COMMERCIAL FLIGTH
- ■ PUBLIC CHARTER FLIGTH
- ■ VIP MEMBERS OF OLYMPIC COMMITTEE
- ■ VIP AUTHORITIES
- ■ BRAZILIAN GOVERNMENT AUTHORITIES
- ■ TRANSPORT TO THE EVENT
- ■ GENERAL AVIATION

Challenges faced by ATFM during the 2014 FIFA World Cup Brazil

MANAGE THE RECEPTION OF DELEGATION IN FLIGHT AND ON THE GROUND

MANAGE THE RECEPTION OF HEADS OF STATE IN FLIGHT AND ON THE GROUND

Challenges faced by ATFM during the 2014 FIFA World Cup Brazil

HEADS OF STATE AND COMMITTEE ARRIVALS COORDINATION

➢ 1ª Australia : May 28th, 2014 (Curitiba - Vitória)

➢ 31ª Portugal : Jun 11th, 2014 (Campinas)

➢ 07 differents airports arrivals

➢ GRU, VCP, GIG, CNF, SSA, CWB e POA

Notice: Due to Airspace Control, no aircraft with Head of State has alternated or delayed.

Challenges faced by ATFM during the 2014 FIFA World Cup Brazil

INTERNAL MOVEMENT'S COORDENATION IN THE EVENT

Opening ceremony
11 Heads of State+ UN Secretary-General– 47 Movements

Período da Copa

Soccer Teams: 326 (250 domestic e 56 internacional flights)

Dopping: 174

Logistics HBS: 48

Soccer referee: 114

President of FIFA: 31

Secretary-General of FIFA: 35

Challenges faced by ATFM during the 2014 FIFA World Cup Brazil
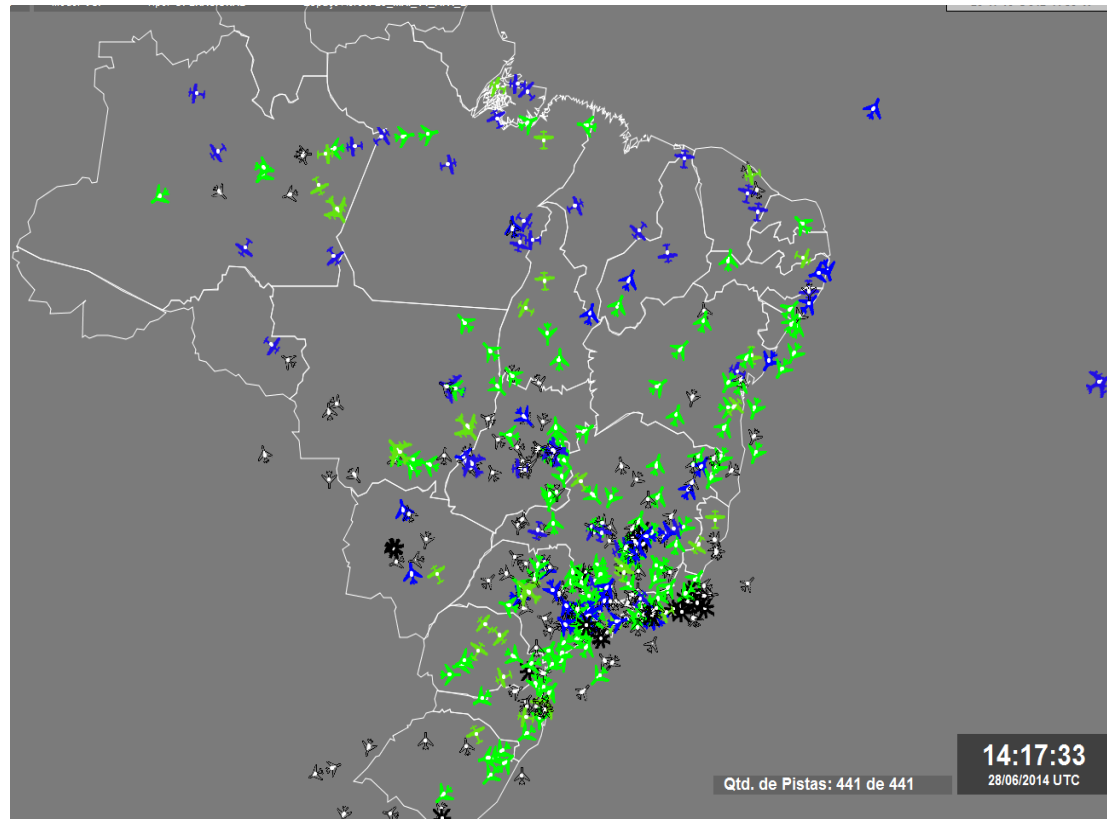
INTERNAL MOVEMENT'S COORDENATION IN THE EVENT

President of the Argentine Federation

Presidente of FIFA

Challenges faced by ATFM during the 2014 FIFA World Cup Brazil

MANAGE EVENTS IN12 HOST CITIES
IN 5 FIR WITH DIFFERENTS CHARACTERISTICS

ATTACHMENT

Challenges faced by ATFM during the 2014 FIFA World Cup Brazil

MANAGE EVENTS IN12 HOST CITIES
IN 5 FIR WITH DIFFERENTS CHARACTERISTICS

Challenges faced by ATFM during the 2014 FIFA World Cup Brazil

MONITORING THE AIRPORT ATC CAPACITY OF A BIG EVENT DURING VACATION TIME IN THE COUNTRY

The results are impressive. AVIANCA, AZUL, GOL e TAM airlines carry 8,8 million passengers during the World Cup; **77,2 thousand flights were performed in the country; 80% rate of medium aircraft occupation; 92% rate of punctuality.** Besides that, 15 airports in Host Cities were responsible for about 90% of the air operation. In the **21** airports that received Cup demands, passengers movement between june 10th and July 15th, was **17,8 million of people**, according to Civil Aviation Secretary.

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Challenges faced by ATFM during the 2014 FIFA World Cup Brazil

MANAGE THE GENERAL AVIATION DEMAND

Although all the planning facing the SLOT allocation for the General Aviation and others aircraft, to manage the flow the demand for this follow-up behaved floating shape due to following aspects:

➢ Increase in the number of private parking areas during the event.

➢ Increase in the number of private parking areas during the event.

SOUTH AMERICA		
COUNTRY	ACFT ALLOCATED	SLOT ALLOCATED
Argentina	121	357
Bolívia	14	15
Chile	23	33
Colômbia	26	67
Equador	8	12
Guiana	5	5
Guiana Francesa	2	2
Paraguai	28	43
Peru	9	10
Suriname	7	10
Uruguai	31	42
Venezuela	66	100
TOTAL	340	696

Challenges faced by ATFM during the 2014 FIFA World Cup Brazil

MANAGE THE GENERAL AVIATION DEMAND

Agência Força Aérea/©Sgt Johnson

ATTACHMENT

Challenges faced by ATFM during the 2014 FIFA World Cup Brazil

MANAGE THE GENERAL AVIATION DEMAND

ATTACHMENT

Challenges faced by ATFM during the 2014 FIFA World Cup Brazil
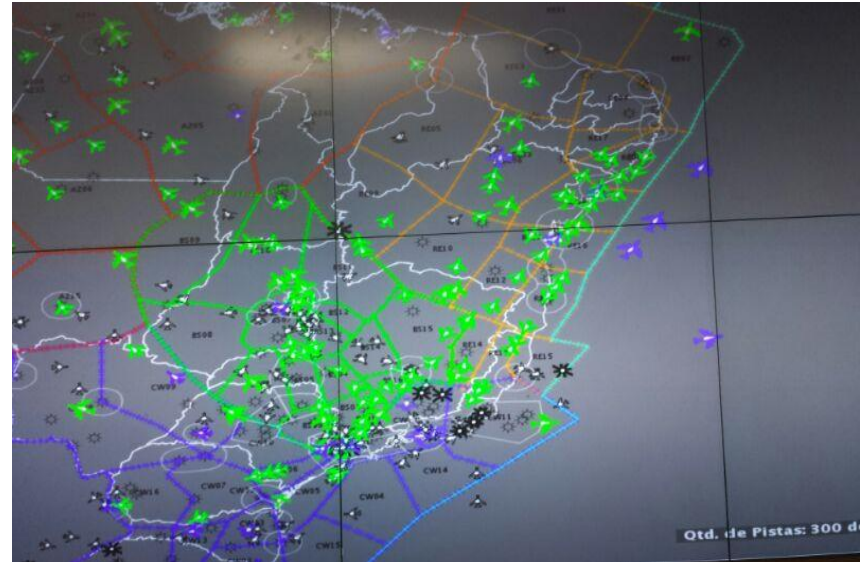
MANAGE THE GENERAL AVIATION DEMAND

ATTACHMENT

Challenges faced by ATFM during the 2014 FIFA World Cup Brazil

MANAGE THE GENERAL AVIATION DEMAND

GENERAL AVIATION IMPACT IN THE SECTORS OF FIR

The high flow of the General Aviation impacted directly in the FIR Sectors, especially in FIR-BS and CW.

In the quarterfinal matches end, it was observed that some of the General Aviation flights used airfields in the vicinity of the host cities prejudicing the SLOT allocation strategy and sometimes compromising the flow in the FIR-BS. Ex. SNDV

ATFM optimizing measures during 2014 FIFA World Cup Brazil

➢   Coordinated Airports With Slot For Landing.

➢   Command And Control Master Room's Operation.

➢   Training and capacity building of CGNA team.

➢   SIGMA as a Decision Support Tool.

➢   Implement of Tactical Measures coordinated by CGNA through video conferences with the ATC and Airspace Defense before, during and after each match.

ATFM optimizing measures during 2014 FIFA World Cup Brazil

COORDINATION OF AIRPORT LANDING ONLY
AIC 05/14

With the exception of Congonhas Airport (SBSP) and Carlos Prates (SBPR), all other Coordinated Airports were classified as LEVEL B, which required SLOT only for landing.

This way, it was possible to optimize the outgoing flow of aircraft without compromising the aprons capacity of the main airports in the country. This definition, together with the maximum residence time in the ground, specific for each airfield, provided some aprons restrictions mitigation .

ATFM optimizing measures during 2014 FIFA World Cup Brazil

COMMAND AND CONTROL MASTER ROOM'S OPERATION

The performance of the Command and Control Master Room that took place on CGNA facilities demonstrated once again its prompt reply on a complex and dynamic environment requiring quick decision-making envolving various segments of the event.
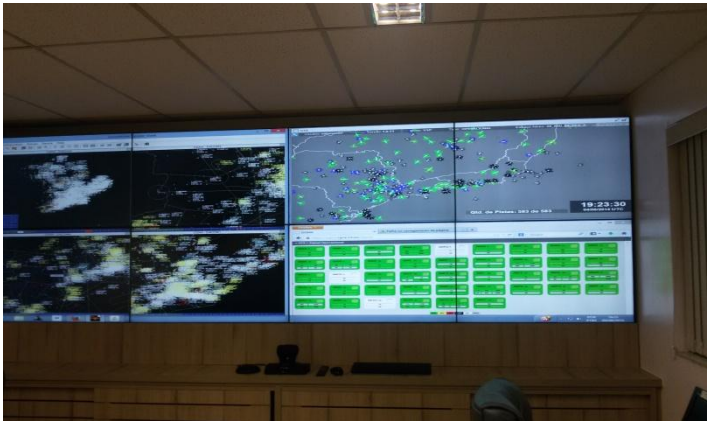
This way, the integration between the GAC, the Air Defence Space, Institutions related to the event and the organizers of Brazil 2014 FIFA World Cup consolidated once and for all the success of this strategy in coordinating such events.

ATFM optimizing measures during 2014 FIFA World Cup Brazil

COMMAND AND CONTROL MASTER ROOM'S OPERATION

42 Days
24 Hours

ATTACHMENT

ATFM optimizing measures during 2014 FIFA World Cup Brazil

PROFESSIONAL TRAINING

ATFM optimizing measures during 2014 FIFA World Cup Brazil

APPLYING THE INTEGRATED MANAGEMENT SYSTEM IN AIR MOVEMENTS - SIGMA

Through Module Automatic Session of SIGMA, was possible to design possible saturations in the FIR sectors or TMA.

through Module VSP (System View Situation Targets) of SIGMA , managers of CGNA have implemented ATFM measures in accordance with the Air mesh fluctuation.

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Measures for ATFM optimization during the 2014 FIFA World Cup Brazil

PRE-MATCHES VIDEO CONFERENCES FOR SPECIFIC TACTICAL MEASURES

During the FIFA World Cup Brazil 2014, CGNA coordinated many video conferences between FMC, ATC and other agencies involved in the event to maintain the adequate flow between the host cities of matches.

In the matches considered critical, the CGNA has implemented specific ATFM measures, together with the Air Traffic Control that facilitated the flow of information with the agencies directly impacted.

ATFM optimizing measures during 2014 FIFA World Cup Brazil

TACTICAL OPERATIONS TEAM FORMATION

With the accomplishment of the match between BRAZIL X CAMEROON, it was necessary to adjust the schedule for the remaining games considered critic regarding the projected demand.

This way, DECEA formed 02 operational teams under CGNA's coordination , formed by experts in Air Traffic Flow (ATFM) and Aeronautical Information Services (AIS) which have been displaced according to the crossing of results involving national teams with strong impact on air operations.

These teams were responsible for enabling the TACTICAL MEASURES defined by CGNA during the quarterfinals, semifinals and final.

ATFM optimizing measures during 2014 FIFA World Cup Brazil

CRIATION OF DEPARTURE CORRIDORS AFTER THE EVENT'S ENDING
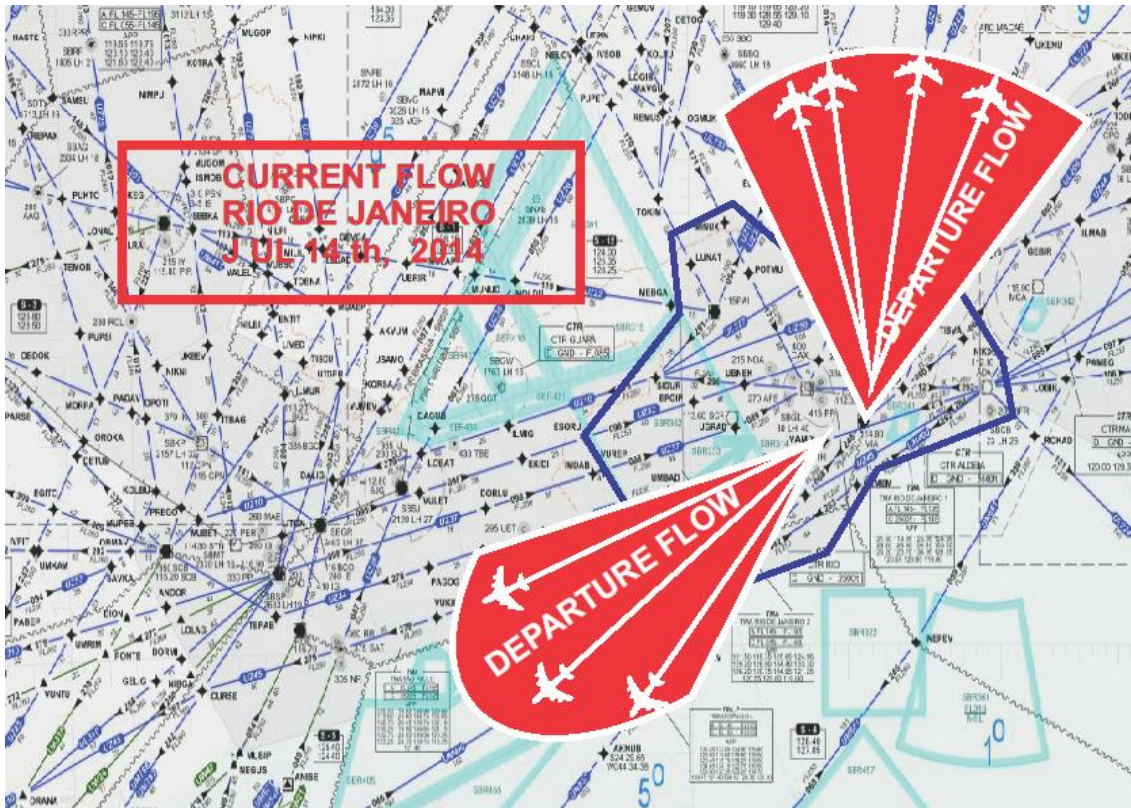
Immediately after the Final between Argentina and Germany, was necessary to create corridors of takeoffs to comport the great demand of flights to Europe and Argentina, and to the others countries located in the Southern Hemisphere.

ATFM optimizing measures during 2014 FIFA World Cup Brazil

MAPPING OF CRITICAL GAMES

DATE	NATIONAL TEAMS	STATE
JUN 25 2014	ARGENTINA X NIGÉRIA	PORTO ALEGRE
JUN 28 2014	BRASIL X CHILE	BELO HORIZONTE
JUL 04 2014	BRASIL X COLÔMBIA	FORTALEZA
JUL 08 2014	BRASIL X ALEMANHA	BELO HORIZONTE
JUL 13 2014	ARGENTINA X ALEMANHA	RIO DE JANEIRO

Once defined the critical games with the combination of the results, it was possible to employ specific ATFM measures, mitigating potential negative impacts to the user during periods of heavy flow.

NOTE: Combination of results observed starting from quarterfinals.

ATFM optimizing measures during 2014 FIFA World Cup Brazil

DEFINITION OF RUNWAYS CAPACITY PEAK VALUES FOR CRITICALLY CONSIDERED GAMES

AIRPORT	GAME DATE	DECLARED CAPACITY 80% WORKLOAD	PROJECTED PEAK CAPACITY	MOVEMENT DURING PEAK TIME
SBPA	25 JULY 2014	29 MOV/HOUR	36 MOV/HOUR	33 MOV/HOUR
SBCF	28 JUN 2014	29 MOV/HOUR	36 MOVHOUR	37 MOV/HOUR
SBBH		25 MOV/HOUR	32 MOV/HOUR	34 MOV/HOUR
SBFZ	04 JULY 2014	27 MOV/HOUR	34MOV /HOUR	33 MOV/HOUR
SBCF	08 JULY 2014	29 MOV/HOUR	36 MOV/HOUR	38 MOV/HOUR
SBBH		25 MOV/HOUR	32 MOV/HOUR	34 MOV /HOUR
SBGL	13 JULY 2014	40 MOV/HOUR	50 MOV /HOUR	52MOV/HOUR
SBRJ		29 MOV /HOUR	36 MOV /HOUR	34 MOV/HOUR
SBJR		-		

Information Source: TATIC FLOW

Points that need to be corrected to optimize ATFM during Major Events

Even in the face of success recognized by the authorities of the aviation industry and by the press, DECEA found that some aspects do not compromise, but impacted the Action Plan for 2014 FIFA Brazil World Cup increasing, sometimes, the workload of ATCOs in certain games.

The volume of air operations during the course of an event of this nature requires the use of efficient systems that should be able to receive and process, in a short time, the large number of information related to ATC.

This way, targeting not only fixing systemic failures, as well as preparing SISCEAB for the next big event, there is a need to correct and improve some points that were observed during the period of the World Cup.

Points that need to be corrected to optimize ATFM during Major Events

AERIAL MESH ELUSIVENESS FOR PLANNING.

The air mesh should be defined and made available in a suitable time.

The information about the mesh must follow a secure information flow.

The Mesh Data should be reliable.

NOTE: Since the beginning of the event until the end of the Cup many versions of mesh were presented, which directly impacted on ATFM planning especially on strategic level .

Points that need to be corrected to optimize ATFM during Major Events

FLIGHT PLAN PROCESSING

The processing capacity should be increased for major events. Processing system must provide specific functionalities for the possibility of anticipating the flight plan

NOTE: In the games considered critical, the volume of information processed in PLN Rooms overwhelmed the flight plan processing system . In the semifinal and final games, there was a loss of approximately 30% of flight plans which increased the workload and also generated small delays in the output stream.

GAME OVER

FULL-TIME

| GERMANY | 1-0 | ARGENTINA |

Germany win after extra time

BRAZIL 2014

Germans reign as Brazil thrills the world

Monday 14 July 2014

ATTACHMENT

GAME OVER

RIO DE JANEIRO BATTLE

The spotlights cast aside the Maracanã Stadium and begin to give way to Rio de Janeiro International Airport. Hundreds of aircraft on taxiways and aprons with estimated departure for the next few hours of the day July 14th, 2014.

GAME OVER

RIO DE JANEIRO INTERNATIONAL AIRPORT - SBGL

RECORD IN MOVEMENTS IN JULY 14th, 2014
52 MOV/HOUR

2014 FIFA WORLD CUP BRAZIL IN NUMBERS

FLOW IN THE AIRPORTS

A daily average of 485,000 passengers passed through 21 airports in 12 host cities, which recorded 7.46% of flight delays - index much lower than the international standard of 15%, and even lower than the European standard, which is 7.6%. The average number of passenger registered was superior to the Carnival of 2014, 365 000 passengers per day, and greater than the period last Christmas, which mobilized 404 000 passengers per day.

2014 FIFA WORLD CUP BRAZIL IN NUMBERS

MOVEMENT OF PASSENGERS IN THE 21 AIRPORTS WHO ATENDED THE DEMANDS OF WORLD CUP 2014	
JUNE 10th to Jul 13th ,2014	16.74 MILLION PASSENGERS
DECEMBER 20th, 2013 - END OF YEAR	420 THOUSAND PASSENGERS
FEBRUARY 28th, 2014 - CARNIVAL	467 THOUSAND PASSENGERS
JULY 1st, 2014 - WORLD CUP	533 THOUSAND PASSENGERS
JULY 3rd, 2014 - WORLD CUP	548 THOUSAND PASSENGERS
SOURCE: Airport Operators	

▭ The record movement of the year
June 10th to July 13th, 2014. Was registered an increase of
11.3% compared to the same period last year

2014 FIFA WORLD CUP BRAZIL IN NUMBERS

GUARULHOS INTERNATIONAL AIRPORT- SBGR	
JUNE 10th to JULY 13th, 2014	3,81 MILLION PASSENGERS
JULY 09 th, 2014	1040 MOVEMENTS
REGULAR FLIGHT	765 MOVEMENTS
CHARTER FLIGHT	83 MOVEMENTS
EXECUTIVE AVIATION FLIGHT	192 MOVEMENTS
SOURCE: Airport Operators	

The Movement was greater than three major airports during the 2010 World Cup: Joanesburg, Cape Town and Durban (2.6 million)

2014 FIFA WORLD CUP BRAZIL IN NUMBERS

BRASÍLIA INTERNATIONAL AIRPORT - SBBR	
JUNE 10th to JULY 13th, 2014	1,66 MILLION PASSENGERS
JUNE 24th,2014 RECORD OF THE WORLD CUP	625MOVEMENTS
REGULAR FLIGHT	406 MOVEMENTS
CHARTER FLIGHT	59 MOVEMENTS
EXECUTIVE AVIATION FLIGHT	160 MOVEMENTS
FONTE: Airport Operators	

2014 FIFA WORLD CUP BRAZIL IN NUMBERS

CONGONHAS AIRPORT - SBSP	
JUNE 10th to JULY 13th, 2014	1,31 MILLION PASSENGERS
JUN 27th, 2014 RECORD OF THE WORLD CUP	563 MOVEMENTS
REGULAR FLIGHT	383 MOVEMENTS
CHARTER FLIGHT	14 MOVEMENTS
EXECUTIVE AVIATION FLIGHT	166 MOVEMENTS
SOURCE: Airport Operators	

2014 FIFA WORLD CUP BRAZIL IN NUMBERS

CONFIS INTERNATIONAL AIRPORT - SBCF	
JUNE 10th to JULY 13th, 2014	1,11 MILLION PASSENGERS
JULY 8th,2014 RECORD OF THE WORLD CUP	506 MOVEMENTS
REGULAR FLIGHT	284 MOVEMENTS
CHARTER FLIGHT	87 MOVEMENTS
EXECUTIVE AVIATION FLIGHT	135 MOVEMENTS
SOURCE: Airport Operators	

The greatest movement recorded in SBCF was in 2012 with 393 movements

2014 FIFA WORLD CUP BRAZIL IN NUMBERS

GALEÃO INTERNATIONAL AIRPORT- SBGL	
JUNE 10th to JULY 13th, 2014	1,80 MILLION PASSENGERS
JULY 14th,2014 RECORD OF THE WORLD CUP	859 MOVEMENTS
REGULAR FLIGHT	412 MOVEMENTS
CHARTER FLIGHT	157 MOVEMENTS
EXECUTIVE AVIATION FLIGHT	290 MOVEMENTS
SOURCE: Airport Operators	

In the early hours of July 14, 2014, the Galeão International Airport recorded 52 Mov / Hour (Declared Capacity 40 Mov/Hour).

2014 FIFA WORLD CUP BRAZIL IN NUMBERS

PUNCTUALITY	
INDEX AVERAGE DELAYS DURING WORLD CUP 2014	**7,03%**
PATTERN INTERNACIONAL	15,00%
EUROPEAN PATTERN	7,60%
SOURCE: SAC (SECRETARIAT OF CIVIL AVIATION)	

Between June 1, 2014 to 01st July 2014 about 490 thousand foreigners arrived on international flights in Brazil, according to the Ministry of Tourism.

THE GREATEST LESSONS LEARNED DURING THE 2014 FIFA WORLD CUP BRAZIL

"FOR THE ATFM THE GAME NOT OVER WITH THE WHISTLE"
Center for Management of Air Navigation - Brazil

'Parabéns, Brasil', diz escocês que pegou 29 voos sem atraso na Copa

Jornalista escreve para diário dos Emirados Árabes Unidos.
Ele pegou 29 voos em 28 dias e visitou 10 das 12 cidades-sede na Copa.

Ana Carolina Moreno
Do G1, em São Paulo

O escocês Gary Meenaghan, de 30 anos, foi um de centenas de jornalistas estrangeiros que viajaram por todo o Brasil a trabalho durante a Copa do Mundo. Repórter esportivo do jornal "The National" dos Emirados Árabes Unidos, Meenaghan assistiu de dentro do estádio a 17 jogos do mundial de futebol em dez das 12 cidades que sediaram o evento. Para chegar a todos esses lugares, ele pegou 29 voos em 28 dias, e comemorou o fato de nenhum deles ter atrasado.

"Parabéns, Brasil", escreveu no Twitter na noite de sexta-feira (11), antes de embarcar no 29º voo, com destino ao Rio de Janeiro, para assistir à final entre Alemanha e Argentina no Maracanã.

"[A experiência superou minhas próprias