DEVELOPMENT AND EVOLUTION OF AIR TRAFFIC FLOW MANAGEMENT ATFM IN MÉXICO

Since the end of the 90´s and beginning of the 21 century, operations within Mexico's Air space experienced a continuous growth. This situation had a significant impact in our air space, the saturation of 3 of the most important airports in our country was the first yellow flag that alerted us of this.

The authorities confronted the task of solving the congestion problem of the International Airport of Mexico City.

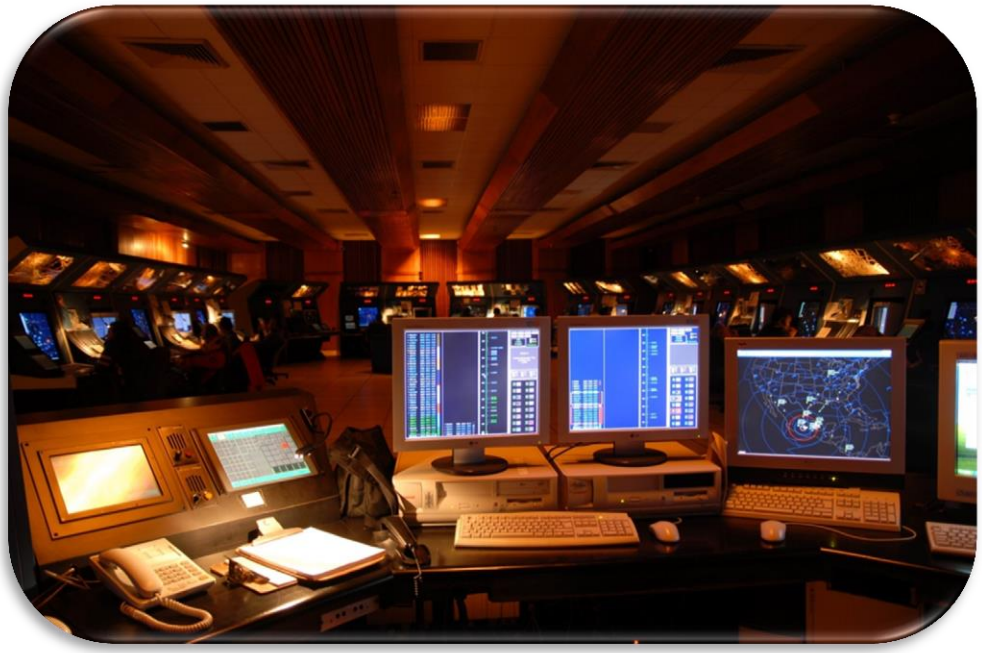
- Relocating general aviation from México City to Toluca airport.
- Restricting the operation of aircraft with speeds below 220KTS.
- Promoting the use of airports at Cuernavaca, Puebla and Queretaro.

These measures helped temporarily, the void left by the general aviation was taken up by commercial aviation.

Results……

- Delays.
- Holding patterns, more than six hours per day, with an average of 30-40 minutes per aircraft.
- Excessive Fuel Consumption.
- Carbon Emissions
- Operating Costs.

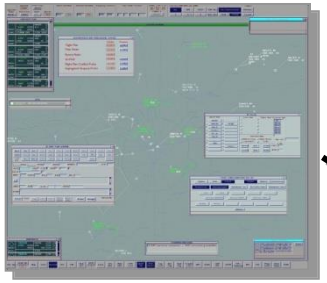
SENEAM took responsibility of this new situation and in February of 2002 established a new service named Flow Control. It began operations inside México´s Air Traffic Control Center. It´s primary function was to provide flow control services to Mexico´s City airport arrivals and to prevent arrivals from exceeding capacity at the nations busiest airport. (AAR Airport Arrival Rate).



In order to accomplish this new task SENEAM created PROSAT, which is a homemade software system that aids the supervisors to make a pre-tactical decisions to sequence aircraft operations in blocks of 15 minutes. This tool in combination with the ETMS and the information provided by EUROCAT X, allows for better organization to the arrival sequence for aircraft bound into Mexico City International Airport.

Information Flow

EUROCAT X

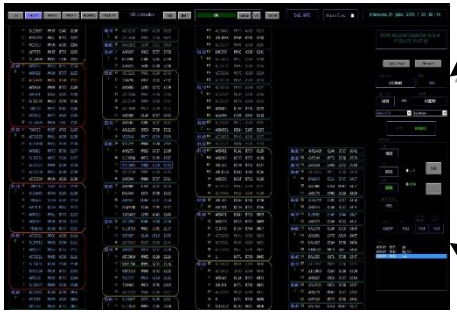


Automatic

SIAAT

Automatic

PROSAT



ETMS

Manual / Automatic

SIAAT X

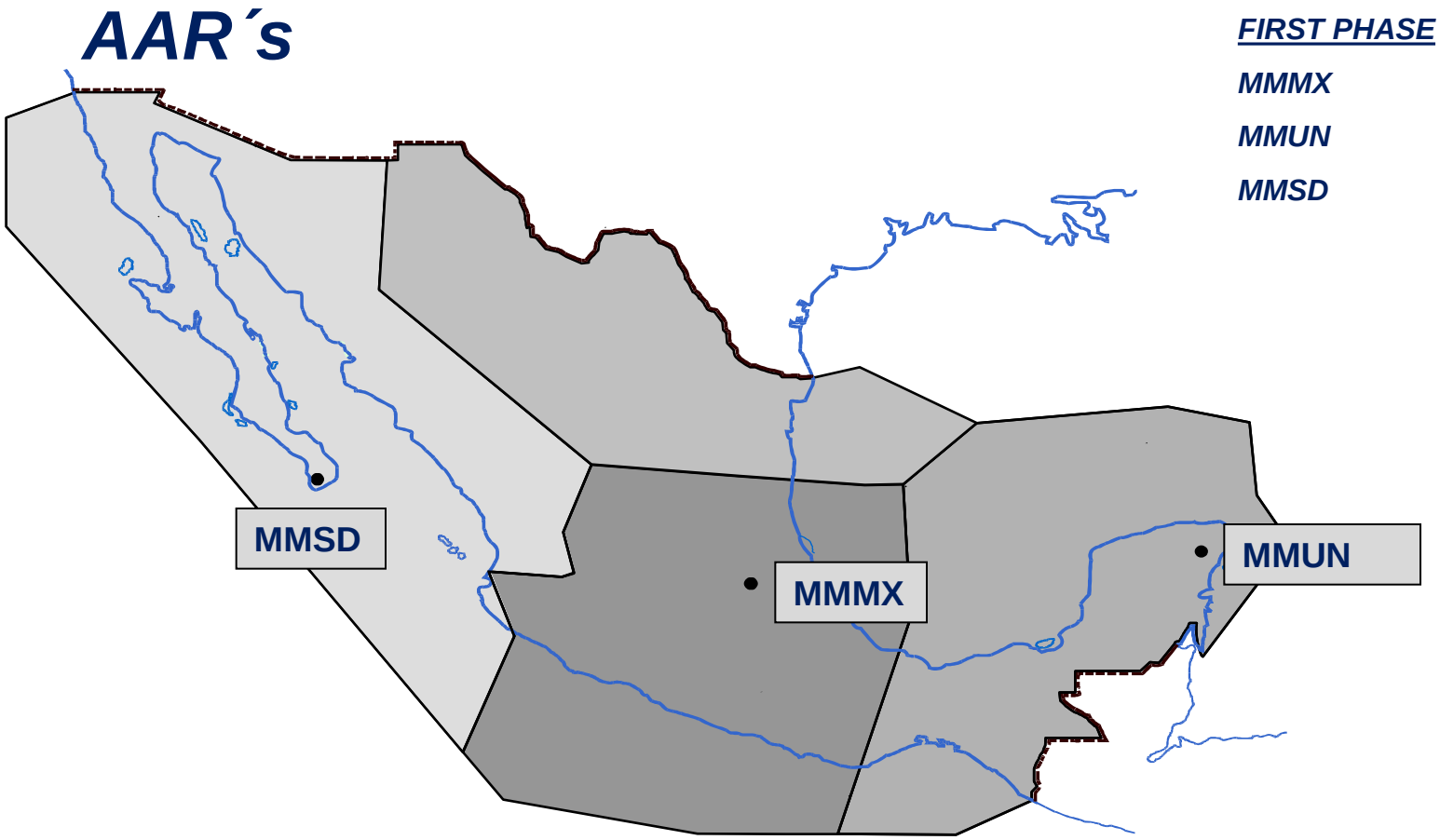
Automatic

AFTN

Messages ATS
Airlines
OSIV's

Automatic

Due to the great success at Mexico´s city airport, the service was implemented in other airports MMSD in November of 2004 and MMUN in October of 2005.



ATFM MEX
DEVELOPMENT UPDATE

The continued growth of the flow control system would not have been possible without the ICAO and FAA authorities, since 2005, we have been involved in frequent meetings that make the continued exchange of ideas and experiences possible.

ATFM MEX
DEVELOPMENT UPDATE

March 2005	•*ICAO 1st ATFM NAM/CAR meeting in México City* •*ATFM to MMSD*
March 2006	•*ICAO 2nd ATFM NAM/CAR meeting at Tegucigalpa Honduras* •*ATFM to MMUN.*
June 2006	•*DG & DGATA visited ATCSCC*
August 2006	•*1st FAA ETMS Supervisors training* •*México ATFM unit officially named CCFMEX*
November 2006	•*CCFMEX starts daily Telcons* •*North American/ European ATFM Task Force, St Louis, Missouri, USA* •*ICAO meeting at Lima Perú*
December 2006	•*AAR National analysis*

ATFM MEX
DEVELOPMENT UPDATE

March 2007	•*LOA between ATCSCC/CCFMEX*
July 2007	•*FAA/SENEAM 1st ATFM meeting at Mérida*
August 2007	•*CCFMEX officially in AIP*
September 2007	•*SCV National analysis*
October 2007	•*ATFM information to ACC's Supervisors*
December 2007	•*WATRS RNAV routes, Miami meeting* •*ATCSCC telcon training at CCFMEX.*

ATFM MEX
DEVELOPMENT UPDATE

February 2008	•*Telcons conducted by CCFMEX* •*Gulf of México RNAV routes analysis by SENEAM*
March 2008	•*FAA/SENEAM meeting at Monterrey, México LOA's of MTY-ZHU, MID-ZHU* • *SENEAM Gulf of México RNAV routes data exchange with FAA*
April 2008	•*GDL & BJX ATFM meeting at GDL* •*ETMS training for SENEAM at ATCSCC, POTOMAC TRACON & Dulles TWR*
May 2008	•*ICAO NACC/ WG/ 2 at Ocho Ríos, Jamaica*
June 2008	•*2nd ATFM meeting NOC/FAA/SENEAM at Mazatlán*

ATFM MEX
DEVELOPMENT UPDATE

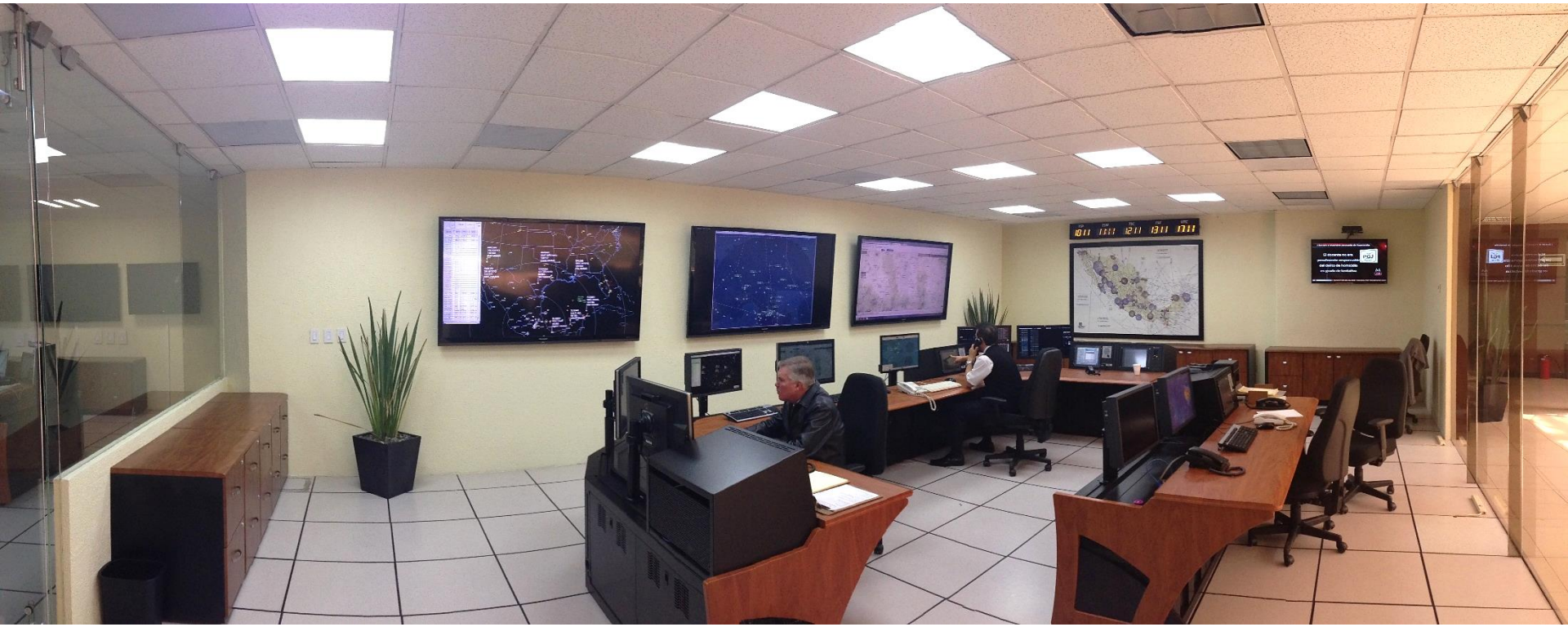
July 2008	•*ICAO ATM/CNS/SG/6 meeting Sto. Domingo, D.R.* •*SCV analysis for Colombia, Cuba & CENAMER.*
August 2008	•***LOA's between MZT-LAX, MZT-ABQ, MTY-ABQ, TIJ-SOCAL*** •*ETMS in MZT, MTY, MID, CUN & SJD* •***ATFM Concepts Seminar in SENEAM (Colombia, COCESNA, Panamá, Cuba, FAA, IATA, DGAC)***
October 2008	•*GREPECAS 15th at Río de Janéiro, Brasil* •*Revision of LOA between ATCSCC & CCFMEX*
November 2008	•*ATFM meeting at Lima, Perú* •***LOA´s between Habana-MID, CENAMER-MID***

ATFM MEX
DEVELOPMENT UPDATE

February 2009	•*Stakeholders at CCFMEX*
March 2009	•*March 2009 ATFM work-shop at Armenia, Colombia*
July 2009	•*3rd ATFM meeting NOC/FAA/SENEAM at GDL*
January 2013	•*Transition of the CCF MEX to SMART (Monitoring system, administration and regulation of air traffic)*

MONITORING, MANAGEMENT AND REGULATION SYSTEM OF AIR TRAFFIC

SMART



SMART Transition Plan

The transition plan is to comply with the objectives put forth by the SMART project and it is divided into 3 phases:

- **Phase I.-** Remove the CCF MEX from ACC MEX control floor, with the functions that have been put into place and a new specific location within the same building, equipped and conditioned with necessary state of the art technology complying with the needs of the following 2 phases.

- **Phase II.-** Implement new tools, operational manuals and necessary procedures to supplement the evolution of SMART to the national level, of which the ATFM, SMOT and the Crisis Center will be based out of the SMART unit.

- **Phase III.-** Develop operational and procedural manuals for the implementation of CDM (CollaborativeDecisionMaking).

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Objective of SMART

- Serve as the Monitoring Control Center to the various units throughout the country that provide air traffic control services; where operational and functional information is concentrated that encompass all of the ATS units involved.

- Regulate air traffic to balance operational demand of arrivals taking into account capacity at the nation's (3) busiest airports which are México (MMMX), Cancún (MMUN) y San José del Cabo (MMSD) and any other airport throughout the country where an increase in demand is foreseen.

- Serve as a Crisis Center to all the services provided in case operations are impacted, concentrating and transmitting information and implementing directives to mitigate impact throughout the air traffic control system.

Monitoring

Essential information.-

- Local meteorological conditions and weather conditions for the corresponding terminal area.
- Operational conditions of the airport (impacts affecting movement area such as runways or taxiways that have certain restrictions or are closed).
- Operational conditions of the systems and tools (navaid failures, frequencies, radars, EUROCAT X AND SIAAT systems, etc.) Special Events that impact acceptance capacity (presidential visits, government forums, national security meetings and festivals, etc.)
- Pertinent technical and operational or personnel based information that could impact systemwide continuity of the services being provided.

Monitoring Applications

Monitoring Applications

Management

Coordination-

- Certification of Safe Flight operations (CVS).
- Priority Aircraft Operations: Presidential aircraft, Heads of State, VIP's, ambulance, Medevac, search and rescue , humanitarian operations etc.
- Special Operations: National Security aircraft, organ transport, etc.
- Crisis Center for air traffic control services


{ 17 Countries }

NEXT STEPS

SMART

PLANSA


Oct 26 / 20:00 - 20:14
slot Id ades
20:00 ARU4AAA MMAA
20:00 TAO336 MMCV
20:00 UAL718 KSFO
20:00 VOI94 MMTG
20:05 AD2765 MMPR
20:05 SLI517 MMBT
20:05 SLI555 MMTG
20:05 SLI634 KSAT
plansa Id cl dp
Oct 26 / 20:15 - 20:29
slot Id ades
20:15 AD2701 MMAA
20:25 AMX642 KLAX
20:25 AMX700 MMHO
20:25 VIV3490 MMPS
plansa Id cl dp
20:20 SLI2098 F d
20:20 SLI511 F d
PLANSA
Manual
Eliminar
Aplicar
Buscar
Cerrar
TOCs


Oct 27
00:15 - 00:29
slot 9
pins 0
lims 13/14
Oct 27
00:30 - 00:44
slot 6
pins 0
lims 13/14
Oct 27
00:45 - 00:59
slot 9
pins 0
lims 13/14
Oct 27
01:00 - 01:14
slot 5
pins 0
lims 13/14
Oct 27
01:15 - 01:29
slot 11
pins 0
lims 13/14
Oct 27
03:15 - 03:29
slot 8
pins 0
lims 13/14
Oct 27
03:30 - 03:44
slot 6
pins 0
lims 13/14
Oct 27
03:45 - 03:59
slot 6
pins 0
lims 13/14
Oct 27
04:00 - 04:14
slot 5
pins 0
lims 13/14
Oct 27
04:15 - 04:29
slot 3
pins 0
lims 13/14
SCT
PLANSA
AICM
Sun 26-Oct-2014
20:07:49

Road Map Implementation of Departures Regulation of the AICM

TOTAL TIME	XX days
BEGINING DATE	02/10/2014
ENDING DATE	xx/xx/xxxx

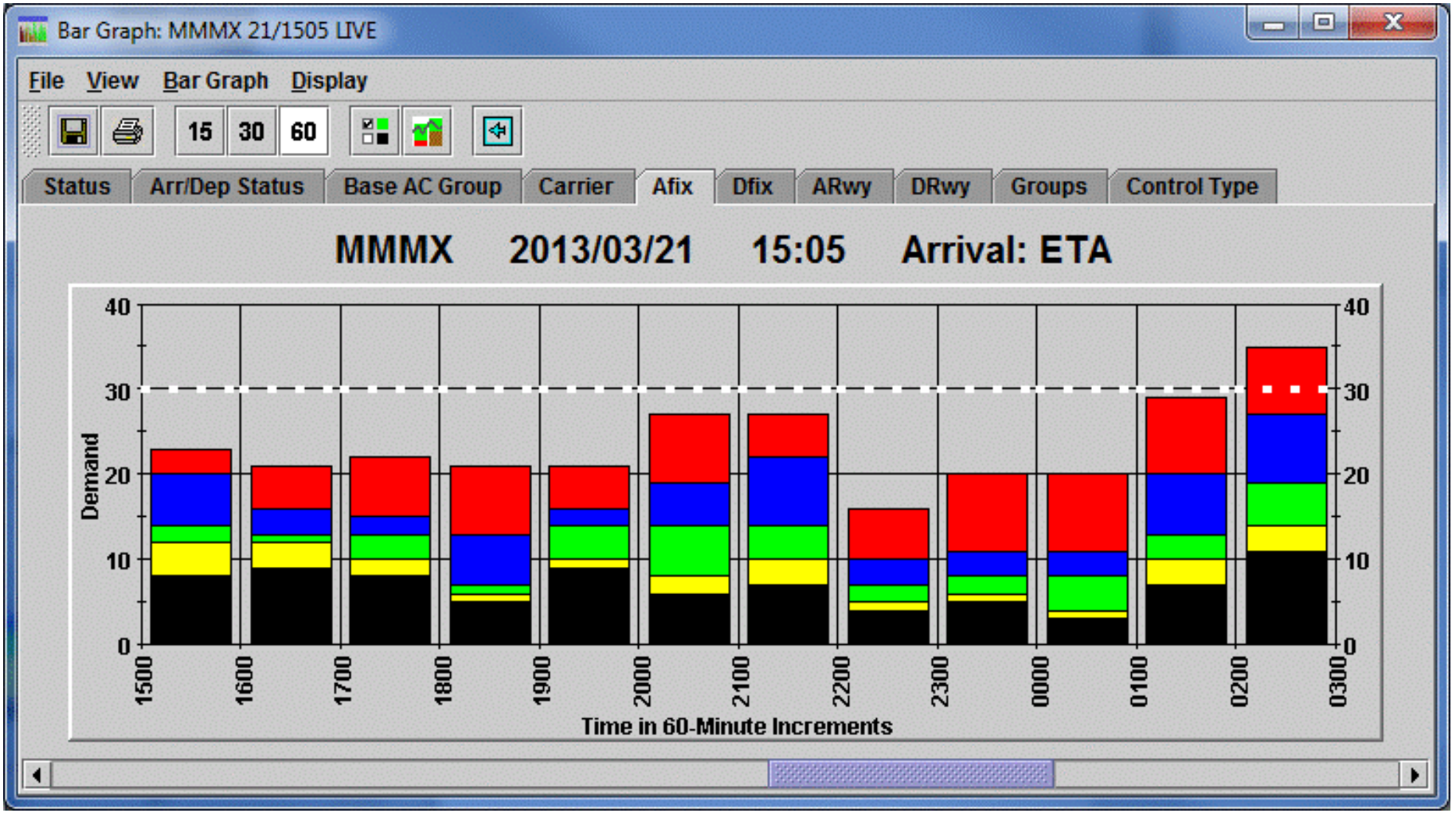
PHASE	NAME	PERIOD IN DAYS	PRECEDENT PHASE	BEGINNING	ENDING
1	Installation of the software PLANSA in the SMART unit	15		02/10/2014	17/10/2014
2	Training of the working crew of the SMART	1	1	27/10/2014	28/10/2014
3	Operative review of the PLANSA application	5	2	28/10/2014	01/11/2014
4	Internal simulations first phase	9	3	10/11/2014	18/11/2014
5	Internal simulation second phase	8	4	19/11/2014	26/11/2014
6	Working meetings with the AICM	30	1, 2, 3, 4 y 5	26/11/2014	29/12/2014
7	External simulations	13	4, 5 y 6	27/11/2014	09/12/2014
8	Simulations evaluation	39	4,5, 6 y 7	10/11/2014	20/12/2014
9	Development of procedures and modification propositions to the regulations	48	4, 5, 6, 7 y 8	01/11/2014	26/12/2014
10	Development of the require regulations by the authority	XX	7 y 8	26/12/2014	Stand by
11	Communication to the Airlines and stakeholders of the procedures and regulations	6	9	Stand by	Stand by
12	Training for the operative crew of the SMART unit	7	4, 5, 6 y 7	26/12/2014	03/01/2014
13	Beginning of the operations		10 y 11	Stand by	Stand by
14	Supervising and making the necessary changes	60	12	Stand by	Stand by

HARMONY

- Airbus ProSky presents a proposed proof of concept for the management of air traffic flow (ATFM).

- Concept test provides appropriate software for ATFM and CDM

- Metron Harmony provides the following principal functions:
  - Predict demand of ANSP-specified resources (e.g., airports)
  - Specify capacity of ANSP-specific resources (e.g., airports)
  - Monitor demand and capacity of ANSP-specified resources (e.g., airports)
  - Evaluate alternative TMIs to address demand-capacity imbalances
  - Perform CDM with stakeholders
  - Initiate, monitor, and modify TMIs for constrained resources
  - Record operational data
  - Report metrics and analyze performance
  - Perform Adaptation Management
  - Perform System Administration


Bar Graph: MMMX 21/1505 LIVE
File View Bar Graph Display
15 30 60
Status Arr/Dep Status Base AC Group Carrier Afix Dfix ARwy DRwy Groups Control Type
MMMX 2013/03/21 15:05 Arrival: ETA
Demand
0 10 20 30 40
1500 1600 1700 1800 1900 2000 2100 2200 2300 0000 0100 0200 0300
Time in 60-Minute Increments

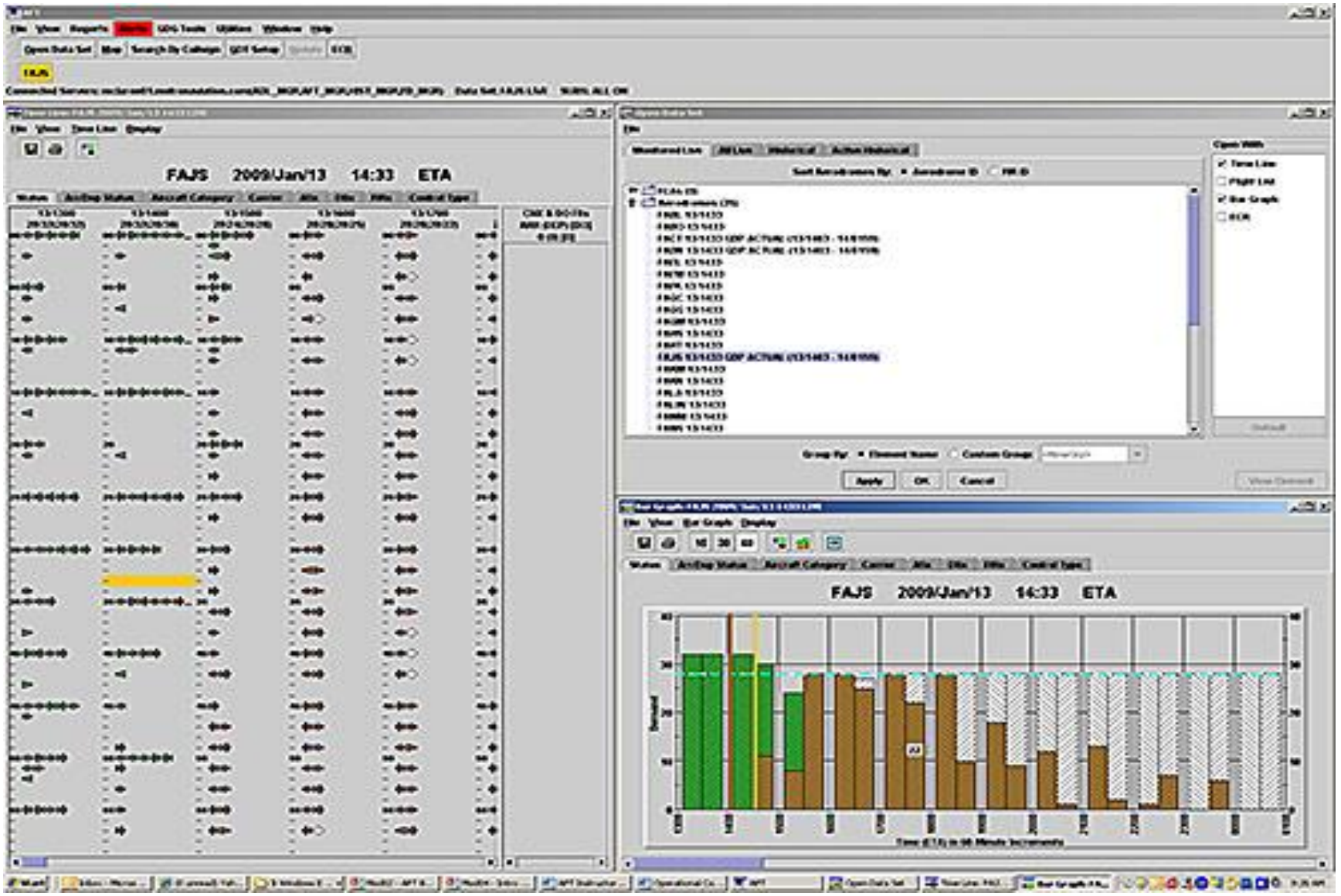
Updated 21/1509 MMMX Flight List

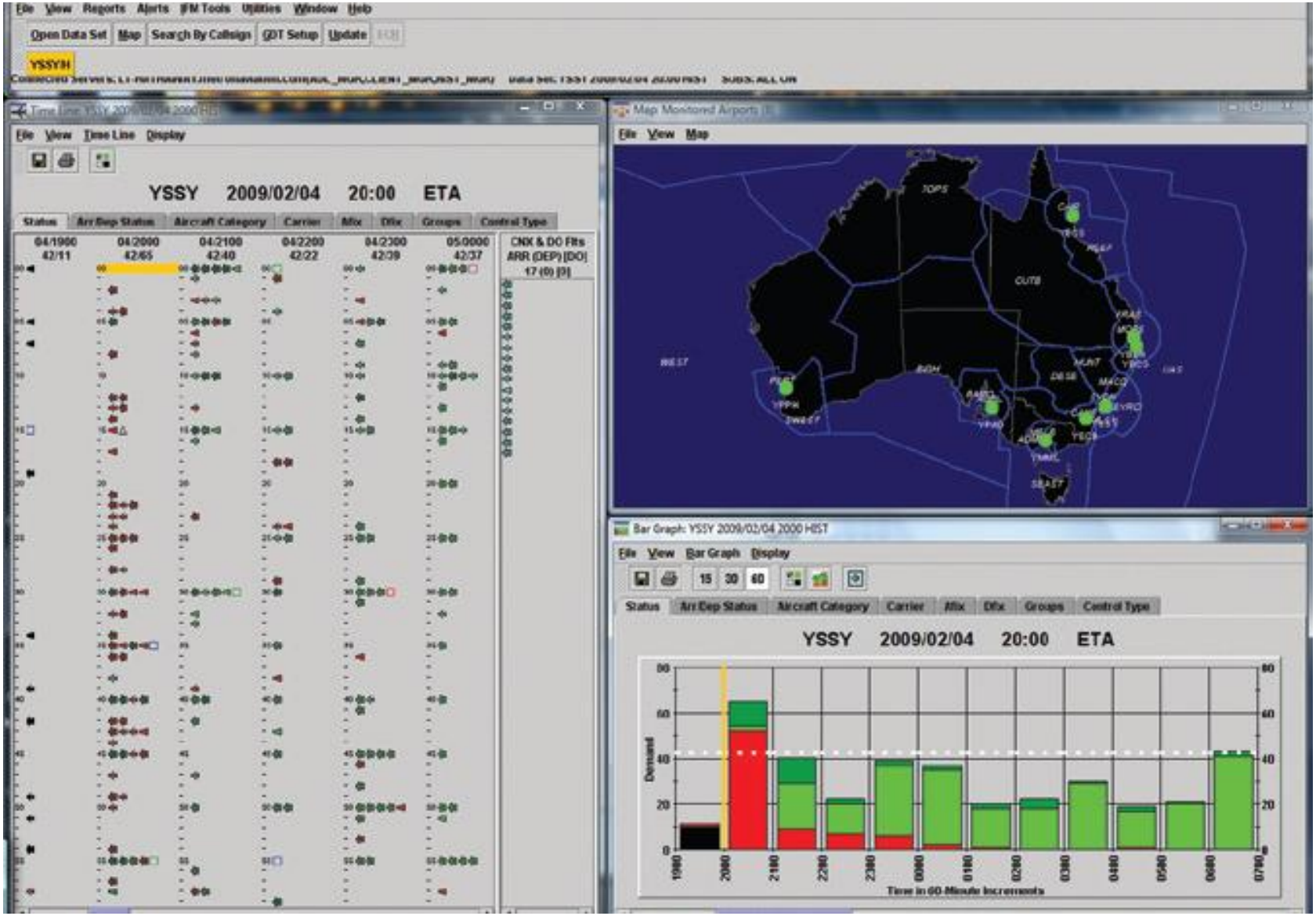
Search for Airport: MMMX

Display: Arrivals & Departures Tower View

	ACID	Major	AC Reg	Status	ADEP	ADES	Elem Slot	Ctl Slot	ETD	ETA	EIBT
1	AMX540	AMX	AMX540	Arrival	MMUN	MMMX			22/0739	22/0952	22/1000
2	AMX401	AMX	AMX401	Arrival	KJFK	MMMX			22/0549	22/1102	22/1110
3	AMX683	AMX	AMX683	Arrival	KORD	MMMX			22/0709	22/1117	22/1125
4	IBE6401	IBE	IBE6401	Arrival	LEMD	MMMX			21/2339	22/1122	22/1130
5	AMX191	AMX	AMX191	Arrival	MMML	MMMX			22/0844	22/1132	22/1140
6	AMX709	AMX	AMX709	Arrival	SKBO	MMMX			22/0608	22/1132	22/1140
7	AMX193	AMX	AMX193	Arrival	MMTJ	MMMX			22/0839	22/1142	22/1150
8	AMX491	AMX	AMX491	Arrival	KLAS	MMMX			22/0808	22/1142	22/1150

- Active - Pop-Up - Active, Pop-Up Page 1 of 8 Display: Up to 50 Results Displaying 1 - 50 of 365


FAJS 2009/Jan/13 14:33 ETA
FAJS 2009/Jan/13 14:33 ETA


File View Reports Alerts IFM Tools Utilities Window Help
Open Data Set
Map
Search By Callsign
GDT Setup
Update
YSSYH
File View Time Line Display
YSSY 2009/02/04 20:00 ETA
Status
Arr Dep Status
Aircraft Category
Carrier
Afix
Dfix
Groups
Control Type
04/1900 42/11
04/2000 42/65
04/2100 42/40
04/2200 42/22
04/2300 42/09
05/0000 42/37
CNX & DO Flts ARR (DEP) [DO] 17 (0) [0]
Map Monitored Airports
File View Map
Bar Graph: YSSY 2009/02/04 2000 HST
File View Bar Graph Display
15 30 60
Status
Arr Dep Status
Aircraft Category
Carrier
Afix
Dfix
Groups
Control Type
YSSY 2009/02/04 20:00 ETA
Demand
Time in 60-Minute Increments

Thank you!