

**THE DEVELOPMENT OF
NATIONAL PERFORMANCE FRAMEWORK FOR AIR
NAVIGATION SYSTEMS
MAURITIUS**

2011 - 2015

**Presented by
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MAURITIUS

Characteristics of the Industry

FIR- 9,000,000 sq Km

Yearly 25,000
Commercial

2,500 Over Flights

3,000 Military
Flights

12,000 Local
Flights



Characteristics of Industry (Contd)

- A 7% traffic growth is predicted for the coming 10 years
- Main challenges augment airspace capacity for en-route RNP-4
- Introduce ADS-B in Mauritius TMA
- Implement RNAV GNSS approach

2. The air navigation service provider

WHO WE ARE AND WHAT WE DO ?

WE ARE THE ANS PROVIDING ARM OF THE DCA WE PROVIDE CNS ATM AIM TO THE AERONAUTICAL COMMUNITY

**WE ARE REGULATED BY DCA MAURITIUS
WE ARE FUNDED BY GOVT ON A THREE
YEAR PERFORMANCE BASED BUDGETTING**

3. MAJOR STAKEHOLDERS/PARTNERS

THE MAJOR STAKEHOLDERS /PARTNERS ARE AIRPORT OPERATORS , AIRLINES ,THE REGULATOR , MET, ADJACENT ANS SERVICE PROVIDERS, FIXED BASED OPERATORS FOR GENERAL AVIATION, MILITARY AND EQUIPMENT SUPPLIERS.THE FUNDING SOURCE IS COLLECTION OF RANC AND GOVERNMENT FUNDED.

4. PROBLEM DEFINITION

THE WHOLE MAURITIAN AIRSPACE IS RNP 10 CLASS A AIRSPACE. LIMITATIONS ARE NO SURVEILLANCE IN THE TMA TO INCREASE CAPACITY WE INTEND TO UPGRADE TO RNP 4. REDUCE CO2 EMISSION AND FUEL BURN BY PROMOTING FLEXI TRACK , AIRLINE PREFERRED FLIGHT PROFILES AND DYNAMIC REROUTING AND FLIGHT PLANNING. IN OUR OCEANIC AIRSPACE WE DONT NEED ATS ROUTES.

**STRATEGIC OPERATIONAL IMPROVEMENT/
NATIONAL PERFORMANCE OBJECTIVE – PFF1
INTRODUCTION OF FLEX TRACKING IN MAURITIUS FIR
TO ENHANCE CAPACITY AND EFFICIENCY OF ENROUTE
AIRSPACE**

Performance Benefits

Safety	1. Safety level maintained
Environment	1. Reduced emissions through shorter flights and use of optimum routes/trajectories
Capacity	1. Increased capacity through better utilization airspace resources
Cost effectiveness	1. Fuel cost reduction through availability of more optimized routes/trajectories; and 2. Ability of aircraft to conduct flight more closely to preferred trajectories

PERFORMANCE MEASUREMENT

METRICS

1. En ROUTE DYNAMIC REFLIGHT PLANNING WITH ATC GROUND ASSISTANCE CLEARANCE REROUTING & FPL WITHIN 5 MIN. OF REQUEST

2. PERCENT DIFFERENCE BETWEEN OPTIMAL AND ACTUAL ROUTE 30 MINUTES OVER 13 HOURS

3. FACILITY AVAILABLE TO ALL ENROUTE AIRCRAFT

4. 1 -3 % ECONOMY PER FLIGHT

5. PERCENTAGE OF TIME THE FLEX TRACK AVAILABLE 100%

Strategy
Medium term (2010 - 2015)

ATM OPERATIONAL CONCEPT COMPONENTS	PROJECTS/TASKS	TIMEFRAME START/END	RESPONSIBILITY	STATUS (AS OF 01/01/10...)
AOM, DCB, TS AND CM	OPR USES BEST WINDS AND REQ PREFERRED FLIGHT PROFILE. ATC REROUTE THE AIRCRAFT.FPL IS AUTOMATICALLY AMENDED AND AIDC COORDINATION TAKES PLACE.AUTOMATED LAT SEP TOOL USED FOR SEPARATION.	JANUARY 2010 - OCTOBER 2015	STATES /MAURITIUS AUSTRALIA	AROUND 30 FLIGHTS INITIALLY.
	1. FLEXIBLE RNAV ROUTES USED WITH ATC GROUND ASSISTANCE.		IMPLEMENTED	
	1. HORIZONTAL SEPARATION REDUCE D TO 50 NM BETWEEN EQUIPED AIRCRAFT IN RNP 10 AIRSPACE		IMPLEMENTED	
	1. IMPLEMENT ELECTRONIC FLIGHT STRIPS		IMPLEMENTED	
	1. ALIGN AIRSPACE CLASSIFICATION TO CLASS A ABOVE FL 195		IMPLEMENTED	

AOM, DCB, TS and CM	1. Transition to new flight plan	01/07/11	Mauritius	Software MODIF as from 01/01/11
	1. Implement AIDC		Implented	
	1. Migration to WGS-84		Implemented	
	1. Implementation of AXIM (AIXM !!!)	2012		
	1. Implement eTod for Area 1		Implemented	
	1. Implementation of eAIP	2012		Soft version available on WEB
	1. Digital NOTAMs	???	NOTAM system automated	
	1. Quality management systems for AIM	2012		Flight Clearance functions already ISO Certified WE have the QMS
	1. Improve data and voice communications		VHF HF CPDLC Implemented VSAT SITA	
	1. Implementation of GNSS	DECEMBER 2011		Procedures Ready awaiting Flight CHECKS
1. Enhance situational awareness		ASD all FLTS		

Risk Management

Risk factors: delay in aircraft equipage; Disaster recovery

Risk mitigation: involvement of aircraft operators in the decision making process, System Design Tower and ACC alternate. We maintain a highly efficient and independent HF and extn VHF

Linkage to GPs

GPI/5: performance-based navigation (RNP10); GPI/7: dynamic and flexible ATS route management; GPI/8: collaborative airspace design and management; GPI/9: situational awareness; GPI/12: FMS-based arrival procedures; GPI/17 Data link applications; GPI/18 Aeronautical information; GPI/19 Meteorological systems; GPI/20 WGS-84; GPI/21 Navigation systems; and GPI/22 Communication infrastructure.

Performance Benefits

Safety

Drastically improved by surveillance

Environment

Reduction of CO2 emission with less fuel burn caused by low level restrictions

Capacity

Increased with reduction of horizontal separation

Cost effectiveness

CDA and quicker turn around for inter island flights very beneficial

**STRATEGIC OPERATIONAL IMPROVEMENT/
NATIONAL PERFORMANCE OBJECTIVE – PFF 2
IMPLEMENTATION OF ADS-B FOR SURVEILLANCE AND
SEPARATION IN LIEU OF RADAR**

Performance Measurement

METRICS

1. 10 DME TO 5 NM SEPARATION

2. 100 PERCENT OF TIME THE FIXED AIRSPACE IS
AVAILABLE TO CIVIL USERS

3 NUMBER OF AIRCRAFT ENTERING MAURITIUS TMA
7 TO 10 FLIGHTS PER HOUR.

4. LEVEL RESTRICTION REDUCED BY 70%

Strategy
Medium term (2010 - 2015)

ATM OPERATIONAL CONCEPT COMPONENTS	PROJECTS/TASKS	TIMEFRAME START/END	RESPONSIBILI TY	STATUS (AS OF 01/01/10...)
REGULATOR,AIRLINES ADJACENT CENTRE	INTRODUCTION OF A SURVEILLANCE SYSTEM IN THE MAURTIUS TMA USING ADS-B AS OPPOSED TO RADAR	APRIL 2011 APRIL 2015	ANS DCA	ON 01 JAN 2010 MEETING UPGRADING OF EUROCAT PLATFORM
	DEVELOPMENT OF CNS/ATM PROCEDURES AND ATC TRAINING	2013/2014	ANS	
	AIRCRAFT EQUIPAGE COOP APP AIRLINES SUB REGIONAL ICAO	2012/2014	OPRS	
	ATM SYSTEM CAPABLE TO INTEGRATE NON ADS-B AIRCRAFT	2017	ANS/OPRS	
	BUSINESS PLAN – OUT OF 3YR PBB FUNDS PROJECT REQUIRE NO ADD FUNDS	APRIL 2011 APRIL 2015	ANS	

RISK MANAGEMENT

RISK FACTORS: DELAY IN AIRCRAFT EQUIPAGE

RISK MITIGATION: INVOLVEMENT OF AIRCRAFT OPERATORS IN THE DECISION MAKING. ICAO ASSISTANCE REGION SPECIFIC. ACCESS TO COMMERCIAL DATABASES

LINKAGE TO GPIS

GPI/8: COLLABORATIVE AIRSPACE DESIGN AND MANAGEMENT; GPI/9: SITUATIONAL AWARENESS; GPI/12: FMS-BASED ARRIVAL PROCEDURES; GPI/17 DATA LINK APPLICATIONS; GPI/18 AERONAUTICAL INFORMATION; GPI/19 METEOROLOGICAL SYSTEMS; GPI/20 WGS-84; GPI/21 NAVIGATION SYSTEMS; AND GPI/22 COMMUNICATION INFRASTRUCTURE.

**STRATEGIC OPERATIONAL IMPROVEMENT/
NATIONAL PERFORMANCE OBJECTIVE – PFF3
OVERLAY OF RNAV GNSS APPROACH PROCEDURES ON EXISTING
ILS APP AND ENHANCEMENTS OF NON- PRECISION APPROACHS**

PERFORMANCE BENEFITS

SAFETY

1. SAFETY LEVEL IMPROVED

ENVIRONMENT

1. NOISE ABATEMENT PROCEDURES

CAPACITY

1. NOT SIGNIFICANT

**COST
EFFECTIVENESS**

PROVIDE SUFFICIENT REDUNDENCY IN CASE OF
ILS/VOR OUTAGES EG AFTER CYCLONES.
REDUCTION OF DIVERSION DUE BAD WEATHER BY
95%.

PERFORMANCE MEASUREMENT

METRICS

1. ILS AND NON-PRECISION APPS NON - AVAILABILITY IS AROUND 5% OF TOTAL USE TIME CAUSING DIVERSIONS AND HOLDINGS. REDUCE UNAVAILABILITY OF AN APPROPRIATE IAP TO ZERO

2. REDUCE DIVERSION OR HOLDING DUE UNAVAILABILITY OF AN APPROPRIATE IAP BY 97%.

4. 1% ECONOMY OF TOTAL FUEL BURNS PER TOTAL OPERATIONS.

5. PERCENT OF TIME THE FIXED AIRSPACE UNAVAILABLE TO CIVIL USERS

STRATEGY
MEDIUM TERM (2010 - 2015)

ATM OPERATIONAL CONCEPT COMPONENTS	PROJECTS/TASKS	TIMEFRAME START/END	RESPONSIBILITY	STATUS (AS OF 01/01/11...)
ANS DCA MET AD & AIRLINE OPRS	IMPLEMENT RNAV GNSS APP PROCEDURES FOR ALL MAURITIUS AIRPORTS	JAN 2011 DEC 2011	DCA ANS	PROCEDURES UNDER FINAL REVIEW BY ANS AND OPRS
	PLAN FLIGHT CHECK OF PROCEDURES TO COINCIDE WITH IMPLEMENTATION DATE	NOV 2011	ANS	OPS FRAMEWORK WITH ASECNA
	TRAINING OF ATC	ONGOING SIMULATOR	ANS	
	MORE THAN 2 AIRAC CYCLES (A FULL 3 MONTH)	JAN 2011 AUG 2011	ANS	

RISK MANAGEMENT	RISK FACTORS: LATE AVAILABILITY OF AERONAUTICAL INFORMATION. ADDITIONAL TRAINING REQUIREMENTS. RISK MITIGATION: INVOLVEMENT OF AIRCRAFT OPERATORS IN THE DECISION MAKING; ACCESS TO COMMERCIAL DATABASES
LINKAGE TO GPIS	GPI/5: PERFORMANCE-BASED NAVIGATION; GPI/7: DYNAMIC AND FLEXIBLE ATS ROUTE MANAGEMENT; GPI/8: COLLABORATIVE AIRSPACE DESIGN AND MANAGEMENT; GPI/9: SITUATIONAL AWARENESS; GPI/12: FMS-BASED ARRIVAL PROCEDURES; GPI/17 DATA LINK APPLICATIONS; GPI/18 AERONAUTICAL INFORMATION; GPI/19 METEOROLOGICAL SYSTEMS; GPI/20 WGS-84; GPI/21 NAVIGATION SYSTEMS; AND GPI/22 COMMUNICATION INFRASTRUCTURE.