THE DEVELOPMENT OF NATIONAL PERFORMANCE FRAMEWORK FOR ANS IN ERITREA 2011-2015

Presented by

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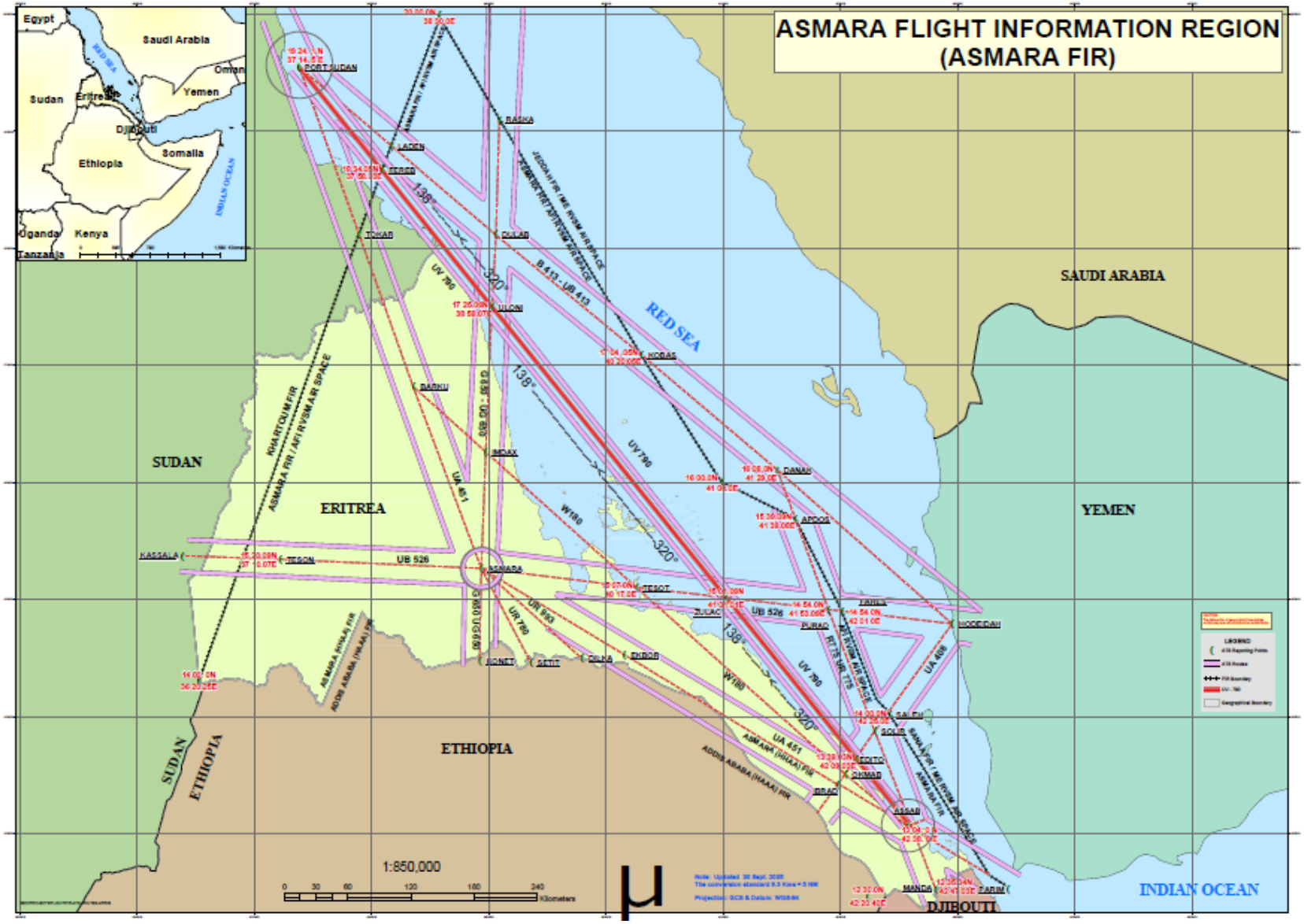
DEVELOPMENT OF NATIONAL PERFORMANCE FRAMEWORK FOR AIR NAVIGATION SYSTEMS IN ERITREA

1. General

- **Area – 124, 000 Km²**
- **Population – About 5 million**
- **Int`l Airports – 3**
- **Domestic Airports – 8**
- **Over flights – about 5000 per year**
- **Landing (Int`l & Dom.) –about 3000 per year**
- **A growth of 5% is predicted for the coming 5 years**

- **The major traffic flow is North – South. Our vision for achieving a seamless Global ATM system is through cooperation with adjacent FIRs.**

5. Performance based National Air Navigation Plan



CHALLENGES

- **Redesign ATS routes**

- **Introduce RNAV approach within the TMA**

- **Improving aerodrome operations**

- **construction of new airport**

2. The air navigation service provider

The Civil Aviation Authority is the regulatory body and does not provide any service. In the State of Eritrea there are two autonomous airport operators namely Asmara International Airport Management (AIAM) and Massawa International Airport Management (MIAM). Both operators are autonomous but government institutions. In addition to airport operations, AIAM provides ground handling, air navigation and meteorological services.

3. MAJOR STAKEHOLDERS/PARTNERS

The major stakeholders /partners are CAA, airlines, airport operators, military and equipment suppliers. The CAA and the Military are funded by government and the airlines and airport operators are autonomous and generate their own funds.

4. PROBLEM DEFINITION

- **ATS services are procedural**
- **Air routes are conventional**
- **No surveillance system in place**

STRATEGIC OPERATIONAL IMPROVEMENT/ NATIONAL PERFORMANCE OBJECTIVE – PFF1 REDESIGN ROUTES OF THE ASMARA FIR TO ENHANCE CAPACITY AND EFFICIENCY OF ENROUTE AIRSPACE	
Performance Benefits	
Safety	**1. Safety level enhanced**
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. Number of PBN routes implemented - 4 RNAV routes**
	2. Percent difference between optimal and actual route -10%
	3. Number of aircraft entering a specified volume of airspace/hr - 5
	4. 10 % reduction in fuel burn

Strategy

Medium term *(2011 - 2015)*

ATM OPERATIONAL CONCEPT COMPONENTS	PROJECTS/TASKS	TIMEFRAME START/END	RESPONSIBILITY	STATUS (AS OF 01/01/10...)
AOM, DCB, TS AND CM	1. Routes redesigned as RNAV routes	February 2011 / November 2015	STATES /All adjacent States , ICAO Regional Office	Planning stage
	2. Ground based conventional Route need to be replaced by RNAV routes	March 2011 / July 2015	CAA, ANS	
	3. Reduce horizontal separation between aircraft through RNAV	March 2011 / July 2015	ANS provider	
	4.IMPLEMENT ELECTRONIC FLIGHT STRIPS	February 2011/ November 2011	ANS provider	
	ALIGN AIRSPACE CLASSIFICATION TO CLASS A ABOVE FL 150		Implemnted	

AOM, DCB, TS and CM	**Transition to new flight plan**	**August 2012**	**CAA, ANS, Vendor**	**Software upgrade**
	Migration to WGS-84			**Implemented**
	Implementation of eAIP	**November 2011**	**CAA**	
	Digital NOTAMs	**2014**		
	Quality management systems for AIM	**2013 /2014**		
	Improve data and voice communications Integration of the existing HF and VHF with NAFISAT VSAT Network	**February 2011/ December 2012**	**CAA , ATNS, ANS provider**	
	1. Implementation of GNSS	**March 2011 April 2012**	**OPRs**	
	1. Enhance situational awareness	**March 2011**		

Risk Management	**Risk factors:** • **Delay in formulation of project** • **Delay in ATC procedures and training**
	Risk mitigation: **Early meeting with operators, ATC personnel and motivation of all concerned.**
Linkage to GPIs	**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.**

STRATEGIC OPERATIONAL IMPROVEMENT/ NATIONAL PERFORMANCE OBJECTIVE – PFF 2 IMPLEMENTATION OF ADS-B FOR SURVEILLANCE

Performance Benefits	
Safety	Greatly improved by surveillance
Environment	Reduced emissions through shorter flights as the result in reduction of separation and less fuel burn caused by low level restrictions
Capacity	Increased capacity through better utilization of airspace
Cost effectiveness	Fuel cost reduction through availability of direct routing.

Performance Measurement	
METRICS	**1. Reduction of horizontal separation to 5 NM.**
	2. Number of aircraft entering the TMA 5 aircarft /hr
	3. 5% less fuel burn as the result of reduction in separation **decrease in holding and delays to arrivals and departures**
	4. Fixer airspace is available to civil users 100% of the time.

Strategy
Medium term *(2011 - 2015)*

ATM OPERATIONAL CONCEPT COMPONENTS	PROJECTS/TASKS	TIMEFRAME START/END	RESPONSIBILITY	STATUS (AS OF 01/01/10…)
REGULATOR,AIRLINES ADJACENT CENTRE	Introduction of surveillance system in the Asmara TMA ADS-B as opposed to Radar which is in the pipeline	APRIL 2011 APRIL 2015	ANS CAA	18 Jan. 2011 convene a meeting of stakeholders on the project
	DEVELOPMENT OF CNS/ATM PROCEDURES AND ATC TRAINING	2013/2014	ANS	
	AIRCRAFT EQUIPAGE COOP APP AIRLINES SUB REGIONAL ICAO	2013/2014	OPRS	
	ATM SYSTEM CAPABLE TO INTEGRATE NON ADS-B AIRCRAFT	2017	ANS/OPRS	
	Business Plan - government approved radar concept Funding easy as ADS-B will be 10% of radar cost	February 2011 January 2014	CAA, ANS	

RISK MANAGEMENT	**RISK FACTORS: delay in aircraft equipage**
	RISK MITIGATION: involvement of aircraft operators in the decision making; ICAO assistance region specific
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.**

STRATEGIC OPERATIONAL IMPROVEMENT/ NATIONAL PERFORMANCE OBJECTIVE – PFF3 Implement RNAV GNSS Approach procedures at Massawa where exists ILS Approach and Assab where there is non – precision Approach	
PERFORMANCE BENEFITS	
SAFETY	**Safety level improved**
ENVIRONMENT	**Noise abatement procedures**
CAPACITY	**Increased capacity through better utilization airspace resource**
COST EFFECTIVENESS	**1. Provide sufficient redundancy in case of ILS/DME outage at Massawa** **2. Reduce the number of diversions by 80%** **3. Replace NDB Approach at Assab** **Note : Assab NDB will not be replaced**

PERFORMANCE MEASUREMENT	
Metrics	1. ILS and non – procedure approaches non-availability is around 10% of the time causing diversions and holdings. Reduce unavailability of an appropriate IAP by 98%
	2. Reduce diversions and/or holdings by 97%
	3. 1% fuel saving

STRATEGY
MEDIUM TERM *(2011 - 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 Eritrean Int'l Airports	JAN 2011 DEC 2011	CAA ANS	18 Jan. 2011 convene a meeting of stakeholders on the project
	Develop procedures	March 2011/ September 2011	ANS	
	Conduct Training OF ATC		ANS	
	Plan flight check of Procedures to coincide with implementation date	JAN 2011 AUG 2011	ANS / ASECNA	

RISK MANAGEMENT	**RISK FACTORS: Late availability of Aeronautical information. Additional training required**
	RISK MITIGATION: collaborative approach with stake holders
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.**