INTERNATIONAL CIVIL AVIATION ORGANIZATION
EASTERN AND SOUTHERN AFRICAN OFFICE

WORKSHOP ON THE DEVELOPMENT OF
NATIONAL PERFORMANCE FRAMEWORK FOR AIR NAVIGATION SYSTEMS
(NAIROBI, 6-10 DECEMBER 2010)

HANDS-ON EXERCISE: PFF EXPLANATION FOR EFFICIENCY

1. Characteristics of the industry

Enumerate the current and projected growth of Air Traffic in your state and also identify, if any, the efficiency challenges in your State.

2. The air navigation service provider

Describe briefly the organization providing the air navigation services in your State including its institutional format, capital structure, principal shareholders and the management.

3. Major stakeholders/partners

Identify the major stakeholders/partners such as the air navigation service providers, the airspace users (the commercial airlines using the airspace, business aviation, general aviation, military, etc.) and the potential funding sources.

4. Problem definition

The current conventional air navigation systems might have several limitations, which would depend on the State or the region concerned. List such limitations in your State.

5. Performance based National Air Navigation Plan

Define the geographical scope of the National Air Navigation Plan and determine the major traffic flows. Explain briefly the vision of your State for achieving a seamless Global ATM system. Specifically, establish national performance objectives for the air navigation infrastructure, list current air navigation systems and through gap analysis define near and medium term operational improvements.

6. Performance framework forms (PFFs)

Using the standard approach, develop PFFs for different national performance objectives by determining relevant projects/tasks and ensuring the linkage to Key Performance Areas (KPAs) and Global Plan initiatives (GPIs).

7. Risk Management

What are the risks identified for this National Air Navigation Plan and if any, briefly describe the risk mitigation plans/techniques.

PERFORMANCE FRAMEWORK FORMS FOR EFFICINCY

STRATEGIC OPERATIONAL IMPROVEMENT/ NATIONAL PERFORMANCE OBJECTIVE – 1 ENHANCE EFFICIENCY OF SERVICE PROVISION IN SWAZILAND TMA AIRSPACE				
Performance Benefits				
Safety	1. Improve safety levels through services delivery management			
Environment	1. Reduced emissions through direct routing of flights and reducing noise over game parks			
Capacity	1. Increased capacity through better utilization airspace and runway resources			
Cost effectiveness	1. Fuel consumption and delay reduction through availability of direct routes/trajectories 2. Ability of aircraft to conduct flight more closely to preferred trajectories 3.ability to utilise aerodromes much more effectively 4.Improve availability of procedures to operator			
Performance Measurement				
Metrics	1. Number of RNAV routes implemented			
	2. Percent difference between optimal and actual route			
	3. Number of aircraft entering a specified volume of airspace/hr			
	4. Pounds of fuel burn per operations			
	5. Percent of time the fixed airspace unavailable to civil users			
Strategy **Medium term *(2011 - 2015)***				
ATM Operational Concept Components	**Projects/Tasks**	**Timeframe Start/End**	**Responsibility**	**Status (as of …)**
AOM, DCB, TS and CM	1. Restructure airspace and determine near term operational improvements	June 2011 - October 2012	States /Territories	Database under preparation
	2. Analyze the ATS route structure in the TMA and implement identifiable improvements such as point to point direct routes			
	3. Reduce horizontal separation between aircraft through the provision of surveillance radar services			
	4. Implement electronic flight strips			
	5. Reduce the upper levels of airspace to FL 245 in the TMA			
	6. Delegate the upper airspace to RSA to improve seamless flight of aircraft transiting through our country			

	Projects/Tasks	Timeframe Start/End	Responsibility	Status (as of …)
AOM, DCB, TS and CM	7. Improve demand and capacity balancing through ATFM process			
	8. Transition to new flight plan			
	9. Develop and Implement AFI PBN state plan			
	10. Migration to WGS-84			
	11.Develop performance measurement plan			
	12. formulate safety plan			
	13 Develop airspace concepts base on AFI PBN roadmap in order to design and implement an optimized standard instrument departures (SIDS) and instrument arrivals(STARs), holding and associate instrument flight procedures on the basis of RNAV1 andPNR1			
	14.Digital NOTAMs			
	15.Quality management systems for AIM			
	16.Improve data and voice communications			
	17.Implementation of GNSS			
	18.Enhance situational awareness			
	19.Enhance preparation and availability and issuance of SIGMETs			
	20.Improve availability, timeliness and quality of OPMET data			
	21.Develop Quality management systems for MET			
Risk Management	Risk factors: lack of funding; delay in finalising airspace delegation to RSA; Insufficient personnel			
	1.Risk mitigation: identify different funding sources; involvement of aircraft operators in the decision making; request management to speed up negotiations and conclude the airspace restructuring embark on a vigorous recruitment and training of personnel.			
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 – 2 **ENHANCE CAPACITY AND EFFICIENCY OF THE TWO AERODROMES**				
Performance Benefits				
Safety	1. improved safety level by separating aerodrome traffic based on aircraft performance			
Environment	1. Reduced emissions through shorter runway occupancy time and taxi time			
Capacity	1. Increased aerodrome capacity through better utilization of airside infrastructure			
Cost effectiveness	1. Potential cost reduction through shorter ground movements			
Performance Measurement				
Metrics	1. Number of operations per hour			
	2. Arrival/departure delay i.e. minutes per flight			
	3. Number of aircraft entering a specified volume of airspace/hr			
	4. Pounds of fuel burn per operations			
Strategy **Medium term *(2011 - 2015)***				
ATM Operational Concept Components	**Projects/Tasks**	**Timeframe Start/End**	**Responsibility**	**Status (as of …)**
AO, DCB, TS and CM	11. Formulate airspace concept and determine near term operational improvements	June 2011 - December 2011	States /Territories	Database under preparation
	12. Improve surface movement and guidance control systems through A-SMGCS			
	13. Maximize runway capacity in all weather operations			
	14. Improve demand and capacity balancing through ATFM process			
	15. Improve data and voice communications			
	16. Implementation of PBN			
	17. Enhance situational awareness			
	18. Migration to WGS-84			
	19. Implement PNAV for all aerodromes			

	20. Implement automation of weather systems at aerodromes			
	21. Implement meteorological down inks at MET and ATS units			
	Projects/Tasks	**Timeframe Start/End**	**Responsibility**	**Status (as of …)**
AOM, DCB, TS and CM	22. Implement MET uplinks from the automated weather systems , ATS and MET units	June2011 to December 2011	States	
	23. Enhance Aerodrome forecast			
	24. Trend forecast to cover the next 6 hours			
	25. Wind shear and aerodrome weather warning			
	26. Aerodrome ground lighting			
	27. Rapid exit taxiways			
	28. Improved signage			
	29. Non-navigational visual aids such as PAPI			
	30. Use of LEDs for runway lighting			
Supporting tools	1. Technology evaluation and gap analysis			
	2. Safety case and safety analysis			
	3. Business case and cost benefit analysis			
	4. Regional workshops and seminars			
ATM Community members	States, Aerodrome operators, Airspace providers, Airspace users, ATM service providers, ATM support industry, Regulatory authorities and ICAO			
ATM Community expectations	1. Right of access to ATM resources and equity for all users			
	2. Capacity to meets peak demands, while minimizing restrictions			
	3. Cost effective air navigation services			
	4. Minimize environmental impact			
	5. Flexibility in adapting flight trajectories			
	6. Technical and operational interoperability and harmonization			
	7. Consistent and dependable levels of service			
	8. Safety is highest priority			
Project Output	Subregional/national performance plan for implementation of air navigation system elements that are operationally suitable, technically feasible and economically viable.			
Project Outcome	Enhanced capacity and efficiency of aerodrome operations.			
Risk Management	Risk factors: lack of funding; delay in aircraft equipage; insufficient data, birds strikes problem			
	Risk mitigation: identification different funding sources; involvement of aircraft operators in the decision making; access to commercial databases, engage environmental expert on birds control			
Linkage to GPIs	GPI/5: performance-based navigation; GPI/9: situational awareness; GPI/13: Aerodrome design and management; GPI/14: Runway operations; GPI/15: Matching IMC and VMC operating capacity; 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.			

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The National Performance Framework for Air Navigation Systems in Swaziland

Swaziland's civil aviation industry is made up of a combination of commercial airline operation, the agricultural crop spraying operations and a bit of general aviation mainly privately owned aircrafts which are engaged on operations ranging from business jets to private owned aircraft for leisure purposes. Air traffic in Swaziland is anticipated to grow three times with the vigorous marketing campaign that has already been undertaken by the new company. The main efficiency challenges at present are, mainly to do with the Transition from government controlled operations to an autonomous authority which is anticipated that it will do business in a much use (operator) friendly way.

At the present moment Swaziland is still at cross roads in the sense that the country is just in the process of moving away from government owned operations of the civil aviation industry to a privately owned government company. The bill establishing the civil aviation authority has already gone through parliament and the board of directors appointed. The DG and the administration staff have been employed. All that is remaining is to populate the rest of the staff from government to the company. This is a problem since it is coursing a delay. This is even compounded more by the fact that operations are to move to a new airport which comes with all its problems of staffing needs and certification of the new aerodrome. The organisation itself which is the new authority is expected to function firstly as a regulatory and a service provide, combined , then changing to separate the two operations at a later stage e.g. five years. from now but not beyound ten. The government of Swaziland is at presently the principal shareholder.

The main stake holders in the industry are the General Aviation industry e.g.(Crop sprayers, business jet owners, light aircraft owners and Micro light owner), MO Agency, environment agency of Swaziland and The Civil Aviation Authority. The national airline (Swaziland airlink)is one of the major stakeholder operating E135J and RJ85. Several airlines have indicated kin interest in operating into Swaziland with some from the Middle East, Eastern Africa,China Tiewan and some low budget cost airline from RSA.The types of aircraft that they will be operting ranges from A340s ,B777, B738 and FK28 With regards to funding, at the present moment the government will supplement the revenue collected by the CAA through air navigation charges.

Currently, due to the non-availability of surveillance services in Swaziland airspaces which is surrounded by three quarters of RSA airspace,(whose entire airspace is covered by RADAR), makes it a problem for traffic coming from a radar service airspace with reduced separation to enter into our airspace only to be requested to increase separation in order to comply with procedural control. This is causing unnecessary en route delay. Also the use of VOR/DME in our TMA' which has a mountainous topography makes it difficult to position the equipment at a right position to get the best coverage of the entire TMA at some lower level behind the mountains. It has been found that due to the need to position the

DVOR at a much better position to make it give that needed coverage, let down proceedures have been compromised to the point that aircraft cloud break only to have the runway centre line to left. That too is not so safe.

The Swaziland TMA is under the Johannesburg FIR. Basically it covers the entire national bounders with some of the TMA airspace in the south over lapping to RSA territorial areas. On the East is the Mozambique FIR. The lateral limits are from 6600ft up to FL460. There is only one international airport servicing the country, which is in the centre of the country. There are 4 air routes leading into the main airport, two from and to the johannesburg FIR to the west,one the south, to and from Durban and the last one to Maputo in east. A second airport is being built east of the present airport about 25 nm. It is anticipated that it will hold most of the international traffic. All the operations presently going on at the present airport will have to move to the new airport call SIKHUPHE. Apart from the two aerodromes there are nine airstrips serving as landing areas for either crop sprays or general aviation. The main present airport has a CAT1 ILS, one DVOR/DME which has its associated letdown and two NDBs which are used as locator becons. With the establishment of a Civil Aviation Authority, the State open up a new way of doing things which is toward global cooperation, improving safety standards and oversight in order to achieve ICAO compliance. The CAA is over hauling the entire civil aviation system with a view to achieving ICAO standards by using the best practice applicable to the industry with the aim of reaching a seamless global ATM systems. The company has acquired new ATM systems including a new surveillance radar, capable of covering the whole airspace. The same radar is capable of covering a big range of our neighbours airspace(Mozambique). The company also acquired new ATM equipment capable of supporting the latest PBN concept.