INTERNATIONAL CIVIL AVIATION ORGANIZATION

THIRD AFRICA-INDIAN OCEAN (AFI) AVIATION SAFETY, SYMPOSIUM
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Session 1: Progress towards improvement of aviation safety in the AFI Region – Implementation / Monitoring / Follow-up

TOPIC: AFI Regional Air Navigation Services (ANS) Key Performance Indicators and Targets

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EXECUTIVE SUMMARY

This paper traces the origins and progress of the AFI Air Navigation Services performance indicators and targets, from the 12 the Air Navigation Conference, through APIRG/19 and a number of AFI Plan Steering Committee meetings. It outlines the main features of the indicators and targets, discusses a number of issues and challenges concerning identification of good indicators, Reorganization of APIRG and possible lessons from other PIRGs.

It has four recommendations in 5.1 through 5.4 inclusive.

REFERENCES:

- Doc 9750 ver. 4
- Doc 9883
- APIRG /19 and 20 Reports
- Reports of AFI Plan Steering Committee meetings (12,13,14,15)
- Working papers at APIRG/20
- Yellow Cover report of the 12 Air Navigation Conference
- Briefing on APANPIRG Priorities and Targets; PIRG-RASG Meeting, Montreal 19 March 2013
- MID Region Air Navigation Strategy – Edition June 2015

1. INTRODUCTION

1.1. The paper has four sections after the introduction. Section 2 gives the history and status of the AFI ANS performance indicators and targets, Section 3 discusses the issues affecting identification and use of indicators, as well as challenges of the AFI regions and how to try to overcome them. Section 4 gives conclusions followed by 5, Recommendations. The paper has three appendices. Appendix A is the table of ANS indicators and targets as presented at the APIRG/20 meeting. Appendix B is the version of indicators and targets adopted by APIRG/20. Appendix C is another version with the same targets as the ones adopted by APIRG/20 but with additional indicators.

2. BACKGROUND

2.1. History

2.1.1. The idea of developing and adopting ANS performance indicators and targets is traceable to recommendation 6/1 of the 12th Air navigation Conference on alignment of regional air navigation plans to the 4th version of the Global Air Navigation Plan (GANP 4) by 2014. The GANP 4 in turn followed up the Performance-Based Approach (PBA) to air navigation which is promoted by Doc 9883 – Manual on Global Performance of Air Navigation Systems. The principles of PBA enunciated by Doc 9883 are characterized by a strong focus on objectives and targets, informed decision-making driven by the desired / required results, and reliance on facts and data.

2.1.2. Thereafter, the journey of adopting ANS performance indicators and targets was launched at the APIRG/19 meeting. The idea then gathered momentum under successive meetings of the AFI Plan Steering Committee (12th, 13th, 14th), culminating in decisions SC14/Dec 05 and SC14/Dec 06 of the 14th Steering Committee meeting which took place in Montreal, Canada on 24 October 2014. SC14/Dec 05 adopted the ANS performance indicators and targets and asked the AFI Plan secretariat to present them to the next APIRG meeting, while SC14/Dec 06 encouraged AFCAC to coordinate with African Union for endorsement.

2.2. Status

2.2.1. The ANS performance indicators and targets (see Appendix A) were presented at the 20th Meeting of APIRG (APIRG/20). The meeting adopted a modified version under Decision 20/04 (see Appendix B). The same decision included provisions to have the performance indicators and targets presented to the 3rd RASG-AFI coordination meeting for information and thereafter to the AFI Plan Steering Committee for endorsement. This paper presents an additional , slightly amended table with the same targets as Appendix B, but with some additional performance indicators (see Appendix C). Many of the additional are indicators are picked from Appendix A while others are new suggestions by the author. The indicators and targets are now due for consideration by the AFI Plan Steering Committee.

3. DISCUSSION

A glance at Performance indicators and targets

3.1. Categorization

3.1.1. The adopted ANS performance indicators can be categorized in two ways. On one hand, they are categorized in terms of the nature of the targets. There are targets that are operational (items 1, 2 and 3) and those that are institutional. The institutional targets are further categorized in terms of those that are national (items 4, 5 and 6) and those that are regional (7 and 8).

3.1.2. On the other hand there is categorization in terms of implementation deadline. There are three deadlines – 31 December 2016, 31 December 2018 and 31 December 2020. Clearly the most urgent are those whose deadline is the nearest – 31 December 2016. These are:-

- PBN plans and updates
- CO2 emissions reduction plans,
- SAR organizations,
- Harmonization of ANS operations and regulations,
- Seamless ANS along air traffic flows.

Whereas those targets of 2018 and 2020 seem to be a little far, this impression is deceptive. Achievement of the targets under these categories requires efforts each year starting now.

Issues and challenges with Indicators

3.1.3. The determination of appropriate/suitable indicators can become a complex task. Ideal indicators have the properties of being quantifiable, comparable across states / regions, and the requisite data easily collectable from states. Indicators in themselves must be easily related to the issue being monitored / measured.

3.1.4. Specifically for the ANS indicators and targets adopted by APIRG, those for operations (item 1, 2 and 3) are more complex than the institutional indicators and targets. Whereas the institutional targets and associated indicators are easier to measure (being clearly definable tasks that are achievable given the resources), the former are more complex because they have underlying layers which include issues arising from the institutional.

3.1.5. The adopted operational targets / indicators measure operational outcomes such as accidents, loss of separation, etc. The operational outcomes are themselves a result of pre-cursor events such as communication failure, surveillance failures, human factors such as ATCO competence, etc. As such, the achievement of the above operational targets requires additional work to identify the precursor events and how to measure, monitor and control their root causes. It may be noted that many of the institutional targets, if met, do contribute to the achievement of the operational targets. This is, especially, the case for item 4 “Implementation of ASBUs” and item 7 “Integrate AN systems by 31 December 2018”, item 6 bullet 3 “Establish wildlife management systems” and bullet 4 “Establish ANS human resource management systems, and item 8 “Implement seamless ANS along Air traffic Flows.)

3.1.6. Another aspect that needs serious consideration is the harmonization of targets and their associated indicators. One aspect of harmonization, especially with regard to operational targets is the normalization of indicators to make the data realistically comparable across states / regions. This affects all the three targets / indicators adopted by APIRG. For example "reduction of number of loss of separation occurrences …" requires first to get the "number of separation occurrences". Even then, this number in itself may be inappropriate if it is not given the context such as the level of activity. The level of activity itself has various options such as number of flight hours, traffic density, etc.

3.1.7. From the foregoing, it is clear that for operational indicators, more work lies ahead to agree on exposure data. And for achievement of operational targets, the precursor events and their root causes to include in order to control the outcome events.

Other Challenges

3.1.8. The usual challenges of the AFI states of apparent lack of commitment and resource constraints continue to bedevil the region. At the APIRG/20 meeting, the ATM/SAR subgroup reported low reporting of deficiencies, incidents and implementation progress. Yet in the new way of doing things, which provides numerous tools and is performance-based, expects even more participation from states in terms of providing accurate information / data on all the relevant aspects of their operations and project implementation. Unless change happens quickly, this situation may continue to be a dilemma. All aviation stakeholders need to assist the region in lobbying the powers that be and championing the need for change of attitudes.

3.2. Planning and implementation framework

APIRG structure and experiences

3.2.1. The achievement of the targets adopted by APIRG/20 and monitored using associated performance indicators will be driven by the new APIRG structure and its contributory bodies. Whereas the individual states will be responsible for implementation of the projects in their territories, the APIRG Project Coordination Committee (APCC) will support the states with the newly created Infrastructure & Information (IIM) and Airspace & Aerodrome Operations (AAO) sub-groups together with their teams of experts and champions, all supported facilitators from ICAO regional offices. Even before the sub-groups are constituted, the former study groups together with the regional offices have identified and are in advanced stages of developing a number of projects.

3.2.2. Under the new arrangements and work methods of the New APIRG, able states will be expected to contribute and dedicate more human resources. All states will also be expected to improve on their collection and reporting of data related to the targets and indicators.

Borrowing a leaf from others

3.2.3. Of all the ICAO regions, APANPIRG and MIDANPIRG (though ahead of APIRG) are the closest in achievements / failure and therefore APIRG can more meaningfully relate with them. For example, like APIRG, APANPIRG has challenges of diversified ANS infrastructure, diverse cultures, wide differences in levels of economic

development, lack of commitment of states (to meetings, seminars, etc), limitations is technical and financial resources, problems of civil-military coordination, and language barrier. Yet APANPIRG has posted successes in developing initiatives for enhanced regional ANS infrastructure, PBN and Inter-regional AIDC.

3.2.4. Like APIRG, MIDANPIRG is still battling with ASBUs Block 0. Their implementation strategy/ approach involving prioritization, monitoring and reporting mechanisms may give APIRG further insights.

4. CONCLUSIONS

4.1. The AFI ANS Performance Indicators and Targets, with a little refinement in harmonization and normalization of a number indicators, are almost ready for application in improving air navigation in the AFI region;

4.2. The usual lack of commitment by many AFI states, if it continues, will be a threat to the successful implementation of ANS improvement projects;

4.3. Operationalisation of the new APIRG structure is still in its infancy and yet it is critical to the successful attainment / achievement of the targets

4.4. More efforts to encourage / persuade AFI states to increase their participation is needed;

4.5. Lessons from APANPIRG and MIDANPIRG are useful to APIRG

5. RECOMMENDATIONS

5.1. The APCC together with stakeholders should finalize the refinement of the ANS performance indicators;

5.2. Aviation stakeholder should add their voice to the powers that be to get more commitment from states. AFCAC could take a leading role in this matter;

5.3. Associated with 5.2, stakeholders should help in lobbying the powers that be to play their role ensure full operationalisation of the new structure and working methods;

5.4. Interfaces with APANPIRG and MIDANPIRG should be encouraged – including peer reviews.

APPENDIX A – Presentation by ICAO at APIRG/20 on Air navigation System Implementation Plan

Attached File:- ANS Implementation Action Plan.pdf

APPENDIX B – ANS Performance Indicators and targets adopted by APIRG/20

Item, Description	Year				
	2016	2017	2018	2019	2020
1. Reduce the number of loss of separation occurrences due to ANS infrastructure deficiencies by 50%	x	x	x	x	X
2. Reduce the number of aircraft accidents related to ATM safety by 50%	x	x	x	X	x
3. Reduce the number of uncoordinated flights by 50%	x	x	x	x	X
Institutional targets (100%) by 31 December 2018 ***At National Level***					
4. Implement ICAO Aviation System Block Upgrades (ASBUs)					
Implement Priority ASBU Block-0 Modules by 2018	x	x	x		
Establish and update national PBN plans by 2016	X				
Implement all applicable elements of PBN by 2018	x	x	X		
Implement Continuous Descent Operations/Continuous Climb Operations (CDO/CCO) by 2018	X	x	x		
5. Reduce CO2 Emissions					
Establish CO2 emissions reduction action plans by December 2016					
Implement mitigation measures					
6. Assess and manage risks					
Establish effective and operational Search and Rescue (SAR) organization by 31 December 2016	X				
Establish aerodrome emergency plans					
Establish wildlife management systems	x	x	x	x	X
Establish ANS human resource management system	x	x	x	x	X
At regional level					
7. Integrate ANS systems by 31 December 2018					
Implement digital ATS coordination	x	x	X		
Implement en-route data link applications	x	x	X		
Implement ANS Quality Management Systems (QMS)	x	x	x		
8. Increase harmonization between ANS operations and regulations by 31 December 2016					
Implement seamless ANS along Air Traffic Flows (AFI Single Sky)					

APPENDIX C – ANS Targets and Suggested Performance Indicators / Metrics

Targets	Deadline	Suggested ANS Performance Indicators/Metrics
A. OPERATIONAL		
1- Reduce the number of loss of separation occurrences due to ANS infrastructure deficiencies by 50%	2020	Number of loss of separation occurrences, normalized by applying a regionally agreed measure of exposure
2- Reduce the number of aircraft accidents related to ATM safety by 50%	-do-	Number of aircraft accidents per FIR, normalized by applying a regionally agreed measure of exposure
3- Reduce the number uncoordinated flights by 50%	-do-	Number of uncoordinated flights per FIR , normalized by applying an agreed measure of exposure
B. INSTITUTIONAL - NATIONAL		
4- Implement ICAO ASBUs upgrades	2018	
a. Implement priority ASBUs Block 0 modules by 2018	-do-	Number of relevant ASBU modules implemented by each state
b. Establish and update national PBN plans by 2016	2016	Number of states with up to date national PBN Plans
c. Implement all applicable elements of PBN by 2018	2018	Number of PBN routes Number of International Aerodromes/TMAs with PBN SIDs implemented Number of International Aerodromes/TMAs with PBN STARs implemented Number of International Aerodromes with Approach Procedures with vertical guidance (APV) Number of International Aerodromes with Approach Procedures with lateral guidance (LNAV)
d. Implement (CDO) and (CCO)	-do-	Number of International Aerodromes/TMA with CDO implemented Number of International Aerodromes/TMAs with CCO implemented Annual environmental benefits attained (reduced fuel consumption/GHG emissions)
5- Reduce CO2 emissions	2018?	
a. Establish CO2 emission reduction action plan by December 2016	2016	. Number of states with CO2 emission reduction action plans
b. Implement mitigation measures	2018?	Percentage reduction of CO2 emissions relative to a baseline case

6- Assess and manage risks	2020?	
a. Establish an effective and operational SAR organization by 31 December 2016	2016	Number of States with SAR Organization Number of States with SAR Plans Number of States with SAR Agreements
b. Establish aerodrome emergency plans	2016?	Number of aerodromes with emergency plans
c. Establish wildlife management plans	2020	Number of aerodromes with wildlife management plans
d. Establish ANS HRM system	-do-	Number of ANSPs with HRM systems
C. INSTITUTIONAL - REGIONAL		
7- Integrate ANS systems by 31 December 2018	2018	
a. Implement digital ATS coordination	-do-	Number of FIRs in which all applicable ACCs have implemented at least one ATS digital interface to use AIDC with neighboring ACCs Number of reported incidents related to lack of coordination between ACCs
b. Implement en-route data-link applications	-do-	Number of FIRs that have implemented data link for e-route operations
c. Implement ANS QMS	-do-	Number of States with ANS QMS implemented
8- Increase harmonization between ANS operations and regulations by 31 December 2016	2016	Percentage of ANS operations harmonized with corresponding regulations
a. Implement seamless ANS along Air Traffic Flows (AFI single sky)	-do-	Number of FIRs along Air Traffic Routes with seamless interconnections for communications (a/g, g/g) and Surveillance data; Number of flight hours along Air Traffic Flows under conditions of seamlessness (continuous connections and surveillance0