



INTERNATIONAL CIVIL AVIATION ORGANIZATION

SECOND MEETING OF THE REGIONAL AVIATION SAFETY GROUP FOR AFRICA AND THE INDIAN OCEAN REGION (RASG-AFI/2)

(Dakar, Senegal, 1-2 November 2013)

Agenda Item 9: Coordination between Regional Groups

OUTCOME OF THE NINETEENTH MEETING OF THE AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP (APIRG/19, DAKAR, SENEGAL, 28-31 OCTOBER 2013)

(Presented by the Secretariat)

SUMMARY
<p>This working paper presents the deliberations of APIRG/19 Meeting on the AFI Regional Air Navigation System Implementation Action aligned with the ICAO Global Air Navigation Plan (GANP) and the Aviation System Block Upgrades (ASBU) Methodology.</p> <p>APIRG/19 Meeting identified Safety related Block 0 modules, the implementation of which needs to be coordinated and addressed through regional aviation safety mechanisms (RASG-AFI, AFI Plan) and other relevant safety initiatives for the AFI Region.</p> <p>Action by the meeting is at paragraph 3.</p>
<p>REFERENCE(S): -APIRG/18 & 19 Reports -RASG-AFI/1 Report</p>
<p>Related ICAO Strategic Objective(s): The working paper relates to the Safety Strategic Objective of ICAO.</p>

1. INTRODUCTION

1.1 This working paper presents the deliberations of APIRG/19 Meeting on the AFI Regional Air Navigation System Implementation Action aligned with the ICAO Global Air Navigation Plan (GANP) and the Aviation System Block Upgrades (ASBU) Methodology.

2. DISCUSSION

Implementation of the AFI Air Navigation System Implementation Action Plan aligned with the ICAO Aviation System Block Upgrade (ASBU) Methodology

2.2 APIRG/19 Meeting noted the ICAO Twelfth Air Navigation Conference (AN-Conf/12) Recommendation 6/1 – *Regional performance framework – planning methodologies and tools*, which – inter alia – requests States and PIRGs to:

- a) finalize the alignment of regional air navigation plans with the Fourth Edition of the *Global Air Navigation Plan* (Doc 9750, GANP) by May 2014;
- b) focus on implementing aviation system block upgrade Block 0 Modules according to their operational needs, recognizing that these modules are ready for deployment;
- c) use the eANPs as the primary tool to assist in the implementation of the agreed regional planning framework for air navigation services and facilities;
- d) involve regulatory and industry personnel during all stages of planning and implementation of aviation system block upgrade modules; and
- e) develop action plans to address the identified impediments to air traffic management modernization as part of aviation system block upgrade planning and implementation activities.

2.3 APIRG/19 Meeting was informed that the Council of ICAO had approved the Fourth Edition of the *Global Air Navigation Plan* (GANP, Doc 9750) on 29 May 2013, and particularly called on the Planning and Implementation Regional Groups (PIRGs) of the ICAO Regions to:

- a) develop regional action plans with priorities and targets;
- b) determine performance indicators/metrics to measure implementation progress and associated benefits; and
- c) identify implementation challenges.

2.4 As a follow up to the above recommendations emanating from the Twelfth Air Navigation Conference, the ICAO Council and the Global PIRG/RASG Coordination Meeting (March 2013), an initial draft AFI Regional Air Navigation System Implementation Action Plan was developed by the Secretariat and circulated to States for their review and comments.

2.5 In order to assist in the development of the AFI Regional Air Navigation System Implementation Action Plan, an ICAO Regional Workshop on ASBU took place in Nairobi, from 21 to 25 October 2013. The workshop which was attended by 88 delegates representing 23 Contracting States and 6 international organizations.

2.6 APIRG/19 Meeting reviewed the initial draft AFI Air Navigation System Implementation Action Plan prepared by the Workshop, and agreed on the priorities, targets and metrics/indicators to measure implementation progress and operational improvements for all the 18 ASBU Block 0 Modules applicable to the AFI Region. 15 Air Navigation

Reporting Forms (ANRFs) were developed for recommended modules, and 3 other ANRFs need to be completed for specific modules (B0-ASEP, B0-OPFL and B0-WAKE).

2.7 APIRG/19 Meeting identified 14 out of 18 Block 0 modules which are related to the Safety Key Performance Area (KPA), the implementation of which needs to be coordinated and addressed through regional aviation safety mechanisms (RASG-AFI, AFI Plan) and other relevant safety initiatives for the AFI Region. These modules support the implementation of the high level safety targets adopted for the AFI Region. A description of the safety related ASBU Modules is provided in **Appendix** to this working paper.

2.8 APIRG/19 Meeting recognized the importance of providing capacity building through workshops and seminars to AFI States and regional stakeholders as the needs arise at different levels of ASBUs.

2.9 APIRG/19 Meeting called upon the African Civil Aviation Commission (AFCAC), Regional Economic Organizations and Financial institutions to provide their support and assist States the implementation of the AFI Regional Air Navigation System Implementation Action Plan.

2.10 In view of the above, APIRG/19 adopted the following Conclusion:

ADOPTION OF AFI REGIONAL AIR NAVIGATION SYSTEM IMPLEMENTATION PLAN ALIGNED WITH THE ICAO AVIATION SYSTEM BLOCK UPGRADES (ASBU)

That:

- a) **AFI States adopt the Regional Air Navigation System Implementation Plan aligned with the 18 Block 0 Modules of the ICAO Aviation System Block Upgrade (ASBU) Methodology, as provided at Appendix to this report;**
- b) **That AFI States implement the adopted modules based on their operational needs, the prioritization and the categorization defined in the Action Plan;**
- c) **The Secretariat finalize the implementation targets established for the adopted ASBU Block 0 Modules, and ensure that these targets are aligned with existing regional programmes aimed at enhancing air navigation capacity and efficiency and aviation safety;**
- d) **The APIRG and the ICAO Regional Office coordinate the implementation of the ASBU Block 0 Modules related to Safety Key Performance Area with regional aviation safety mechanisms (RASG-AFI, AFI Plan) and other relevant safety initiatives for the AFI Region;**
- e) **ICAO continually provide capacity building through workshops and seminars to AFI States and regional stakeholders as the needs arise in the different levels of ASBUs; and**
- f) **The African Civil Aviation Commission (AFCAC), Regional Economic Communities and Financial institutions to provide their support and assist States the implementation of the AFI Regional Air Navigation System Implementation Action Plan.**

3. ACTION BY THE MEETING

3.1 This meeting is invited to:

- a) note the information provided in this working paper;
- b) agree that the AFI Regional Air Navigation System Implementation Action Plan adopted by APIRG/19 Meeting support the high level safety targets and the enhancement of aviation safety in the AFI Region; and
- c) request the RASG-AFI to address the implementation of the relevant safety related ASBU Block 0 Modules identified by APIRG/19 Meeting as shown in Appendix to this working paper, in coordination with the relevant bodies and aviation safety mechanisms.

-END-

Appendix to WP/20

**Summary Table of Safety Related
Aviation System Block Upgrades (ASBU) Block 0 Modules
for the AFI Region**

**Performance Improvement Area 1:
Airport Operations**

Title of the Module:					
B0-APTA: Optimization of Approach Procedures Including Vertical Guidance					
<u>Elements:</u> 1. APV with Baro VNAV 2. APV with SBAS 3. APV with GBAS		<u>Equipage/Air</u> - Basic IFR GNSS avionics integrated with Baro VNAV functionality - SBAS avionics - GBAS avionics		<u>Equipage/Ground</u> - SBAS (reference stations, master stations, GEO satellites) - GBAS	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u> 1. Indicator: <i>Percentage of international aerodromes having instrument runways provided with APV on the basis of Baro VNAV/SBAS/GBAS</i>	Qualitative performance benefits associated with five main KPAs only				
	<u>KPA- Access/Equity</u> Increased aerodrome accessibility	<u>KPA- Capacity</u> Increased runway capacity	<u>KPA- Efficiency</u> Reduced fuel burn due to lower minima, fewer diversions, cancellations, delays	<u>KPA- Environment</u> Reduced emissions due to reduced fuel burn.	<u>KPA- Safety</u> Increased safety through stabilized approach paths.

**Performance Improvement Area 1:
Airport Operations**

Title of the Module:					
B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)					
<u>Elements</u>	<u>Equipage/Air</u>			<u>Equipage/Ground</u>	
1. Surveillance 2. Alerting systems 3. (Not included in the Module but added here as they are closely linked to this Module) Visual aids for navigation and Wild life strike hazard reduction	- ADS-B / SSR transponder system			- SMR/SSR Mode S/ ADS B/ Multilateration - Surveillance display with alerting functionalities in the tower. - A cooperative transponder system for vehicles - Visual aids for navigation	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u>	Qualitative performance benefits associated with five main KPAs only				
1. Indicator: <i>Percentage of international aerodromes with SMR/ SSR Mode S/ ADS-B Multilateration</i>	<u>KPA- Access/Equity</u> Improves KPA- Access/Equity to portions of the manoeuvring area obscured from view of the control tower for vehicles and aircraft. Ensures equity in ATC handling of surface traffic regardless of the traffic's position on the international aerodrome.	<u>KPA- Capacity</u> Sustained level of aerodrome capacity during periods of reduced visibility	<u>KPA- Efficiency</u> Reduced taxi times through diminished requirements for intermediate holdings based on reliance on visual surveillance only. Reduced fuel burn.	<u>KPA- Environment</u> Reduced emissions due to reduced fuel burn	<u>KPA- Safety</u> Reduced runway incursions. Improved response to unsafe situations. Improved situational awareness leading to reduced ATC workload.
2. Indicator: <i>Percentage of international aerodromes with a cooperative transponder systems on vehicles</i>					
3. Indicator: <i>Percentage of international aerodromes complying with visual aid requirements as per Annex 14</i>					

**Performance Improvement Area 2:
Globally Interoperable Systems and Data – Through Globally Interoperable System
Wide Information Management**

<u>Title of the Module:</u> B0-FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration					
<u>Elements:</u> 1. AIDC 2. (Not included in the Module but added here as they are closely linked to this Module) AMHS/IPS		<u>Equipage/Air</u> - Nil		<u>Equipage/Ground</u> - A set of AIDC messages in FDPS - AFTN (AMHS/IPS)	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u>	Qualitative performance benefits associated with five main KPAs only				
1. Indicator: <i>Percentage of ATS units with AIDC</i>	<u>KPA-Access/Equity</u> Not Applicable	<u>KPA-Capacity</u> Reduced controller workload and increased data integrity supporting reduced separations translating directly to cross sector or boundary capacity flow increases.	<u>KPA-Efficiency</u> The reduced separation can also be used to more frequently offer aircraft flight levels closer to the optimum; in certain cases, this also translates into reduced en-route holding.	<u>KPA-Environment</u> Not Applicable	<u>KPA-Safety</u> Better knowledge of more accurate flight plan information.
2. Indicator: <i>States implementing AMHS/IPS</i>					

**Performance Improvement Area 2:
Globally Interoperable Systems and Data – Through Globally Interoperable System
Wide Information Management**

Title of the Module:					
B0-DATM; Service Improvement through Digital Aeronautical Information Management					
<u>Elements:</u> 1. AIXM 2. eAIP 3. Digital NOTAM 4. (Not included in the Module but added here as they are closely linked to this Module) WGS-84; eTOD; and QMS for AIM	<u>Equipage/Air</u> - Nil			<u>Equipage/Ground</u> AIXM; eAIP and Digital NOTAM WGS-84; eTOD; QMS for AIM The aeronautical information is made available to external users via either a subscription to an electronic access or physical delivery; The electronic access can be based on Internet protocol services.	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u> 1. Indicator: <i>States implementing AIXM; eAIP, Digital NOTAM WGS-84; eTOD; QMS for AIM</i>	Qualitative performance benefits associated with five main KPAs only				
	<u>KPA-Access/Equity</u> Not Applicable	<u>KPA-Capacity</u> Not Applicable	<u>KPA-Efficiency</u> Not Applicable	<u>KPA-Environment</u> Reduced amount of paper for promulgation of information	<u>KPA-Safety</u> Reduction in the number of possible inconsistencies

**Performance Improvement Area 2:
Globally Interoperable Systems and Data – Through Globally Interoperable System
Wide Information Management**

Title of the Module:					
B0-AMET: Meteorological information supporting enhanced operational efficiency and safety					
<u>Elements:</u>	<u>Equipage/Air</u>			<u>Equipage/Ground</u>	
1. WAFS-IAVW-TCW 2. Aerodrome warning, wind shear warning and alerts 3. SIGMET information	- Nil			<ul style="list-style-type: none"> - Connection to the AFS satellite and public Internet distribution systems - Connection to the AFTN - Local arrangements for reception of aerodrome warning ,wind shear warning and alerts 	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u>	Qualitative performance benefits associated with five main KPAs only				
1 Indicator: <i>States implementation of SADIS 2G satellite broadcast and/or Secure SADIS FTP service.</i>	<u>KPA-Access/Equity</u> Not Applicable	<u>KPA-Capacity</u> Optimized usage of airspace and aerodrome capacity due to MET support	<u>KPA-Efficiency</u> Reduced arrival/departure holding time, thus reduced fuel burn due to MET support -	<u>KPA-Environment</u> Reduced emissions due to reduced fuel burn due to MET support	<u>KPA-Safety</u> Reduced incidents/accidents in flight and at international aerodromes due to MET support.
2. Indicator: <i>States implementation of WAFS Internet File Service (WIFS)</i>					

**Performance Improvement Area 3:
Optimum Capacity and Flexible Flights – Through Global Collaborative ATM**

<u>Title of the Module:</u> B0-NOPS: Improved Flow Performance through Planning based on a Network-Wide view					
<u>Elements:</u> Air Traffic Flow Management		<u>Equipage/Air</u> - Nil		<u>Equipage/Ground</u> - System software for ATFM	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u>	Qualitative performance benefits associated with five main KPAs only				
1. Indicator: <i>Percentage of ATS units using ATFM services.</i>	<u>KPA-Access/Equity</u> Improved Access and equity in the use of airspace or aerodrome by avoiding disruption of air traffic. ATFM processes take care of equitable distribution of delays.	<u>KPA-Capacity</u> Better utilization of available capacity, ability to anticipate difficult situations and mitigate them in advance.	<u>KPA-Efficiency</u> Reduced fuel burn due to better anticipation of flow issues; Reduced block times and times with engines on. -	<u>KPA-Environment</u> Reduced fuel burn as delays are absorbed on the ground, with shut engines; or at optimum flight levels through speed or route management. .	<u>KPA-Safety</u> Reduced occurrences of undesired sector overloads

**Performance Improvement Area 3:
Optimum Capacity and Flexible Flights – Through Global Collaborative ATM**

Title of the Module:					
B0-ASUR: Initial capability for ground surveillance					
<u>Elements:</u> 1. ADS-B 2. Multilateration		<u>Equipage/Air</u> - ADS-B OUT. - Mode S radar transponders for Multilateration		<u>Equipage/Ground</u> - FDPS and SDPS - ADS-B - Multilateration	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u>	Qualitative performance benefits associated with five main KPAs only				
1. Indicator: <i>Percentage of international aerodromes with ADS-B/MLAT</i>	<u>KPA- Access/Equity</u> Not Applicable	<u>KPA- Capacity</u> Typical separation minima are 3 NM or 5 NM enabling an increase in traffic density compared to procedural minima. TMA surveillance performance improvements are achieved through high accuracy, better velocity vector and improved coverage.	<u>KPA- Efficiency</u> Not Applicable	<u>KPA- Environment</u> Not Applicable	<u>KPA- Safety</u> Reduction of the number of major incidents. Support to search and rescue.

**Performance Improvement Area 3:
Optimum Capacity and Flexible Flights – Through Global Collaborative ATM**

Title of the Module:					
B0-ASEP: Air Traffic Situational Awareness(ATSA)					
<u>Elements:</u>		<u>Equipage/Air</u>		<u>Equipage/Ground</u>	
1. ATSA-AIRB 2. ATSA-VSA		- ADS-B OUT - ADS-B IN - Traffic display		- Nil	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u>	Qualitative performance benefits associated with five main KPAs only				
<i>1. Indicator: Percentage of aircraft with ADS-B OUT</i>	<u>KPA-Access/Equity</u> Not Applicable	<u>KPA-Capacity</u> Not Applicable	<u>KPA-Efficiency</u> Improved situational awareness in identifying level change opportunities with current separation minima (AIRB) and improved visual acquisition (VSA).	<u>KPA-Environment</u> Not Applicable	<u>KPA-Safety</u> Improved situational awareness and reduced likelihood of wake turbulence encounters and missed approaches.
<i>2. Indicator: Percentage of aircraft with ADS-B IN_</i>					

**Performance Improvement Area 3:
Optimum Capacity and Flexible Flights – Through Global Collaborative ATM**

Title of the Module:					
B0-OPFL: Improved KPA-Access/Equity to Optimum Flight Levels through Climb/Descent Procedures using ADS-B					
<u>Elements:</u> ITP using ADS-B		<u>Equipage/Air</u> - ADS-B IN - ADS-B OUT		<u>Equipage/Ground</u> - Conflict probe logics	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u>	Qualitative performance benefits associated with five main KPAs only				
<i>1. Indicator: Percentage of aircraft used ITP</i>	<u>KPA-Access/Equity</u> Not Applicable	<u>KPA-Capacity</u> Improvement in capacity on a given air route.	<u>KPA-Efficiency</u> Increased efficiency on oceanic and potentially continental en-route	<u>KPA-Environment</u> Reduced emissions	<u>KPA-Safety</u> A reduction of possible injuries for cabin crew and passengers.

**Performance Improvement Area 3:
Optimum Capacity and Flexible Flights – Through Global Collaborative ATM**

Title of the Module:					
B0-ACAS: ACAS Improvements					
<u>Elements:</u> ACAS II (TCAS version 7.1)		<u>Equipage/Air</u> - TCAS V7.1		<u>Equipage/Ground</u> Nil	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u>	Qualitative performance benefits associated with five main KPAs only				
1. Indicator: <i>Percentage of aircraft with ACAS, logic Version 7.1</i>	<u>KPA- Access/Equity</u> Not Applicable	<u>KPA- Capacity</u> Not Applicable	<u>KPA- Efficiency</u> ACAS improvement will reduce unnecessary resolution advisory (RA) and then reduce trajectory deviations.	<u>KPA- Environment</u> Not Applicable	<u>KPA- Safety</u> ACAS increases safety in the case of breakdown of separation.

**Performance Improvement Area 3:
Optimum Capacity and Flexible Flights – Through Global Collaborative ATM**

Title of the Module:					
B0-SNET: Increased Effectiveness of Ground-Based Safety Nets					
<u>Elements:</u> 1. Short Term Conflict Alert (STCA) 2. Area Proximity Warning (APW) 3. Minimum Safe Altitude Warning (MSAW)		<u>Equipage/Air</u> - SSR Mode C/S transponder - ADS-B OUT		<u>Equipage/Ground</u> - Short Term Conflict Alert, - Area Proximity Warnings and - Minimum Safe Altitude Warnings	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u> 1. Indicator: <i>Percentage of ATS units with ground based safety nets</i>	Qualitative performance benefits associated with five main KPAs only				
	<u>KPA-Access/Equity</u> Not Applicable	<u>KPA-Capacity</u> Not Applicable	<u>KPA-Efficiency</u> Not Applicable	<u>KPA-Environment</u> Not Applicable	<u>KPA-Safety</u> Significant reduction of the number of major incidents

**Performance Improvement Area 4:
Efficient Flight Path – Through Trajectory-based Operations**

Title of the Module:					
B0-CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)					
<u>Elements:</u> 1. CDO 2. PBN STARs		<u>Equipage/Air</u> - Nil		<u>Equipage/Ground</u> - Nil	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u>	Qualitative performance benefits associated with five main KPAs only				
1. Indicator: <i>Percentage of international aerodromes with CDO implemented</i>	<u>KPA-Access/Equity</u> Not Applicable	<u>KPA-Capacity</u> Not Applicable	<u>KPA-Efficiency</u> Cost savings through reduced fuel burn. Reduction in the number of required radio transmissions.	<u>KPA-Environment</u> Reduced emissions as a result of reduced fuel burn	<u>KPA-safety</u> More consistent flight paths and stabilized approach paths. Reduction in the incidence of controlled flight into terrain (CFIT).
2. Indicator: <i>Percentage of international aerodromes/TMAs with PBN STARs implemented</i>					

**Performance Improvement Area 4:
Efficient Flight Path – Through Trajectory-based Operations**

<u>Title of the Module:</u>					
B0-TBO: Improved Safety and Efficiency through the initial application of Data Link En-Route					
<u>Elements:</u> 1.ADS-C over oceanic and remote areas 2.Continental CPDLC		<u>Equipage/Air</u> - FANS 1/A; ATN B1		<u>Equipage/Ground</u> - ADS-C - VDL Mode 2/Continental CPDLC	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u>	Qualitative performance benefits associated with five main KPAs only				
1. Indicator: <i>Number of ADS-C /CPDLC procedures available over oceanic and remote Areas</i>	<u>KPA-Access/Equity</u> Not Applicable	<u>KPA-Capacity</u> A better localization of traffic and reduced separation allow increased capacity. Reduced communication workload and better organization of controller tasks allowing increasing sector capacity.	<u>KPA-Efficiency</u> Routes/tracks and flights can be separated by reduced minima, allowing to apply flexible routings and vertical profiles closer to the user-preferred ones.	<u>KPA-Environment</u> Reduced emissions as a result of reduced fuel burn.	<u>KPA-Safety</u> ADS-C based safety nets supports cleared level adherence monitoring, route adherence monitoring, danger area infringement warning and improved search and rescue. Reduced occurrences of misunderstandings; solution to stuck microphone situations.

**Performance Improvement Area 4:
Efficient Flight Path – Through Trajectory-based Operations**

Title of the Module:					
B0-CCO: Improved Flexibility and Efficiency in Departure Profiles (CCO)					
<u>Elements:</u> 1. CCO 2. PBN SIDs		<u>Equipage/Air</u> - Nil		<u>Equipage/Ground</u> - Nil	
Implementation monitoring and intended performance impact					
<u>Implementation progress</u>	Qualitative performance benefits associated with five main KPAs only				
1. Indicator: <i>Percentage of international aerodromes with CCO implemented</i>	<u>KPA-Access/Equity</u> Not Applicable	<u>KPA-Capacity</u> Not Applicable	<u>KPA-Efficiency</u> Cost savings through reduced fuel burn and efficient aircraft operating profiles. Reduction in the number of required radio transmissions.	<u>KPA-Environment</u> Authorization of operations where noise limitations would otherwise result in operations being curtailed or restricted. Environmental benefits through reduced emissions.	<u>KPA-Safety</u> More consistent flight paths. Reduction in the number of required radio transmissions. Lower pilot and air traffic control workload
2. Indicator: <i>Percentage of international aerodromes with PBN SIDs implemented</i>					