CONSOLIDATED APIRG/17 CONCLUSIONS

Draft Conclusions No.	Title of Conclusions	Text of Conclusions	Follow-up Action	To be initiated by	Deliverable/ Intended Outcome	Target Dates	Status of Implementation
Draft Conclusion 18/xxxx	**NATIONAL PBN IMPLEMENTATION PLAN**	That States, (a) that have not already done so, complete their national PBN implementation plans as a matter of urgency, using the template at Appendix C to the report on agenda item 2; (b) consider the use of planning tools provided by the PBN/GNSS Task Force, as well as project management software; and (c) provide updates to Regional Offices. (This Draft Conclusion is to supersede APIRG Conclusions 17/47 and 17/48)				30 September 2011 Continuous process 30 Oct 2010	Many States have still to developed plans Continuous process
~~**Draft Conclusion 17/47**~~	~~**NATIONAL PBN IMPLEMENTATION PLAN**~~	~~That States:~~ ~~(a) Use the Regional PBN implementation plan template at Appendix 3.4E to this report , for the development of a national PBN implementation plan and consider the action planning provided by the Joint PBN/GNSS/I Task Forces Meeting to support planning;~~ ~~(b) Provide feedback to the ESAF and WACAF Regional Offices by 30 October 2010 regarding~~					

Draft Conclusions No.	Title of Conclusions	Text of Conclusions	Follow-up Action	To be initiated by	Deliverable/ Intended Outcome	Target Dates	Status of Implementation
		~~progress in the development of their national plans, indicating any challenges, if any, that are delaying the development of the plan, as well as measures taken or to be taken to overcome such challenges; and~~ ~~(c) Complete their National PBN plans as soon as possible.~~					
~~**Draft Conclusion 17/48**~~	~~**PBN IMPLEMENTATION TOOLS**~~	~~That States:~~ ~~(a) Use project management plans and implementation action plans provided by the PBN Task Force, as well as project management softwares (such as Microsoft project or freely available applications), to support PBN implementation activities; and~~ ~~**(b)** Carry out a gap analysis using the project plan template attached to the report, or similar approach, in order to more accurately develop their PBN implementation plans.~~					

Draft Conclusions No.	Title of Conclusions	Text of Conclusions	Follow-up Action	To be initiated by	Deliverable/ Intended Outcome	Target Dates	Status of Implementation
Draft Conclusion 18/xxxxx	**LOWERING OF RNAV/RNP ROUTES UM214 AND UM215**	That, ~~concerned States~~ States that have not already done so, be urged to establish the lowest usable flight level on the RNAV routes UM214 and UM215 as flight level 250 for operational reasons. (This Draft Conclusion is to supersede APIRG Conclusions 17/51)		ICAO ROs	Lower limit of FL250 implemented	AIRAC date of 13 Jan 2011	
New Draft Conclusion 18/xxxx	**AFI PBN REGIONAL PERFORMANCE FRAMEWORK FORMS**	That; (a) the AFI PBN Regional Performance Framework Forms are updated as at **Appendix 3X-1 to 3X-3**, to the report on agenda item 3; (b) noting that the 2009 deadline established in Assembly Resolution A36-23 for the completion of State PBN implementation Plans has passed, States that have not done so, complete their national PBN implementation plans as a matter of urgency. (This draft Conclusion supersedes PBN/GNSS TF/1 Draft Conclusion 1/3).					
~~**Draft Conclusion 1/04**~~	~~**DEVELOPMENT AND IMPLEMENTATION OF PBN NATIONAL PLANS**~~	~~That:~~ ~~(a) ICAO Regional Offices assess the PBN plans submitted by the States against the available global and regional guidance pertaining to PBN; and~~ ~~(b) ICAO should pursue its efforts~~					

Draft Conclusions No.	Title of Conclusions	Text of Conclusions	Follow-up Action	To be initiated by	Deliverable/ Intended Outcome	Target Dates	Status of Implementation
		~~towards establishing an effective PBN programme with a view to assisting States in overcoming PBN implementation challenges.~~ (Deleted in view of APIRG Concl; 17/105 and PBN/GNSS TF/1 Draft Conclusion 1/01)					
Draft Conclusion 18/xxxx	**TRAINING IN SUPPORT OF PBN IMPLEMENTATION**	That, in order to support the implementation of PBN in the AFI Region, AFI Regional Offices organize seminars/workshops for training of relevant personnel directly involved in the implementation of PBN (This draft Conclusion is to supersede APRIG Conclusion 17/53)	Organize Seminars and workshops	ICAO ROs	Seminars and Workshops	2010-2012	Seminar scheduled Dec. 2011
~~**Draft Conclusion 17/53:**~~	~~**TRAINING IN SUPPORT OF PBN IMPLEMENTATION**~~	~~That, in order to support the implementation of PBN in the AFI Region:~~ ~~a) PBN Task Force identify priority training needs for implementation for PBN;~~ ~~b) AFI Regional Offices organize seminars/workshops for training of relevant personnel directly involved in the implementation of PBN.~~					

Draft Conclusions No.	Title of Conclusions	Text of Conclusions	Follow-up Action	To be initiated by	Deliverable/ Intended Outcome	Target Dates	Status of Implementation
Draft Conclusion 18/xxxx	**AFI PBN IMPLEMENTATION REGIONAL PLAN**	That: (a) the AFI Regional PBN Implementation Plan is updated as at **Appendix 4B** to the report on agenda item 4; and (b) the Plan be included in the AFI Doc 003. (This draft Conclusion is to supersede APRIG Conclusion 17/46)	Implementation PBN Regional plan Update Doc003	States ICAO ROs	Updated AFI Regional PBN implementation plan Updated Doc003	According to plan 31Mar 2011	
~~**Draft Conclusion 17/46:**~~	~~**AFI PBN IMPLEMENTATION REGIONAL PLAN**~~	~~That:~~ ~~(a) The AFI Regional PBN implementation plan is updated and endorsed as at Appendix g 3.4D to this report, to more accurately reflect PBN implementation goals in Assembly Resolution A36-23, guidance in the PBN Manual (9613), and Regional planning guidance provided by APIRG; and~~ ~~(b) The Regional PBN Implementation Plan be included in the AFI Doc 003.~~					

Draft Conclusions No.	Title of Conclusions	Text of Conclusions	Follow-up Action	To be initiated by	Deliverable/ Intended Outcome	Target Dates	Status of Implementation
~~**Draft Conclusion 1/07**~~	~~**IMPLEMENTATION OF PHASE I OF AFI GNSS STRATEGY**~~	~~That AFI States which have not yet done so:~~ ~~(a) complete the implementation of WGS-84 coordinates; and~~ ~~(b) ensure that all the prerequisites are met when implementing GNSS applications for en route and non-precision approach (NPA) operations in accordance with the current Phase 1 of AFI GNSS Strategy, and in support of PBN operations.~~ Part (a) of the Draft Conclusion to be merged with APIRG Concl.17/90 and 17/96. Part (b) of the draft Conclusion to be included in GNSS Implementation Strategy	~~Proposal for AFI SIP~~	~~ICAO ROs Dakar and Nairobi~~.	~~Assist States having difficulties in WGS-84 implementation~~	~~2012~~	~~Continuous Process .~~
Draft Conclusion 18/xxxx	**REVISED TERMS OF REFERENCE OF THE PBN/GNSS TASK FORCE**	That, the terms of reference of the APIRG PBN/GNSS Task Force are revised as at **Appendix 6A** to the report on agenda item 6.					

*Note: ICAO has established the following Strategic objectives for the period 2011-2013

A: *Safety: Enhance global civil aviation safety:*
B: Security: Enhance Global civil aviation security;
C: Environmental Protection and Sustainable Development of Air Transport: Foster harmonised and economically viable development of international civil aviation that does not unduly harm the environment.

APIRG 15 and 16 Outstanding Routes

Table 1A – Route segments still required, to be implemented by time of APIRG/18

IATA to review the requirements and re-submit the list with supporting details

No	Route Designator	Meeting	Country	Comment
1.	UG402	APIRG15	Algeria, Niger, Burkina Faso, Benin	Accelerate Implementation
2.	UG404	APIRG15	Morocco, Algeria, Mali, Niger	Accelerate Implementation
3.	UG629	APIRG15	Morocco, Algeria, Mali, Niger, Nigeria	Accelerate Implementation
4.	UG981	APIRG15	Niger, Nigeria, Cameroun, Guinea, Gabon	Accelerate Implementation IATA to review & re-submit
5.	UM220	APIRG 16	Sudan	Review with South Sudan
6.	UM365	APIRG 16	Sudan	Review with South Sudan
7.	UM665	APIRG 16	Sudan	Accelerate Implementation

Table 1B – Routes/segments identified by ATM/AIM/SAR SG/12 as no longer required

1	UG403	APIRG15	Algeria, Niger	No longer Required
2	UG616	APIRG15	Niger, Nigeria	No Longer Required
3	UB525	APIRG 16	Ethiopia, Sudan, Egypt	No Longer Required; UT124
4	UL612	APIRG 16	DR Congo, Sudan, Egypt	No Longer Required; UG607

Table 2 - Unimplemented Routes/segments developed by PRND WG/1 (2010) to be implemented by time of APIRG/18

No	Temp. Route Designator	Route Segment	Country	Comment
1.	UT127	TIKAR-MRW	Sudan	Internal Route structure Review
2.	UT151	OXILO-DCT-LAG	Nigeria	VHF Coverage. To be reviewed in line with required comms/surveillance implementation.
3	UT152	MLK-DCT-LAG	Sudan	Implementation suspended; Suggest use of UB763
4	UT253	NV-KESOM-MOGDU-DCT-BKK	India	India to be approached to expedite implementation. ICAO interregional coordination support required
5	UT261	BRN-DCT-ATMUL	Egypt	Awaiting Military Clearance
6	UT263	LUKRO-KAN	Nigeria	Implementation suspended; Suggest UH206 via JOS To be reviewed by Nigeria in line with required comms/ surveillance implementation

7	UT271	TLE-MPK	Nigeria	Implementation suspended; Suggest UA609 via OPALA To be reviewed by Nigeria in line with required comms/ surveillance implementation
8	UG402	TMS-DCT-GAO-DCT-TYE	Algeria	On-going
9	UW900	OZT-GAO-LV (See UG981 APIRG 15)	Nigeria	VHF Coverage To be reviewed by Nigeria in line with required comms/ surveillance implementation

Table 3- New User Preferred Routes

To be implemented by time of APIRG/18

No	Route Designator	Route Segment	Country	Comment
1.	UB533	DAR-Nampula (DV-VNP)	Tanzania, Mozambique	Extension of UB533 NV-VNP Has been coordinated. Both States to finalize implementation. Implementation January 2012 AIRAC date
2.	UTxxx	NBO-NDJ (BUN-FL)	DR Congo, Chad	Previously existed route
3.	UG650	NBO-JED (NV-GWZ-ASM-JDW)	Ethiopia, Eritrea	Eretria/Ethiopia co-ordination
4.	UTxxx	NBO-ALG	Sudan, Chad, Libya, Algeria	New
5.	UT384	DAROT- P4	Mogadishu, Seychelles	Re-align to connect T940. IATA to coordinate with both States
6.	RouteLab 3	ADD-BKK, NBO-BKK	NONE in AFI	ICAO Asia Region (8 Routes)
7.	UQ579	DWA-IMKAT-EKBUL-MUBAK-TAREM	Eretria, Ethiopia, Kenya, Uganda	iFLEX route
8.	UQxxx	NBO-BKO	Kenya, Uganda, DR Congo, Cameroun, Nigeria, Ghana and ASECNA.	iFLEX route
9.	UQxxx	IAD (Washington)-ADD	Several Countries	iFLEX route

Note: IATA agreed to undertake the task of re-assessing current route requirements and will provide an updated list of priority routes to the Working Group in the form of a package for future implementation in the AFI Region.

----END----

AFI ATS ROUTES CATALOGUE (ARRC)

AFI/00X	ATS Route Name:	Entry-Exit:	Inter-Regional Cross Reference if any		Users Priority		Originator of Proposal	
							Date of Proposal	

Route Description		States Concerned	Expected Implementation date	Implementation Status	ANP Status	Action Taken / Required	Deadline for each Action
Flight Level Band:							
Potential City Pairs:							

Conclusions/Remarks			Last updated	

AFI/00X	ATS Route Name:	Entry-Exit:	Inter-Regional Cross Reference if any		Users Priority		Originator of Proposal	
							Date of Proposal	

Route Description		States Concerned	Expected Implementation date	Implementation Status	ANP Status	Action Taken / Required	Deadline for each Action
Flight Level Band:							
Potential City Pairs:							

Conclusions/Remarks			Last updated	

- END -

PROPOSED REVISED TERMS OF REFERENCE (TOR)

PBN ROUTE NETWORK DEVELOPMENT WORKING GROUP (PRND WG*)*

A) TERMS OF REFERENCE

1. Review the AFI ATS route network in order to assess its capacity and constraints;

2. Based on the airspace user needs and in coordination with stakeholders (States, International Organizations, user representative organizations and other ICAO Regions), AFI Regional Performance Objectives, the Regional PBN Implementation Plan, as well as related ICAO provisions and guidance material, identify requirements and improvements for achieving and maintaining an efficient route network in the AFI Region;

3. Propose a strategy and prioritized plan for development of improvements to the route network, highlighting:

   - areas that require immediate attention
   - interface issues with adjacent ICAO Regions
   - the implementation of PBN

4. Develop a working depository for route proposals that will be used as a dynamic reference document for ongoing discussions on routes under development/modification. In this respect, the ~~TF~~ Working Group should explore the utility that can be realized from the route catalogue concept/ATS route database;

5. Engage the necessary parties regarding routes under consideration;

~~6. In coordination with the ARMA, carry out safety assessment of the proposed changes to the ATS route network;~~

6. Recognizing that, prior to implementation of new ATS routes or changes to existing routes, States are to conduct safety assessments in accordance with provisions of Annex 11 to the Chicago Convention, continue to sensitize States on the importance of this obligation and need to coordinate with the ARMA;

7. After adoption by the ATM/AIM/SAR SG, or as delegated by the same, submit completed route proposals for amendment of the Basic ANP Table ATS-1, to the AFI Regional Offices for processing;

8. Assess the role that may be contributed by a special project for a comprehensive review of the AFI ATS route network as envisaged by APIRG 15 and make recommendations, with detailed project description if the role of a project is confirmed.

B) COMPOSITION

It is recognized that in order to facilitate the effectiveness of proceedings of the Working Group, the preferable core size of the Working Group should be about 15 members. However, that this does not preclude other AFI States from attending proceedings of the Working Group as necessary, the ~~The~~ PRND Working Group will comprise ~~of~~:

a) experts nominated by AFI Provider States from both civil aviation entities and military authorities;

Cape Verde, Ghana (*to confirm*), Kenya Mozambique, Namibia, Nigeria, Seychelles, Somalia, South Africa, Swaziland, Tanzania, Zimbabwe
(Agreed at the PRND WG/2 Meeting)

b) ARMA, ASECNA, IATA, IFALPA and IFATCA;

c) representatives from adjacent States and concerned international organizations (on ad-hoc basis).

C) WORKING ARRANGEMENTS

The Working Group shall:

a) report to the ~~ATS/AIS/SAR~~ ATM/AIM/SAR Sub Group through the PBN TF (or its successor); ~~and~~

b) meet as required and at least once a year; and

c) use electronic communication between members as much as feasible.

------END------

AFI RVSM SAFETY POLICY

JULY 2011

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AFI REDUCED VERTICAL SEPARATION MINIMUM (RVSM) SAFETY POLICY

1. INTRODUCTION

This document, the AFI RVSM Safety Policy Document, sets out the Safety Policy and the Safety Objectives in order to guide the safe maintenance of the AFI RVSM system in the AFI Region.

The AFI RVSM Safety Policy Document is intended to provide a framework to facilitate the safety regulation process for the maintenance of AFI RVSM.

The AFI RVSM Safety Policy Document provides guidance to States to ensure that safety is continuously met, the aircraft approval process is effective, the target levels of safety are being met, operational errors do not increase and ATC procedures and equipment introduced to manage RVSM remain effective.

2. RVSM OPERATIONAL APPLICATION

The application of AFI RVSM is maintaining the safe vertical separation minimum of, 1000 FT, between adjacent State CAA RVSM Approved aircraft between the Flight Levels FL290 and FL410 inclusive. This provides six additional cruising levels to air traffic, increases the capacity of the Air Traffic Management system and facilitates the task of Air Traffic Services in maintaining a safe, orderly and expeditious flow of traffic. The additional capacity and system benefits of AFI RVSM shall, by facilitating the Air Traffic Control function, also continue to enhance safety benefits.

AFI RVSM shall be applied between State CAA RVSM approved aircraft within the confines of the designated AFI RVSM airspace. Therefore, all operators proposing to operate across the lateral limits of the AFI RVSM airspace shall be required to indicate on Filed Flight Plans their RVSM status i.e. W. Non-RVSM approved aircraft, other than bone fide State aircraft, shall not be permitted to operate within RVSM airspace. Non-RVSM approved State aircraft shall indicate on their Flight Plans, STS: Non RVSM.

Uninterrupted climb through AFI RVSM airspace to FL430 or above by non RVSM approved aircraft will be permitted.

Uninterrupted descent through AFI RVSM airspace from FL430 or above by non RVSM approved aircraft will be permitted

There will be no RVSM Transition Airspace within the AFI Region.

AFI RVSM requires that specific training of aircrew and ATC staff shall be performed to ensure safe RVSM operations. ATC equipment and procedures shall be maintained in such a way that they ensure the maintenance of safe AFI RVSM.

3. AFI RVSM SAFETY MAINTENANCE

This Safety Policy has been established to meet the requirements of ICAO Standards, Recommended Practices, Global best practices and guidance material on managing collision risk consequent to safe AFI RVSM operations.

The following statements define the AFI RVSM Safety Policy:

(i) AFI RVSM applies an explicit, pro-active approach to safety management in maintaining continued safe RVSM operations.

(ii) The responsibility of management for the safe performance of AFI RVSM is recognised. Each States RVSM Program Manager is responsible for the overall management of RVSM within the State. The RVSM National Program Manager is responsible for liaison with the Regulatory Authority and ARMA.

(iii) AFI RVSM shall be conducted in accordance with ICAO provisions, Global best practices and guidelines as applicable.

(iv) 100% of aircraft operating within the designated AFI RVSM airspace shall be RVSM approved excluding bone fide non approved State aircraft;

(v) AFI RVSM shall minimise the contribution to RVSM related incidents by maintaining a safe RVSM system as far as is reasonably practicable.

4. RVSM MAINTENANCE SAFETY OBJECTIVES

AFI RVSM shall not contribute to an increase in incidents or accidents by ensuring that:

(i) In accordance with ICAO SARP's the management of vertical collision risk within RVSM airspace shall meet the Target Level of Safety of 5×10^{-9} fatal accidents per flight hour;

(ii) In accordance with ICAO SARP's, the risk of mid-air collision in the vertical dimension within RVSM airspace, due to technical height keeping performance, shall meet a Target Level of Safety of 2.5×10^{-9} fatal accidents per flight hour.

5. RVSM SAFETY DELIVERABLES

5.1 Collision Risk Assessment

A Collision Risk Assessment (CRA) shall be carried out annually in order to provide the evidence that the collision risk in RVSM airspace meets the Target Level of Safety required by ICAO.

5.2 Safety Management System Plans

Each State shall ensure that their SMS plan appropriately addresses all RVSM System elements. These elements shall be made available during routine safety audits for review.

6 STATE RVSM NATIONAL MANAGER

The State RVSM National Manager shall facilitate the overall application and maintenance of RVSM in accordance with the AFI RVSM safety policy within the States area of responsibility.

Each State shall ensure that the ARMA has the most current contact details for the nominated State RVSM Manager.

---END---

MINIMUM RVSM DEFICIENCIES REPORTING LIST

REDUCED VERTICAL SEPARATION MINIMA (RVSM)								
1.	AFI/RAN 8 Rec. 5/21	No safety data		No contribution to CRA	CAAs/ACCs to periodically submit data to ARMA	Target date: 1/8/2011		
2.	Annex 6	No records of Approvals/ Withdrawals	2006	RVSM safety reduction in separation	RVSM Approvals/Withdrawals to be submitted to ARMA (F2, F3)	Target date: 1/8/2011		
3.	Annex 6	No or limited Height Monitoring	2006	No monitoring of ASE	CAAs to comply with Height Monitoring Plan	Target date: 1/8/2011		

Note: ICAO Council definition of a Deficiency:

A deficiency is a situation where a facility, service or procedure does not comply with a regional air navigation plan approved by the Council, or with related ICAO Standards and Recommended Practices, and which situation has a negative impact on the safety, regularity and/or efficiency of international civil aviation.

TERMS OF REFERENCE (TOR) OF THE AFI AIR TRAFFIC MANAGEMENT/METEOROLOGY (AFI ATM/MET) TASK FORCE

1. Terms of Reference

1.1 Under guidance from ICAO Secretariat:

a) Evaluate the current and future requirements for MET in support of ATM in the AFI Region and update Regional Air Navigation Plan accordingly and provide guidance material to assist States to develop MET services to meet these requirements;

b) Assess aviation meteorological services, systems and architecture in the region and how they can integrate weather information into decision support tools;

c) Review and update the AFI Volcanic Ash Contingency Plan (VACP) and monitor VACP exercises;

d) Investigate sub-regional exchange of MET information and associated agreements that facilitate ATM operations particularly over busy routes that overlap different FIRs;

e) Promote coordination between MET and ATM communities in the AFI Region to enhance the level of understanding of MET requirements and capabilities in support of ATM;

f) Monitor global policy associated with source data and delivery of MET products for ATM;

g) Coordinate with MET/SG and ATM/AIS/SAR/SG on framework for contingency plan for specific phenomenon including volcanic ash, radioactive cloud, tropical cyclone and Tsunami with reference to developments made WMO scientific steering committee;

h) Report to the MET/SG Sub-group of APIRG for further co-ordination through the ICAO Secretariat with other relevant bodies.

1.2 The objective being to improve efficiency of ATM and airlines by providing tailored regional MET products needed to optimize flight routes in all weather conditions.

1.3 The Benefits will be to increase efficiency – save time and fuel as well as reduce carbon emissions.

2. Work Programme

2.1 The work to be addressed by the AFI ATM/MET Task Force includes:

a) Develop regional MET requirements for ATM by:

- conducting MET/ATM meetings (TF meetings, Seminars) to contribute in developing MET requirements for ATM;
- analyzing existing ATM/MET surveys and develop new surveys, when necessary, to determine regional ATM requirements for MET;
- recommending regional MET requirements for ATM to MET/SG Meetings;
- Determining regional MET requirements for ATM.

b) Developing methods to use weather information in decision support tools;

c) Review and update the AFI Volcanic Ash Contingency Plan (VACP) by:

- Regularly updating the VACP through new requirements from the IAVWOPSG
- Conducting annual VACP exercises or AFI ATM/MET Volcanic Ash Exercises (VAEX/AFI);
- reporting on annual VAEX/AFI to MET/SG meetings.

d) Develop sub-regional exchange of MET information to facilitate ATM operations by:

- Encouraging States develop agreements on the exchange of MET information that provides benefits to ATM operations on sub-regional level;
- Encouraging States report developments to MET/ATM TF and MET/SG meetings;
- Developing sub-regional exchange of MET information to facilitate ATM operations in busy routes.

e) Develop regional implementation plan for Meteorological Service for Terminal Area (MSTA) by:

- Monitoring developments of MSTA (pending approval at conjoint ICAO/WMO Divisional meeting 2014);
- Monitoring ICAO Annex 3 developments (requirements for MSTA);
- Developing regional implementation plan for MSTA ;
- Monitoring regional implementation of MSTA;
- Reporting implementation progress to MET/SG.
- Developing regional implementation plan for Meteorological Services for the Terminal Area.

f) Monitor global policies associated with source data and delivery of MET products for ATM by:

- monitoring global policies associated with source data and delivery of MET products for ATM ;
- reporting results to MET/SG meetings;
- monitor global policies associated with source data and delivery of MET products for ATM.

3. Composition

3.1 The Task Force is composed of experts from:

a) South Africa, Senegal, France, Kenya, Gambia and Morocco.

b) Representatives of VAAC Toulouse, ASECNA, IATA, IFALPA and WMO are expected to participate in the work of the Task Force.

---END---

INTERNATIONAL CIVIL AVIATION ORGANIZATION

VOLCANIC ASH CONTINGENCY PLAN

AFI REGION

First Edition - April 2011

THIS DOCUMENT IS ISSUED BY THE WACAF AND NAIROBI OFFICES OF ICAO
UNDER THE AUTHORITY OF THE APIRG

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FOREWARD

Within and adjacent to the Africa and Indian Ocean (AFI) Region there are areas of volcanic activities which are likely to affect flight in the AFI Region. The major volcanoes in the region are located in the following States: Algeria, Cameroon, Cape Verde Islands, Chad, Comoros Island, Democratic Republic of Congo, Djibouti, Eritrea, Ethiopia, France (Reunion Island), Kenya, Madagascar, Mali, Niger, Nigeria, Rwanda, Sao Tome and Principe, Spain (Canary Islands, Madeira), Sudan, Tanzania and Uganda. The names of the concerned volcano are listed in **Attachment F** (source: Smithsonian Institution).

The AFI Volcanic Ash Contingency Plan sets out standardised guidelines for the alerting of aircraft when eruptions occur, and procedures to be followed.

Volcanic ash is a hazard for flight operations. Recent encounters with volcanic ash have resulted in one or more of the following and other problems:

- Engine failures and malfunctions;
- Subsequent failure of electrical, pneumatical and hydraulic systems;
- Blocking of sensors, resulting inter alia in erroneous airspeed indications;
- Smoke, dust and/or chemical pollution of cabin air; resulting in the need for aircrews to use oxygen masks;
- Communication problems;
- Loss of visibility through cockpit windows.

Regulatory authorities of States of the Operator[1], or State of Registry [2]as appropriate, should therefore prescribe appropriate operational procedures for flight crew to be followed in case of operation in or near airspaces that are contaminated by volcanic ash. Operators are required by ICAO Annex 6 to assess the risk of operation in volcanic ash and to implement appropriate mitigation measures in accordance with their Safety Management System as approved by the State of the Operator.

It should be noted that this document is an air traffic management (ATM) contingency plan including its interfaces with supporting services such as MET and AIS and that the Plan therefore primarily addresses the Provider States[3]. Where distinct actions by the Meteorological Watch Offices (MWOs) are described, these are additional procedures to be considered by MWOs. Where actions by Volcanic Ash Advisory Centre (VAAC) and Aircraft Operators are described, these are for clarification only.

Volcanic Ash can also affect the operation of aircraft on aerodromes. In extreme cases, aerodromes might no longer be available for operation at all, resulting in repercussions on the Air Traffic Management systems; e.g. diversions, revised traffic flow, etc.

These suggested procedures are not intended to establish or confirm a safe level of ash concentration. Operation through any area where volcanic ash is forecast is at the discretion of the operator.

NOTE: *All modeled ash concentrations are subject to a level of uncertainty relative to errors in the estimation of the eruption strength.*

[1] The term "State of the Operator" refers to the role of a Contracting State as the regulatory authority with regard to aircraft operators having been issued an Aircraft Operator's Certificate (AOC) by that` State.

[2] The term "State of Registry" refers to the State on whose register the aircraft is entered.

[3] The term "Provider State" refers to the role of a Contracting State as responsible for the provision of air navigation services within airspace over its territory and, as agreed by Regional Air Navigation Meeting, within defined airspace over the High Seas.

Considering that a commercial aircraft will travel about 150 km (80 NM) in 10 minutes and that volcanic ash can rise to flight levels commonly used by turbine-engine aeroplanes in half that time, timely response to reports of volcanic ash is essential.

It is imperative that information on the volcanic activity is disseminated as soon as possible. In order to assist the staff in expediting the process in originating and issuing relevant messages (SIGMET, NOTAM, ASHTAM), a series of templates should be available for different stages of the volcanic activity. Examples of SIGMET, NOTAM and ASHTAM announcing volcanic activities in the different stages and operational measures are contained in **Attachment E**. ASHTAM is promulgated by service providers in the AFI Region, APIRG/16 Conclusion 16/52 refers.

A list of ICAO registered volcanoes should be available at the international NOTAM office with volcano name, number and nominal position. The volcanoes in the AFI region are listed in **Attachment F.**

In order to ensure the smooth implementation of the contingency plan in case of an actual volcanic eruption, annual AFI ATM/MET Task Force Volcanic Ash Exercises (VAEX/AFI) should be conducted.

Terminology

Area of Low Contamination: An airspace of defined dimensions where volcanic ash may be encountered at concentrations equal to or less than $2x10^{-3}$ g/m^3.

Area of Medium Contamination: An airspace of defined dimensions where volcanic ash may be encountered at concentrations greater than $2x10^{-3}$ g/m^3, but less than $4x10^{-3}$ g/m^3.

Area of High Contamination: An airspace of defined dimensions where volcanic ash may be encountered at concentrations equal to or greater than $4x10^{-3}$ g/m^3, or areas of contaminated airspace where no ash concentration guidance is available.

Note 1: Concentration areas are defined by the MET office co-located with the AFI VAAC: Toulouse MET Office.

Note 2: "defined dimensions" refers to horizontal and vertical limits.

The response to a volcanic event ***that affects air traffic*** has been divided into three distinct phases described briefly below. Volcanic activity at many locations is continuously monitored by the scientific community. Furthermore, flight crew are required to report observations of significant volcanic activity by means of a Special Air Report (Special AIREP). Arrangements are in place to ensure that such information is transferred without undue delay to the appropriate aeronautical institutions responsible for subsequent action:

ALERTING PHASE The initial response, "***raising the alert***", commences when a volcanic eruption is expected. Alerting information will be provided by SIGMET, NOTAM or ASHTAM as appropriate and disseminated to affected aircraft in flight by the most expeditious means. In addition to the normal distribution list, the NOTAM/ASHTAM will be addressed to meteorological and volcanological agencies.

If it is considered that the event could pose a hazard to aviation, a Danger Area[4] will be declared by NOTAM around the volcanic source. Normally, clearances will not be issued through the Danger Area.

REACTIVE PHASE The Reactive Phase commences at the outbreak of the volcanic eruption and entrance of volcanic ash into the atmosphere and mainly pertains to aircraft in flight. A "***Start of eruption SIGMET***" will be issued and a Danger Area will be declared by NOTAM. Clearances will not be issued through the Danger Area.

PROACTIVE PHASE The Proactive Phase commences with the issuance of the first Volcanic Ash Advisory (VAA) and Volcanic Ash Graphic (VAG) after completion of reactive responses. Supplementary modelled ash concentration charts may be available. The volcanic ash forecasts up to T+18 hours are to be used to prepare SIGMET. SIGMET shall be issued as soon as practicable but not more than 12 hours before the commencement of the period of validity, and shall be valid for up to 6 hours. The T+12 hours and T+18 hours (and further into the future, if available) volcanic ash forecasts are to be used to prepare NOTAM/ASHTAM. Significant changes may result in a reversion to a temporary Reactive Phase situation and unscheduled issuance of VAA, VAG and ash concentration charts by Toulouse VAAC MET Office, SIGMET and NOTAM/ASHTAM. As appropriate, Danger Areas will be notified via NOTAM.

Note that where SIGMET and NOTAM are mentioned in this document, volcanic ash SIGMET and volcanic ash NOTAM are being referred to.

This document pays due respect to Standards and Recommended Practices in ICAO Annexes, WMO procedures, and guidance material contained in ICAO documents, including, but not limited to, the following:

ICAO Annex 3 – *Meteorological Services for International Air Navigation*; ICAO Annex 11 – *Air Traffic Services*; ICAO Annex 15 - *Aeronautical Information Services*; ICAO Doc 4444 – *Procedures for Air Navigation Services – Air Traffic Management;* ICAO Doc 8126 – *Aeronautical Information Services Manual*; ICAO Doc 8896 – *Manual of Aeronautical Meteorological Practice*; ICAO Doc 9691 – *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds*; ICAO Doc 9766 – *Handbook on the International Airways Volcanic Watch*; ICAO Doc 9859 – *Safety Management Manual*; ICAO AFI *SIGMET Guide*; and WMO No.386 Volume I (*Manual of Global Telecommunications System*) Part II (*Operational Procedures for the Global Telecommunications System*).

[4] Wherever this document discusses the possible establishment of Danger Areas, States are not prevented from establishing Restricted or Prohibited Areas over the sovereign territory of the State if considered necessary by the State concerned.

1. ALERTING PHASE

1.1 This phase is characterised by a limited availability of information on the extent and severity of the volcanic event. The purpose of this phase is to ensure the safety of aircraft in flight and to promulgate information as a matter of urgency. Regardless of the extent of information available the alerting phase actions should be carried out for every event.

1.2 **ORIGINATING AREA CONTROL CENTRE (ACC) ACTIONS** (eruption in its own flight information region (FIR))

1.2.1 In the event of significant pre-eruption volcanic activity, a volcanic eruption occurring, or a volcanic ash cloud being reported which could pose a hazard to aviation, an ACC, on receiving information of such an occurrence, should carry out the following actions:

a) Define an initial Danger Area in accordance with established procedures, or if no such procedures have been established the danger area should be defined as a circle with a radius of 222 km (120 NM). If the eruption has not commenced or if no information on upper winds is available, the circle should be centred on the estimated location of the volcanic activity. If the eruption has started and predicted upper wind information is available, the circle should be centred 111 km (60 NM) downwind from while enclosing the volcano. The purpose of this initial Danger Area is to ensure safety of flight in the absence of any prediction from a competent authority of the extent of contamination.

b) Advise the associated Meteorological Watch Office (MWO) and the appropriate Volcanic Ash Centre (VAAC) (unless the initial notification originated from either of these entities). The VAAC will then inform the appropriate ACCs.

c) Alert flights already within the Danger Area and offer assistance to enable aircraft to exit the area in the most expeditious and appropriate manner. Aircraft that are close to the Danger Area should be offered assistance to keep clear of the area. Tactically re-clear flights which would penetrate the Danger Area onto routes that will keep them clear. The ACC should immediately notify other affected ACC's of the event and the location and dimensions of the Danger Area. It should also negotiate any re-routings necessary for flights already coordinated but still within adjacent flight information regions (FIRs). It is also expected that adjacent ACCs will be asked to reroute flights not yet coordinated to keep them clear of the Danger Area.

d) Ensure that a NOTAM/ASHTAM is originated. This must provide as precise information as is available regarding the activity of the volcano. The name (where applicable), reference number and position of the volcano should be included along with the date and time of the start of the eruption (if appropriate). It is imperative that this information is issued by the international NOTAM office and disseminated as soon as possible.

e) In order to assist the staff in expediting the process of composing the NOTAM/ASHTAM, a series of templates should be available for this stage of the volcanic activity. Example NOTAM and ASHTAM are provided in **Attachment E**.

1.2.2 In addition to sending the NOTAM/ASHTAM and any subsequent NOTAM/ASHTAM to the normal distribution list, it will be sent to the relevant meteorological agencies after adding the

appropriate World Meteorological Organization (WMO) header. Example NOTAM and ASHTAM are provided in **Attachment E.**

1.3 ADJACENT ACC ACTIONS

1.3.1 During the Alerting Phase aircraft should be tactically rerouted to avoid the Danger Area. Any ash contamination should be contained within a limited area and disruption to traffic should not be excessive. Adjacent ACCs should take the following action to assist:

a) When advised, re-clear flights to which services are being provided and which will be affected by the Danger Area.

b) Unless otherwise instructed, continue normal operations except:

i) if one or more routes are affected by the Danger Area, stop clearing aircraft on these routes and take steps to reroute onto routes clear of the Danger Area; and

ii) initiate a running plot of the affected area.

2. REACTIVE PHASE

2.1 This phase commences at the outbreak of volcanic eruption. Major activities of the Reactive Phase are: Issuance of an eruption commenced SIGMET, eruption commenced NOTAM/ASHTAM and rerouting of airborne traffic. As appropriate, Danger Areas will be notified via NOTAM. This phase will last until such time as the Proactive Phase can be activated.

2.2 ORIGINATING ACC ACTIONS (eruption in its own FIR)

2.2.1 The ACC providing services in the FIR within which the volcanic eruption takes place should inform flights about the existence, extent and forecast movement of volcanic ash and provide information useful for the safe conduct of flights.

2.2.2 Rerouting of traffic commences immediately or may be in progress if the alerting time has been sufficient to facilitate activation of the Alerting Phase. The ACC should assist in rerouting aircraft around the Danger Area as expeditiously as possible. Adjacent ACCs should also take the Danger Area into account and give similar assistance to aircraft as early as possible.

2.2.3 During this phase the ACC should:

a) Maintain close liaison with its associated MWO. The MWO should issue a SIGMET message on the extent and forecast movement of the ash cloud based on appropriate sources of information.

b) Ensure a NOTAM is originated to define a Danger Area.

c) Ensure that reported differences between published information and observations (pilot reports, airborne measurements, etc.) are forwarded as soon as possible to the appropriate authorities.

d) Should significant reductions in intensity of volcanic activity take place during this phase and the airspace no longer is contaminated by volcanic ash, a NOTAMC cancelling the last active NOTAM shall be issued stating the cause for cancellation; new ASHTAM should be promulgated to update the situation. Otherwise, begin planning for the Proactive Phase in conjunction with the affected ACCs.

2.3 ADJACENT ACC ACTIONS

2.3.1 During the Reactive Phase the adjacent ACCs should take the following action:

a) Maintain close liaison with the originating ACC to design, implement and keep up to date measures which will enable aircraft to remain clear of Danger Areas.

b) In the event that tactical measures are required, the adjacent ACC should, in cooperation with the originating ACC, impose such measures. .

c) Maintain a running plot of the affected area.

d) Begin planning for the Proactive Phase in conjunction with the appropriate ACCs concerned.

3. PROACTIVE PHASE

3.1 The Proactive Phase commences with the issuance of the first VAA/VAG by Toulouse VAAC after completion of the reactive responses. The VAA/VAG will contain forecasts of the expected vertical and horizontal extent of the volcanic ash cloud, and its expected movement, at six-hourly time-steps for the period T+0 to T+18 hours. In addition, the meteorological office co-located with the VAAC will issue ash concentration forecasts to supplement the VAA/VAG information, at six-hourly intervals with a nominal validity time of 0000Z, 0600Z, 1200Z and 1800Z which will define Areas of Low, Medium and High Contamination.

3.2 Following the Reactive Phase, the VAA/VAG and (where available) ash concentration forecasts should be used to define airspace volumes encompassing the furthest extent of contamination predicted for that period. These volumes should be used to:

a) publish NOTAM indicating the extent of Danger Areas, indicating which areas of contamination are included therein;

b) issue SIGMET warning of potential hazard from areas of volcanic ash contamination;

c) publish NOTAM to separately indicate the extent of Areas of Medium Contamination if not included in a Danger Area.

3.3 Longer term forecasts (i.e. beyond T+6 hours) should be used to generate NOTAM in order to ensure that adequate information is available to support flight planning. These messages should differentiate between levels of contamination.

3.4 Operators should use the information published regarding Areas of Low, Medium and High Contamination to plan their flights in accordance with their regulatory requirements and the service

that will be provided in the airspace concerned. Operators should be aware that, depending on the State concerned, Danger Areas may be established to contain an Area of High Contamination, Areas of Medium/High Contamination, or Areas of Low/Medium/High Contamination.

3.5 The volcanic ash may affect any combination of airspace; therefore, it is impossible to prescribe measures to be taken for any particular situation. Nor is it possible to detail the actions to be taken by any particular ACC. The following guidance may prove useful during the Proactive Phase but should not be considered mandatory:

a) ACCs affected by the movement of the ash should continue to originate NOTAM/ASHTAM at appropriate intervals. ACCs concerned should continue to publish details on measures taken.

b) Depending on the impact of the volcanic ash, the appropriate ACC may take the initiative to organise teleconferences to exchange latest information on the developments with Toulouse VAAC, ANSPs and MWO's and operators concerned.

c) During this phase the VAAC should endeavour to assess the vertical extent of the ash contamination and provide appropriate VAA/VAG to define the contaminated airspace as accurately as possible. For the purpose of flight planning, operators should treat the horizontal and vertical limits of the Danger Area to be over-flown as they would mountainous terrain. Operators are cautioned regarding the risk of cabin depressurisation or engine failure resulting in the inability to maintain level flight above the Danger Area, especially where Extended Twin Operations (ETOPS) aircraft are involved.

d) Any reported differences between published information and observations (pilot reports, airborne measurements, etc.) should be forwarded as soon as possible to the appropriate authorities; and

e) When the airspace is no longer contaminated by volcanic ash, a NOTAMC cancelling the active NOTAM shall be promulgated. New ASHTAM should be promulgated to update the situation.

4. AIR TRAFFIC CONTROL PROCEDURES[5]

4.1 If volcanic ash is reported or forecast in the FIR for which the ACC is responsible, the following procedures should be followed:

a) relay all available information immediately to pilots whose aircraft could be affected to ensure that they are aware of the horizontal and vertical extent of the ash contamination;

b) if requested, suggest appropriate rerouting to assist flights to avoid areas of known or forecast ash contamination;

c) When appropriate, remind pilots that volcanic ash may not be detected by ATC radar systems;

[5] This information is adapted from the *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds* (Doc 9691). Refer to this document for full details.

d) If modelled ash concentration charts are available showing Areas of Low, Medium and High Contamination, the Provider State may establish Danger Areas. Depending on the State concerned, the Danger Areas will be established to contain an Area of High Contamination, Areas of Medium/High Contamination, or Areas of Low/Medium/High Contamination;

e) In the absence of ash concentration guidance, the entire area of forecast volcanic ash should be considered as an Area of High Contamination, for the purposes of applying ATC procedures, until ash concentration guidance is available;

f) Normally, ATC should not provide a clearance for an aircraft to enter or operate within a Danger Area. Assistance to enable an aircraft to exit a Danger Area in the most expeditious and appropriate manner should be provided;

g) If the ACC has been advised by an aircraft that it has entered an area of ash contamination and indicates that a distress situation exists:

i) consider the aircraft to be in an emergency situation;

ii) do not initiate any climb clearances to turbine-powered aircraft until the aircraft has exited the area of ash contamination; and

iii) do not attempt to provide vectors without pilot concurrence.

4.2 Experience has shown that the recommended escape manoeuvre for an aircraft which has encountered volcanic ash is to reverse its course and begin a descent (if terrain permits). However, the final responsibility for this decision rests with the pilot.

5. GENERAL GUIDANCE FOR THE DEVELOPMENT OF ATS CONTINGENCY PLANS FOR VOLCANIC ASH[6]

5.1 In a contingency plan relating to volcanic ash certain steps need to be taken to provide a coordinated and controlled response for dealing with an event of this nature. Responsibilities should be clearly defined for the manager in charge, supervisors and Air Traffic Controllers (ATCOs). The plan should also identify the officials who need to be contacted, the type of messages that are to be created, the proper distribution of the messages and how to conduct business.

5.2 ATCOs need to be trained and be made aware of the potential effects if aircraft encounter unsafe levels of volcanic ash.

5.3 Some particular points of guidance are as follows:

a) Volcanic ash clouds may extend for hundreds of miles horizontally and reach the stratosphere vertically;

b) Volcanic ash may block the pitot-static system of an aircraft, resulting in unreliable airspeed indications;

c) Braking conditions at airports where volcanic ash has recently been deposited on the runway will affect the braking ability of the aircraft. This is more pronounced on runways contaminated with wet ash. Pilots and ATCOs should be aware of the consequences of volcanic ash being ingested into the engines during landing and taxiing.

[6] This information is adapted from the *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds* (Doc 9691). Refer to this document for full details.

For departure it is recommended that pilots avoid operating in visible airborne ash; instead they should allow sufficient time for the particles to settle before initiating a take-off roll, in order to avoid ingestion of ash particles into the engine. In addition, the movement area to be used should be carefully swept before any engine is started;

d) Volcanic ash may result in the failure or power loss of one or all engines of an aeroplane; and

e) Airports might have to be declared unsafe for flight operations. This might have consequences for the ATM system.

5.4 The ACC serves as the critical communication link between the pilot, dispatcher and meteorologists during a volcanic eruption. During episodes of volcanic ash contamination within the FIR, the ACC has two major communication roles. First and of greatest importance is its ability to communicate directly with aircraft en route which may encounter the ash. Based on the information provided in the volcanic ash SIGMET and VAAs and working with MWO, the ATCOs should be able to advise the pilot of which flight levels are affected by the ash and the projected trajectory and drift of the contamination. Through the use of radio communication, ACCs have the capability to coordinate with the pilot alternative routes which would keep the aircraft away from the volcanic ash.

5.5 Similarly, through the origination of a NOTAM/ASHTAM for volcanic activity the ACC can disseminate information on the status and activity of a volcano even for pre-eruption increases in volcanic activity. NOTAM/ASHTAM and SIGMET together with special AIREPs are critical to dispatchers for flight planning purposes. Operators need as much advance notification as possible on the status of a volcano for strategic planning of flights and the safety of the flying public. Dispatchers need to be in communication with pilots en route so that a coordinated decision can be made between the pilot, the dispatcher and ATC regarding alternative routes that are available. It cannot be presumed, however, that an aircraft which is projected to encounter ash will be provided with the most desirable route to avoid the contamination. Other considerations have to be taken into account such as existing traffic levels on other routes and the amount of fuel reserve available for flights which may have to be diverted to other routes to allow for the affected aircraft to divert.

5.6 The NOTAM/ASHTAM for volcanic activity provide information on the status of activity of a volcano when a change in its activity is, or is expected to be, of operational significance. They are originated by the ACC and issued through the respective international NOTAM office based on the information received from any one of the observing sources and/or advisory information provided by the Toulouse VAAC. In addition to providing the status of activity of a volcano, the NOTAM/ASHTAM also provides information on the location, extent and movement of the ash contamination and the air routes and flight levels affected. NOTAM can also be used to limit access to the airspace affected by the volcanic ash. Complete guidance on the issuance of NOTAM and ASHTAM is provided in Annex 15 — *Aeronautical Information Services*. Included in Annex 15 is a volcano level of activity colour code chart. The colour code chart alert may be used to provide information on the status of the volcano, with "red" being the most severe, i.e. volcanic eruption in progress with an ash column/cloud reported above flight level 250, and "green" at the other extreme being volcanic activity considered to have ceased and volcano reverted to its normal pre-eruption state. It is very important that NOTAM for volcanic ash be cancelled and ASHTAM be updated as soon as the volcano has reverted to its normal pre-eruption status, no further eruptions are expected by volcanologists and no ash is detectable or reported from the FIR concerned.

5.7 It is essential that the procedures which the ACC personnel, including supporting services such as MET and AIS should follow during a volcanic eruption/ash cloud event described in the foregoing paragraphs are translated into the local staff instructions (adjusted as necessary to take account of local circumstances). It is also essential that these procedures/instructions form part of the basic training for all MET, ATS and AIS personnel whose jobs would require them to take action in

accordance with the procedures. Background information to assist the ACC or Flight Information Centre (FIC) in maintaining an awareness of the status of activity of volcanoes in their FIR(s) is provided in the ICAO monthly International Airways Volcano Watch (IAVW) website at: http://www2.icao.int/en/anb/met-aim/met/iavwopsg/Pages/default.aspx under Worldwide Weekly Volcanic Activity Reports webpage. The major AFI volcanoes are listed in **Attachment F**.

ATTACHMENT A - ANTICIPATED PILOT ISSUES WHEN ENCOUNTERING VOLCANIC ASH

1. Air Traffic Controllers (ATCOs) should be aware that flight crews will be immediately dealing with some or all of the following issues when they encounter volcanic ash:

a) smoke or dust appearing in the cockpit which may prompt the flight crew to don oxygen masks (could interfere with the clarity of voice communications);

b) acrid odour similar to electrical smoke;

c) multiple engine malfunctions, such as stalls, increasing Exhaust Gas Temperature (EGT), torching, flameout, and thrust loss causing an immediate departure from assigned altitude;

d) on engine restart attempts, engines may accelerate to idle very slowly, especially at high altitudes (could result in inability to maintain altitude or Mach number);

e) at night, St. Elmo's fire/static discharges may be observed around the windshield, accompanied by a bright orange glow in the engine inlet(s);

f) possible loss of visibility due to cockpit windows becoming cracked or discoloured, due to the sandblast effect of the ash;

g) cockpit windows could be rendered completely opaque; and/or

h) sharp distinct shadows cast by landing lights as compared to the diffused shadows observed in clouds (this affects visual perception of objects outside the aircraft).

2. Simultaneously, ATC can expect pilots to be executing contingency procedures. This may include a possible course reversal and/or an emergency descent.

ATTACHMENT B - ACTION TAKEN BY METEOROLOGICAL WATCH OFFICES (MWO) IN THE EVENT OF A VOLCANIC ERUPTION[7]

1. On receipt of information of a volcanic eruption and/or the existence of volcanic ash, the MWO will:

a) Notify, if necessary, the AFI VAAC (Toulouse) designated to provide VAA/VAG for the FIR for which the MWO is responsible that a volcanic eruption and/or ash has been reported. In the event that the MWO becomes aware, from a source other than an ACC, of the occurrence of pre-eruption activity, a volcanic eruption or ash from any other source , the information will be passed with all available relevant details on the extent, forecast movement and concentration of volcanic ash immediately to the ACC and to the designated VAAC;

b) Reported differences between ash encounters by aircraft and the information published in VAA/VAG, SIGMET or NOTAM/ASHTAM received by an ACC shall be made available as soon as possible to the respective MWO, preferably in the form of an AIREP. The MWO will relay the information to the respective originators of the published information;

c) Notify adjacent MWOs designated to provide SIGMET that a volcanic eruption and/or ash cloud has been reported, provide available relevant details on the extent, forecast movement and (if known) concentration of volcanic ash. In the event that any other MWO becomes aware of the occurrence of volcanic ash cloud from any source other than the VAAC, the information should be passed immediately to the VAAC and any adjacent MWO(s) downstream of the moving ash cloud;

d) As soon as practicable, advise the ACC and the VAAC whether or not the volcanic ash is identifiable from satellite images/data, ground based or airborne measurements or other relevant sources;

e) Issue SIGMET relating to the horizontal and vertical extent of volcanic ash cloud and its expected movement (provided in the VA from Toulouse VAAC) for a validity period of up to 6 hours. The SIGMET shall include an observed (or forecast) position of the ash cloud at the *start* of the period of validity, and a forecast position at the *end* of the period of validity. The SIGMET should be based on the advisory information provided by the VAAC. Include in the SIGMET distribution list the two Regional OPMET Databanks (RODBs) in Dakar and Johannesburg (Pretoria RODB). As well as inter-regional distribution, the RODBs will ensure dissemination of the SIGMET to ~~all~~ the VAAC, the London World Area Forecast Centre (WAFC) and the AFI Bulletin Compiling Centres (BCC);

f) provide information to assist with the origination of NOTAM by ACCs and maintain continuous coordination with ACCs, adjacent MWOs and the VAAC concerned to ensure consistency in the issuance and content of SIGMET and NOTAM/ASHTAM; and

g) provide, if possible, regular volcanic briefings, based on the latest available ash observations and forecasts, to ACCs, Airport Operators and aircraft operators concerned, giving an outlook for beyond T+12 hours.

[7] This information is adapted from the *Handbook on the International Airways Volcano Watch (IAVW)* (Doc 9766). Refer to this document for full details.

ATTACHMENT C - ACTION TO BE TAKEN BY THE AFI VAAC IN THE EVENT OF A VOLCANIC ERUPTION[8]

1. On receipt of information from a MWO or any other source, of significant pre-eruptive/eruption activity and/or a volcanic ash cloud observed, the VAAC should:

a) Initiate the volcanic ash computer trajectory/dispersal model in order to provide advisory information on volcanic ash trajectory to MWOs, ACCs and operators concerned;

b) Review satellite images/data and any available pilot reports of the area for the time of the event to ascertain whether a volcanic ash cloud is identifiable and, if so, its extent and movement;

c) Prepare and issue advisories on the extent, and forecast trajectory, of the volcanic ash contamination in message format for transmission to the MWOs, ACCs and operators concerned in the VAAC area of responsibility, and to the two Regional OPMET Data Banks (RODB) in Dakar and Pretoria. As well as inter-regional distribution, the RODBs will ensure dissemination of the advisory to all VAACs, the London World Area Forecast Centre (WAFC);

d) Monitor subsequent satellite information or other available observations to assist in tracking the movement of the volcanic ash;

e) Continue to issue advisory information (i.e. VAA/VAG), for validity periods T+0, T+6, T+12 and T+18 hours after data time, to MWOs, ACCs and operators concerned at least at 6 hour intervals, and preferably more frequently, until such time as it is considered that the volcanic ash is no longer identifiable from satellite data, no further reports of volcanic ash are received from the area and no further eruptions of the volcano are reported; and

f) Maintain regular contact with other VAACs and meteorological offices concerned, and, as necessary, the Smithsonian Institute Global Volcanism Network, in order to keep up to date on the activity status of volcanoes in the VAAC area of responsibility.

[8] This information is adapted from the *Handbook on the International Airways Volcano Watch (IAVW)* (Doc 9766). Refer to this document for full details.

ATTACHMENT D - PROCEDURES FOR THE PRODUCTION OF MODELLED ASH CONCENTRATION CHARTS

1. The following procedures are to be applied by the meteorological office of a Provider State, having accepted, by regional air navigation agreement, the responsibility for providing a VAAC within the framework of the International Airways Volcano Watch (IAVW).

2. All VAA and VAG information issued by a meteorological office under designation as a VAAC within the framework of the IAVW shall be prepared in accordance with ICAO provisions.

3. Additionally, where feasible, the meteorological office may issue modelled ash concentration charts and corresponding coordinate data files at 6-hourly intervals showing the different ash concentrations for the validity periods T+0, T+6, T+12 and T+18 hours after data time. These charts will show forecast ash distribution in terms of Areas of Low, Medium and High Contamination and be published at the same time, and with the same validity periods, as the VAA/VAG described above. Updated charts and data files should be distributed prior to the end of the validity time of those previously distributed.

4. These data may be used by Provider States to prepare SIGMET, NOTAM/ASHTAM and to establish Danger Areas as appropriate.

ATTACHMENT E - EXAMPLE SIGMET, NOTAM, ASHTAM

Guidance on WMO headers referred to in Alerting Phase, paragraph 1.2.2 refers can be found in WMO No.386 Volume I (*Manual of Global Telecommunications System)* Part II *(Operational Procedures for the Global Telecommunications System)*

NOTAM Offices are reminded that ASHTAM (or NOTAM for volcanic ash) should be distributed via AFTN to their associated MWO, the SADIS Gateway and all the VAAC, in accordance with guidelines contained in ICAO Doc 9766 Chapter 4 paragraph 4.3.

1. SIGMET

```
WVUK02 EGRR 180105
EGGX SIGMET 2 VALID 180105/180705 EGRR-
EGGX SHANWICK OCEANIC FIR VA ERUPTION MT KATLA PSN N6337
W01901 VA CLD OBS AT 0100Z N6100 W02730 - N6100 W02230 - N5800
W01730 - N5630 W02000 FL200/350 MOV SE 35KT FCST 0705Z VA CLD
APRX N5800 W02000 - N5730 W01200 - N5500 W00910 - N5430 W01530
- N5800 W02000=
```

Note: PSN replaces LOC as per Amendment 75 to Annex 3 (applicable 18 November 2010)

2. NOTAM alerting pre-eruptive activity

```
(A0777/10NOTAMN
Q) BIRD/QWWXX/IV/NBO/W/000/999/6337N01901WXXX
A) BIRD B) 1002260830 C) 1002261100  E) INCREASED VOLCANIC
ACTIVITY, POSSIBLY INDICATING IMMINENT ERUPTION, REPORTED FOR
VOLCANO KATLA 1702-03 6337.5N01901.5W ICELAND-S. VOLCANIC
ASHCLOUD IS EXPECTED TO REACH 50,000 FEET FEW MINUTES FROM
START OF ERUPTION.AIRCRAFT ARE REQUIRED TO FLIGHT PLAN TO
REMAIN AT LEAST XXXNM CLEAR OF VOLCANO AND MAINTAIN WATCH FOR
NOTAM/SIGMET FOR AREA.
F) GND G) UNL)
```

Note: XXX is a distance established by the Provider State in accordance with paragraph 1.2.1 a)

3. NOTAM establishing Danger Area after initial eruption

```
(A0778/10 NOTAMR A0777/10
Q) BIRD/QWWXX/IV/NBO/W/000/999/6337N01901WXXX
A) BIRD
B) 1002260900 C) 1002261200
E) VOLCANIC ERUPTION REPORTED IN VOLCANO KATLA 1702-03
6337.5N01901.5W ICELAND-S. VOLCANIC ASHCLOUD REPORTED REACHING
FL500. AIRCRAFT ARE REQUIRED TO REMAIN AT LEAST XXXNM CLEAR OF
VOLCANO AND MAINTAIN WATCH FOR NOTAM/SIGMET FOR BIRD AREA.
F) GND G) UNL)
```

Note: XXX is a distance established by the Provider State in accordance with paragraph 1.2.1 a)

4. NOTAM establishing Danger Area to include Area of High [or High/Medium or High/Medium/Low] Contamination

```
(A0503/10 NOTAMN
Q)EGGN/QWWXX/IV/NBO/AE/000/350
A) EGPX B) 1005182300 C) 1005190500
E) TEMPORARY DANGER AREA HAS BEEN ESTABLISHED FOR VOLCANIC ASH
AREA OF HIGH CONTAMINATION IN AREA 5812N00611W 5718N00216W
5552N00426W 5629N00652W
F) SFC
G) FL350)
```

5. NOTAM to define Area of Medium Contamination for which a Danger Area has not been established

```
(A0207/10 NOTAMN
Q) EUEC/QWWXX/IV/AE/000/200
A) EIAA B) 1005190700 C) 1005191300
E) VOLCANIC ASH AREA OF MEDIUM CONTAMINATION FORECAST IN AREA
5243N00853W 5330N00618W 5150N00829W
F) SFC
G) FL200)
```

6. ASHTAM alerting pre-eruptive activity

```
VALI0021 LIRR  01091410
ASHTAM 005/10
A) ROMA FIR B) 01091350 C) ETNA 101-06 D) 3744N01500E
E) YELLOW ALERT
J) VULCANOLOGICAL AGENCY
```

7. ASHTAM alerting eruptive activity

```
VALI0024 LIRR  01151800
ASHTAM 015/10
A) ROMA FIR B) 01151650 C) ETNA 101-06 D) 3744N01500E
E) RED ALERT F) AREA AFFECTED 3700N01500E 3900N01600E
3800N001700W SFC/35000FT  G) NE H) ROUTES AFFECTED WILL BE
NOTIFIED BY ATC  J) VULCANOLOGICAL AGENCY
```

8. ASHTAM alerting reduction in eruptive activity

```
VALI0035 LIRR  01300450
ASHTAM 025/10
A) ROMA FIR B) 01300350 C) ETNA 101-06 D) 3744N01500E
E) YELLOW ALERT FOLLOWING ORANGE J) VULCANOLOGICAL AGENCY
```

ATTACHMENT F – MAJOR VOLCANOES IN THE AFI REGION

MAJOR VOLCANOES IN THE AFI REGION

	Volcano Name	Volcano Type	Volcano Status	Location
1	TAHALRA VOLCANIC FIELD	Pyroclastic cones	Holocene	Algeria
2	ATAKOR VOLCANIC FIELD	Scoria cones	Holocene	Algeria
3	MANZAZ VOLCANIC FIELD	Scoria cones	Holocene	Algeria
4	IN EZZANE VOLCANIC FIELD	Volcanic field	*Holocene*	Algeria-Niger border
5	CAMEROON	Stratovolcano	Historical	Cameroon
6	TOMBEL GRABEN	Cinder cones	Holocene	Cameroon
7	MANENGOUBA	Stratovolcano	*Holocene*	Cameroon
8	OKU VOLCANIC FIELD	Stratovolcano	*Holocene*	Cameroon
9	NGAOUNDERE PLATEAU	Volcanic field	*Holocene*	Cameroon
10	LA PALMA	Stratovolcanoes	Historical	Canary Islands
11	HIERRO	Shield volcano	Radiocarbon	Canary Islands
12	TENERIFE	Stratovolcano	Historical	Canary Islands
13	GRAN CANARIA	Fissure vents	Radiocarbon	Canary Islands
14	FUERTEVENTURA	Fissure vents	Holocene	Canary Islands
15	LANZAROTE	Fissure vents	Historical	Canary Islands
16	FOGO	Stratovolcano	Historical	Cape Verde Islands
17	BRAVA	Stratovolcano	Holocene	Cape Verde Islands
18	SAO VICENTE	Stratovolcano	Holocene	Cape Verde Islands
19	TARSO TOH	Volcanic field	Holocene	Chad
20	TARSO TOUSSIDE	Stratovolcano	Holocene	Chad
21	TARSO VOON	Stratovolcano	Fumarolic	Chad
22	EMI KOUSSI	Pyroclastic shield	Holocene	Chad
23	LA GRILLE	Shield volcano	Holocene	Comore Island
24	KARTHALA	Shield volcano	Historical	Comore Island
25	KARISIMBI	Stratovolcano	Potassium-Argon	Democratic Republic Congo-Rwanda border
26	VISOKE	Stratovolcano	Historical	Democratic Republic Congo-Rwanda border
27	MAY-YA-MOTO	Fumarole field	Fumarolic	Democratic Republic of Congo
28	NYAMURAGIRA	Shield volcano	Historical	Democratic Republic of Congo
29	NYIRAGONGO	Stratovolcano	Historical	Democratic Republic of Congo
30	TSHIBINDA	Cinder cones	Holocene	Democratic Republic of Congo
31	ARDOUKOBA	Fissure vents	Historical	Djibouti
32	GARBES	Fumarole field	*Pleistocene-*	Djibouti
33	BOINA	Fumarole field	*Pleistocene-*	Djibouti-Ethiopia border
34	JALUA	Stratovolcano	Holocene	Eritrea
35	ALID	Stratovolcano	Holocene	Eritrea
36	DUBBI	Stratovolcano	Historical	Eritrea
37	NABRO	Stratovolcano	*Holocene?*	Eritrea
38	ASSAB VOLCANIC FIELD	Volcanic field	Holocene	Eritrea
39	GUFA	Volcanic field	Holocene	Eritrea-Djibouti border
40	DALLOL	Explosion craters	Historical	Ethiopia
41	GADA ALE	Stratovolcano	Holocene	Ethiopia
42	ALU	Fissure vents	Holocene	Ethiopia
43	DALAFFILLA	Stratovolcano	Historical	Ethiopia
44	BORALE ALE	Stratovolcano	Holocene	Ethiopia
45	ERTA ALE	Shield volcano	Historical	Ethiopia
46	ALE BAGU	Stratovolcano	Holocene	Ethiopia
47	HAYLI GUBBI	Shield volcano	Holocene	Ethiopia
48	ASAVYO	Shield volcano	Holocene	Ethiopia
49	MAT ALA	Shield volcano	Holocene	Ethiopia
50	TAT ALI	Shield volcano	Holocene	Ethiopia
51	BORAWLI	Stratovolcano	Holocene	Ethiopia
52	AFDERA	Stratovolcano	*Holocene?*	Ethiopia
53	MA ALALTA	Stratovolcano	Holocene	Ethiopia
54	ALAYTA	Shield volcano	Historical	Ethiopia
55	DABBAHU	Stratovolcano	Historical	Ethiopia

MAJOR VOLCANOES IN THE AFI REGION

	Volcano Name	Volcano Type	Volcano Status	Location
56	DABBAYRA	Shield volcano	Holocene	Ethiopia
57	MANDA HARARO	Shield volcanoes	Historical	Ethiopia
58	GROPPO	Stratovolcano	Holocene	Ethiopia
59	KURUB	Shield volcano	Holocene	Ethiopia
60	MANDA GARGORI	Fissure vents	Anthropology	Ethiopia
61	BORAWLI	Lava domes	Holocene	Ethiopia
62	DAMA ALI	Shield volcano	Historical	Ethiopia
63	GABILLEMA	Stratovolcano	Holocene	Ethiopia
64	YANGUDI	Complex volcano	Holocene	Ethiopia
65	AYELU	Stratovolcano	Holocene	Ethiopia
66	ADWA	Stratovolcano	Holocene	Ethiopia
67	HERTALI	Fissure vent	Holocene	Ethiopia
68	LIADO HAYK	Maars	*Holocene?*	Ethiopia
69	DOFEN	Stratovolcano	Holocene	Ethiopia
70	FENTALE	Stratovolcano	Historical	Ethiopia
71	BERU	Volcanic field	Holocene	Ethiopia
72	KONE	Calderas	Historical	Ethiopia
73	UNNAMED	Pyroclastic cones	Holocene	Ethiopia
74	BOSET-BERICHA	Stratovolcanoes	Holocene	Ethiopia
75	BISHOFTU VOLCANIC FIELD	Fissure vents	Holocene	Ethiopia
76	UNNAMED	Fissure vents	Holocene	Ethiopia
77	SODORE	Pyroclastic cones	Holocene	Ethiopia
78	GEDAMSA	Caldera	Holocene	Ethiopia
79	BORA-BERICCIO	Pumice cones	Holocene	Ethiopia
80	TULLU MOJE	Pumice cone	Anthropology	Ethiopia
81	UNNAMED	Fissure vents	Holocene	Ethiopia
82	EAST ZWAY	Fissure vents	Holocene	Ethiopia
83	BUTAJIRI-SILTI FIELD	Fissure vents	Holocene	Ethiopia
84	ALUTU	Stratovolcano	Radiocarbon	Ethiopia
85	O'A CALDERA	Caldera	Holocene	Ethiopia
86	CORBETTI CALDERA	Caldera	Holocene	Ethiopia
87	BILATE RIVER FIELD	Maars	Holocene	Ethiopia
88	TEPI	Shield volcano	Holocene	Ethiopia
89	HOBICHA CALDERA	Caldera	*Holocene?*	Ethiopia
90	CHIRACHA	Stratovolcano	*Holocene?*	Ethiopia
91	TOSA SUCHA	Cinder cones	Holocene	Ethiopia
92	UNNAMED	Cinder cones	Holocene	Ethiopia
93	KORATH RANGE	Tuff cones	*Holocene?*	Ethiopia
94	MALLAHLE	Stratovolcano	*Holocene?*	Ethiopia/Eritrea
95	SORK ALE	Stratovolcano	*Holocene?*	Ethiopia/Eritrea
96	MANDA-INAKIR	Fissure vents	Historical	Ethiopia-Djibouti border
97	MOUSA ALLI	Stratovolcano	Holocene	Ethiopia-Eritrea-Djibouti border
98	MEGA BASALT FIELD	Pyroclastic cones	Holocene	Ethiopia-Kenya border
99	NORTH ISLAND	Tuff cones	Holocene	Kenya
100	CENTRAL ISLAND	Tuff cones	Holocene	Kenya
101	SOUTH ISLAND	Stratovolcano	Historical	Kenya
102	MARSABIT	Shield volcano	*Holocene?*	Kenya
103	THE BARRIER	Shield volcano	Historical	Kenya
104	NAMARUNU	Shield volcano	Tephrochronology	Kenya
105	SEGERERUA PLATEAU	Pyroclastic cones	Holocene	Kenya
106	EMURUANGOGOLAK	Shield volcano	Radiocarbon	Kenya
107	SILALI	Shield volcano	Ar/Ar	Kenya
108	PAKA	Shield volcano	Ar/Ar	Kenya
109	BOGORIA	Shield volcano	*Pleistocene-Geysers*	Kenya

MAJOR VOLCANOES IN THE AFI REGION

	Volcano Name	Volcano Type	Volcano Status	Location
110	KOROSI	Shield volcano	Holocene	Kenya
111	OL KOKWE	Shield volcano	Holocene	Kenya
112	NYAMBENI HILLS	Shield volcano	Holocene	Kenya
113	MENENGAI	Shield volcano	Tephrochronology	Kenya
114	HOMA MOUNTAIN	Complex volcano	Holocene	Kenya
115	ELMENTEITA BADLANDS	Pyroclastic cones	Holocene	Kenya
116	OL DOINYO EBURRU	Complex volcano	Holocene	Kenya
117	OLKARIA	Pumice cones	Radiocarbon	Kenya
118	LONGONOT	Stratovolcano	Anthropology	Kenya
119	SUSWA	Shield volcano	Holocene	Kenya
120	CHYULU HILLS	Volcanic field	Anthropology	Kenya
121	HARUJ	Volcanic field	Holocene	Libya
122	WAU-EN-NAMUS	Caldera	*Holocene?*	Libya
123	AMBRE-BOBAOMBY	Volcanic field	Holocene	Madagascar
124	NOSY-BE	Cinder cones	Holocene	Madagascar
125	ANKAIZINA FIELD	Cinder cones	Holocene	Madagascar
126	ITASY VOLCANIC FIELD	Scoria cones	Radiocarbon	Madagascar
127	ANKARATRA FIELD	Cinder cones	Holocene	Madagascar
128	MADEIRA	Shield volcano	Radiocarbon	Madeira
129	TIN ZAOUATENE VOLCANIC FIELD	Volcanic field	Holocene	Mali
131	TODRA VOLCANIC FIELD	Cinder cones	Holocene	Niger
132	BIU PLATEAU	Volcanic field	*Holocene?*	Nigeria
133	PITON DE LA FOURNAISE	Shield volcano	Historical	Reunion Island
134	SAO TOME	Shield volcano	*Holocene?*	Sao Tome and Principe
135	JEBEL MARRA	Volcanic field	Radiocarbon	Sudan
136	KUTUM VOLCANIC FIELD	Scoria cones	*Holocene?*	Sudan
137	MEIDOB VOLCANIC FIELD	Scoria cones	Holocene	Sudan
138	BAYUDA VOLCANIC FIELD	Cinder cones	Radiocarbon	Sudan
139	JEBEL UMM ARAFIEB	Shield volcano	*Holocene?*	Sudan
140	OL DOINYO LENGAI	Stratovolcano	Historical	Tanzania
141	KILIMANJARO	Stratovolcano	Holocene	Tanzania
142	MERU	Stratovolcano	Historical	Tanzania
143	IGWISI HILLS	Tuff cones	Holocene	Tanzania
144	UNNAMED	Pyroclastic cone	Holocene	Tanzania
145	SW USANGU BASIN	Lava domes	Holocene	Tanzania
146	NGOZI	Caldera	Radiocarbon	Tanzania
147	IZUMBWE-MPOLI	Pyroclastic cones	Holocene	Tanzania
148	RUNGWE	Stratovolcano	Radiocarbon	Tanzania
149	KYEJO	Stratovolcano	Historical	Tanzania
150	FORT PORTAL	Tuff cones	Radiocarbon	Uganda
151	KYATWA	Tuff cones	*Holocene?*	Uganda
152	KATWE-KIKORONGO	Tuff cones	Holocene	Uganda
153	BUNYARUGURU	Maars	Holocene	Uganda
154	KATUNGA	Tuff cone	Holocene	Uganda
155	BUFUMBIRA	Cinder cones	*Holocene?*	Uganda
156	MUHAVURA	Stratovolcano	Holocene	Uganda-Rwanda border

- END -

AFI STRATEGY FOR THE IMPLEMENTATION OF NEW ICAO FLIGHT PLAN FORMAT AND SUPPORTING ATS MESSAGES

Recognizing that:

The Global Air Traffic Management Operational Concept (Doc 9854) requires information management arrangements that provide accredited, quality-assured and timely information to be used to support ATM operations;

ATM Requirement 87 in the Manual of Air Traffic Management System Requirements (Doc 9882) provides that 4-D trajectories be used for traffic synchronization applications to meet ATM system performance targets, explaining that automation in the air and on the ground will be used fully in order to create an efficient and safe flow of traffic for all phases of flight;

The amended ICAO Flight Plan and associated ATS Message formats contained in Amendment 1 to the Fifteenth Edition of the PANS ATM (Doc 4444, applicable 15 November 2012) have been formulated to meet the needs of aircraft with advanced capabilities and the evolving requirements of automated air traffic management systems;

The complexities inherent in automated computer systems preclude the adoption of a single regional implementation date and transitions to the new flight plan format will therefore occur in accordance with the declared transition period described in this document.

All States shall implement all provisions of Amendment 1 to the Fifteenth Edition of the PANS ATM (Doc 4444, applicable 15 November 2012).

APIRG/17 established the AFI FPLT TF under Decision 17/61 to facilitate and guide the transition and implementation.

The AFI implementation of Amendment 1 to the PANS-ATM shall:

a) Ensure that all States and airspace users implement all the provisions of Amendment 1 from 15 November 2012, not just selected aspects of the Amendment;

b) Acknowledge that States, having taken all practical efforts to fully implement all the Amendment 1 provisions in accordance with guidelines, are obliged, in event of any non-implemented provisions, to inform ICAO about the "significant difference" in accordance with established ICAO procedures by 30 June 2011 and publish such difference in their State AIPs. However, that such action may not be taken before interested stakeholders including international organizations have been given an opportunity to intervene in pre-empting the "significant difference."

Note: *The "significant difference" in this context does not relate to Standards and the obligation imposed by Article 38 of the Convention. It however, relates to provisions of Annex 15 to the Convention, inter alia, under section 4.1 thereof, regarding publication of significant differences between State practices and SARPs and procedures.*

c) Ensure that, from 15 November 2012, all States and airspace users accept and disseminate the 'NEW' flight plan and associated ATS message formats only, and transmission of 'PRESENT' flight plan is forthwith discontinued.

Note: *In the context of the implementation, 'PRESENT' refers to the existing flight planning and ATS message formats as defined in the current version of the PANS-ATM and 'NEW' refers to the amended provisions as contained in Amendment 1 to the PANS-ATM.*

The AFI transition to the PANS-ATM Amendment 1 provisions shall:

a) Comply with the regional guidance provided by APIRG's FPLT TF;

b) Preserve global consistency in implementation by basing implementation activities, to the extent possible, on Guidelines 1 to 6 as described in the ICAO guidance material circulated under cover of State Letter AN 13/2.1-09/9, dated 6 February 2009;

c) Ensure that the FPLT TF undertakes coordination to facilitate harmonization with implementation in neighbouring regions;

d) Ensure that State specific constraints are reduced, if not eliminated;

e) Declare a transition period from 1 January 2012 until 14 November 2012, comprising;

- 1 January to 31 March 2012 - ANSPs software delivery and internal testing,
- 1 April to 30 June 2012 – ANSPs implementation, and
- 1 July to 14 November 2012 at 23:59 – airspace users testing and implementation.

f) Encourage States:

- To commence with implementation process as soon as practical, and not await the transition period;
- Not to implement 'NEW' capability before the commencement of the ANSPs external testing and implementation period;
- Insofar as possible, to complete ANSP implementation of 'NEW' capability by the end of the ANSP's external testing and implementation period.

g) Recognizing the risk to automated systems of having all airspace users simultaneously commencing 'NEW' on the common implementation date (15 November 2012), encourage users to take full advantage of the airspace users testing and implementation period to ensure operational readiness of flight planning systems;

h) Encourage States (ANSPs) and airspace users to coordinate appropriate implementation methodologies in order to ensure a staggered migration of airspace users to 'NEW' during the airspace users testing and implementation period (i.e. 1 July – 14 November 2012);

i) Encourage States (ANSPs) and airspace users to immediately commence preparations to implement Amendment 1 provisions in accordance with the declared transition period and report progress to the Regional Offices quarterly (i.e., January, April, July and September).

j) Require States to keep the Regional Offices updated on ~~of~~ scheduled transition dates;

k) Require States to make necessary preparations in order to accommodate up to 120 hours prior to Estimated Off Blocks Time (EOBT) as of 15 November 2012; and

l) Require that States retain capability to simultaneously support 'PRESENT' and 'NEW' provisions (flight plan and ATS message format) from the activation of their 'NEW' capabilities until the end of the transition period (i.e. until and inclusive of 14 November 2012), at which point transmission of 'PRESENT' shall be discontinued.

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AFI FLIGHT PLAN TRANSITION TASK FORCE (FPLT TF)

Proposed Revised Terms of Reference (TOR)

Terms of reference:

1) Conduct a comprehensive review of Amendment 1 to the Fifteenth Edition of the PANS ATM (Doc 4444, effective 15 November 2012) in order to identify, study and address implementation complexities arising from the adoption of amended PANS ATM Chapter 4, Chapter 11, Appendix 2 and Appendix 3 provisions relating to the ICAO Flight Plan and associated ATS Message formats;

2) Collect and analyze information on the status of AFI ANSP flight plan processing systems including ongoing upgrades to such systems;

3) On the basis of the above, and in accordance with relevant additional ICAO provisions and the SP AFI/8 RAN Recommendation 6/5, develop a coordinated AFI transition strategy and plan with associated timelines to enable the streamlined coordinated implementation of the amended Flight Plan and ATS Message provisions contained in Amendment 1 to the Fifteenth Edition of the PANS ATM; and

4) Periodically review the status of preparedness and propose solutions.

Considerations:

In addressing these terms of reference, the Task Force should consider, inter alia, the following aspects:

a) Likelihood that changes within the systems in the AFI Region could differ from systems in other ICAO Regions and accordingly provide recommendable Regional action with global goals;
b) Inter and intra regional issues;
c) Impact on inter-system co-ordination messaging;
d) Impact on non-automated flight plan processing systems;
e) Systems that transition early will need to be capable of handling both "NEW" and "PRESENT" instruction sets;
f) Inter-system exchanges need to take account of differing automation capabilities in order to avoid excessive message rejection;
g) Establishment of an Information Management system to track implementation timelines for various States/systems;
h) Management of Repetitive Flight Plans;
i) Implications for presentation formats, including paper & electronic flight progress strips;
j) Impacts to users (flight planning systems etc);

k) Appropriately timed withdrawal of existing State or Regional specific requirements to ensure consistency with new (global) instruction set; and
l) Existing ICAO guidance material.

Membership

Core members:

- ATM specialist and systems engineering experts (CNS) from AFI States and ANSPs with existing and planned automated flight plan processing systems
- ASECNA, IATA, IFALPA, IFATCA,

Note:
Algeria, Kenya, Senegal, Seychelles, South Africa, Sudan and Tanzania have offered their expertise as core members.

Other members

AFI States and ANSPs other than the above
Expertise from States, ANSPs outside the AFI Region that may be invited by the Task Force based on beneficial inputs they may contribute

Note:
Industry participation including systems providers, if required, is to be included under responsibility of State delegations. The Task Force may however, invite specific expertise from international organizations and relevant aviation industry entities (including vendor organizations) in order to enhance information available for the Task Force to progress its work. Such invitations shall be managed to exclude promotion of commercial interests.

Reporting

The Task Force shall report progress to the AFI ATM/AIM/SAR Sub-Group in coordination with CNS Sub-Group. However, owing to the limited time available for planning and in some cases acquisition of systems, valuable planning information emanating from the Task Force may, after coordination with Secretary of APIRG be provided to States without waiting for forthcoming meetings of the AFI ATM/AIM/SAR Sub-Group.

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AFI REGIONAL PERFORMANCE OBJECTIVES/NATIONAL PERFORMANCE OBJECTIVES FOR PBN

AFI REGIONAL PERFORMANCE OBJECTIVES/NATIONAL PERFORMANCE OBJECTIVES OPTIMIZATION OF THE ATS ROUTE STRUCTURE IN EN-ROUTE AIRSPACE				
Benefits				
Environment **Efficiency** **Safety**	• reduction in gas emissions • ability of aircraft to conduct flight more closely to preferred trajectories • increase in airspace capacity • facilitate utilization of advanced technologies (e.g., FMS-based arrivals) and ATC decision support tools (e.g., metering and sequencing), thereby increasing efficiency			
Strategy ***Short term (2010)*** ***Medium term (2011-2015)***				
ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
AOM	***En-route airspace***	2008		
	• develop regional implementation plan	2008-2009	AFI PBN TF	Completed
	• develop regional action plan	2009-2010	AFI PBN TF	Completed
	• establish collaborative decision making (CDM) process	2010	States	Continuous
	• develop airspace concept based on AFI PBN regional implementation plan, in order to design and implement a trunk route network, connecting major city pairs in the upper airspace and for transit to/from aerodromes, on the basis of PBN, e.g. RNAV 10 and RNAV 5, and taking into account interregional harmonization	2009-2012	AFI PBN TF/States	In progress
	• harmonize national and regional PBN implementation plans	2010-2016	AFI PBN TF/States	On-going
	• develop performance measurement plan	2010-2012	States	In progress
	• formulate safety plan	2010-2012	States	To be developed
	• publish national regulations for aircraft and operators approval using PBN manual as guidance material	2010-2011	States	To be developed
	• identify training needs and develop corresponding guidelines	2010-2011	States	In progress
	• identify training programmes and develop corresponding guidelines	2010-2011	AFI PBN TF/States	in progress
	• formulate system performance monitoring plan	2010-2011	AFI PBN TF/States	To be developed

	• implementation of en-route ATS routes	2010-2012	AFI PBN TF/States	In progress
	• monitor implementation progress in accordance with AFI PBN implementation plan and State implementation plan	2010 and beyond	AFI PBN TF/States	On-going

AFI REGIONAL PERFORMANCE OBJECTIVES/NATIONAL PERFORMANCE OBJECTIVES OPTIMIZATION OF THE ATS ROUTE STRUCTURE IN TERMINAL AIRSPACE				
Benefits				
Environment **Efficiency** **Safety**	• reduction in gas emissions • ability of aircraft to conduct flight more closely to preferred trajectories • increase in airspace capacity • improved availability of procedures • facilitate utilization of advanced technologies (e.g., FMS based arrivals) and ATC decision support tools (e.g., metering and sequencing), thereby increasing efficiency			
Strategy ***Short term (2010)*** ***Medium term (2011-2015)***				
ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
AOM	***Terminal airspace***	2008		
	• develop regional implementation plan	2009	AFI PBN TF	Completed
	• develop regional action plan	2009-2010	AFI PBN TF	Completed
	• develop State PBN implementation plan	2009 (see note1)	States	In progress (X States have completed)
	• establish collaborative decision making (CDM) process	2010	States	In progress
	• develop airspace concept based on AFI PBN roadmap, in order to design and implement an optimized standard instrument departures (SIDs), standard instrument arrivals (STARs), holding and associated instrument flight procedures, on the basis of PBN and, in particular RNAV 1 and Basic-RNP 1	2009-2012	PBN TF/States	In progress
	• develop performance measurement plan	2010-2012	States	In progress
	• formulate safety plan	2010-2012	States	To be developed
	• publish national regulations for aircraft and operators approval using PBN manual as guidance material	2010-2011	States	To be developed
	• identify training needs and develop corresponding guidelines	2010-2011	States	In progress
	• identify training programmes and develop corresponding guidelines	2010-2011	AFI PBN TF	To be developed
	• formulate system performance monitoring plan	2010-2012	AFI PBN TF/States	In progress
	• develop a regional strategy and work programme implementation of SIDs and STARs	2009-2012	AFI PBN TF/States	In progress
	• monitor implementation progress in accordance with AFI PBN implementation roadmap and State implementation plan	2010 and beyond	AFI PBN TF/States	On going
Linkage to GPIs	GPI/5: performance-based navigation; GPI/7: dynamic and flexible ATS route management; GPI/8: collaborative airspace design and management; GPI/10: terminal area design and management; GPI/11: RNP and RNAV SIDs and STARs; GPI/12: FMS-based arrival procedures.			

OPTIMIZATION OF VERTICALLY GUIDED RNP APPROACHES				
Benefits				
Environment **Efficiency** **Safety**	• reduction in gas emissions • increased accessibility to aerodromes, including continuity of access • increased runway capacity • reduced pilot workload • availability of reliable lateral and vertical navigation capability			
Strategy				
ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
AOM	***Terminal airspace***	2008		
	• develop regional implementation plan	2008 – 2009	AFI PBN TF	Completed
	• develop regional action plan	2009-2010	AFI PBN TF	Completed
	• develop State PBN implementation plan	2009 (*)	States	In progress
	• establish collaborative decision making (CDM) process	2010	States	In progress
	• develop airspace concept based on AFI PBN implementation plan, in order to design and implement RNP APCH with Baro-VNAV or LNAV only (see note 1) in accordance with relevant Assembly resolutions , and RNP AR APCH where beneficial	2009 – 2012	AFI PBN TF/States	In progress
	• develop performance measurement plan	2010-2012	States	In progress
	• formulate safety plan	2010-2012	States	To be developed
	• publish national regulations for aircraft and operators approval using PBN manual as guidance material	2010-2011	States	To be developed
	• identify training needs and develop corresponding guidelines	2010-2011	States	In progress
	• identify training programmes and develop corresponding guidelines	2010-2011	AFI PBN TF/States	To be developed
	• implementation of APV procedures	2010 - 2016	AFI PBN TF/States	In progress
	• Formulate system performance monitoring plan	2010-2012	AFI PBN TF/States	in progress
linkage to GPIs	GPI/8: collaborative airspace design and management; GPI/10: terminal area design and management; GPI/11: RNP and RNAV SIDs and STARs; GPI/12: FMS-based arrival procedures			

(*)States that have not already done so should complete their national PBN implementation plans as soon as possible.

Note 1: where altimeter setting does not exist or aircraft are not suitably equipped for APV

- END -

AFI REGIONAL PERFORMANCE OBJECTIVES/NATIONAL PERFORMANCE OBJECTIVES FOR SEARCH AND RESCUE (SAR)

ESTABLISHMENT OF SUB-REGIONAL SAR ARRANGEMENTS				
Benefits				
Efficiency and Safety	• cost-efficient use of accommodation and RCC equipment on a shared basis • service provision more uniform across a geographic area defined by risk • proficient services provided near and within States with limited resources. • harmonization of aviation / maritime procedures • inter-operability of life-saving equipment • development of a pool of experienced SAR mission coordinators skilled across both aviation and maritime domains thus reducing coordination and fragmentation			
Strategy				
ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
N/A	• conduct AFI Regional SAR workshop	every year	ICAO	
	• establish collaborative decision making process • Collaboration between states • Networking process by setting up a website; nominate a focal point within ICAO to manage the website • Nominate a focal point within each state/organization to coordinate SAR issues	2011 – 2012	ICAO /States	Not started
	• develop needs assessment and gap analysis • conduct self audits	2011 – 2012	APIRG/STATES	Not started
	• develop regional action plan to resolve the deficiencies	2011 – 2012	APIRG/STATES	Not started
	• conduct regional SAR Administrators training and SAR Mission Coordinators training	2011 – 2012	ICAO	Not started
	• determine regional and sub regional organisation, functions and responsibilities, accommodation and equipment needs.:	2011 – 2012	APIRG/ STATES	Not started
	• produce draft legislation, regulations, operational procedures, letters of agreement SAR plans and safety management policies for regional SAR provision using IAMSAR manual as guidance.	2010 – 2012	APIRG	Implementation on a continuous basis

	• determine future training needs and develop training plans and conduct training as required	2010 – permanent	APIRG/STATES	Implementation on a continuous basis
	• develop SAR plan ➢ alerting procedures ➢ resource databases ➢ interface procedures with aerodrome emergency procedures and generic disaster response providers ➢ RCC check lists ➢ staffing, proficiency and certification plans ➢ preventive SAR programmes ➢ quality programmes ➢ education and awareness programmes ➢ in-flight emergency response procedures	2011 – 2012	States	Not started
	•			
	• conduct SAR exercises required.: -National -Multinational	2012 - Permanent	States	Not started
	• monitor implementation process	As appropriate	ICAO/States	Not started
linkage to GPIs	N/A			

Notes: 1.Enablers: Regional Organizations like SADC, ECOWAS, CEMAC, EAC etc.

2. The Task Force has identified the following groups of RCCs as potential base for regional/subregional SAR close co-operation e.g: SAR exercise, training, meetings etc…:

- Casablanca, Canarias, Dakar, Roberts, Sal,
- Algiers, Asmara, Cairo, Tripoli, Tunis
- Accra, Brazzaville, Kano, Kinshasa, Ndjamena, Niamey,
- Addis, Entebbé, Khartoum, Mogadishu, Nairobi
- Southern Africa States
- Antananarivo, Mauritius, Seychelles

3. All work requires close cooperation with all States affected, ICAO, IMO, Cospas-Sarsat and other worldwide bodies as require.

-END-

Performance Objectives

ATM PERFORMANCE OBJECTIVES

REGIONAL PERFORMANCE OBJECTIVE - IMPLEMENTATION OF THE NEW ICAO FPL PROVISIONS BY 15 NOVEMBER 2012

Benefits

Environment	• reduction in fuel consumption and reduction of carbon emissions
Efficiency	• ability of air navigation service providers t make maximum use of aircraft capabilities • ability of aircraft to conduct flights more closely to their preferred trajectories • facilitate utilization of advanced technologies thereby increasing efficiency • increase airspace capacity • optimized demand and capacity balancing through the efficient exchange of information
Safety	• enhance safety by use of modern capabilities onboard aircraft • enhance the success of SAR operations • generally enable PBN and other advanced navigation capabilities

Strategy

Short term (2010-2012)

ATM OC COMPONENTS	TASKS	TIMEFRAME START-END	RESPONSIBILITY	STATUS
AUO SDM	• plan the transition arrangements to ensure that the changes from the current to the new ICAO FPL form occur in a timely and seamless manner and with no loss of service	2009-June 2011	States	~~Ongoing~~ Complete
	• ensure that the capabilities of local systems are fully adaptable to the changes envisaged in the new FPL form	2010 to June 2012	States	Ongoing Not completed
	• ensure the ability of FDPS's to parse information correctly to guarantee that misinterpretation of data does not occur	2010 to June 2012	States	Ongoing Not completed
	• analyze each individual data item within the various fields of the new flight plan form, comparing the current values and the new values to verify any issue regarding the provision of service by the flight planning facility itself or downstream units	2010 to June 2012	States	Ongoing Not completed
	• ensure that there are no individual State peculiarities or deviations from the flight plan provisions	~~2011~~ 2012	States	Ongoing

	• ensure that the accepting ATS Reporting Office accepts and disseminates all aircraft capabilities and flight intent to all the downstream ACCs as prescribed by the PANS-ATM provisions	2012	States	Ongoing
	• in order to reduce the change of double indications it is important that any State having published a specific requirement(s) which are now addressed by the amendment should withdraw those requirements in sufficient time to ensure that aircraft operators and flight plan service providers, after 15 November 2012, use only the new flight plan indications	2010-2012	States	Ongoing
	• inform on the implementation status to the ICAO regional offices on an ongoing basis	2010-2012	States	Ongoing
	• keep the Flight Plan Implementation Tracking System (FITS) up to date based on the information provided by the States	2010-2012	ICAO Regional Offices	Ongoing
linkage to GPIs	GPI/5 RNAV and RNP (Performance-based navigation) GPI-12 Functional integration of ground systems with airborne system GPI/18 Aeronautical Information			