



*International Civil Aviation Organization*

**MIDANPIRG Steering Group**

**Fifth Meeting (MSG/5)**  
*(Cairo, Egypt, 18 - 20 April 2016)*

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**Agenda Item 4: MID Region Air Navigation Planning**

**ATM PLANNING MATTERS**

*(Presented by the Secretariat)*

<p><b>SUMMARY</b></p> <p>This paper presents the ATM planning matters through the review of the outcome of the ATM SG/2 meeting for consideration and/or endorsement by MSG.</p> <p>Action by the meeting is at paragraph 3.</p>
<p><b>REFERENCES</b></p> <p>– ATM SG/2 Report</p>

**1. INTRODUCTION**

1.1 The Second meeting of the MIDANPIRG ATM Sub-Group (ATM SG/2) was successfully held at the ICAO Middle East Regional Office in Cairo, Egypt, from 30 November to 03 December 2015.

1.2 The meeting was attended by a total of thirty one (31) participants from seven (7) States (Bahrain, Egypt, Iran, Qatar, Saudi Arabia, UAE and United States of America) and five (5) Organizations/Industries (CANSO, Google, IATA, IFATCA and MIDRMA).

1.3 The meeting developed three (3) Draft Conclusions and one (1) Draft Decision.

**2. DISCUSSION**

***ATS Route Network***

2.1 The ATM SG/2 meeting recalled that the MIDANPIRG/15 meeting noted that a number of States were still implementing changes to the Regional ATS Route Network without complying with the established procedures for the amendment of the MID Air Navigation Plan (ANP). Accordingly, the meeting urged States to adhere to the established ICAO procedures related to the publication and amendment of regional ATS routes, prior to the publication of the ATS Routes amendment in their Aeronautical Information Publications (AIPs).

2.2 The meeting reviewed and updated the MID ANP - Table ATS 1 and agreed to remove the comment “FIR Boundary Point” and the coordinates of the Waypoints composing the ATS Routes, in order to avoid confusion and inconsistencies and facilitate the maintenance of the information in the Table.

2.3 The meeting noted with concern that no update on the Route Catalogue was received. Accordingly, States and Users were encouraged to review the Route Catalogue available on the ICAO Website, take necessary measures to implement the proposed routes in a coordinated manner and provide feedback/updates to the ICAO MID Regional Office.

2.4 Taking into consideration the escalated situation in some States, the ATM SG/2 meeting reviewed the Top Ten Routes, endorsed by MIDANPIRG/15 and agreed to a revised list with six (6) routes to be implemented as a priority, as at **Appendix A**. The meeting urged concerned States to take necessary measures to implement these routes in an expeditious manner.

2.5 The ATM SG/2 meeting noted with appreciation EUR/NAT and EUROCONTROL contribution to the meeting.

2.6 Based on the above, the meeting may wish to agree on the following MSG Conclusion to replace the MIDANPIRG Conclusion 14/11:

<b>Why</b>	To improve the ATS Route Network in the MID Region, in a prioritized manner
<b>What</b>	State Letter /Implementation of the top ten ATS routes
<b>Who</b>	ICAO MID Regional Office / States
<b>When</b>	May 2016 / November 2016

**DRAFT MSG CONCLUSION 5/XX:                      IMPLEMENTATION OF THE TOP SIX  
ATS ROUTES**

*That, concerned States be urged to take necessary measures to implement the identified routes at **Appendix A** and provide the ICAO MID Regional Office with an update on the actions undertaken by **15 November 2016**, for review by the ANSIG/2 meeting.*

**Contingency Planning**

2.7 The ATM SG/2 meeting commended the work of the Contingency Coordination Teams (CCTs), established in accordance with the MID Region ATM Contingency Plan, which succeeded to provide a forum for sharing information, identify the challenges and agree on contingency measures to ensure the safety of air traffic during contingency situations. In this respect, the meeting encouraged States to implement the provisions of the MIDANPIRG Conclusion 15/20, and support the work of the CCTs.

2.8 The ATM SG/2 meeting reviewed and updated the MID Region ATM Contingency Plan (MID Doc 003) as at **Appendix B**. In this respect the meeting is invited to agree to the following Draft MSG Conclusion:

<b>Why</b>	To update the MID Region ATM Contingency Plan
<b>What</b>	MID Region ATM Contingency Plan
<b>Who</b>	MSG/5 on behalf of MIDANPIRG
<b>When</b>	April 2016

***DRAFT MSG CONCLUSION 5/XX: MID REGION ATM CONTINGENCY PLAN***

*That, the revised version of the MID Region ATM Contingency Plan (MID Doc 003, Edition April 2016) is endorsed.*

2.9 The ATM SG/2 meeting underlined that no contingency arrangement can be successful unless it has been consulted with all affected stakeholders, including the airlines, military, ATC units, regulators and aerodrome operators.

2.10 The meeting may wish to note that some airspace users continue to circumnavigate Baghdad, Damascus and Tripoli FIRs due to the conflict zones. With regard to Yemen, some air operators resumed operations through Sana'a FIR using the ATS routes over the high seas.

2.11 The ATM SG/2 meeting noted that the majority of the information posted on the ICAO Conflict Zone Information Repository (CZIR) is related to the MID Region. The meeting encouraged States to provide updated information related to conflict zones, in accordance with the interim procedure to disseminate information on risks to civil aviation arising from conflict zones attached to State Letter Ref.: SMM 1/4-15/16 dated 20 March 2015.

2.12 The ATM SG/2 meeting noted that ICAO issued State Letter Ref.: AN 13/35-15/36 dated 21 May 2015, related to State emergency response to natural disasters and associated air traffic contingency (ATC) measures, reminding States of their obligations with regard to the importance and necessity of proactive contingency planning. Accordingly, the meeting encouraged States to implement the provisions of the above-mentioned State Letter and review their plans and measures to ensure they are fit for purpose.

2.13 The ATM SG/2 meeting encouraged States to implement the global and regional contingency provisions/measures to ensure the safety of the air traffic operating across the MID Region, and complete the signature of the contingency agreements with their adjacent States, if not yet done so.

***Civil/Military Cooperation and Flexible Use of Airspace***

2.14 The ATM SG/2 meeting was apprised of the Global and European experience related to the implementation of the Civil/Military Cooperation including the Flexible Use of Airspace (FUA) Concept.

2.15 The ATM SG/2 meeting recalled that MIDANPIRG/15 meeting established the MID Civil/Military Support Team, with a view to expedite the implementation of the FUA Concept in the MID Region. Accordingly, the meeting encouraged States to request the ICAO MID Regional Office to coordinate the conduct of a Support Team visit, which includes in its work programme a Civil/Military Cooperation Workshop.

2.16 The ATM SG/2 meeting reviewed and agreed to the MID eANP Volume III Reporting and Monitoring Table related to ASBU B0-FRTO as at **Appendix C**. The meeting encouraged States to provide the ICAO MID Regional Office with their inputs to the Table by 15 April 2016. No inputs were received.

2.17 The ATM SG/2 meeting recalled that MIDANPIRG/15 urged States to take necessary measures to implement the provisions of the Resolution A38-12 and MIDANPIRG/14 Conclusions 14/12 and 14/13 and provide the ICAO MID Regional Office with an update on the action(s) undertaken before 1 October 2015. It was underlined that no feedback was received. Accordingly, the meeting urged States to provide their feedback to the ICAO MID Regional Office related to the actions undertaken, by **15 July 2016**.

### ***Air Traffic Flow Management***

2.18 The ATM SG/2 meeting noted that a project related to regional/sub-regional ATFM system was endorsed as one of the MAEP projects. In this respect, the Second meeting of the MAEP Steering Committee (MAEP SC/2, 20-22 October 2015) emphasized the importance of the project. However, it was agreed that the project implementation could not be initiated before 2017, providing that all the enablers/prerequisites are implemented and taking into consideration the initiatives carried out by States.

2.19 The meeting recalled that MIDANPIRG/15, through Decision 15/16, tasked the ATM Sub-Group to develop a preliminary project proposal addressing the necessity, feasibility, and timelines related to the eventual implementation of a regional/sub-regional ATFM system, for consideration by the MAEP Steering Committee. Taking into consideration the outcome of the MAEP SC/2 meeting, the meeting agreed that the development of the project proposal (business plan) should be carried out by the PMO, once established.

2.20 The meeting reviewed and agreed to the MID eANP Volume III Reporting and Monitoring Table related to the ASBU B0-NOPS as at **Appendix D**. The meeting encouraged States to provide the ICAO MID Regional Office with their inputs/plans related to the implementation of the B0-NOPS by 15 April 2016. However, no inputs were received.

2.21 The ATM SG/2 meeting encouraged all stakeholders to participate in the ICAO ATFM Seminar tentatively scheduled to be held in UAE in November 2016.

### ***MID Region FIRs discrepancies***

2.22 The ATM SG/2 meeting recalled that in accordance with Annex 15, Appendix 7, Table A7-1, Publication **Resolution** for the FIR boundary points is **1 minute**. However, in accordance with Annex 11, Appendix 5, Table 1, the accuracy for FIR boundary points is 2 Km.

2.23 The meeting was apprised of the outcome of the AIM SG/2 meeting (Kish Island, Iran, 31 August – 2 September 2015), in particular Draft Conclusions 2/3 and 2/4. The meeting reviewed the Guidelines for the publication of FIR boundary points, at **Appendix E** and agreed that the Guidelines should be taken into consideration in the publication of the FIR boundary points in the AIPs.

2.24 The meeting reviewed the Table ATM I-1 *MID Region Flight Information Regions (FIRs)/Upper Information Regions (UIRs)* at **Appendix F** highlighting the inconsistencies between adjacent FIRs and agreed to the following Draft Conclusion:

<b>Why</b>	Populate MID eANP Table ATM-I (FIR descriptions)
<b>What</b>	State Letter/FIR descriptions
<b>Who</b>	MID Office/States
<b>When</b>	April 2016/October 2016

*DRAFT CONCLUSION 2/1: PUBLICATION OF FIR BOUNDARY POINTS*

*That, States be urged to:*

- a) take into consideration the Guidelines at **Appendix E** for the description of their FIR boundaries;*
- b) review the Table ATM I-1 MID Region Flight Information Regions (FIRs)/Upper Information Regions (UIRs) at **Appendix F** and coordinate with neighboring States, as appropriate, the definition of common boundaries; and*
- c) provide the ICAO MID Regional Office with their updates and comments before **15 October 2016**.*

***Remotely Piloted Aircraft System (RPAS)***

2.25 The ATM SG/2 meeting noted that the ANC during its 196th Session in May 2014 established the RPAS Panel to replace the Unmanned Aircraft Systems Study Group (UASSG).

2.26 The main objective of the RPAS Panel is to develop Standards and Recommended Practices (SARPs), procedures and guidance to facilitate safe, secure and efficient integration of Remotely Piloted Aircraft (RPA) into non-segregated airspace and aerodromes, maintaining the existing level of safety for manned aviation, with priority to Instrument Flight Rules (IFR) operations in controlled airspace. The personnel licensing provisions related to RPAS will be adopted in 2018.

2.27 The ATM SG/2 meeting encouraged States to use the guidance material related to RPAS provided in the ICAO Doc 10019 and the information available on the RPAS webpage: <https://www4.icao.int/rpas>

2.28 The ATM SG/2 meeting received with appreciation the presentation on the USA experience related to the safe integration of Unmanned Aircraft Systems (UAS) into non-segregated airspace.

2.29 It was highlighted that integrating UAS into the USA airspace system presents both opportunities and challenges, but the focus remains on ensuring safety. New policies, procedures, and approval processes are necessary to adequately respond to the increasing number of requests by civilian operators to conduct UAS operations.

2.30 The meeting encouraged States to consider the developments related to RPAS, and take necessary measures for the amendment of the relevant civil aviation regulations and procedures in a timely manner, in order to ensure safe integration of the RPA into the non-segregated airspace. States were also encouraged to attend the RPAS Workshop that will be held by ICAO. The meeting may wish to note that the RPAS and Remote ATS Symposium will be held in Stockholm, Sweden, from 9 to 10 May 2016.

2.31 The meeting agreed that RPAS should be addressed also under the framework of RASG-MID from a safety perspective. Taking into consideration that the work of RASG-MID is based on data driven processes, the meeting agreed to the following Draft Conclusion, which will be presented to the RASG-MID/5 meeting for review and endorsement:

*DRAFT CONCLUSION 2/2: REMOTELY PILOTED AIRCRAFT SYSTEM (RPAS)  
OCCURRENCES*

*That, States be urged to report any safety occurrence related to RPA operations to the ICAO MID Regional Office by 15 March 2016, for review and analysis by the First meeting of the Accident and Incident Analysis Working Group (AIA WG/1, Cairo, Egypt, 29-31 March 2016).*

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) review and endorse the proposed Draft Conclusions;
- b) take into consideration the global and regional developments related to ATM when developing their national plans
- c) urge States to:
  - i. implement the provisions of the MIDANPIRG Conclusion 15/20, and support the work of the CCTs;
  - ii. complete the signature of the contingency agreements with their adjacent States, if not yet done so; and
  - iii. implement the provisions of the ICAO State Letter Ref.: AN13/35-15/36 dated 21 May 2015.
- d) encourage States to:
  - i. develop the necessary regulations for the safe integration of RPA into the non-segregated airspace, taking into consideration the global developments; and
  - ii. report any occurrence related to RPAS to the ICAO MID Regional Office.

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## APPENDIX A

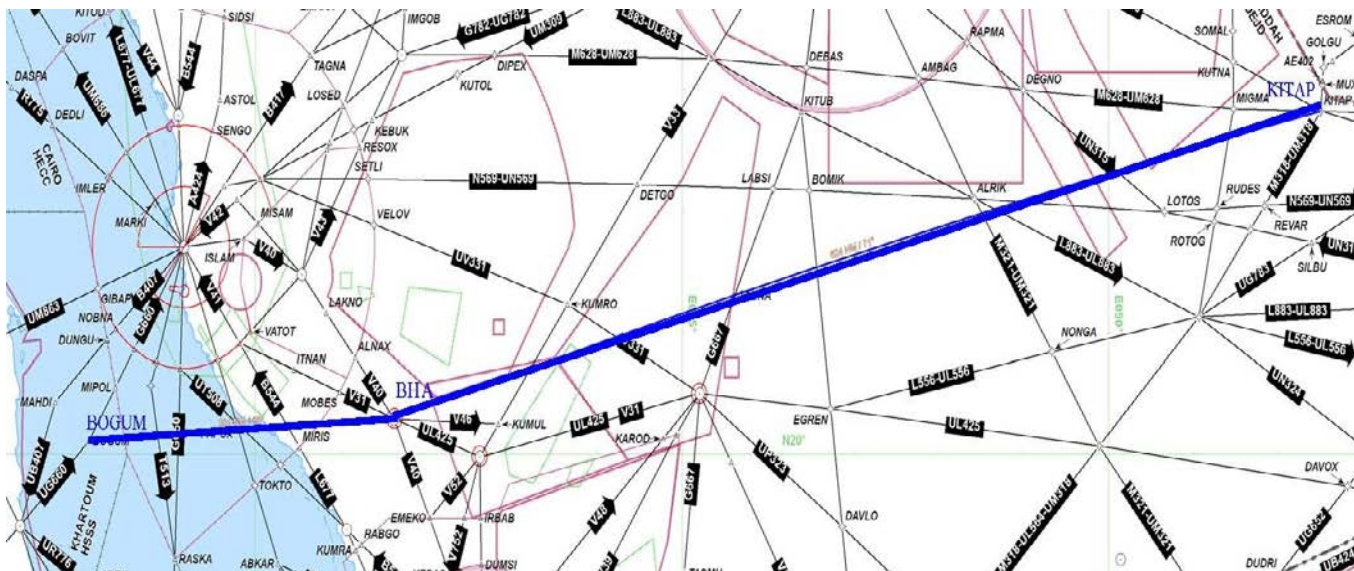
## MID TOP SIX PROPOSED ATS ROUTES

TPR	ATS Route Catalogue Reference	ATS Route Affected	States Concerned	Status			Remarks
				Reviewed by	Date	Changed	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	RC-045	New	Saudi Arabia-Sudan	ATM SG/2	Dec. 2015	No	Moved to ANP
2	RC-055	L315	Egypt-Saudi Arabia	ATM SG/2	Dec. 2015	Yes	Saudi proposed SOBEL-DEDLI
3	RC-083	New	Egypt-Saudi Arabia	ATM SG/2	Dec. 2015	No	Route amended and moved to ANP
4	Not from catalogue	New	Iran-Turkey	ATM SG/2	Dec. 2015	Yes	
5	Not from catalogue	New	Iran-Pakistan	ATM SG/2	Dec. 2015	Yes	
6	Not from catalogue	New	Egypt-Cyprus	ATM SG/2	Dec. 2015	Yes	

**Table explanation**

- a) TPR used as reference for the proposed Top Six routes to be considered for implementation, numbers do not reflect the level of priority.
- b) Source of the proposed routes.
- c) Affected ATS Routes by the implementation of the new proposed routes.
- d) States Concerned with the implementation.
- e) The Group, Sub-Group or Task Force that had reviewed and updated the status of implementation of these top 10 routes.
- f) Date of last status update.
- g) Indicates if the status is changed or Not.
- h) Remarks

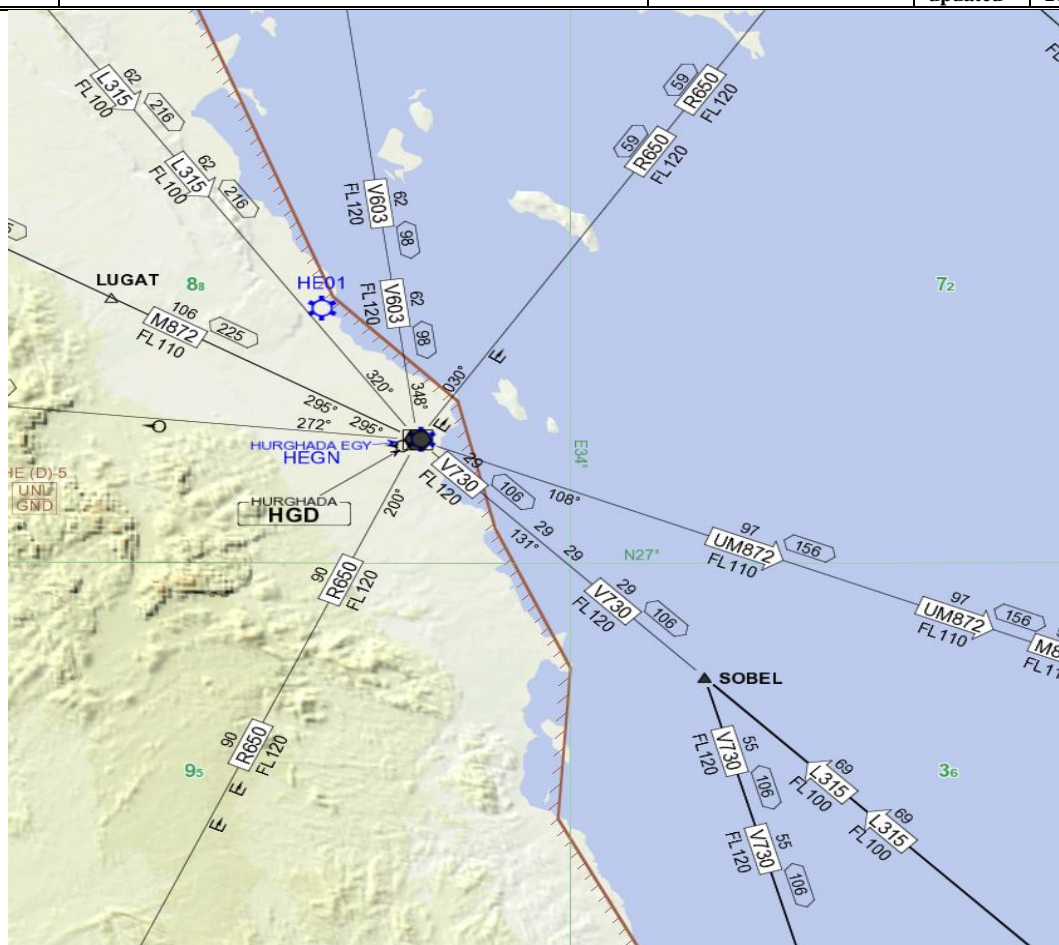
TPR 1 (MID/RC-045)	ATS Route Name: New Route	Entry-Exit: PSD- KITAP	Inter-Regional Cross Reference		Users Priority		Originator of Proposal	IATA
							Date of Proposal	ARN TF/2
Route Description		States Concern ed	Expected Impl. date	Implementation Status	ANP Status		Action Taken / Required	Deadline for each Action
Port Sudan (PSD)		Saudi Arabia		Not implemented	Moved to ANP August 2014	Sudan has no objection from Port Sudan to SALWA (CDR)  KSA suggest Port Sudan BHA-KITAP (Normal route) will avoid CDR  KSA needs more time for studying.		
BOGUM		Sudan						
AI BAHA (BHA)								
KITAP								
Flight Level Band:								
Potential City Pairs: DGAA, DNMM, HSSS, OEJN, SBGR to OBBI, OMAA, OMDDB, OTBD (Central and Eastern Arabian Peninsula to Sudan, West Africa, South America)								
Conclusions/Remarks		Saves 58 miles and 3196 Kg of CO2 to recalculate					Last updated	ATM SG/2 Dec. 2015



TPR 1



TPR 2  (MID/RC-055)	ATS Route Name: L315	Entry-Exit: HEMA-CVO	Inter-Regional Cross Reference if any		Users Priority	Med	Originator of Proposal	IATA	
							Date of Proposal		ARN TF/2
Route Description MAK-CVO		States Concerned	Expected Impl. date	Implementation Status		ANP Status	Action Taken / Required		Deadline for each Action
GIBAL		Egypt		Implemented with opposite direction		Already in ANP	Saudi Arabia proposed L315 westbound and new Segment HDG or SOBEL-DEDLI for eastbound.		
HGD		Saudi Arabia		CVO-HGD Eastbound			This requires that CVO-HGD to be bi- directional.		
CVO				GIBAL-HGD Westbound			Egypt needs more time for studying		
Flight Level Band: Upper							<b>IATA is requesting the route to be Eastbound</b>		
Potential City Pairs: North-western Red Sea to HECA and Europe							Coordination is required between Egypt and Saudi Arabia		
Conclusions/Remarks		Saves 9 miles					Last updated	ATM SG/2 December 2015	



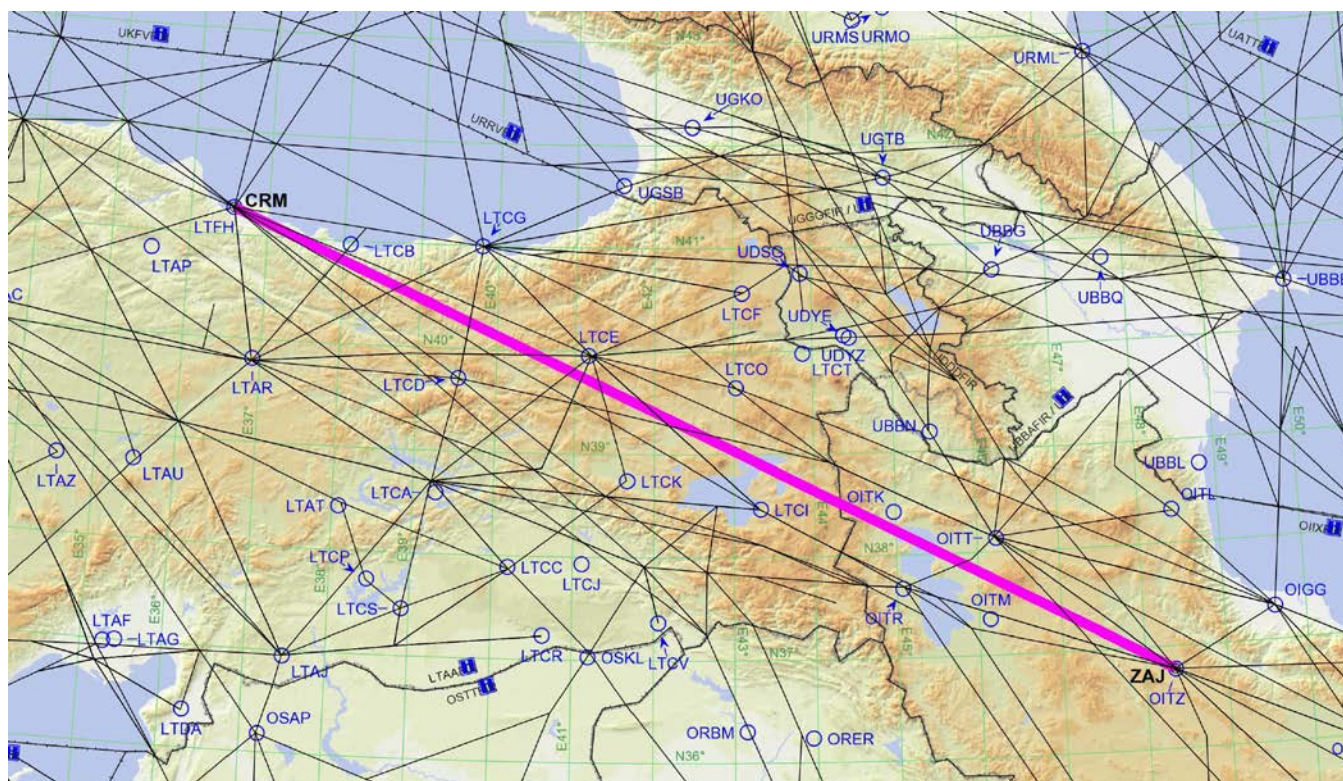
TPR 2

TPR 3 (MID/RC-083)	ATS Route Name: New Route UQ598 Westbound	Entry-Exit: PASAM – HIL	Inter-Regional Cross Reference if any		Users Priority	High	Originator of Proposal	IATA iFLEX Proposal	
							Date of Proposal	17 May 2011	
Route Description		States Concerned	Expected Impl. date	Implementation Status	ANP Status		Action Taken/Required	Deadline for each Action	
HIL PASAM HGD		Egypt  Saudi Arabia			Moved to ANP	Priority Routes Important Segment HGD-PASAM It’s a west bound direction (FUA) N697 - HIL-PASAM- HGD -V608 RC 083 amended to include segment AST- DITAR only  Concerned States to implement the route		TBD	
Flight Level Band:									
Potential City Pairs:									
Conclusions/Remarks							Last updated	ATM SG/2 Dec. 2015	



TPR 3

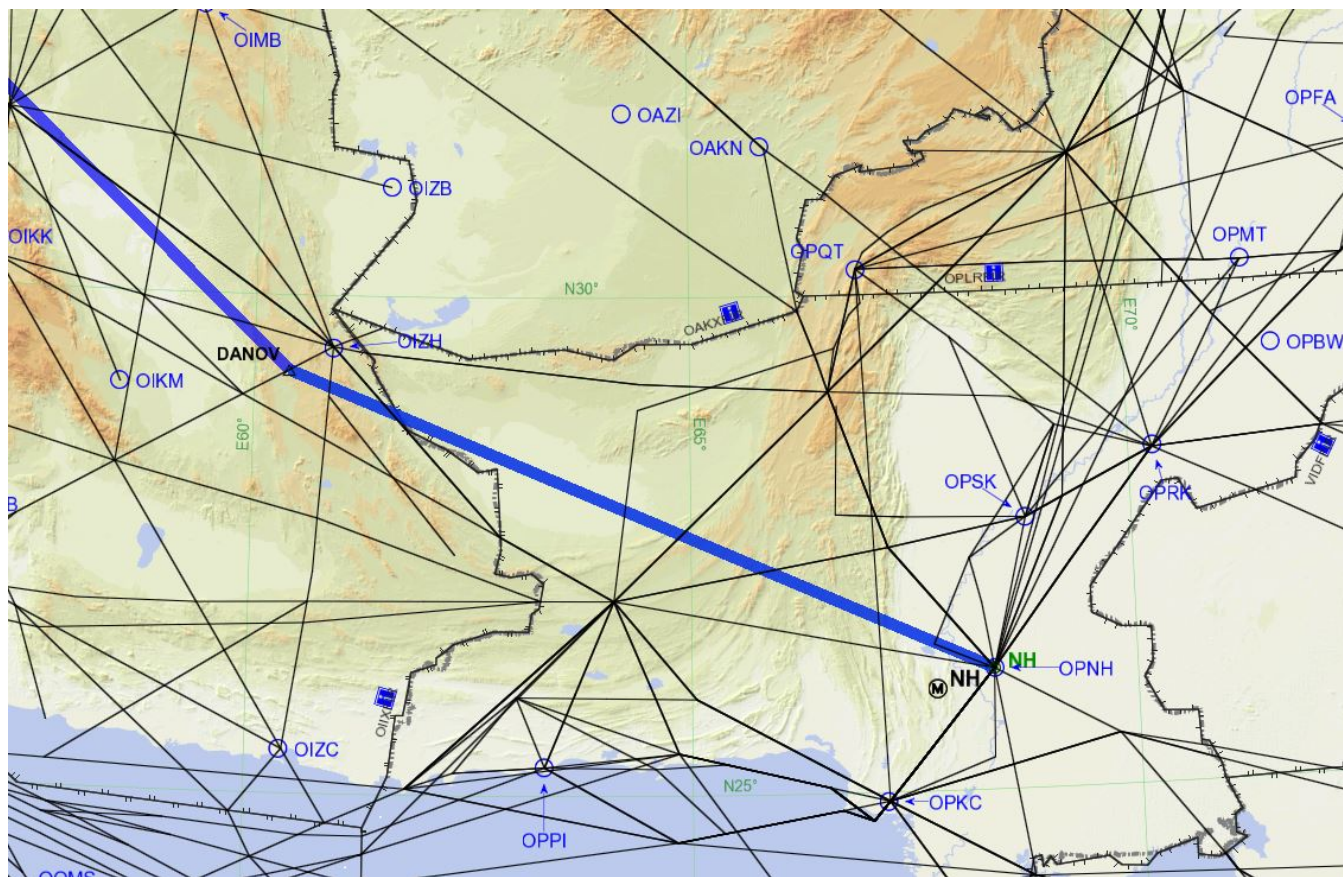
TPR 4	ATS Route Name: New Route	Entry-Exit: New	Inter-Regional Cross Reference if any		Users Priority	High	Originator of Proposal	Iran	
							Date of Proposal	7 August 2015	
Route Description		States Concerned	Expected Impl. date	Implementation Status		ANP Status	Action Taken/Required		Deadline for each Action
CRM ZAJ		Iran  Turkey					Iran is ready to implement the route as soon as possible pending Turkey acceptance.		TBD
Flight Level Band:							Concerned States to implement the route		
Potential City Pairs:									
Conclusions/Remarks		To accommodate the traffic in case ALARM is closed						Last updated	ATM SG/2 Dec. 2015



TPR 4

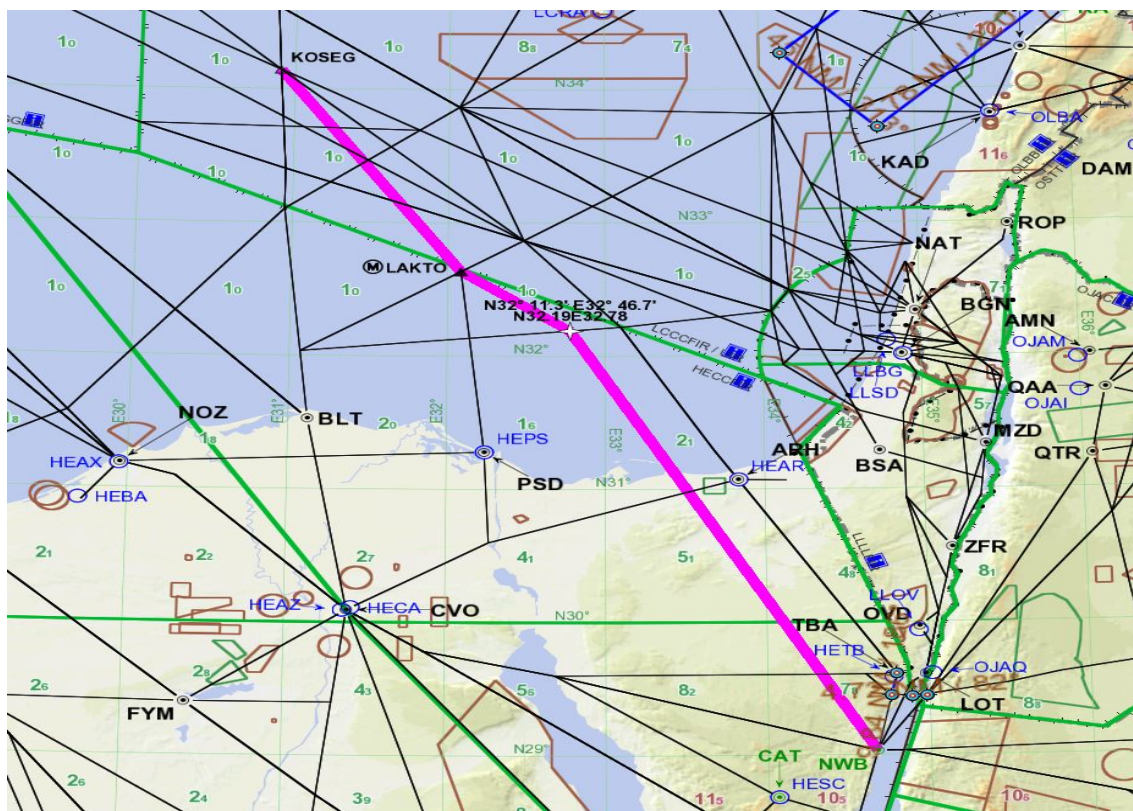


TPR 5	ATS Route Name: New Route	Entry-Exit: New	Inter-Regional Cross Reference if any		Users Priority	High	Originator of Proposal	Iran
							Date of Proposal	11 May 2015
Route Description		States Concerned	Expected Impl. date	Implementation Status		ANP Status	Action Taken/Required	Deadline for each Action
DANOV NH		Iran  Pakistan					Iran is ready to implement the route as soon as possible pending Turkey acceptance	TBD
Flight Level Band:								
Potential City Pairs:								
Conclusions/Remarks		To ensure efficient continuity of Iran OTS in Karachi FIR				Last updated		ATM SG/2 Dec 2015



TPR 5

TPR 6	ATS Route Name: New Route	Entry-Exit: PASAM – HIL	Inter-Regional Cross Reference if any		Users Priority	High	Originator of Proposal	Egypt	
							Date of Proposal	1 Dec 2015	
Route Description		States Concerned	Expected Impl. date	Implementation Status	ANP Status		Action Taken/Required	Deadline for each Action	
NWB New Point LAKTO KOREG		Egypt  Cyprus					Egypt is ready to implement the route as soon as possible pending Cyprus acceptance	TBD	
Flight Level Band:							More coordination is required for the continuity of the route within Nicosia FIR  Concerned States to implement the route		
Potential City Pairs:									
Conclusions/Remarks							Last updated	ATM December 2015	SG/2



TPR 6

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MSG/5-WP/11

APPENDIX B

MID Doc 003

## INTERNATIONAL CIVIL AVIATION ORGANIZATION

### MIDDLE EAST AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (MIDANPIRG)

#### MID REGION ATM CONTINGENCY PLAN

EDITION ~~JUNE~~APRIL, ~~2015~~2016

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# **MID REGION AIR TRAFFIC MANAGEMENT CONTINGENCY PLAN**

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## **FOREWORD**

This Document is for guidance only. Regulatory material relating to the MID Regional aircraft operations is contained in relevant ICAO Annexes, PANS/ATM (Doc.4444), Regional Supplementary Procedures (Doc.7030), States AIPs and current NOTAMs, which should be read in conjunction with the material contained in this Document.

Guidelines for contingency measures for application in the event of disruptions of air traffic services and related supporting services were first approved by the Council on 27 June 1984 in response to Assembly Resolution A23-12, following a study by the Air Navigation Commission and consultation with States and international organizations concerned, as required by the Resolution. The guidelines were subsequently amended and amplified in the light of experience gained with the application of contingency measures in various parts of the world and in differing circumstances.

The purpose of the guidelines is to assist in providing for the safe and orderly flow of international air traffic in the event of disruptions of air traffic services and related supporting services and in preserving the availability of major world air routes within the air transportation system in such circumstances.

The MID Regional Air Traffic Management Contingency Plan is primarily for the information to operators and pilots planning and conducting operations in MID Region. The intent is to provide a description of the arrangements in place to deal with a range of contingency situations.

This Contingency Plan has been developed with the approval of the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG); a MID Regional planning body established under the auspices of the International Civil Aviation Organization (ICAO). This Group is responsible for developing the required operational procedures; specifying the necessary services and facilities and; defining the aircraft and operator approval standards employed in the MID Region.

## RECORD OF AMENDMENTS

[illegible]

## INTRODUCTION

The MID Region Air Traffic Management (ATM) Contingency Plan has been developed to ensure, to the extent possible, the continued safety of air navigation in the event of disruption or potential disruption of Air Traffic Services and related supporting services in the MID Region, in accordance with the provisions of ICAO Annex 11 – Air Traffic Services, Chapter 2, paragraph 2.30 and its Attachment C. The Plan might be also activated in cases when airspace users decided to circumnavigate airspace(s) due to conflict zones, weather, etc. which might increase significantly the air traffic in other airspace(s).

The total aircraft movements to, from and within the Middle East Region are estimated to increase from some 976400 in 2010 to slightly above 5204000 in 2030 at an average annual growth rate of 8.7 per cent over the same period.

The table shows the aircraft movements forecast to the year 2030:

	Actual	Forecast	Average Annual Growth
			2010-2030
	2010	2030	(per cent)
AFR-MEA	68588	446722	9.8
ASIA-MEA	261359	1384191	8.7
EUR-MEA	276285	977855	6.5
INTRA MEA	349324	2287506	9.9
NAM-MEA	20843	107917	8.6
<b>TOTAL</b>	<b>976399</b>	<b>5204191</b>	<b>8.7</b>

Contingency Routing (CR) has been developed and contained in the Plan based on the major traffic flows through the MID Region, taking into consideration the movements' number between City Pairs.

This Plan is designed to provide alternative routes for the traffic flows between the MID Region and Asia, Africa, and Europe, which will allow aircraft operators to circumnavigate airspace(s) in the MID Region, as deemed necessary, or due to a perceived risk to the safety of flight, with a minimum of disruption to flight operations.

These alternative routes (Contingency Routing – CR) are based mainly on the existing route network. Concerned States, in consultation with airspace users, might establish temporary routes to be able to accommodate extra traffic in a safe manner.

It is recognized that operators may incur economic penalties during application of the contingency scenarios. Therefore, air traffic flow measures would be implemented as deemed necessary.

The ICAO MID Regional Office will coordinate with ICAO HQ and the concerned Regional Offices any amendment to the Regional Contingency Plan.

The appropriate ICAO Regional Office will distribute this contingency plan to all relevant States and international organizations within their regions.

This Document is available to users through the ICAO MID website [https://portal.icao.int/RO\\_MID/Pages/eDocs.aspx](https://portal.icao.int/RO_MID/Pages/eDocs.aspx)

In order to maintain the effectiveness of the Plan, Stakeholders are encouraged to provide the ICAO MID Regional Office ([icaomid@icao.int](mailto:icaomid@icao.int)) with their comments/suggestions and updates.

### ***MID Region ATM Contingency Focal Points***

The List of the MID Region ATM Contingency Focal Points is at **Table 1**. This list should be reviewed and updated, as appropriate.

**Table 1.MID Region ATM Contingency Focal Points**

NAMES	PHONE (WORK)	PHONE (HOME)	MOBILE PHONE	FAX	E-MAIL	OTHER CONTACT DETAILS
<b>BAHRAIN</b>						
<del>Mr. Ali Ahmed Mohammed</del>	<del>973 17321116</del>		<del>973 39969399</del>	<del>973 17321 9977</del>		Bahrain ACC Duty Supervisor Tel: 973 1732 1081/1080 Fax: 973 1732 1029 Email : <a href="mailto:bahate@caa.gov.bh">bahate@caa.gov.bh</a>
Mr. Saleem Mohammed Hasan	9731732 1117		973 39608860	973 17321 9966	<a href="mailto:saleemmh@caa.gov.bh">saleemmh@caa.gov.bh</a>	
<b>EGYPT</b>						
<del>Mr. Moatassem Bellah Abd Elraheem Baligh</del>	<del>202 265 7849</del>	<del>202 639 1792</del>	<del>01001695252</del>	<del>202 268 0627</del>	<del>moatassem_5@hotmail.com</del>	
<del>Mr. Aly Hussien Aly</del>	<del>202 637 3950</del>	<del>202 417 8460</del>	<del>201 01609 760</del>	<del>202 268 0627</del>		
<b>IRAN</b>						
<del>Mr. Ebrahim Shoushtari Deputy CEO for Aeronautical Operations (IAC)</del>	<del>982163148900</del>		<del>989121861900</del>	<del>9821 63148906</del>	<del>E-shoushtari@yahoo.com E.shoushtari@airport.ir</del>	<del>Note. – During New Year Holidays in Iran (20 March – 5 April) or for any urgent message Contact Tehran ACC on +9821 44544116</del>
Mr. Ali- Arabi DG of ATS Department	98 21 445 44101		98-9122967946	9821 44544102	<a href="mailto:aarabi@airport.ir">aarabi@airport.ir</a>	
Mr. Javad – Pashaei Deputy Director of ATS Dept.	9821 44544103		989122967946	9821 44544102	<a href="mailto:aarabi@airport.ir">aarabi@airport.ir</a>	
Mr. Ramezan Ali Ziaee Deputy Director of ATS Dept.	9821-44544103		989123874917	9821 44544102	<a href="mailto:r.a.ziaee@airport.ir">r.a.ziaee@airport.ir</a>	

NAMES	PHONE (WORK)	PHONE (HOME)	MOBILE PHONE	FAX	E-MAIL	OTHER CONTACT DETAILS	
IRAQ							
Mr. Ali Mohsin Hashim ATS Director	96418133370	9647702997761	9647815762525		ate_iraqcaa@yahoo.com		
JORDAN							
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## CHAPTER 1

### MID STATES' CONTINGENCY PLANS

1.1. Air traffic services authorities shall develop and promulgate contingency plans for implementation in the event of disruption, or potential disruption, of air traffic services and related supporting services in the airspace for which they are responsible for the provision of such services. Such contingency plans shall be developed with the assistance of ICAO as necessary, in close coordination with the air traffic services authorities responsible for the provision of services in adjacent portions of airspace and with airspace users concerned. The contingency plans should include contingency arrangements to be implemented in the event of natural disasters, military conflicts or public health emergencies.

1.2. States should include in their contingency plans provisions related to the spread of communicable diseases, based on the ICAO guidance related to the Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation (CAPSCA).

1.3. The State(s) responsible for providing air traffic services and related supporting services in particular portions of airspace is (are) also responsible, in the event of disruption or potential disruption of these services, for instituting measures to ensure the safety of international civil aviation operations and, where possible, for making provisions for alternative facilities and services. To that end the State(s) should develop, promulgate and implement appropriate contingency plans. Such plans should be developed in consultation with other States and airspace users concerned and with ICAO, as appropriate, whenever the effects of the service disruption(s) are likely to affect the services in adjacent airspace.

1.4. The responsibility for appropriate contingency action in respect of airspace over the high seas continues to rest with the State(s) normally responsible for providing the services until, and unless, that responsibility is temporarily reassigned by ICAO to (an) other State(s).

1.5. States should periodically review their national contingency plan and coordinate any amendments with neighbouring States and ICAO.

1.6. MID States' Contingency Plans are available at the ICAO MID Regional Office and the status of contingency agreements in the MID Region is at **Table 2**.



**Table 2. Status of Contingency Agreements in the MID Region**

STATE	CORRESPONDING STATES			REMARKS
<b>BAHRAIN</b>	<input checked="" type="checkbox"/> IRAN <input checked="" type="checkbox"/> KUWAIT	<input checked="" type="checkbox"/> QATAR <input checked="" type="checkbox"/> SAUDI ARABIA	<input checked="" type="checkbox"/> UAE	Completed
<b>EGYPT</b>	<input checked="" type="checkbox"/> GREECE <input checked="" type="checkbox"/> JORDAN	<input checked="" type="checkbox"/> LYBIA <input checked="" type="checkbox"/> CYPRUS	<input checked="" type="checkbox"/> SAUDI ARABIA <input checked="" type="checkbox"/> SUDAN	Completed
<b>IRAN</b>	<input checked="" type="checkbox"/> ARMENIA <input type="checkbox"/> AZERBAIJAN <input type="checkbox"/> TURKMANISTAN <input type="checkbox"/> AFGHANISTAN	<input checked="" type="checkbox"/> BAHRAIN <input checked="" type="checkbox"/> IRAQ <input type="checkbox"/> KUWAIT <input checked="" type="checkbox"/> OMAN	<input checked="" type="checkbox"/> PAKISTAN <input checked="" type="checkbox"/> TURKEY <input type="checkbox"/> UAE	6/11
<b>IRAQ</b>	<input checked="" type="checkbox"/> IRAN <input type="checkbox"/> JORDAN	<input type="checkbox"/> KUWAIT <input type="checkbox"/> SAUDI ARABIA	<input type="checkbox"/> SYRIA <input type="checkbox"/> TURKEY	0/6
<b>JORDAN</b>	<input checked="" type="checkbox"/> EGYPT <input type="checkbox"/> IRAQ	<input type="checkbox"/> ISRAEL <input checked="" type="checkbox"/> SAUDI ARABIA	<input type="checkbox"/> SYRIA	2/5
<b>KUWAIT</b>	<input checked="" type="checkbox"/> BAHRAIN <input type="checkbox"/> IRAN	<input type="checkbox"/> IRAQ	<input checked="" type="checkbox"/> SAUDI ARABIA	2/4
<b>LEBANON</b>	<input type="checkbox"/> CYPRUS	<input type="checkbox"/> SYRIA		0/2
<b>LIBYA</b>	<input type="checkbox"/> ALGERIA <input type="checkbox"/> CHAD <input checked="" type="checkbox"/> EGYPT	<input type="checkbox"/> MALTA <input type="checkbox"/> NIGER	<input type="checkbox"/> SUDAN <input type="checkbox"/> TUNIS	1/7
<b>OMAN</b>	<del><input checked="" type="checkbox"/> BAHRAIN</del> <input type="checkbox"/> INDIA <input checked="" type="checkbox"/> IRAN	<input type="checkbox"/> PAKISTAN <input type="checkbox"/> SAUDI ARABIA	<input checked="" type="checkbox"/> UAE <input checked="" type="checkbox"/> YEMEN	4/ <del>6</del> 7
<b>QATAR</b>	<input checked="" type="checkbox"/> BAHRAIN	<input type="checkbox"/> SAUDI ARABIA	<input type="checkbox"/> UAE	1/3
<b>SAUDI ARABIA</b>	<input checked="" type="checkbox"/> BAHRAIN <input checked="" type="checkbox"/> EGYPT <input type="checkbox"/> ERITREA <input type="checkbox"/> IRAQ	<input checked="" type="checkbox"/> JORDAN <input checked="" type="checkbox"/> KUWAIT <input type="checkbox"/> OMAN	<input type="checkbox"/> SUDAN <input type="checkbox"/> UAE <input type="checkbox"/> YEMEN	4/10
<b>SUDAN</b>	<input type="checkbox"/> CENTRAL AFRICAN <input type="checkbox"/> CHAD <input checked="" type="checkbox"/> EGYPT	<input type="checkbox"/> ERITREA <input type="checkbox"/> ETHIOPIA <input type="checkbox"/> LIBYA	<input type="checkbox"/> SAUDI ARABIA <input type="checkbox"/> SOUTH SUDAN	1/8
<b>SYRIA</b>	<input type="checkbox"/> IRAQ <input type="checkbox"/> JORDAN	<input type="checkbox"/> LEBANON <input type="checkbox"/> CYPRUS	<input type="checkbox"/> TURKEY	0/5
<b>UAE</b>	<input checked="" type="checkbox"/> BAHRAIN <input type="checkbox"/> IRAN	<input checked="" type="checkbox"/> OMAN <input type="checkbox"/> QATAR	<input type="checkbox"/> SAUDI ARABIA	2/5
<b>YEMEN</b>	<input type="checkbox"/> DJIBOUTI <input type="checkbox"/> ERITREA <input type="checkbox"/> ETHIOPIA	<input type="checkbox"/> INDIA <input checked="" type="checkbox"/> OMAN <input type="checkbox"/> SAUDI ARABIA	<input type="checkbox"/> SOMALIA	1/7

☒ Agreement Signed    ☐ Agreement NOT Signed    Signed Agreements / Total No. of required Agreements

## CHAPTER 2

### COMMON PROCEDURES

#### Implementation of the plan

- 2.1. A Contingency Coordination Team (CCT) to be established from the following members:
- ICAO (HQ and Regional Offices Focal points) and IATA as permanent members;
  - States concerned as essential members; and
  - Other ~~organizations~~Organizations, Agencies etc., when deemed necessary, as temporary members.

The main tasks of the CCT are as follows:

- monitor continuously information from all relevant sources;
- initiate action for the activation/deactivation of the Contingency Plan;
- arrange for the constant supply of relevant aeronautical information to the ICAO Regional Offices and Headquarters;
- liaise with international/regional organizations as appropriate;
- exchange up-to-date information with States directly concerned and States which are potential participants in contingency arrangements.

2.2. The notification/coordination process at **Table 3** would be used to facilitate the challenges related to the implementation of contingency arrangements.

2.3. In the event of adoption of contingency procedures States/ANSPs will notify all affected agencies and operators appropriately.

2.4. In Limited Service situations: the individual States/ANSP will decide upon the level of notification necessary and take action as required to cascade the information.

2.5. In **No Service situations**: it is likely that the ATC facility involved will be subject to evacuation. In this instance the States/ANSP will issue NOTAMs and broadcast on appropriate frequencies that contingency procedures have been initiated. The notification process employed by individual States/ANSPs is detailed in their national plan. However the general format will be as the following example of the type of information which may be promulgated:

#### NOTAM

*“Due to emergency evacuation of (States ACC) all ATC services are terminated. Flights within (States ACC) FIR should continue as cleared and contact the next ATC agency as soon as possible. Flights not in receipt of an ATC clearance should land at an appropriate airfield or request clearance to avoid (State) FIR. Flights should monitor (defined frequencies).”*

Broadcast an evacuation message on appropriate frequencies:

*“Emergency evacuation of (Sates ACC) is in progress. No air traffic control service will be provided by (States ACC). Use extreme caution and monitor (control frequencies), emergency frequencies and air to air frequencies. Contact the next air traffic control unit as soon as possible”.*

#### Traffic Information Broadcast by Aircraft (TIBA) procedures

2.6. The following communications procedures have been developed in accordance with the Traffic Information Broadcast by Aircraft (TIBA) procedures recommended by ICAO (Annex 11 – Air Traffic Services,

Attachment C). These procedures should be applied when completing an altitude change to comply with the ATC clearance.

2.7. At least 5 minutes prior to the commencement of a climb or descent the flight should broadcast on the last assigned frequency, 121.5, 243.0 and 123.45 the following:

*“ALL STATION (callsign) (direction) DIRECT FROM (landfall fix) TO (oceanic entry point) LEAVING FLIGHT LEVEL (number) FOR FLIGHT LEVEL (number) AT (distance)(direction) FROM (oceanic entry point) AT (time)”*

When the level change begins, the flight should make the following broadcast:

*“ALL STATIONS (callsign) (direction) DIRECTION FROM (landfall fix) TO (oceanic entry point) LEAVING FLIGHT LEVEL (number) NOW FOR FLIGHT LEVEL (number).”*

When level, the flight should make the following broadcast:

*“ALL STATIONS (callsign) MAINTAINING FLIGHT LEVEL (number).”*

**Table 3. Notification/coordination process**

Airspace Avoidance				
Airlines	Airline Actions	IATA Actions	ICAO MID Office	States/ ANSP
Monitor global activities that have an effect on flight operations. (currently in place)	NONE	NONE	NONE	NONE
Review state activity that requires airline safety and security review (currently in place)	Notify IATA as to effected FIR' and factors under review. (security and or safety)	When more than (30%) of airlines reporting, notify ICAO MID	Call for the Contingency Coordination Team (CCT)	NONE
Identify specific Factors and pending trigger events (currently in place)	inform IATA on review findings and possible trigger events	Inform CCT on findings and number of airlines reporting	Notify effected states/ANSP on number of airlines reviewing current activity	NONE
Event triggered: reviewing avoidance options and select avoidance scenario	Inform IATA of selected scenario and volume/initial timelines.	Inform CCT	Notify effected States/ANSP scenario and volume/timelines	Review scenario and give feedback on feasibility
48 Hours prior to activation of planned avoidance re-routes	Notify IATA	Notify CCT	Notify effected states/ANSP	Prepare NOTAMS and avoidance scenario
24 Hours prior to activation of planned avoidance re-routes	Notify IATA	Notify CCT	Notify effected states/ANSP	Publish NOTAMS

## CHAPTER 3

### AIR TRAFFIC MANAGEMENT

#### ATS Responsibilities

3.1. Tactical ATC considerations during periods of overloading may require re-assignment of routes or portions thereof.

3.2. Alternative routes should be designed to maximize the use of existing ATS route structures and communication, navigation and surveillance services.

3.3. In the event that ATS cannot be provided within the (XXX) CTA/UTA/FIR, the Civil Aviation Authority shall publish the corresponding NOTAM indicating the following:

- a) Time and date of the beginning of the contingency measures;
- b) Airspace available for landing and overflying traffic and airspace to be avoided;
- c) Details of the facilities and services available or not available and any limits on ATS provision (e.g., ACC, APP, TWR and FIS), including an expected date of restoration of services if available;
- d) Information on the provisions made for alternative services;
- e) ATS contingency routes;
- f) Procedures to be followed by neighbouring ATS units;
- g) Procedures to be followed by pilots; and
- h) Any other details with respect to the disruption and actions being taken that aircraft operators may find useful.

3.4. In the event that the CAA is unable to issue the NOTAM, the (alternate) CTA/UTA/FIR will take action to issue the NOTAM of closure airspace upon notification by corresponding CAA or the ICAO MID Regional Office.

#### Separation

3.5. Separation criteria will be applied in accordance with the *Procedures for Air Navigation Services-Air Traffic Management* (PANS-ATM, Doc 4444) and the *Regional Supplementary Procedures* (Doc 7030).

#### Level Restrictions

3.6. Where possible, aircraft on long-haul international flights shall be given priority with respect to cruising levels.

## **Other measures**

3.7. Other measures related to the closure of airspace and the implementation of the contingency scheme with the (XXX) CTA/UTA/FIR may be taken as follows:

- a) Suspension of all VFR operations;
- b) Delay or suspension of general aviation IFR operations; and
- c) Delay or suspension of commercial IFR operations.

## **Transition to Contingency Plan**

3.8. During times of uncertainty when airspace closures seem possible, aircraft operators should be prepared for a possible change in routing while en-route, familiarization of the alternative routes outlined in the contingency plan as well as what may be promulgated by a State via NOTAM or AIP.

3.9. In the event of airspace closure that has not been promulgated, ATC should, if possible, broadcast to all aircraft in their airspace, what airspace is being closed and to stand by for further instructions.

3.10. ATS providers should recognize that when closures of airspace or airports are promulgated, individual airlines might have different company requirements as to their alternative routings. ATC should be alert to respond to any request by aircraft and react commensurate with safety.

3.11. During the contingency operations, States concerned should take necessary measures to grant special over flight permissions to those flights avoiding the affected Airspace(s).

## **Transfer of Control and Coordination**

3.12. The transfer of control and communication should be at the common FIR boundary between ATS units unless there is mutual agreement between adjacent ATS units. ATS providers should also review current coordination requirements in light of contingency operations or short notice of airspace closure.

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## CHAPTER 4

### AIRSPACE AND ALTERNATIVE ROUTINGS

4.1. This Contingency Plan has been developed based on existing ATS routes and making use of appropriate contingency routes in the MID Region. Priority has been given to safety considerations and to ensuring that to the extent possible, ATC operations are not complicated. Temporary routes may be established where necessary.

4.2. The contingency routings are designed to take into consideration that disruptions to normal traffic flows have the potential to create an additional burden and complexity to ATC. Therefore, temporary contingency routes would be designed to be safe and instantly manageable by ATC. This may require additional track miles to be flown by the aircraft operator.

4.3. The alternative routings were given “CR” designators based on various scenarios that may be implemented. It is to be highlighted that the scenarios drawn on the charts were developed based on the existing route network, and do not reflect new routes. Furthermore, one scenario could be used to avoid different FIRs, subject to users’ requirements. The scenarios are detailed in the **Table 3** below:

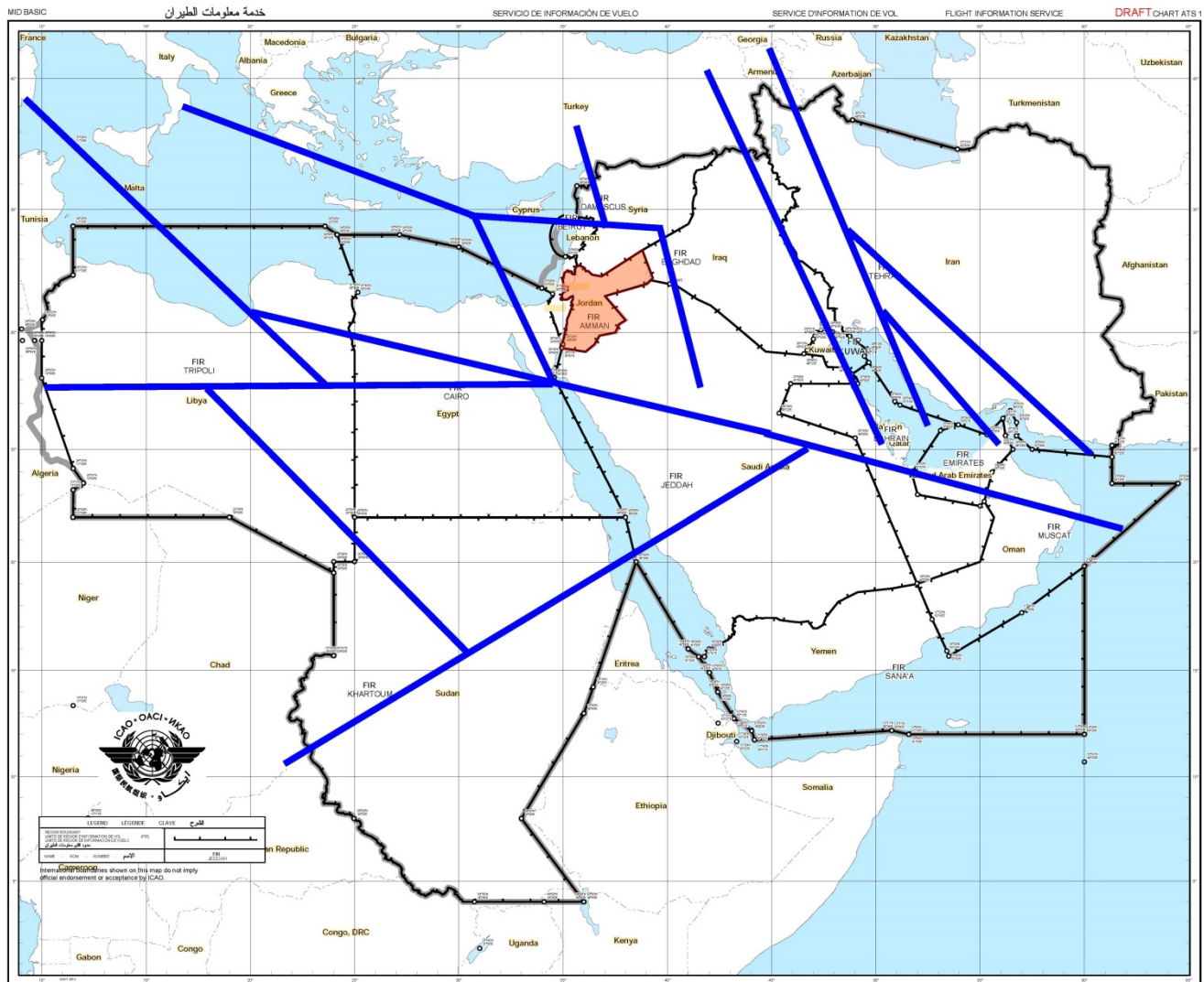
CR	FIR(s) to be Avoided	Traffic Flows through the MID Region Alternative routings/FIRs	Remarks
CR 1	Amman	<p><i><b>Eastern Europe from/to Asia</b></i></p> <ul style="list-style-type: none"> <li>▪ Ankara, Baghdad, Jeddah</li> <li>▪ Ankara, Tehran</li> <li>▪ Ankara, Damascus, Baghdad, Jeddah</li> </ul> <p><i><b>Western Europe from/to Asia</b></i></p> <ul style="list-style-type: none"> <li>▪ Nicosia, Cairo, Jeddah</li> <li>▪ Nicosia, Beirut, Damascus, Baghdad, Jeddah</li> </ul> <p><i><b>Northern Africa from/to Asia</b></i></p> <ul style="list-style-type: none"> <li>▪ Cairo, Jeddah</li> </ul> <p><i><b>Southern Africa from/to Asia</b></i></p> <p>Not Applicable</p>	
CR 2	Baghdad	<p><i><b>Eastern Europe from/to Asia</b></i></p> <ul style="list-style-type: none"> <li>▪ Ankara, Tehran, (Kuwait) or (Bahrain) or (UAE)</li> <li>▪ Ankara, Damascus, Amman, Jeddah</li> </ul> <p><i><b>Western Europe from/to Asia</b></i></p> <ul style="list-style-type: none"> <li>▪ Nicosia, Beirut, Damascus, Amman, Jeddah</li> <li>▪ Nicosia, Damascus, Amman, Jeddah</li> <li>▪ Nicosia, Cairo, Jeddah</li> </ul> <p><i><b>Northern Africa from/to Asia</b></i></p> <ul style="list-style-type: none"> <li>▪ Cairo, Jeddah</li> </ul> <p><i><b>Southern Africa from/to Asia</b></i></p> <ul style="list-style-type: none"> <li>▪ Addis Ababa, (Asmara, Jeddah) or (Mogadishu, Sana’a)</li> </ul>	
CR 3	Bahrain	<p><i><b>Eastern Europe from/to Asia</b></i></p> <ul style="list-style-type: none"> <li>▪ Ankara, (Baghdad), Tehran, UAE, Muscat</li> <li>▪ Ankara, Baghdad, Jeddah, Sana’a, Muscat</li> </ul> <p><i><b>Western Europe from/to Asia</b></i></p> <ul style="list-style-type: none"> <li>▪ Nicosia, Beirut, Damascus, Amman, Jeddah, Sana’a; Muscat</li> <li>▪ Nicosia, Damascus, Amman, Jeddah</li> <li>▪ Nicosia, Cairo, Jeddah, Sana’a, Muscat</li> </ul> <p><i><b>Northern Africa from/to Asia</b></i></p> <ul style="list-style-type: none"> <li>▪ Cairo, Jeddah, Sana’a, Muscat</li> </ul> <p><i><b>Southern Africa from/to Asia</b></i></p>	

		<ul style="list-style-type: none"> <li>▪ Khartoum, Jeddah, Sana'a, Muscat</li> <li>▪ Addis Ababa, Mogadishu, Sana'a, Muscat</li> </ul>	
CR 4	Beirut, Damascus	<p><b><i>Eastern Europe from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Ankara, Baghdad Jeddah or Kuwait;</li> <li>▪ Ankara, Tehran</li> </ul> <p><b><i>Western Europe from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Nicosia, Cairo, Jeddah</li> </ul> <p><b><i>Northern Africa from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Cairo, Jeddah</li> </ul> <p><b><i>Southern Africa from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Khartoum Addis Ababa, Mogadishu, Sana'a</li> <li>▪ Khartoum, Jeddah</li> </ul>	
CR 5	Cairo	<p><b><i>Eastern Europe from/to Asia</i></b></p> <p>Not Applicable</p> <p><b><i>Western Europe from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Nicosia, Beirut, Damascus, Amman, Jeddah</li> <li>▪ Nicosia, Damascus, Baghdad; Kuwait, Bahrain, UAE</li> <li>▪ Malta, Tripoli, Khartoum, Jeddah</li> <li>▪ Malta, Tripoli, Khartoum, Asmara, Jeddah or Sana'a</li> </ul> <p><b><i>Northern Africa from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Tripoli, Khartoum, Jeddah</li> <li>▪ Tripoli, Khartoum, Asmara, Jeddah or Sana'a</li> <li>▪ Algiers, Niamey, N'djamena, Khartoum, Asmara, Jeddah or Sana'a</li> </ul> <p><b><i>Southern Africa from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Khartoum, Jeddah, Sana'a, Muscat</li> <li>▪ Addis Ababa, (Asmara, Jeddah) or (Mogadishu, Sana'a)</li> </ul>	
		▪	
CR 6	Iran	<p><b><i>Eastern Europe from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Baku, Turkmenbashi, Ashgabat, Turkmenabad, Kabul, Karachi, Muscat or Delhi</li> <li>▪ Baghdad, Kuwait, Bahrain, UAE, Muscat</li> <li>▪ Nicosia Damascus Amman, Jeddah</li> </ul> <p><b><i>Western Europe from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Nicosia, Beirut, Damascus, Amman, Jeddah</li> <li>▪ Nicosia, Cairo, Jeddah</li> </ul> <p><b><i>Northern Africa from/to Asia</i></b></p> <p>Not Applicable</p> <p><b><i>Southern Africa from/to Asia</i></b></p> <p>Not Applicable</p>	
CR 7	Jeddah	<p><b><i>Eastern Europe from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Ankara, Baghdad, Kuwait, Bahrain, UAE, Muscat</li> <li>▪ Ankara, Damascus, Amman, Baghdad, Kuwait, Bahrain, UAE</li> </ul> <p><b><i>Western Europe from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Nicosia, Beirut, Damascus, Amman, Baghdad, Kuwait, Bahrain,</li> <li>▪ Athens or Nicosia, Cairo, Amman, Baghdad, Kuwait, Bahrain</li> </ul> <p><b><i>Northern Africa from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Cairo, Khartoum, Asmara, Sana'a</li> </ul> <p><b><i>Southern Africa from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Khartoum, Asmara, Sana'a</li> <li>▪ Addis Ababa, Mogadishu, Sana'a, Muscat</li> </ul>	
CR 8	Khartoum	<b><i>Eastern Europe from/to Asia</i></b>	

		<p>Not Applicable</p> <p><b><i>Western Europe from/to Africa</i></b></p> <p>Not Applicable</p> <p><b><i>Northern Africa from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Cairo, Jeddah</li> <li>▪ Tripoli, N'djamena, Brazzaville, Kinshasa, Entebbe, Nairobi Addis Ababa, Mogadishu, Sana'a, Jeddah or Muscat.</li> </ul> <p><b><i>Southern Africa from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Kinshasa, Entebbe, Nairobi Addis Ababa, Mogadishu, Sana'a, Jeddah or Muscat</li> </ul>	
CR 9	Muscat, UAE	<p><b><i>Eastern Europe from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Ankara, Baghdad, Jeddah, Sana'a</li> </ul> <p><b><i>Western Europe from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Nicosia, Beirut, Damascus, Amman, Jeddah, Sana'a</li> <li>▪ Nicosia, Damascus, Amman, Jeddah</li> <li>▪ Nicosia, Cairo, Jeddah, Sana'a</li> </ul> <p><b><i>Northern Africa from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Cairo, Jeddah, Sana'a</li> </ul> <p><b><i>Southern Africa from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Khartoum, Jeddah, Sana'a</li> <li>▪ Addis Ababa, (Asmara Jeddah) or (Mogadishu, or Sana'a)</li> </ul>	
CR 10	Sana'a	<p><b><i>Eastern Europe from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Ankara, Baghdad, Tehran, UAE, Muscat</li> <li>▪ Ankara, Baghdad, Jeddah, Bahrain, Muscat</li> </ul> <p><b><i>Western Europe from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Nicosia, Beirut, Damascus, Amman, Jeddah, Bahrain; Muscat</li> <li>▪ Nicosia, Damascus, Amman, Jeddah, Bahrain; Muscat</li> <li>▪ Nicosia, Cairo, Jeddah, Bahrain; Muscat</li> </ul> <p><b><i>Northern Africa from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Cairo, Jeddah, Bahrain; Muscat</li> </ul> <p><b><i>Southern Africa from/to Asia</i></b></p> <ul style="list-style-type: none"> <li>▪ Khartoum, Jeddah, Bahrain; Muscat</li> <li>▪ Addis Ababa, (Asmara Jeddah) or (Mogadishu, Mumbai, Muscat</li> </ul>	
CR 11	Tripoli	<p><b><i>Eastern Europe from/to Asia</i></b></p> <p>Not Applicable</p> <p><b><i>Western Europe from/to Africa</i></b></p> <ul style="list-style-type: none"> <li>▪ Malta, Cairo, Khartoum</li> </ul> <p><b><i>Northern Africa from/to South Africa or Middle East</i></b></p> <ul style="list-style-type: none"> <li>▪ Malta, Athens, or Nicosia to Cairo, Khartoum or Jeddah</li> <li>▪ Tunis, Algiers, Niamey, N'djamena</li> </ul> <p><b><i>Southern Africa from/to Asia</i></b></p> <p>Not Applicable</p>	

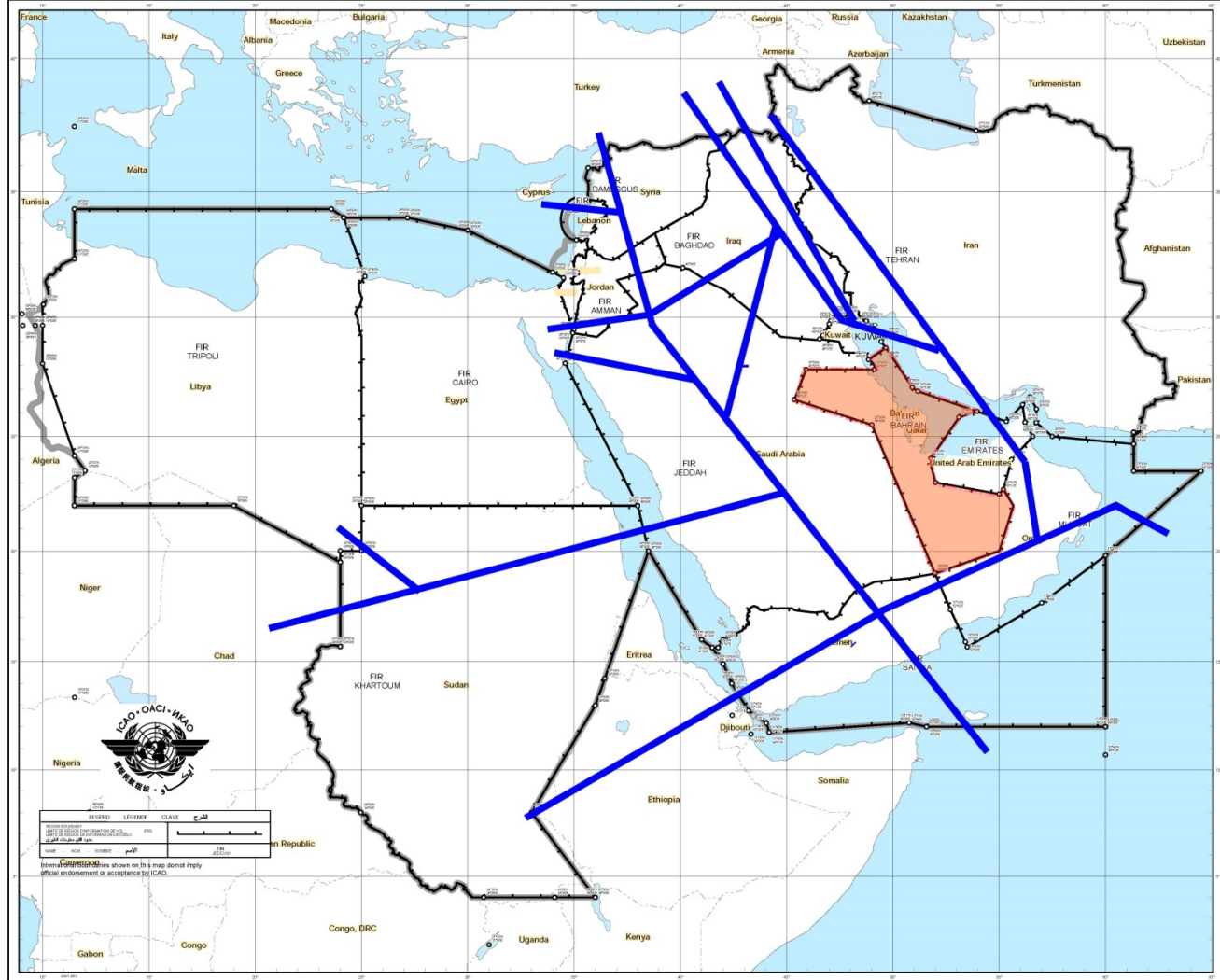
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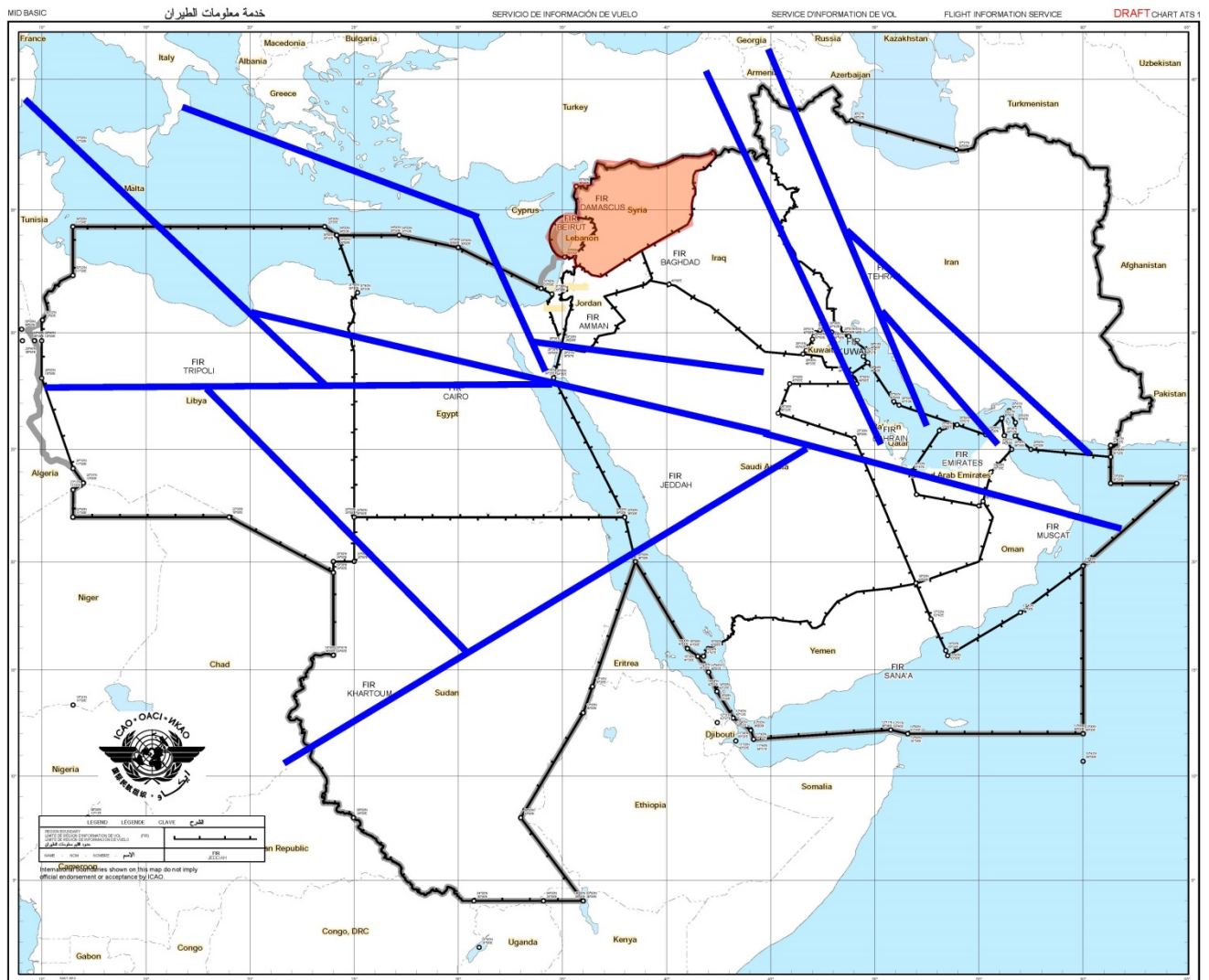




CR1

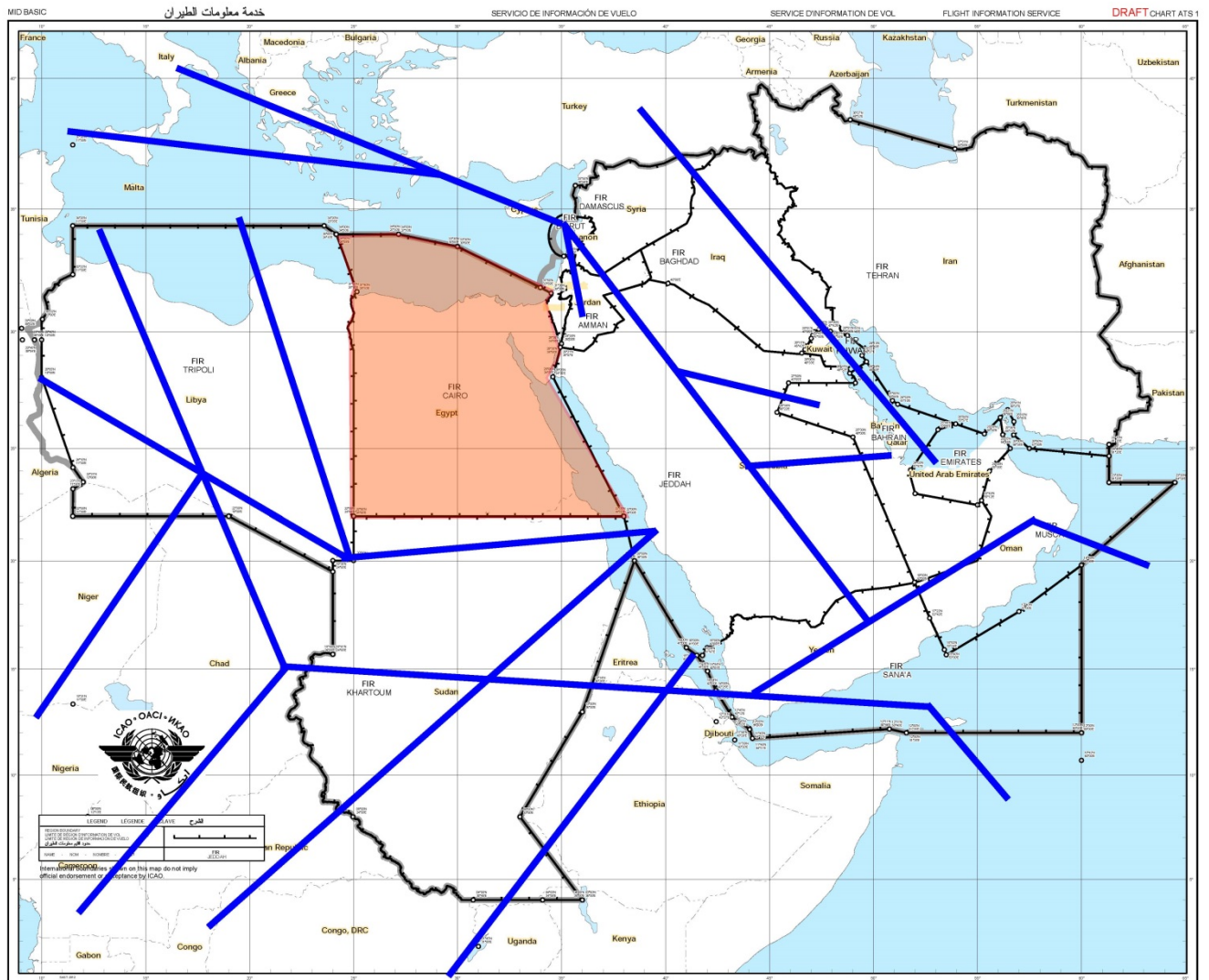




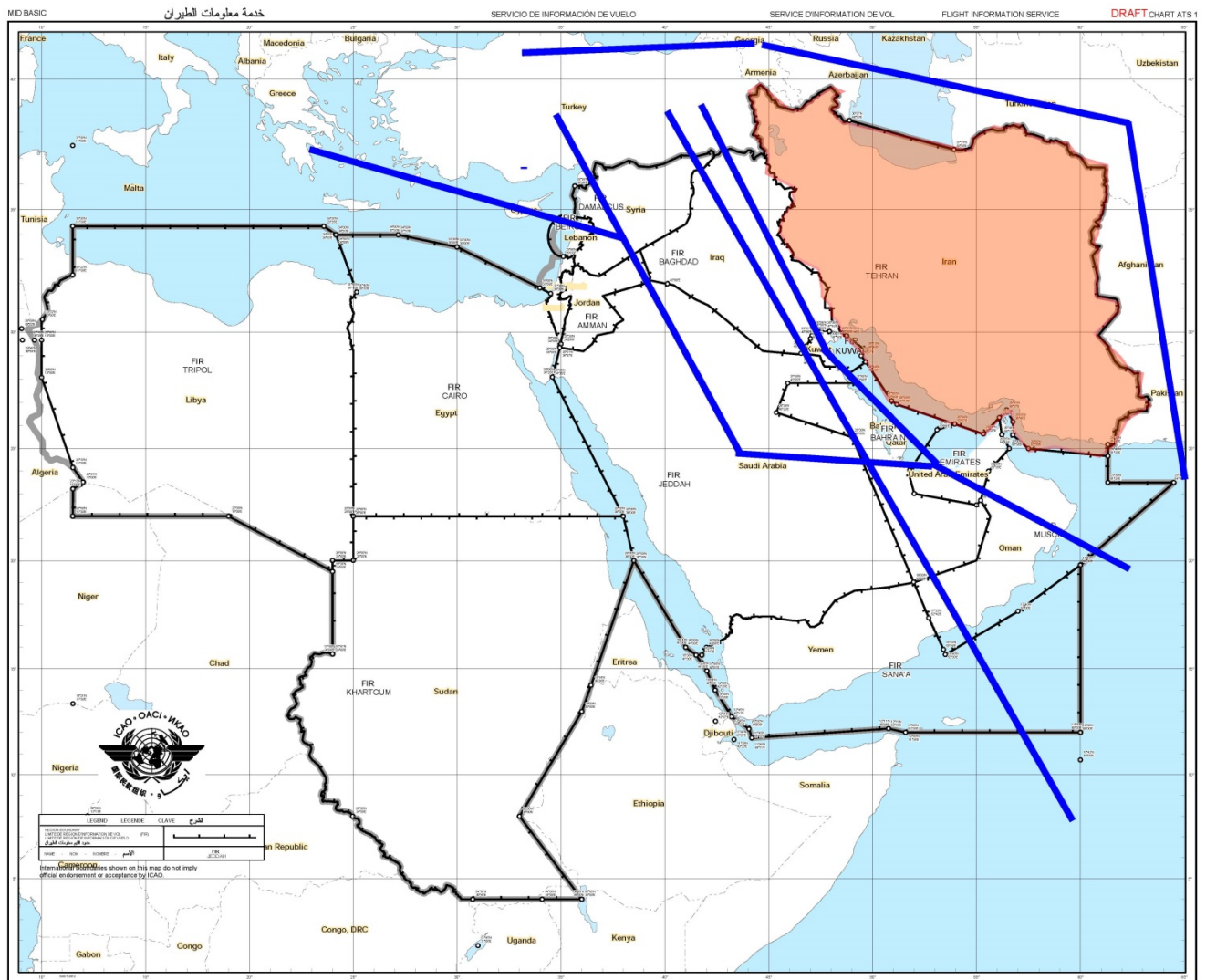


CR 4

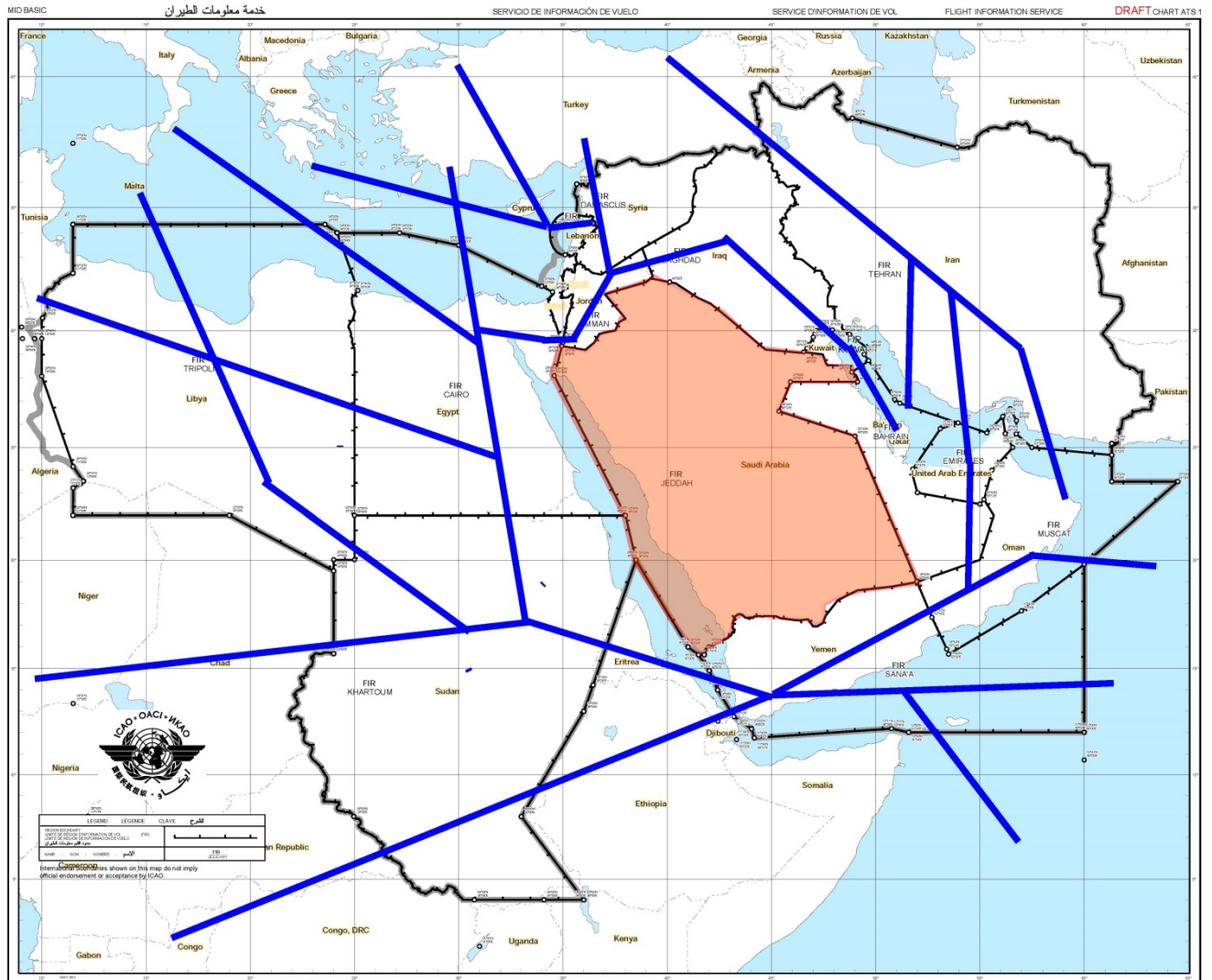




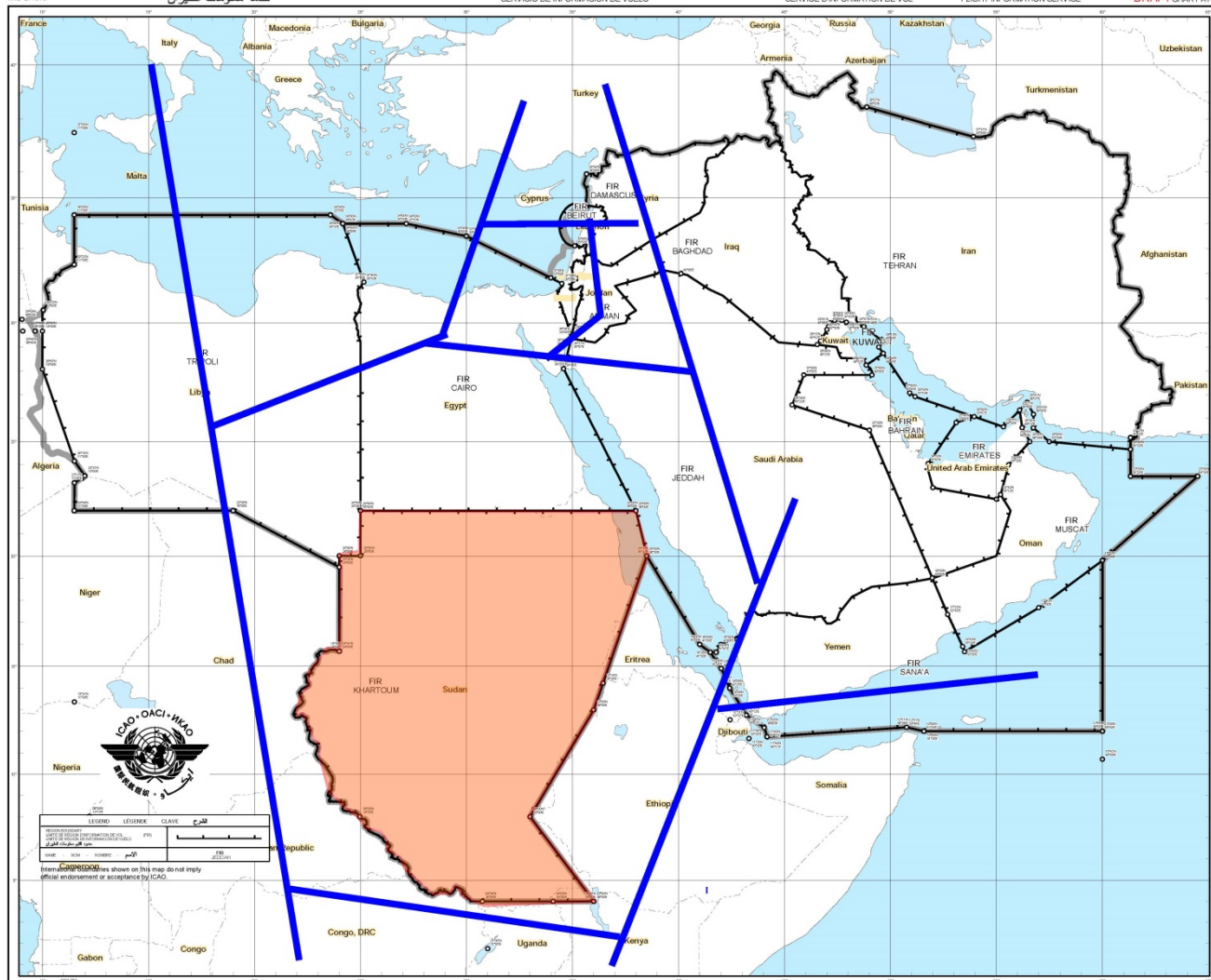
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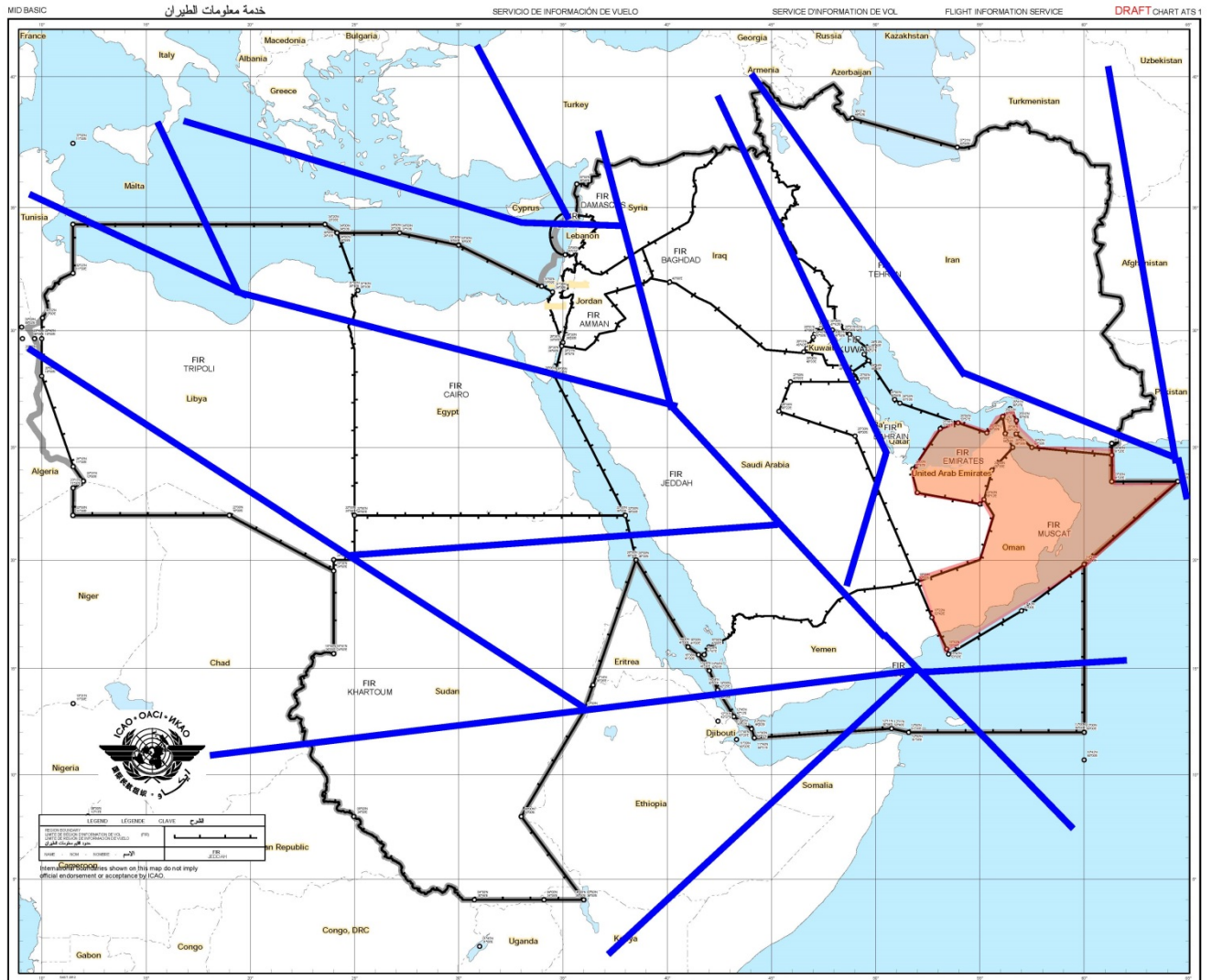
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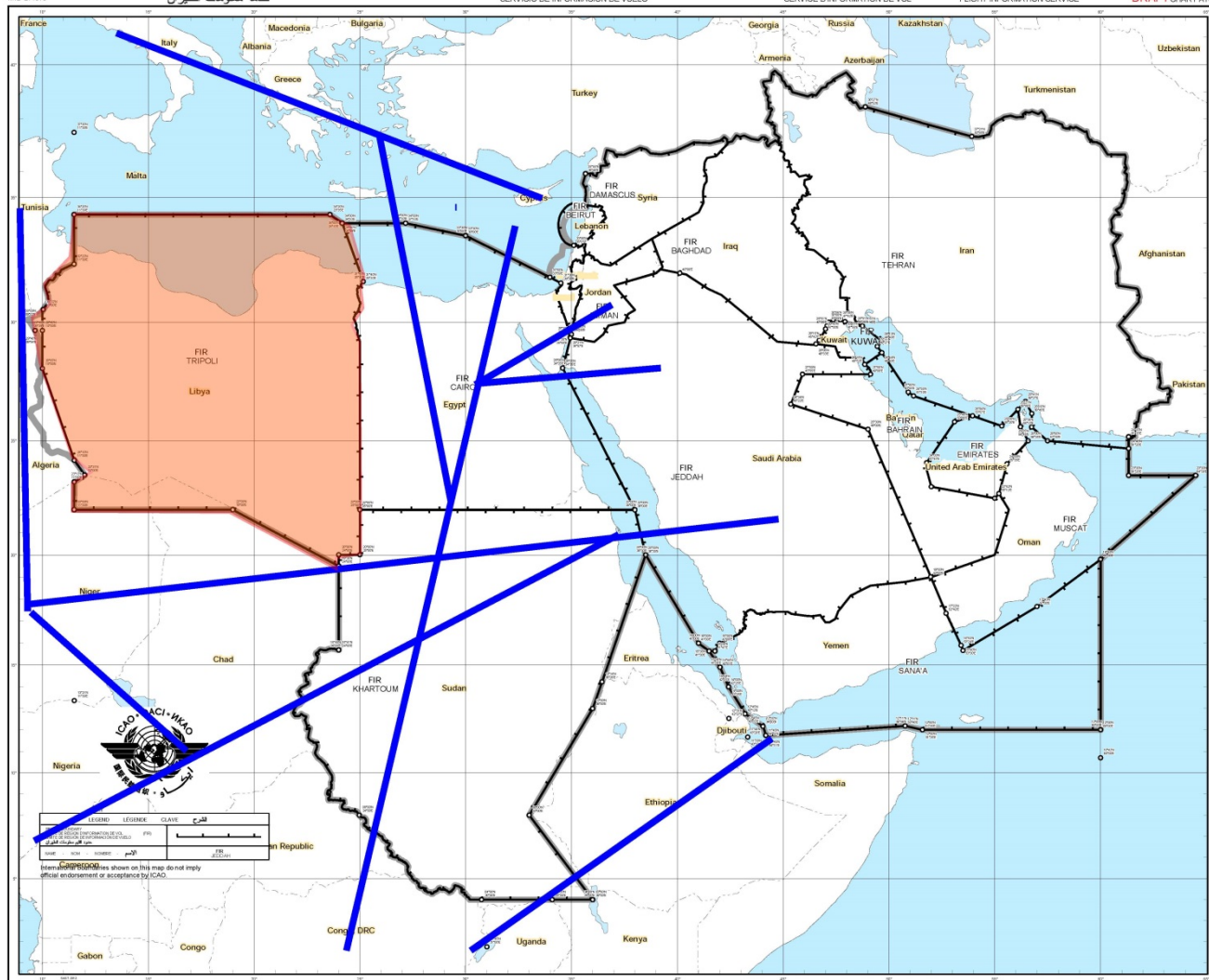






CR 9





CR 11

## CHAPTER 5

### MID REGION ATM VOLCANIC ASH CONTINGENCY PLAN

5.1. The MID Region ATM Volcanic Ash Contingency Plan (MID ATM VACP) was developed based on the VACP prepared by the International Volcanic Ash Task Force (IVATF) in August 2012. The MID ATM VACP sets out standardised guidelines and procedures for the provision of information to airlines and en-route aircraft before and during a volcanic eruption. The plan and its appendices are at **Attachment A** to this Document.

5.2. The MID ATM VACP includes the **pre-eruption, start of eruption, ongoing; and recovery** phases. It is to be highlighted that most MID States would practice the **ongoing** and **recovery** phases only as the **pre-eruption** and **start of eruption** phases would only apply to the States where volcanoes erupt. Furthermore, the MID Region would receive volcanic ash advisories and volcanic ash advisories in graphic form from the Volcanic Ash Advisory Center (VAAC) Toulouse.

5.3. Volcanic contamination, of which volcanic ash is the most serious, is a hazard for safe flight operations. Mitigating the hazards posed by volcanic ash in the atmosphere and/or at the aerodrome cannot be resolved in isolation but through collaborative decision making (CDM) involving all stakeholders concerned. During an eruption, volcanic contamination can reach and exceed the cruising altitudes of turbine-powered aircraft within minutes and spread over vast geographical areas within a few days. Encounters with volcanic ash may result in a variety of hazards including one or more of the following:

- a) the malfunction, or failure, of one or more engines leading not only to reduction, or complete loss of thrust but also to failures of electrical, pneumatic and hydraulic systems;
- b) the blockage of pitot and static sensors resulting in unreliable airspeed indications and erroneous warnings;
- c) windscreens rendered partially or completely opaque;
- d) smoke, dust and/or toxic chemical contamination of cabin air requiring crew to don oxygen masks, thus impacting verbal communication; electronic systems may also be affected;
- e) the erosion of external and internal aircraft components;
- f) reduced electronic cooling efficiency leading to a wide range of aircraft system failures;
- g) the aircraft may have to be manoeuvred in a manner that conflicts with other aircraft; and
- h) volcanic ash deposition on a runway may degrade aircraft braking performance, most significantly if the volcanic ash is wet; and in extreme cases, this can lead to runway closure.

5.4. Operators are required by ICAO Annex 6 – *Operation of Aircraft* to implement appropriate mitigation measures for volcanic ash in accordance with their safety management system (SMS), as approved by the State of the Operator/Registry. The guidelines provided in the MID ATM VACP document assume that the ICAO requirements regarding safety management systems have been implemented by the operators. Detailed guidance on Safety Risk Assessments (SRAs) for flight operations with regard to volcanic ash contamination can be found in the manual on *Flight Safety and Volcanic Ash – Risk Management of Flight Operations with Known or Forecast Volcanic Ash Contamination* (ICAO Doc 9974).

5.5. Distribution of applicable Aeronautical Information Services (AIS) and Meteorological (MET) messages related to volcanic ash are set out in relevant ICAO Annexes, specifically Annex 15–*Aeronautical Information Services* and Annex 3 – *Meteorological Service for International Air Navigation*.

5.6. Volcanic ash can also affect the operation of aircraft at aerodromes. Volcanic ash deposition at an aerodrome, even in very small amounts, can result in the closure of the aerodrome until all the deposited ash has been removed. In extreme cases, the aerodrome may no longer be available for operation at all, resulting in repercussions on the ATM system, e.g. diversions, revised traffic flows, etc.

5.7. Some aircraft types or engine technologies are more vulnerable to volcanic ash contaminants than others; therefore, any specific mitigation measures to be applied would have to take into account any such variance. Considering that a commercial aircraft travels about 150 km (80 NM) in 10 minutes and that volcanic ash can rise to flight levels commonly used by turbine-engine aircraft in half that time, a timely response to volcanic eruptions and volcanic ash in the atmosphere is essential.

5.8. It is imperative that information on the volcanic activity is disseminated as soon as possible. In order to assist staff in expediting the process of originating and issuing relevant AIS and MET messages, a series of templates should be available for different stages of the volcanic activity. For the list of ICAO registered volcanoes see the *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (ICAO Doc 9691)*. Volcanoes name, number and nominal position should be available at the State's International NOTAM office. Volcanic ash exercises (VOLCEX) should be conducted at a frequency determined by the ICAO Region concerned, in order to ensure the smooth implementation and effectiveness of the contingency plan in case of an actual volcanic eruption.

5.9. This document has been prepared, and is in line with a proposal for amendment to the *Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM, Doc 4444)* paragraph 15.8 *Procedures for an ATC unit when a volcanic ash cloud is reported or forecast* — which is expected to become applicable in November 2014.

5.10. General considerations during the development of an ATM contingency plan for volcanic ash and anticipated flight crew issues when encountering volcanic ash are provided in Appendices A and B respectively.

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**ATTACHMENT A**

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**



**MID REGION ATM VOLCANIC ASH CONTINGENCY PLAN**

**Edition 1.0:  
December 2013**







# MID REGION AIR TRAFFIC MANAGEMENT VOLCANIC ASH CONTINGENCY PLAN

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## 1. TERMINOLOGY

### 1.1. Areas of Contamination

1.1.1. Information on areas of observed and/or forecast volcanic ash in the atmosphere is provided by means of appropriate MET messages in accordance with Annex 3 – *Meteorological Service for International Air Navigation*.<sup>1</sup>

### 1.2. Danger Areas

1.2.1. If it is considered that the volcanic event could pose a hazard to aviation, a danger area<sup>2</sup> may be declared by NOTAM. However, this option should only be applied over and in the proximity of the volcanic source. Normally, clearances will not be issued through the danger area unless explicitly requested by the flight crew. In this context it should be noted that the final responsibility for aircraft safety rests with the flight crew. Therefore, the final decision regarding route, whether it will be to avoid or proceed through an area of volcanic activity, is the flight crew's responsibility. 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.

1.2.2. Although it is the prerogative of the Provider State to promulgate a danger area in airspace over the high seas, it should be recognized that restrictions to the freedom of flight over the high seas cannot be imposed in accordance with the United Nations Convention on the Law of the Sea (Montego Bay 1982).

### 1.3. Phases of An Event

1.3.1. The response to a volcanic event that affects air traffic has been divided into four distinct phases in this document: Pre-Eruption, Start of Eruption, On-going Eruption and Recovery Phases as follows:

**Pre-Eruption Phase** (when applicable): The initial response, “raising the alert”, commences when a volcanic eruption is expected.

Appropriate AIS and MET messages may be issued in accordance with Annex 15 and Annex 3 respectively, and disseminated to affected aircraft in flight by the most expeditious means. It should be noted that, sometimes volcanoes erupt unexpectedly without any alert being raised; hence the pre-eruption phase may be omitted.

**Start of Eruption Phase** (when applicable): The start of eruption phase commences at the outbreak of the volcanic eruption and entrance of volcanic ash into the atmosphere and mainly pertains to aircraft in flight. Appropriate AIS and MET messages may be issued as appropriate in accordance with Annex 15 and Annex 3 respectively, and a danger area may be declared by

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<sup>1</sup> Principally this will include volcanic ash advisory messages (issued by volcanic ash advisory centres) and SIGMET information on volcanic ash (issued by meteorological watch offices).

<sup>2</sup> Depending on the State's regulation, the area may be established as a “danger area”, “restricted area” or “prohibited area”. Over the high seas only “danger area” may be established.

NOTAM. Normally, clearances will not be issued through the danger area unless explicitly requested by the flight crew.

**On-Going Eruption Phase:** The on-going eruption phase commences with the issuance of the first Volcanic Ash Advisory (VAA) containing information on the extent and movement of the volcanic ash cloud following completion of the previous reactive responses. Appropriate AIS and MET messages may be issued as appropriate in accordance with Annex 15 and Annex 3, respectively.

**Recovery Phase:** The recovery phase commences with the issuance of the first VAA containing a statement that “NO VA EXP” (i.e. “no volcanic ash expected”) which normally occurs when it is determined that no volcanic ash is expected in the atmosphere and the volcanic activity has reverted to its pre-eruption state.

*Note: These descriptions are amplified in Chapter 3 of this document.*

1.3.2. Although the four distinct phases herein describe actions to be undertaken during an actual volcanic event, they are based on a theoretical scenario. Actual eruptions may not always be distinct with respect to ATM actions to be undertaken. Similarly, an eruption may occur without any pre-eruptive activity, or may cease and restart more than once. Hence, the first observation may be the presence of an ash cloud which is already some distance away from the volcano. It is essential that the contingency planning prepares the ATM system for an appropriate response depending on the actual conditions. Therefore, the “Pre-Eruption Phase” and “Start of Eruption Phase” described in this document are annotated “when applicable” in order to provide for flexibility in the application of the contingency plan in those parts of the world with insufficient volcano monitoring and alerting.

1.3.3. Flight crews are required to report observations of volcanic activity by means of a special air-report (Special AIREP). Arrangements should be put in place to ensure that such information is transferred without delay to the appropriate aeronautical institutions responsible for subsequent action. The communication and dissemination of pilot reports on volcanic activity is described in Appendix C.

## **2. PRE-ERUPTION PHASE**

### **2.1. General**

2.1.1. Where flight operations are planned in areas that are susceptible to volcanic eruptions, ATS units may expect to receive from flight crews the ICAO Volcanic Activity Report (VAR) form (published in the *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444, Appendix 1).

2.1.2. The focus of this phase is to gain early recognition of volcanic events. This phase is frequently characterised by a very limited availability of information on the potential extent and severity of the impending eruption. The priority is to ensure the continued safety of aircraft in flight; this requires promulgating information as a matter of urgency. Notwithstanding the potentially limited extent of information available, the pre-eruption phase actions described below should be carried out for every expected eruption.

2.1.3. The initial response, “raising the alert”, commences when a volcanic eruption is expected. Initial awareness of the event may be by means of a Special AIREP/VAR and/or from

information provided by meteorological or volcano-logical agencies. Arrangements in each State between designated volcano observatories, meteorological and air traffic management agencies should ensure that alerting information is provided expeditiously by the most appropriate means to provide continued safety of flight.

2.1.4. Emphasis is placed on raising awareness of the hazard and to protect aircraft in flight. The actions are based on well-prepared, well-exercised contingency plans and standard operating procedures. Aircraft are expected to clear or avoid the volcanic ash affected area based on standard operating procedures.

## **2.2. Originating ACC Actions** (*eruption expected in its own flight information region*)

2.2.1. In the event of significant pre-eruption volcanic activity, which could pose a hazard to aviation, an area control centre (ACC)<sup>3</sup>, on receiving information of such an occurrence, should carry out the following:

- a) ensure that appropriate AIS messages are originated in accordance with Annex 15. These must provide as precise information as is available regarding the activity of the volcano. It is imperative that this information is issued by the international NOTAM office and disseminated as soon as possible in accordance with the provisions of Annex 15;
- b) when so required by the State, define an initial, precautionary danger area in accordance with established procedures. The size of the danger area should encompass a volume of airspace in accordance with the information available, aiming to avoid undue disruption of flight operations;
  - i. if no such procedures have been established, the danger area should be defined as a circle with a radius of xxx km (xx NM)<sup>4</sup>. The circle should be centred on the estimated or known location of the volcanic activity;
  - ii. although ATC would not normally initiate a clearance through a danger area, it will inform aircraft about the potential hazard and continue to provide normal services. It is the responsibility of the pilot-in-command to determine the safest course of action.
- c) advise the associated MET service provider(s) in accordance with national/regional arrangements unless the initial notification originated from such provider(s), who will then inform the appropriate air traffic flow management (ATFM) units;
- d) alert flights already within the area concerned and offer assistance to enable aircraft to exit the area in the most expeditious and appropriate manner. Flight crews should be provided with all necessary information required to make safe and efficient decisions in dealing with the hazards in the defined

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<sup>3</sup> Where the term “ACC” is used throughout this document, it is intended to also include all ATS facilities.

<sup>4</sup> The size of the area is to be agreed in the region concerned and should be based on local knowledge as regards the volcano concerned.

area. Aircraft that are close to the area should be offered assistance to remain clear of the area. Flights which would be expected to penetrate the area should be re-cleared onto routes that will keep them clear;

- e) immediately notify other affected ACCs of the event and the location and dimensions of the area concerned. The ACC should also negotiate any re-routings necessary for flights already coordinated but still within adjacent Flight Information Regions (FIRs) and provide any information on potential implications on traffic flow and its capability to handle the expected traffic. It is also expected that adjacent ACCs will be asked to reroute flights not yet coordinated to keep them clear of the area. It should be noted that flight crews may make the decision not to completely avoid the area based on, for example, visual observations; and
- f) implement flow management measures if necessary to maintain the required level of safety.

*Note 1. — In order to assist staff in expediting the process of composing the AIS messages, a series of templates should be available for this stage of the volcanic activity.*

2.2.2. In addition to sending the relevant AIS messages to the normal distribution list, it will be sent to the relevant meteorological facilities.

### **2.3. Adjacent ACC Actions**

2.3.1. During the pre-eruption phase, ATC will not normally initiate clearances through a danger area; however, it will inform aircraft about the potential hazard and continue to provide normal services. 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 area; and
- b) unless otherwise instructed, continue normal operations and:
  - i. if one or more routes are affected by the area, suggest re-routings to the affected aircraft onto routes clear of the area; and
  - ii. maintain awareness of the affected area.

### **2.4. ATFM Unit Actions**

2.4.1. The ATFM unit and the associated Volcanic Ash Advisory Centre (VAAC) will determine how their initial communications will take place on the basis of bilateral agreements. Upon reception of preliminary information on volcanic activity from the lead VAAC, the ATFM unit should initiate actions in accordance with its procedures to ensure exchange of information in order to support CDM between air navigation service providers (ANSPs), Meteorological Watch Offices (MWOs), VAACs and aircraft operators concerned.

## **3. START OF ERUPTION PHASE**

### **3.1. General**

3.1.1. This phase commences at the outbreak of a volcanic eruption, with volcanic ash being ejected into the atmosphere. The focus of the processes in this phase is to protect aircraft in flight and at aerodromes from the hazards of the eruption through the collection and use of relevant information.

3.1.2. In addition to relevant actions described under the pre-eruption phase, major activities of the start of eruption phase such as the issuance of relevant AIS and MET messages in accordance with Annex 15 and Annex 3, respectively and provision of information and assistance to airborne traffic. Danger areas will be declared via NOTAM, as appropriate. This phase will last until such time as the on-going eruption phase can be activated.

### **3.2. Originating ACC Actions (eruption in its own FIR)**

3.2.1. 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 and efficient conduct of flights.

3.2.2. If necessary, rerouting of traffic should commence immediately or may be in progress if the alerting time has been sufficient to facilitate activation of the pre-eruption 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.

3.2.3. During the start of eruption phase, although ATC will not normally initiate a clearance through a danger area, it will inform aircraft about the hazard and will continue to provide normal services. It is expected that aircraft will attempt to remain clear of the danger area. However, it is the responsibility of the pilot-in-command to determine the safest course of action.

3.2.4. During the start of eruption phase the ACC should:

- a) ensure that a NOTAM is originated to define a danger area delineated cautiously so as to encompass a volume of airspace in accordance with the limited information available. In determining the area, information on upper winds should be taken into account, if available. The purpose is to ensure safety of flight in the absence of any prediction from a competent authority of the extent of contamination;
- b) maintain close liaison with MET facilities, who should issue appropriate MET messages in accordance with Annex 3;
- c) devise and update ATFM measures when necessary to ensure safety of flight operations, based on these forecasts and in cooperation with aircraft operators and the adjacent ACCs using the CDM process;
- d) ensure that reported differences between published information and observations (pilot reports, airborne measurements, etc.) are forwarded as soon as possible to the appropriate authorities to ensure its dissemination to all concerned;



- e) begin planning for the on-going eruption phase in conjunction with the aircraft operators, the appropriate ATFM unit and ACCs concerned; and
- f) issue appropriate AIS messages in accordance with Annex 15. Significant reductions in intensity of volcanic activity should take place during this phase and the airspace no longer is contaminated by volcanic ash. Otherwise, begin CDM planning for the on-going eruption phase in conjunction with aircraft operators, the appropriate ATFM unit and the affected ACCs.

### **3.3. Adjacent ACC Actions**

3.3.1. During the start of eruption phase, adjacent ACCs should take the following actions:

- a) maintain a close liaison with the appropriate ATFM unit and the originating ACC to design, implement and keep up to date ATFM measures which will enable aircraft to ensure safety of flight operations;
- b) the adjacent ACC, in cooperation with the originating ACC and aircraft operators, should impose as required additional tactical measures to those issued by the appropriate ATFM unit;
- c) maintain awareness of the affected area; and
- e) begin planning for the on-going eruption phase in conjunction with the aircraft operators, the appropriate ATFM unit and ACCs concerned.

### **3.4. ATFM Unit Actions**

3.4.1. During the start of eruption phase, depending on the impact and/or extent of the volcanic ash, the appropriate ATFM unit should organise the exchange of latest information on the developments with the associated VAACs, ANSPs, MWOs and operators concerned in order to support CDM.

## **4. ON-GOING ERUPTION PHASE**

**4.1.** The on-going eruption phase commences with the issuance of the first volcanic ash advisory (VAA) by the lead VAAC which contains information on the extent and movement of the volcanic ash cloud in accordance with Annex 3 provisions.

*Note 2 - Volcanic ash advisory information in graphical format (VAG) may also be issued by the VAAC, containing the same information as its text-based VAA equivalent.*

**4.2.** The VAA/VAG should be used to:

- a) prepare appropriate AIS and MET messages in accordance with Annex 15 and Annex 3 provisions, respectively; and
- b) plan and apply appropriate ATFM measures.

**4.3.** The volcanic contamination may affect any combination of airspace; therefore, it is not possible to prescribe measures to be taken for all situations. Furthermore, it is not possible to detail the actions to be taken by any particular ACC. The following guidance therefore may prove useful during the on-going eruption phase but should not be considered mandatory or exhaustive:

- a) ACCs affected by the movement of the volcanic ash should ensure that appropriate AIS messages are originated in accordance with Annex 15. ACCs concerned and the appropriate ATFM unit should continue to publish details on measures taken to ensure dissemination to all concerned;
- b) depending on the impact and/or extent of the volcanic ash, the appropriate ATFM unit may take the initiative to organize teleconferences to exchange the latest information on the developments, in order to support CDM, with the VAACs, ANSPs and MWOs and operators concerned;
- c) ACCs and ATFM units should be aware that for the purposes of flight planning, operators could treat the horizontal and vertical extent of the volcanic ash contaminated area to be over-flown as if it were mountainous terrain; and
- 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 (see Appendix C).

## **5. RECOVERY PHASE**

**5.1.** The recovery phase commences with the issuance of the first VAA/VAG containing a statement that “NO VA EXP” (i.e. “no volcanic ash expected”) — which normally occurs when it is determined that the volcanic activity has reverted to its pre-eruption state and the airspace is no longer affected by volcanic ash contamination. Consequently, appropriate AIS messages should be issued in accordance with Annex 15.

**5.2.** ACCs and ATFM units should revert to normal operations as soon as practical.

## **6. AIR TRAFFIC CONTROL PROCEDURES**

**6.1.** If a volcanic ash cloud is reported or forecasted in the FIR for which the ATS unit is responsible, the following actions should be taken:

- a) relay all pertinent information immediately to flight crews whose aircraft could be affected to ensure that they are aware of the ash cloud’s position and levels affected;
- b) request the intention of the flight crew and endeavour to accommodate requests for re-routing or level changes;
- c) suggest appropriate re-routing to the flight crew to avoid an area of reported or forecast ash clouds; and

- d) request a special air-report when the route of flight takes the aircraft into or near the forecast ash cloud and provide such special air-report to the appropriate agencies.

*Note 3.— The recommended escape manoeuvre for an aircraft which has encountered an ash cloud is to reverse its course and begin a descent if terrain permits.*

*Note 4. — The final authority as to the disposition of the aircraft, whether to avoid or proceed through a reported or forecast volcanic ash cloud, rests with the flight crew.*

**6.2.** When advised by the flight crew that the aircraft has inadvertently entered a volcanic ash cloud, the ATS unit should:

- a) take such action applicable to an aircraft in an emergency situation; and
- b) do not initiate modifications of route or level assigned unless requested by the flight crew or necessitated by airspace requirements or traffic conditions.

*Note 5.— General procedures to be applied when a pilot reports an emergency situation are contained in Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM, Doc 4444, Chapter 15, 15.1.1 and 15.1.2).*

*Note 6.— Guidance material concerning the effect of volcanic ash and the impact of volcanic ash on aviation operational and support services is provided in Chapters 4 and 5 of the Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691).*

## **7. ATFM PROCEDURES**

**7.1.** Depending on the impact and/or extent of the volcanic ash and in order to support CDM, the appropriate ATFM unit should organize the exchange of the latest information on the developments with the associated VAACs, ANSPs, MWOs and operators concerned.

**7.2.** The ATFM unit will apply ATFM measures on request of the ANSPs concerned. The measures should be reviewed and updated in accordance with updated information. Operators should also be advised to maintain watch for relevant AIS and MET messages for the area.

## **APPENDIX A**

### **GENERAL CONSIDERATIONS DURING THE DEVELOPMENT OF AN ATM CONTINGENCY PLAN FOR VOLCANIC ASH**

1. In a contingency plan relating to volcanic ash contamination, 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 to ATS personnel. 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.
2. ATS personnel need to be trained and be made aware of the potentially hazardous effects if an aircraft encounters a volcanic ash cloud. Some particular aspects include:
  - a) volcanic ash contamination may extend for hundreds, or even thousands 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 aerodromes 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. Flight crews and ATS personnel should be aware of the consequences of volcanic ash being ingested into the engines during landing and taxiing. 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 aircraft; and
  - e) aerodromes with volcanic ash deposition may be declared unsafe for flight operations. This may have consequences for the ATM system.
4. The area control centre (ACC) in conjunction with ATFM units serves as the critical communication link between affected aircraft in flight and the providers of information during a volcanic eruption. During episodes of volcanic ash contamination within the FIR, the ACC has two major communication roles. First and most important is its ability to communicate directly with aircraft enroute which may encounter the volcanic ash. Based on the information provided in SIGMET information for volcanic ash and volcanic ash advisories (VAAs), and working with MWOs, ATS personnel should be able to advise the flight crew of which flight levels are affected by the volcanic ash and the forecast movement of the contamination. Through various communication means, ATS units have the capability to coordinate with the flight crew alternative routes which would keep the aircraft away from the volcanic ash cloud.
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 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 flight crew enroute so that a coordinated decision can be made between the flight crew, the dispatcher and ATS regarding alternative routes that are available. The ACC should advise the ATFM unit concerning the availability of alternative routes. However, it cannot be presumed 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.

6. The NOTAM/ASHTAM for volcanic activity provides 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 associated 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 volcanic ash is detectable or reported within the FIR concerned.

7. It is essential that the procedures to be followed by ATS personnel during a volcanic eruption, as well as supporting services such as MET, AIS and ATFM, should be translated into local staff instructions (adjusted as necessary to take account of local circumstances). It is also essential that such local staff instructions form part of the basic training for all ATS, AIS, ATFM and MET 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 monthly Scientific Event Alert Network Bulletin published by the United States Smithsonian Institution and sent free of charge to ACCs/FICs requesting it.

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## **APPENDIX B**

### **ANTICIPATED FLIGHT CREW ISSUES WHEN ENCOUNTERING VOLCANIC ASH**

1. ATS personnel 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) because of the abrasive effects of volcanic ash on windshields and landing lights, visibility for approach and landing may be markedly reduced. Forward visibility may be limited to that which is available through the side windows; 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, ATS personnel can expect flight crews to be executing contingency procedures such as the following:
  - a) if possible, the flight crew may immediately reduce thrust to idle;
  - b) exit volcanic ash cloud as quickly as possible. The shortest distance/time out of the ash may require an immediate, descend and/or 180 degrees turn (if terrains permit);
  - c) don flight crew oxygen masks at 100 per cent (if required);
  - d) monitor airspeed and pitch attitude. If unreliable airspeed is suspected, or a complete loss of airspeed indication occurs (volcanic ash may block the pitot system), the flight crew will establish the appropriate pitch attitude;
  - e) land at the nearest suitable aerodrome; and
  - f) upon landing, thrust reversers may be used as lightly as feasible.

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## **APPENDIX C**

### **COMMUNICATION AND DISSEMINATION OF PILOT REPORTS OF VOLCANIC ACTIVITY**

#### **1. INTRODUCTION**

1.1. ICAO Annex 3-*Meteorological Service for International Air Navigation* (paragraph 5.5, g and h) prescribes that volcanic ash clouds, volcanic eruptions and pre-eruption volcanic activity, when observed, shall be reported by all aircraft. The ICAO *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444) contain detailed provisions on this special air report requirement in paragraphs 4.12.3 and 4.12.5, and the Volcanic Activity Report form in Appendix 1.

1.2. Experience has shown that reporting and sharing of information on volcanic ash encounters in accordance with the above mentioned provisions (in-flight and post-flight) varies across the world. The efficiency and quality of reporting currently depends heavily on regional characteristics and the level of regional integration. A high level of global harmonization is essential to achieve the desired level of implementation and consistency of the information.

#### **2. PURPOSES OF VOLCANIC ASH REPORTING AND DATA COLLECTION**

2.1. The main purposes for volcanic ash reporting and data collection are to:

- a) locate the volcanic hazards;
- b) notify immediately other aircraft (in-flight) about the hazard;
- c) notify other interested parties: ANSPs (ATC, AIS, ATFM), VAACs, MWO, etc. to ensure the consistent production of appropriate information and warning products in accordance with existing provisions; and
- d) analyse collected reports from the post-flight phase in order to:
  - identify areas of concern;
  - validate and improve volcanic ash forecasts;
  - improve existing procedures;
  - assist in defining better airworthiness requirements; and
  - share lessons learned, etc.

#### **3. PHASE OF OPERATIONS**

3.1. The roles and responsibilities of the participants in the collection, exchange and dissemination of the volcanic information are distinctly different in two distinct phases:

- a) in-flight; and
- b) post-flight.

3.2. The following section analyses these separately.

#### **4. PARTICIPANTS IN THE REPORTING PROCESS, THEIR ROLES AND RESPONSIBILITIES**

4.1. Identification of the participants as well as their roles and responsibilities in general, but specifically during the two different phases of operations, is an important element in improving collection, exchange and dissemination of volcanic information. The number of participants and their roles and responsibilities depends on the phase of operations (in-flight, post-flight), their position in the information chain within one of these two phases and national/regional arrangements. One of the main issues regarding participants' roles and



responsibilities is that each of them is, at one time or another, both a data/information provider and user of the information.

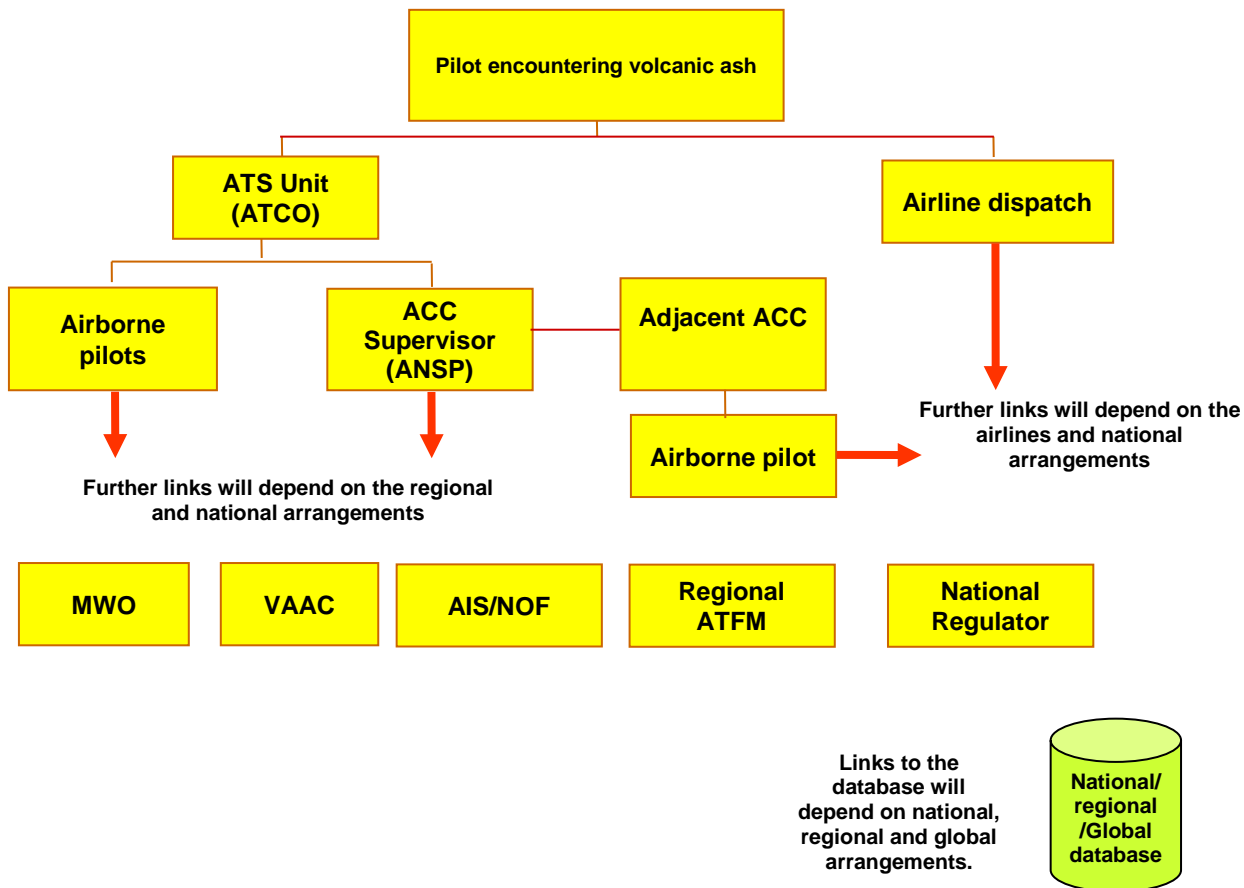
#### 4.2. *In-Flight Phase*

##### 4.2.1 Participants, Roles & Responsibilities:

<b>Participants</b>	<b>Roles &amp; Responsibilities</b>
Pilots, civil and/or military, observing and/or encountering volcanic activity	To provide as much detailed information as possible about the type, position, colour, smell, dimensions of the volcanic contamination, level and time of the observation and forward VAR Part I immediately to the ATS unit with which the pilot is in radiotelephony (R/T) communication. Record the information required for VAR Part II on the appropriate form as soon as possible after the observation or encounter and file the report via data link, if available.
ATS unit receiving the information from the pilot encountering volcanic event	To ensure that information received by an air traffic controller from the pilot has been copied, clarified (if necessary), and disseminated to other pilots as well as to the ACC Supervisor. In addition, air traffic controllers could ask other pilots flying within the same area if they have observed any volcanic activity.
ATS unit/ACC Supervisor (if applicable) or other Air Navigation Service Provider responsible person	To use all means of communication and available forms to ensure that the information received from the air traffic controller has been: <ul style="list-style-type: none"> <li>- passed on to the associated Meteorological organizations in accordance with national/regional arrangements;</li> <li>- fully and immediately disseminated across the organization, in particular to adjacent sectors and the associated NOTAM Office (NOF);</li> <li>- passed on to the neighbouring sectors and ACCs (if necessary);</li> <li>- passed on to the regional ATFM centre if existing (e.g. CFMU in Europe);</li> <li>- passed on to the national/regional authority responsible for the handling of contingency situations.</li> </ul>
Neighbouring ANSPs (ACCs)	To ensure that information is provided to flight crews flying towards the area affected by the volcanic contamination; disseminated across the organization and the system prepared to cope with the possible changes of the traffic flows; and that the information is provided to the national authority responsible for the handling of contingency situations and passed on to the NOF and MWO as required.
MET Watch Office	To use the information originated by flight crews and forwarded by the ATS unit, in accordance with Annex 3.
VAAC	To use the information originated by flight crews, MWOs and other competent sources in accordance with Annex 3
AIS / NOF	To publish appropriate AIS messages in accordance with Annex 15
ATFM unit or centre (if existing)	To ensure that information received is stored and made available for information to all partners in its area of responsibility (ANSPs, airlines, VAAC, MET etc.). As part of the daily activity, coordinate ATFM measures with ACCs concerned.

##### 4.2.2 *In-flight reporting – Sample Flow Chart of the volcanic ash information*

4.2.2.1 The chart below is a graphical representation of a possible path of the in-flight volcanic ash information and may differ between regions depending on regional arrangements. It also gives the position of the volcanic ash participants in the reporting chain. The flow chart is not exhaustive and the path of the information can be extended and new participants could be added depending of the national and regional requirements:



#### 4.3 Post-Flight Operations Roles & Responsibilities and order of reporting

Participants	Roles & Responsibilities
Civil and/or military pilots/airlines having observed or encountered an eruption or volcanic contamination	To file the volcanic ash report with as much detailed information as possible about the volcanic activity and/or encounter (position, colour, smell, dimensions, FL, time of observation, impact on the flight, etc.). Ensure that the VAR is filed and transmitted to the relevant recipients as soon as possible after landing (if not filed via data link already during the flight). Make an entry into the Aircraft Maintenance Log (AML) in case of an actual or suspected encounter with volcanic contamination.
ANSP	To provide a summary report of effects of the volcanic activity that affected its operations at least once per day to the national authority with as much detailed information as possible about the number of encounters, impact on air traffic management, etc.).
AOC Maintenance - Post flight Inspection	To report about the observation of the aircraft surfaces, engine, etc., and to provide the information to the national, regional or global central data repository, where applicable.

Investigation authority	All aeronautical service providers (including operators, ANSPs, airports, etc.) shall investigate the effects of a volcanic activity, analyse the information, search for conclusions, and report the investigation results and relevant information to the national supervisory authority and any central data repository.
National Authority	To handle the national central data repository and report to the regional/global central data repository if any. To analyse reports from its aeronautical service providers and take action as appropriate.
Regional Central Data Repository	To collect the national data and make them available to interested stakeholders under agreed conditions.
MWO	To use the national and regional information coming from national and regional central data repositories.
VAAC	To use the information originated by flight crews, and other competent sources to: a) validate its products accordingly and; b) improve the forecast.
Global Data Repository (and research institutes - where appropriate)	To analyse the information stored in the regional central data repository and provide the research outcomes for lessons learnt process.
Knowledge management (e.g. SKYbrary)	To use the post-flight lessons learnt and disseminate them to interested stakeholders.
ICAO	To review/revise ATM volcanic ash contingency plans.

#### 4.4 *Tools for presenting and sharing the volcanic ash information*

4.4.1 To report, transmit and disseminate the volcanic ash encounter information, different types of tools can be used. The list below is provided to give ideas as to what tools can be used. It could also be split into regulatory and general information tools. At any case, it is not an exhaustive list and can be updated with new elements depending on regional experiences.

- a) Radiotelephony and Data link Communications;
- b) VAR;
- c) NOTAM/ASHTAM;
- d) SIGMET;
- e) VAA/VAG;
- f) Central data repository e.g. CFMU Network Operations Portal (NOP);
- g) Centralized web based sites with the regularly updated information and maps – e.g. <http://www.eurocontrol.int/>
- h) Teleconferences;
- i) Periodic Bulletins with the set of information defined by the data providers and data users; e.g. Smithsonian Institution Weekly Bulletin; and/or
- j) Centralized internet-based sites for the sharing of lessons learnt (Knowledge management – e.g. SKYbrary [http://www.skybrary.aero/index.php/Main\\_Page](http://www.skybrary.aero/index.php/Main_Page)).

## APPENDIX D

### SIGMET and NOTAM EXAMPLES DURING VOLCANIC ASH

#### **Volcanic Ash (VA) Cloud (CLD) in Kuwait FIR**

WVKW31 OKBK 030900  
OKBK SIGMET 1 VALID 030900/031500 OKBK-  
OKAC KUWAIT FIR VA CLD OBS AT 0840Z W OF E48 FL180/320 MOV E 45KT NC FCST1500Z VA CLD  
APRX E OF E4730=

#### **Cancellation SIGMET as volcanic ash cloud exits Kuwait FIR into Tehran FIR (sooner than expected)**

WVKW31 OKBK 031400  
OKBK SIGMET 2 VALID 031400/031500 OKBK-  
OKAC KUWAIT FIR CNL SIGMET 1 030900/031500 VA MOV TO OIIX FIR=

#### **VA CLD in Cairo FIR**

WVEG31 HECA 030900  
HECA SIGMET 1 VALID 030900/031500 HECA-  
HECC CAIRO FIR VA CLD OBS AT 0840Z N OF LINE N3140 E2510 - N29 E30 W OF LINE N3150 E3359 –  
N29 E30 FL100/290 MOV SE 35KT NC FCST1500Z VA CLD APRX N OF LINE N3140 E2510 – N2806  
E3435=

#### **Cancellation SIGMET as volcanic ash cloud exits Cairo FIR into Jeddah FIR (sooner than expected)**

WVEG31 HECA 031330  
HECA SIGMET 2 VALID 031330/031500 HECA-  
HECC CAIRO FIR CNL SIGMET 1 030900/031500 VA MOV TO OEJD FIR=

#### **Example NOTAM based on SIGMET issued for Cairo FIR**

Q) HECC/QWWXX/IV/NBO/W/100/290/999  
A) HECC B) 1311030900 C) 1311031500  
E) ATM AND ACFT TAKE NECESSARY ACTION DUE TO VOLCANIC ASH AREA OF HIGH/MEDIUM  
CONTAMINATION (FROM VOLCANO ETNA 211060, 37.734N 015.004E) AS FOLLOWS:  
3400N 2410E – 3140N 2510E – 2900N 3000E – 3150N 3359E – 3330N 3000E – 3400N 2710E – 3400N 2410E  
F) FL100 G) FL290

#### **Special Air-Reports on Volcanic Ash**

Special air-reports on volcanic ash sent to ACCs should then be sent via AFTN to the relevant Meteorological Watch Office (MWO) which is forwarded to the relevant Volcanic Ash Advisory Centre (VAAC) – for MID Region that is VAAC Toulouse.

SPECIAL AIREP → ACC → MWO → VAAC

Pilots should use the special air-reports format on volcanic ash as at Table A4-1 in Appendix 4 of ICAO Annex 3.

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**Table B0-FRTO**

**EXPLANATION OF THE TABLE**

Column

- 1 Name of the State
- 2 Status of implementation of Flexible Use of Airspace (FUA). The Implementation should be based on the published aeronautical information:  
FI – Fully Implemented  
PI – Partially Implemented  
NI – Not Implemented
- 3 Total Number of ATS Routes in the State.
- 4 Total number of required routes (through Regional Agreement) to be implemented through segregated areas
- 5 Number of routes that are NOT implemented in the State due military restrictions (segregated areas)
- 6 Remarks

Applicability State	FUA Implemented	Total number of ATS Routes	Total number of required routes to be implemented through segregated areas	Number of routes that are NOT implemented due military restrictions (segregated areas)	Remarks
1	2	3	4	5	6
Bahrain	FI	78	1 (UM430)	0	Time route
Egypt					
Iran					
Iraq	PI	15	0	2	P/UP975 closed btw SIDNA & MUTAG
Jordan	PI	12	1 (UM690)	1 (G662)	
Lebanon	PI	9	1 (M1)	M1 (KAD-LATEB)	
Libya					
Kuwait					
Oman					
Qatar					
Saudi Arabia	PI	153	1 (RC083)	0	
Sudan	PI	16	4	2	
Syria	PI	19	0	0	
Unite Arab Emirates	PI	41	3	4	
Yemen					
Total					
Percentage					

**B0 – NOPS: Improved Flow Performance through Planning based on a Network-Wide view**

**Monitoring and Reporting**

**EXPLANATION OF THE TABLE**

Column

- 1 Name of the State
- 2 Status of implementation of a mechanism for the implementation of ATFM Measures based on collaborative decision:  
FI – Fully Implemented  
PI – Partially Implemented  
NI – Not Implemented
- 3 Provide reference to the Document including the mechanism for the implementation of ATFM Measures
- 4 List of implemented ATFM Measures
- 5 Provide a list of ATFM Measures, which were coordinated with the neighbouring States
- 6 Remarks

State	Mechanism for the Implementation of ATFM Measures based on Collaborative Decision	Reference (Document)	ATFM Measures Implemented	ATFM Measures were Coordinated with the Following States	Remarks
1	2	3	4	5	6
Bahrain					
Egypt					
Iran					
Iraq					
Jordan					
Lebanon					
Libya					
Kuwait					
Oman					
Qatar					
Saudi Arabia					
Sudan					
Syria					
Unite Arab Emirates					
Yemen					
Total					
Percentage					

## APPENDIX E

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### GUIDELINES FOR THE PUBLICATION OF FIR BOUNDARY POINTS

- 1) Where FIR is a list of geographical coordinates:
  - a) The list of points and their coordinates must follow a clockwise sequence.
  - b) The list must have a beginning point and an ending point that are the same coordinate.
  - c) The latitude and longitude coordinates must be reported in **DMS (degrees, minutes and seconds)**.
  - d) Where an FIR shares a common point with another neighbouring FIR, coordinates should be mutually agreed.

***Note:** Transfer of Control Points, ATS route significant points or waypoints may not necessarily be aligned with boundaries delineation.*
  - e) Where delineation of FIR/UIR follows an arc of specific dimension, it should be defined as follows:

***[starting point of ARC]** following an arc of a circle at a **radius of [distance]** NM centered on **[coordinates in DMS]** and ending at point **[coordinates in DMS]**.*
- 2) Where FIR is described using “sovereign” boundaries
  - a) The description should be simple
    - i) *Follow sovereign boundary between [State 1] and [State 2]).*<sup>1</sup>
  - b) Where delineation of FIR/UIR is made by reference to sovereign boundaries common to neighbouring FIR/UIR, the delineation shall be mutually agreed upon.
  - c) Where an FIR/UIR follows a sovereign boundary, the United Nations international boundary data set is referred to by ICAO.

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<sup>1</sup> Use short names of States as shown at: <http://www.icao.int/about-icao/pages/member-states.aspx>

# Review of MID Table ATM I-1

The table below shows columns from the MID ATM table, with two additional columns in gray: 1) “Comments” notes the clarification needed with regards to the lateral limits coordinates, and 2) # of FIR/UIR Description Requirements refers to the description of FIRs as listed in the Guidelines.

**NOTE:** The MID Table for the eANP will not include the additional columns.

**MID TABLE ATM I-1**

FIR/UIR Location Indicator	Lateral limits coordinates	COMMENTS FROM ICAO	# of FIR/UIR Description Requirement	Remarks
1	2		See FIR/UIR Definition #	3
Amman (OJAC)	<p>FIR/UIR Amman</p> <p>292125N 0345743E On the Gulf of Aqaba</p> <p>291102N 0360420E 293002N 0363021E</p> <p>295203N 0364521E 300003N 0373021E</p> <p>302003N 0374021E 303003N 0380021E</p> <p>313003N 0370021E 320002N 0390021E</p> <p>TO 320911N 0391206E At Jordan, Saudi Arabia and Iraqi boundaries. Then the point 321349N 0391804E At the Southern corner of the Jordanian-Iraqi boundaries and along Jordanian-Syrian-Israeli boundaries then back to starting point 292125N 0345743E.</p>	<p>Coordinates should match with FIR JEDDAH</p>	<p>1a</p> <p>1d</p> <p>2c</p> <p>2a</p>	<p>Source: the State's AIS Publication</p>
Baghdad (ORBB)	<p>FIR/UIR Baghdad</p> <p>Along the Iraqi boundaries with Iran, Kuwait, Saudi Arabia, Syria and Turkey.</p> <p>See coordinate description FIR Jeddah and FIR Kuwait</p>	<p>Coordinates should be defined in the description for Baghdad FIR for perfect alignment of FIRs delineation shared with FIRs Jeddah and Kuwait</p>	<p>1a</p> <p>1d</p> <p>2a</p>	<p>Source: the State's AIS Publication</p>
Bahrain (OB BB)	<p>FIR/UIR Bahrain</p> <p>284400N 0494000E 270500N 0505500E 265500N 0511000E 260400N 0535700E 254900N 0530600E 240300N 0514700E</p> <p>thence along the Saudi Arabia / UAE national borders to the point where</p>			<p>MID ANP PfA 00/1 ATS approved 7 March 2005 and</p> <p>Source: the</p>



FIR/UIR Location Indicator	Lateral limits coordinates	COMMENTS FROM ICAO	# of FIR/UIR Description Requirement	Remarks
1	2		See FIR/UIR Definition #	3
	the national borders of Oman, Saudi Arabia and UAE meet to 224200N 0551200E, then the Saudi Arabia / Oman territorial boundary to 190000N 0520000E 253000N 0490000E 263330N 0452130E 275000N 0455500E 275000N 0490800E thence along the limit of the Saudi Arabia territorial waters to 281500N 0485200E then back to starting point 284400N 0494000E	Description should match with the one in FIR Jeddah and Muscat  This coordinate should match with FIR Kuwait and add starting point coordinate	1a 1d 2b 2c 2a	State's AIS Publication (AIP ENR 2.1-1 dated 17 October 2013)  PfA (Serial MID Basic ANP 13/03 – ATM/SAR)-realignment of Bahrain and Jeddah FIRs pending approval
Beirut (OLBB)	FIR/UIR Beirut The geographical Lebanese/Syrian borders, then along the Lebanese/Palestinian borders, and a semicircular Arc, radius 45 NM centered KAD VOR		1d 2b 2c 2a 1e	Not Source: the State's AIS Publication
Cairo (HECC)	FIR/UIR Cairo *Northern border 340000N 0241000E 340000N 0271000E 333000N 0300000E *Eastern border 315000N 0335900E 313600N 0343000E then follow the International border to: 293000N 0345500E 293000N 0350000E 280600N 0343500E 220000N 0380000E *Southern border 220000N 0380000E 220000N 0250000E *Western border 220000N 0250000E 314000N 0251000E 340000N 0241000E	Coordinate should match with FIR Tripoli	1d 2a	Source: the State's AIS Publication
Damascus (OSTT)	FIR/UIR Damascus  From 355500N 0354000E to 355600N 0355500E then along the national border of Syria with Turkey and Iraq to a point 332200N 0384800E, then along the national border of Syria with Jordan to 324100N 0353800E then along the		1a 1d 2b 2c 2a	Source: the State's AIS Publication

FIR/UIR Location Indicator	Lateral limits coordinates	COMMENTS FROM ICAO	# of FIR/UIR Description Requirement	Remarks
1	2		See FIR/UIR Definition #	3
	Western Syrian border to 331500N 0353700E then along the Lebanese Syrian border to a point 343800N 0355700E then to a point 343800N 0354300E then northwards along a line maintaining 12 NM from the coastline, to 355500N 0354000E			
Emirates (OMAE)	FIR/UIR Emirates  262100N 0560600E 253600N 0561300E 250000N 0563500E 240000N 0553500E 224200N 0551200E to the point where the national borders of Oman, Saudi Arabia and UAE meet, then along the national border between Saudi Arabia and UAE to 240300N 0514700E 254900N 0530600E 260400N 0535700E 253800N 0552000E 262100N 0560600E			Source MID ANP Serial No. EUR 85/02-ATS/88-COM/400-MET/75-SAR/16-AIS/1 dated 9 December 1986 and PfA Serial 00/1 ATS approved 7 march 2005
Jeddah (OEJD)	FIR/UIR Jeddah  292124N 0345718E 291131N 0360356E 293001N 0362956E 295201N 0364456E 300002N 0372956E 302002N 0373956E 303002N 0375956E 313002N 0365956E 320002N 0385956E 320915N 0391203E 315653N 0402447E 312223N 0412627E 310642N 0420508E 291155N 0444318E 290340N 0462534E 290604N 0463311E then along the national boundary between Kuwait and Saudi Arabia and then along the limit of Saudi Arabian territorial waters to: 275000N 0490800E 275000N 0455500E 263330N 0452130E 253000N 0490000E 190000N 0520000E clockwise to 184720N 0504700E 183700N 0490700E 181000N 0481100E 172700N 0473600E 170700N 0472800E 165700N 0471100E 165700N 0470000E 171700N 0464500E 171400N 0462200E 171500N 0460600E 172000N 0452400E 172600N 0451300E 172600N 0443900E 172420N	Coordinates do not match with neighboring FIR Amman  Coordinates should be defined as in this description within Baghdad FIR for perfect alignment with Jeddah FIR  This coordinate does not match with shared FIR Kuwait and Baghdad  Coordinates should be defined as in this description within Sanaa' FIR for perfect alignment with Jeddah FIR	1a 1d 2b 2c 2a	Source: the State's AIS Publication (AIP ENR 2.1-1 dated 11 March 2010)  PfA (Serial MID Basic ANP 13/03 – ATM/SAR) realignment of Bahrain and Jeddah FIRs pending approval

FIR/UIR Location Indicator	Lateral limits coordinates	COMMENTS FROM ICAO	# of FIR/UIR Description Requirement	Remarks
1	2		See FIR/UIR Definition #	3
	0443400E 172600N 0442800E 172600N 0442158E then follow Saudi Arabia and Republic of Yemen international boundaries in accordance with Jeddah treaty to the coast line boundary: 162415N 0424620E 162415N 0420900E 161724N 0414700E 160000N 0420000E 154700N 0415300E 153955N 0413947E 160000N 0410000E 200000N 0383000E 220000N 0380000E 280600N 0343500E then back to starting point 292124N 0345718E	This coordinate does not match with shared FIR Asmara coordinate  Coordinates should match with FIR Amman and FIR Cairo		
Khartoum (HSSS)	FIR/UIR Khartoum  154500N 0240000E 200000N 0240000E 200000N 0250000E 220000N 0250000E 220000N 0380000E 200000N 0383000E 125500N 0360000E 080000N 0330000E 040000N 0360500E 040000N 0301200E Common national boundary: SUDAN /KINSHASA SUDAN/CONGO DROF SUDAN /BRAZZAVILLE SUDAN/CENTRAL AFRICA SUDAN/NDJMEANA.	Replace text with the following to be consistent with the other MID FIR descriptions: Example: Then follow international boundary between Sudan and Congo, DRC, Central Africa and Chad then back to starting point 154500N 0240000E.	1a 2a	Source: the State's AIS Publication
Kuwait (OKAC)	FIR/UIR Kuwait  290604N 0463319E 291502N 0464211E 294319N 0470024E 295105N 0470454E 300001N 0470920E 300613N 0472217E 300613N 0474228E 300113N 0475528E 295924N 0480042E 300146N 0480434E 300120N 0480952E 295110N 0482451E 295121N 0484503E 291300N 0494000E 290000N 0492700E 284400N 0494000E 281500N 0485203E then following the Saudi Arabia territorial waters and Kuwait / Saudi Arabia International boundary to the point 290604N 0463319E	This coordinate does not match with shared FIR Jeddah and Baghdad  These highlighted FIR Kuwait coordinates define the border shared with Baghdad FIR  Shared coordinate with FIR Tehran and along FIR boundary of Baghdad  Coordinates should match with FIR Bahrain  As above in GREEN.	1a 1b 2b 2c 2a	Source: Limited MID RAN Jan 1996  the State's AIS Publication
Muscat (OOMM)	FIR/UIR Muscat  250000N 0563500E 253600N 0561300E 262100N 0560600E 264100N 0562700E 261000N			Source: the State's AIS Publication

FIR/UIR Location Indicator	Lateral limits coordinates	COMMENTS FROM ICAO	# of FIR/UIR Description Requirement	Remarks
1	2		See FIR/UIR Definition #	3
	0564500E 253500N 0564500E 250000N 0573000E 244000N 0612000E 233000N 0612000E 233000N 0643000E 194800N 0600000E 174000N 0570000E 154000N 0533000E 163800N 0530400E 172200N 0524400E 190000N 0520000E thence along the common national boundary Sultanate of Oman/Kingdom of Saudi Arabia and along the common national boundary Sultanate of Oman/United Arab Emirates to 224200N 0551200E 240000N 0553500E 250000N 0563500E	Coordinate should match with Sanaa' FIR  Description should match with BAHRAIN FIR	1d 2b 2c 2a	
Sanaa' (OYSC)	FIR/UIR Sanaa' 190000N 0520000E 173000N 0443500E 173500N 0430800E 164100N 0430800E 160800N 0412900E 145106N 0422354E 141542N 0423630E 123600N 0431800E 123142N 0432712E 121036N 0440206E 114500N 0441100E 114730N 0444348E 115900N 0470800E 121100N 0504500E 120718N 0510242E 120000N 0513000E 120000N 0600000E 161400N 0600000E 194800N 0600000E 174000N 0570000E 164618N 0552436E 160718N 0541648E 154000N 0533100E 163324N 0530612E 190000N 0520000	Add Coordinates should be defined in the description within Sana'a FIR for perfect alignment as in descriptions of Jeddah FIR and AFI FIR Asmara, Addis Ababa, Mogadishu  See Appendix C for an example of this issue.  Please verify with FIR Mogadishu coordinates for perfect alignment  Coordinate should match with Muscat FIR for perfect alignment	1a 1d 2b 2c 2a	Source: the State's AIS Publication  MID ANP
Tehran (OIIX)	FIR/UIR Tehran  372100N 0535500E 382630N 0485230E thence along the Islamic Republic of Iran / Azerbaijan, Armenia, Turkey and Iraq territorial borders to Persian gulf to 295110N 0484500E 291300N 0494000E 290000N 0492700E 270500N 0505500E 265500N 0511000E 253800N 0552000E 264100N 0562700E 261000N 0564500E 253500N 0564500E 250000N 0573000E 244000N 0612000E, thence along the Islamic Republic of Iran / Pakistan,	Coordinates are not consistent with FIR Kuwait	1d 2b 2c 2a	Source: the State's AIS Publication

FIR/UIR Location Indicator	Lateral limits coordinates	COMMENTS FROM ICAO	# of FIR/UIR Description Requirement	Remarks
1	2		See FIR/UIR Definition #	3
	Afghanistan and Turkmenistan territorial borders to 372100N 0535500E			
Tripoli (HLLL)	FIR/UIR Tripoli  342000N 0113000E 342000N 0233500E 340000N 0241000E 314100N 0250800E 200000N 0250000E 200000N 0240000E 193000N 0240000E 220000N 0190000E 220000N 0113000E to Western Border Libya-GSPAJ along Western Border Libya-GSPAJ to 322200N 0113000E 342000N 0113000E	This coordinate should match with FIR Cairo	1d 2b 2c 2a	Source: the State's AIS Publication

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