



International Civil Aviation Organization

**THIRD MEETING OF THE ASIA/PACIFIC (APAC) VOLCANIC ASH
EXERCISES STEERING GROUP (VOLCEX/SG/3)**

Bangkok, Thailand, 14 – 16 March 2016

Agenda Item 6: Any other Business

REGIONAL ATM CONTINGENCY PLAN TASK FORCE OUTCOMES

(Presented by the Secretariat)

SUMMARY

This paper presents a summary of relevant outcomes from the Regional ATM Contingency Plan Task Force

1. INTRODUCTION

1.1 The 5th Meeting of the Regional ATM Contingency Plan Task Force (RACP/TF/5) was held in Bangkok, Thailand from 1 to 4 December 2015.

1.2 RACP/TF/5 produced the final draft version of the Regional ATM Contingency Plan that, subject to completion of some outstanding tasks to finalize the document, is expected to be adopted by the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) in September 2016.

2. DISCUSSION

Regional ATM Contingency Plan

2.1 RACP/TF/5 agreed to the following Draft Conclusion:

Draft Conclusion RACP/TF 5-1 – Regional ATM Contingency Plan

That, on completion of the outstanding Tasks in the RACP/TF Task List, Version 1.0 of the Asia/Pacific Regional ATM Contingency Plan be adopted, and uploaded to the ICAO Asia/Pacific Regional Office Website.

2.2 The draft Regional ATM Contingency Plan now includes provisions developed from recommendations arising from VOLCEX/SG/2 relating to:

Recommendation 4: Regulatory provisions for response to volcanic ash contingency events;

Recommendation 5: Airspace and airport management in response to volcanic eruption and volcanic ash cloud; and

Recommendation 6: Regular updates of volcanic ash information

2.3 The draft Contingency Plan now includes information specific to volcanic ash cloud contingency responses including Background Information (**Attachment A**), Contingency Planning Principles (**Attachment B**) and Performance Improvement Plan (**Attachment C**).

2.4 The Contingency Plan will include as an appendix a summary list of actions to be taken by relevant Volcanic Observatories, Volcanic Ash Advisory Centres, MWOs, AIS Units and ACCs.

ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) update and complete the list of actions to be taken by relevant Volcanic Observatories, Volcanic Ash Advisory Centres, MWOs, AIS Units and ACCs; and
- c) discuss any relevant matters as appropriate.

BACKGROUND INFORMATION

Requirement for Contingency Plans

5.1 Annex 11 to the Convention on Civil Aviation requires that ATS 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.

5.2 The 47th Conference of Directors General of the Asia/Pacific Region (Macao, China, October 2010) requested the ICAO Regional Office to consider the establishment of a task force for planning, coordination and implementation of a regional ATM Contingency Plan (Action Item 47/1).

5.3 Subsequently, the 22nd Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/22, Bangkok, Thailand, June 2011) formed a Regional ATM Contingency Planning Task Force (RACP/TF) for planning, coordination and implementation of a regional ATM contingency plan.

5.4 The RACP/TF Terms of Reference directed the Task Force to review the current status of ATM Contingency Plans and the contingency preparedness of Asia and Pacific Region States, and identify areas where ATM contingency planning requires improvement, and to make recommendations on those areas of improvement.

Contingency Planning Principles

5.5 ATM contingency planning principles form the basis for development of Level 1, Level 2 and Level 3 Contingency Plans in response to Category A, B and C contingency events, inter-State contingency agreements, contingency route structures, flight level allocation schemes and aircraft longitudinal spacing, communications transfer arrangements, and for any delegation of ATC separation, FIS and SAR alerting services:

5.6 Asia/Pacific Region Contingency Planning Principles as agreed by RACP/TF and endorsed by APANPIRG are included as **Appendix X**.

Basic Plan Elements

5.7 The plan includes Basic Plan Elements (BPE) which define the minimum recommended considerations for inclusion in Level 1 and Level 2 Contingency Plans. The BPE include Administration, Plan Management, Airspace, ATM Procedures, Pilot/Operator Procedures, Communications Facilities and Procedures, Aeronautical Support services including AIS and MET, and Contact Details. **Appendix X** lists the agreed BPE.

Contingency Plan Coordination and Operations Functions

5.8 Each State should establish an ATM contingency Central Coordinating Committee (CCC) function for the development, maintenance, activation and conduct of contingency plans, and for the forming and convening of an ATM Operational Contingency Group (AOCG) function.

5.9 The Central Coordinating Committee function should include relevant representation from the Regulatory Authority, Air Navigation Service Provider, Military Authority, Other relevant national authority, airspace user representatives, airport authorities meteorological authority, airport authority and other relevant authorities and agencies.

5.10 The ATM Operational Contingency Group (AOCG) function should be convened by the CCC with a primary responsibility to oversee the day to day operations under the contingency arrangements, and coordinate operational ATS activities, 24 hours a day, throughout the contingency period. The terms of reference of the AOCG will be determined by the CCC. The AOCG function will include any necessary specialist input from the following disciplines:

- Air Traffic Control (ATC)
- Aeronautical Telecommunication (COM)
- Aeronautical Meteorology (MET)
- Aeronautical Information Services (AIS)
- ATS equipment maintenance service provider

The AOCG functions shall include:

- i) review and update of the Contingency Plan as required;
- ii) keep up to date at all times of the contingency situation;
- iii) organize contingency teams in each of the specialized areas;
- iv) keep in contact with and update all affected airspace and system users, customers and other relevant stakeholders;

(Note: Annex 11 provides guidelines for coordination of contingency matters with ICAO)

- v) exchange up-to-date information with the adjacent ATS authorities concerned to coordinate contingency activities;
- vi) notify the designated organizations of the contingency situation sufficiently in advance and/or as soon as possible thereafter;
- vii) take necessary action for issuing NOTAMs in accordance with the contingency plan or as otherwise determined by the particular contingency situation. Where the contingency situation is sufficiently foreseeable the relevant NOTAMs should be issued 48 hours in advance of the contingency events, using templates. NOTAM templates are provided in **Appendix X**.

5.11 Terms of reference, and procedures for the activation of the ATM Operational Contingency Group (AOCG) function should be developed.

Volcanic Ash Cloud Contingency Planning

5.12 The ICAO *Air Traffic Management Volcanic Ash Contingency Plan Template* provides information on terminology related to volcanic ash contingency responses, and the *pre-eruption, start of eruption, on-going eruption* and *recovery* phases of volcanic ash cloud events. Information is also provided on air traffic services procedures, and on air traffic flow management procedures.

5.13 The phases of volcanic eruption activity may be summarized as follows:

Pre-Eruption Phase: a volcanic eruption is expected.

Start of Eruption Phase: commences with the outbreak of the volcanic eruption and entrance of volcanic ash into the atmosphere.

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.

Recovery Phase: commences with the issuance of the first VAA containing a statement that no volcanic ash is expected.

5.14 **Appendix X** summarizes the actions to be taken by relevant Volcanic Observatories, Volcanic Ash Advisory Centres, MWOs, AIS Units and ACCs¹.

5.15 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. This document assumes that ICAO requirements regarding safety management systems have been implemented by all States and aircraft 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)

5.16 States' regulatory provisions and arrangements should be reviewed to ensure that, in accordance with the guidance provided in ICAO Doc 9974:

- a) Aircraft operators are required to include in their safety management system (SMS) an identifiable safety risk assessment for operations into airspace forecast to be, or at aerodromes known to be, contaminated with volcanic ash
- b) Safety oversight procedures are used for the evaluation of operators' capability to conduct flight operations safely into airspace forecast to be, or aerodromes known to be, contaminated with volcanic ash.

¹ Actions to be taken by the relevant organizations and units are currently being examined by the Volcanic Ash Exercises Steering Group.

5.17 States' airspace and airport management policies and procedures should be reviewed to ensure that (in accordance with the guidance provided in ICAO Doc 9974 – *Flight Safety and Volcanic Ash* and the provisions of ICAO Doc 4444 – *PANS-ATM*, 15.8.1c and Note 2):

- a) Airspace affected by volcanic ash cloud should not be 'closed'.
- b) Specification in NOTAM of alternate routing or other air traffic flow management (ATFM)² measures to manage airspace constraints arising from volcanic ash cloud should be solely for the purpose of ensuring the predictability and regularity of air traffic, and should be based on an assessment of capacity and demand in airspace affected by volcanic ash and/or or by aircraft avoiding the volcanic ash cloud
- c) NOTAM specifying alternate routing or other ATFM measures related to a volcanic eruption or volcanic ash cloud should be issued separately from the ASHTAM/NOTAM issued in accordance with Annex 15, 5.1.1.1, r and u;
- d) Aerodromes should only be closed by NOTAM for periods of observed volcanic ash contamination of the surface of the aerodrome movement area;
- e) Airport capacity limitations of alternate aerodromes, including apron capacity, should be considered, and recommendations for the use of other alternates considered for inclusion in NOTAM (in c, above);
- f) If required by State regulations, any declaration of a Danger Area or Restricted Area should be confined to the pre-eruptive or erupting volcano and the area containing its forecast or observed ejecta.

5.18 AIS units are required under the provisions of Annex 15 to issue information relating to volcanic ash cloud. Information may be issued in either NOTAM or ASHTAM format. Annex 15 specifies that ASHTAM shall include *Item E — Colour code for level of alert indicating volcanic activity*. As colour-coded activity levels for volcanic ash cloud are not in use in volcanic observatories in the Asia/Pacific Region. NOTAM format should be used to disseminate volcanic ash cloud information.

² ATFM capability for the Asia/Pacific Region is expected to be implemented under the provisions of the Asia/Pacific Region Manual for Collaborative ATFM.

APPENDIX A: ATM Contingency Planning Principles

1. All ATS units, including ATC Sectors, Units, Centres and supporting Flight Information and Briefing Offices should have a Level 1 Contingency Plan to ensure the safe transit of international traffic in the event of disruption or withdrawal of ATS, or unsafe airspace conditions such as volcanic ash cloud, nuclear emergency or national security responses.
2. The overriding principle is that safety has primacy over efficiency and optimal levels and routes;
3. Contingency Operations will necessitate lower than normal airspace capacity to ensure safety.
4. System and ATC service redundancy is the most effective contingency capability.
5. All Contingency Plans should define the following where applicable:
 - A Contingency Route Structure supported by a Flight Level Allocation Scheme (FLAS) and minimum navigation and height-keeping (e.g. RVSM or non-RVSM) capability for access;
 - Note: Contingency Route Structures and/or FLAS need not be defined where the Contingency Plan states that all routes and/or levels remain available during contingency operations.*
 - Provisions for tactical definition and coordination of additional routes/FLAS and priority for access to accommodate selected non-scheduled operations such as humanitarian, medical evacuation and flood and fire relief (FFR) flights;
 - Priority determination for routine scheduled and non-scheduled flights;
 - Flights excluded from operations in contingency airspace, and minimum navigation and height keeping (RVSM) capability required for access to the contingency airspace;
 - Specified minimum longitudinal spacing between consecutive aircraft entering the contingency airspace on non-separated ATS contingency routes;
 - Contingency communication arrangements including means of communication within contingency airspace and communications transfer arrangements for aircraft entering and leaving the airspace;
 - Details of delegation of air traffic services arrangements (if any);
 - Contingency points of contact
6. Level 2 Contingency Arrangements (arrangements between neighbouring administrations) should be included in bi-lateral or multi-lateral agreements between States in all cases where activation of any Level 1 Contingency Plan will impact upon a neighbouring State's ATSU.
7. Level 1 Contingency Plans should include, either in detail or by reference, any relevant Level 2 Contingency Arrangements.

8. Close cooperation between neighbouring administrations, together with supporting mechanisms for the tactical definition and promulgation of contingency routes for the avoidance of Category B and C contingency airspace.
9. Collaborative Air Traffic Flow Management Measures should be the first priority response to Category A contingency events, and for the management of deviating traffic during Category B and C events.
10. Contingency routes must be vertically separated whenever lateral route separation is less than the minimum specified by the State for contingency operations.
11. Contingency Flight Level allocation scheme planning should include consideration of allocating the optimum flight levels to routes used by long haul aircraft, depending on the traffic density on the route, wherever practicable.
12. Contingency ATS routes should provide minimum lateral separation of 100 NM between aircraft that are not vertically separated under a FLAS, except where the minimum aircraft navigational capability specified in the contingency plan permits reduced lateral separation specified in ICAO Doc 7030 *Regional Supplementary Procedures* Section 6.2 or ICAO Doc. 4444 *PANS-ATM*.

States should specify any necessary buffers to minimum lateral separation requirements where meteorological phenomena may require aircraft to deviate from the ATS route to maintain flight safety. Information on the buffers should be provided in operational information provided on pre-activation or activation of the contingency plan.

13. Minimum longitudinal spacing between aircraft operating on the same contingency route and not vertically separated should be 15 minutes or 120 NM. However, this may be reduced to 10 minutes or 80 NM in conjunction with application of the Mach number technique where authorized by the relevant authority and agreed in the appropriate LOA or other Contingency Arrangement.
14. Contingency ATS routes and FLAS, and contingency procedures, should be agreed between geographically grouped neighbouring States to form sub-regional contingency plans.
15. Contingency ATS routes should be published in State AIP to permit the storing of route details in airspace users' navigation databases.
16. Airspace classifications for ICAO Classes A, B and C airspace should remain unchanged during contingency operations to facilitate managed access to the airspace in accordance with the contingency plan. Classes D and E airspace may be reclassified as Class C or higher where necessary to preclude VFR operations.
17. Define ground and airborne navigation requirements if necessary
18. Alternate aerodromes should be specified where necessary in Level 1 contingency plans for airport control towers and terminal airspace.
19. Aircraft 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.
20. Airspace affected by volcanic ash cloud should not be closed to international civil aviation.

21. Amended ATS routes, whether published or promulgated ad-hoc, may be prescribed as part of the air traffic flow management (ATFM) response to expected demand and capacity imbalance caused by aircraft avoiding volcanic ash cloud.
22. Aerodromes should only be closed by NOTAM for periods of observed volcanic ash contamination of the surface of the aerodrome movement area;
23. Closure of airports affected by volcanic ash deposition should be supported by a safety assessment conducted in collaboration between airport operator, aircraft operators and the air navigation service provider.

PERFORMANCE IMPROVEMENT PLAN

ATM Contingency Operations Capability

Note: prior to implementation, ATM Contingency plans should be verified by an appropriate safety assessment conducted under the State's Safety Management System.

- **Expected implementation by 10 November 2016**

Level 1 (Domestic or Internal State) Plans

7.1 Each State should establish an ATM contingency Central Coordinating Committee (CCC) function for the development, maintenance, activation and conduct of contingency plans, and for the forming and convening of an ATM Operational Contingency Group (AOCG) function.

7.2 Terms of reference and procedures for the activation of the ATM Operational Contingency Group (AOCG) function should be developed.

7.3 Level 1 contingency plans for Category A, B and C contingency events, conforming with the Principles and including the Basic Plan Elements of the Regional ATM Contingency Plan, should be developed and implemented for all ATS units.

7.4 Human performance-based training and procedures for response to ATM contingency operations for all staff providing related ATS, including ATC, Flight Information, Aeronautical Information, Aeronautical Telecommunication and ATS equipment maintenance staff should be developed and implemented.

7.5 Programs of regular desktop and inter-unit coordinated exercises of all Level 1 contingency plans should be implemented.

7.6 Processes should be implemented to ensure the outcomes of any testing, pre-activation or activation a contingency plan or any contingency exercise are reviewed and analysed, and lessons learned incorporated in contingency procedures and training.

7.7 Details of contingency ATS routes and associated flight level allocation schemes should be published in State AIP (Section ENR 3.5).

7.8 Relevant sections of contingency plans that may have an effect on international flights should be made available on the public internet website of the ANSP, and the hyperlink provided to ICAO Asia/Pacific Regional Office for inclusion in the Regional ATM Contingency Plan.

Note: A single combined document comprising information from all relevant Level 1 contingency plans may be suitable for this purpose

Level 2 Contingency Arrangements

7.9 Level 2 contingency arrangements should be formalized for all cases where the pre-activation or activation of a Level 1 contingency plan would impact upon ATS within the area of responsibility of a neighbouring State.

7.10 Level 2 contingency arrangements should include procedures for the tactical definition and promulgation by NOTAM of contingency ATS routes to avoid airspace affected by Category B contingency conditions.

7.11 Details of contingency ATS routes and flight level allocation scheme details should be published in State AIP.

Level 3 Sub-Regional Contingency Plans

7.12 Where practicable, each State should harmonize its Contingency ATS Route and FLAS structures with those of all neighbouring States.

Volcanic Ash Contingency Planning

7.13 States' regulatory provisions and arrangements should be reviewed to ensure that, in accordance with the guidance provided in ICAO Doc 9974 – *Flight Safety and Volcanic Ash* :

- a) Aircraft operators are required to include in their safety management system (SMS) an identifiable safety risk assessment for operations into airspace forecast to be, or at aerodromes known to be, contaminated with volcanic ash
- b) Safety oversight procedures are used for the evaluation of operators' capability to conduct flight operations safely into airspace forecast to be, or aerodromes known to be, contaminated with volcanic ash.

7.14 States' airspace and airport management policies and procedures should be reviewed to ensure that, in accordance with the guidance provided in ICAO Doc 9974 – *Flight Safety and Volcanic Ash* and the provisions of ICAO Doc 4444 – PANS-ATM, 15.8.1c and Note 2:

- c) Airspace affected by volcanic ash cloud should not be 'closed'
- d) Specification in NOTAM of alternate routing or other air traffic flow management (ATFM)¹ measures to manage airspace constraints arising from volcanic ash cloud should be solely for the purpose of ensuring the predictability and regularity of air traffic, and should be based on an assessment of capacity and demand in airspace affected by volcanic ash and/or or by aircraft avoiding the volcanic ash cloud
- e) NOTAM specifying alternate routing or other ATFM measures related to a volcanic eruption or volcanic ash cloud should be issued separately from the ASHTAM/NOTAM issued in accordance with Annex 15, 5.1.1.1, r and u
- f) Aerodromes should only be closed by NOTAM for periods of observed volcanic ash contamination of the surface of the aerodrome movement area

¹ ATFM capability for the Asia/Pacific Region is expected to be implemented under the provisions of the Asia/Pacific Region Manual for Collaborative ATFM.

g) Airport capacity limitations of alternate aerodromes, including apron capacity, should be considered, and recommendations for the use of other alternates considered for inclusion in NOTAM (in c, above)

h) If required by State regulations, any declaration of a Danger Area or Restricted Area should be confined to the pre-eruptive or erupting volcano and the area containing its forecast or observed ejecta.

7.15 Each State should ensure that a list of ICAO registered volcanoes relevant to the State, drawn from ICAO Doc 9691 - Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds Appendix F, is maintained at all International NOTAM Offices, with volcano name, number and nominal position

7.16 A series of templates should be available for different stages of volcanic activity to assist Meteorological Watch Office (MWO) and Aeronautical Information Service (AIS) staff in expediting the process of originating and issuing relevant MET and AIS messages.

7.17 Multi-lateral Volcanic Ash Cloud Exercises should be conducted by each State at least annually. Internal desktop contingency plan exercises should include volcanic ash cloud scenarios.

7.18 States should establish a mechanism to provide regular and timely updates of information during a volcanic eruption and/or ash cloud event to ensure all stakeholders are up to date with current information, situation reports and contingency planning;

7.19 States should establish an internal crisis management centre to support the collaborative and timely sharing of information such as volcanic eruptions, or other crises that will have a significant impact on airport and/or airspace management.

Note 1: This information sharing process is supplemental to the mandatory provisions of Annex 3 and Annex 15 relating to the dissemination of volcanic eruption and ash cloud information.

Note 2: Information relating to volcanic eruption and ash cloud should be collaboratively shared through the State's CDM/ATFM processes, where established.

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