



International Civil Aviation Organization

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

Bangkok, Thailand, 14 – 16 March 2016

Agenda Item 2: Review terms of reference of APAC VOLCEX/SG

REVIEW TERMS OF REFERENCE

(Presented by the Secretariat)

SUMMARY

This paper presents the terms of reference for the Asia/Pacific volcanic ash exercises steering group (APAC VOLCEX/SG) for review and possible update by the meeting.

1. INTRODUCTION

1.1. “Volcanic ash exercises should be conducted by ICAO on a regional basis in order to practice and develop inter-agency response to volcanic activity, in order to maintain safety, regularity and efficiency of aviation in the event of a volcanic eruption”¹.

1.2. “A volcanic ash exercises steering group may be established by a PIRG [ICAO Planning and Implementation Regional Group] to coordinate all aspects of the organization and conduct of the exercises. The steering group should have representatives from, as a minimum, the volcanic ash advisory centres (VAACs) concerned, air navigation service providers (ANSPs), airspace users and regulators”².

1.3. The terms of reference of the APAC VOLCEX/SG, as adopted at the twenty-fifth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/25), in its Decision 25/47 – *Establishment of a Volcanic Ash Exercises Steering Group in the APAC Region*, is provided at the **Attachment 1** to this paper for review and possible update by the meeting.

2. DISCUSSION

2.1 The terms of reference of the APAC VOLCEX/SG are based on the guidance contained in ICAO Doc 9766 – *Handbook on the International Airways Volcano Watch*, Appendix F – *Guidance for conducting volcanic ash exercises in ICAO Regions*; a copy of which is provided at the **Attachment 2** to this paper.

¹ ICAO Doc 9766, *Handbook on the International Airways Volcano Watch (IAVW)*, Appendix F – *Guidance for conducting volcanic ash exercises in ICAO Regions*, paragraph 1.1

²² Ibid. paragraph 1.4

2.2 A proposed update to the terms of reference document of the APAC VOLCEX/SG is provided at the **Attachment 3** to this paper to provide additional guidance on attributes of the APAC VOLCEX/SG including the composition, administration and functions of the group.

3. ACTION REQUIRED BY THE MEETING

3.1 The meeting is invited to:

- a) Note the information contained in this paper;
- b) Propose updates to the terms of reference of the APAC VOLCEX/SG, as necessary; and
- c) Forward any proposed updates to the terms of reference to the MET SG for further review and possible approval.

APAC VOLCANIC ASH EXERCISES STEERING GROUP

TERMS OF REFERENCE

VISION

Maintain safety, regularity and efficiency of aviation in the event of a volcanic eruption.

OBJECTIVES

Coordinate all aspects of the organization and conduct of volcanic ash exercises in the APAC region in order to:

1. Test volcanic activity alerting, AIS and MET message routing, volcanic ash information, air traffic control procedures, air traffic flow and capacity management and aircraft operator response and the CDM between the various actors in accordance with regional and global procedures. The exercises should be designed to:
 - a) practice the conduct of volcanic activity response in accordance with the regional reference documents;
 - b) verify existing information, AIS and MET message routing via AFTN addresses, relevant e-mail addresses, telephone and fax numbers, and internet addresses (URLs);
 - c) maintain appropriate information and message routing between all involved agencies and organizations;
 - d) provide volcanic activity response training for key personnel involved;
 - e) allow regulators to assess the preparedness and operational response in terms of planning, process and procedures of operators; and
 - f) provide, when appropriate, recommendations for amendment of the reference documents, in accordance with the lessons learned and conclusions contained in the final exercise report.
2. Ensure that detrimental effects of exercises on the aviation system performance are avoided, but that nevertheless useful experience and information is generated; and
3. Practice and develop inter-agency response to volcanic activity.

SCOPE

There is significant regional variation in the nature, frequency, observation of and response to volcanic eruptions. As the APAC region encompasses much of the volcanically active zone known as the “Ring of Fire”, there are several States where regular air traffic flow is at risk from encounters with volcanic ash.

The IAVW was established globally to mitigate the risks; however the diverse nature of the APAC region, in terms of both its geography and its communities, is reflected by the diverse challenges faced in responding to volcanic ash events. Therefore, each exercise may have different objectives, which the scenario will be designed to address. For example, any or all of the activities listed below may be tested depending on the scope of the individual exercise:

- a) AFTN, e-mail addresses, websites, message routing and voice communications;
- b) alerting and observation of ash (e.g. use of VONA and VAR);
- c) VAAC response (e.g. volcanic ash information);
- d) ATS response (including air traffic control and AIS for NOTAM issuance);
- e) ATM response;
- f) aircraft operator response (including safety risk assessment);
- g) MWO response (i.e. SIGMET); and
- h) suitability of information, its frequency, format and content.

DELIVERABLES

The steering group is expected to:

1. Appoint an exercise leader for volcanic ash exercise/s
2. Conduct planning meetings for volcanic ash exercise/s (initial exercise to be conducted in 2015)
3. Publish volcanic ash exercise directive/s, including:
 - ✓ Scenario/s – location/s should cover an area/s that could be affected by volcanic ash and the time/period/s should ensure volcanic ash would impact international routes
 - ✓ Procedures/instructions
 - ✓ Participants
4. Conduct volcanic ash exercise/s (initial exercise to be conducted in 2015)
5. Conduct debrief meeting/s to review the volcanic ash exercise/s, including:
 - ✓ Discuss reports
 - ✓ Review the lessons learnt
 - ✓ Revise and improve the volcanic ash exercise directive/s (based on lessons learnt)
 - ✓ Recommend improvements to the regional volcanic ash ATM contingency plan
 - ✓ Recommend improvements to global ICAO provisions and forward to APANPIRG and/or IAVWOPSG
 - ✓ Update the future work plan – for subsequent volcanic ash exercise/s
 - ✓ Consolidated report to the appropriate Sub-Group/s and APANPIRG

STAKEHOLDERS, ROLES and RESPONSIBILITIES

| STAKEHOLDERS / STAKEHOLDER GROUPS ¹ | ROLES | RESPONSIBILITIES |
|--|-------------|--|
| <u>Air navigation service providers (ANSP)</u> ² | Participant | Inform aircraft, issue ASHTAM/NOTAM, activate contingencies, forward special air-reports |
| Airport operators | Participant | Tactical response |
| <u>Airspace users</u> | Participant | Tactical response |
| <u>ICAO</u> | Facilitator | Support the steering group, meetings and exercises |
| Meteorological watch offices (MWO) | Participant | Provide MET watch, issue SIGMET, supply information on volcanic ash (VA) |
| Regional OPMET Data Banks (RODB) | Support | OPMET exchange |
| <u>Regulators</u> | Participant | Regulations |
| <u>Volcanic ash advisory centres (VAAC)</u> | Participant | Issue volcanic ash advisory information (VAA) including graphical format (VAG) |
| Volcano observatories | Participant | Send information on volcanic activity including Volcano Observatory Notice for Aviation (VONA) |

Minimum representation (bold type underlined) required for a quorum for the volcanic ash exercises steering group³.

¹ Includes relevant industry organizations (CANSO, IATA, AIC, IFALPA)

² Includes air traffic management (ATM), area control centres (ACC), aeronautical information services (AIS) and NOTAM offices (NOF)

³ Note: A representative from each stakeholder group should be involved as necessary during each phase (planning, conducting, debrief) of volcanic ash exercises.

APPENDIX F

GUIDANCE FOR CONDUCTING VOLCANIC ASH EXERCISES IN ICAO REGIONS

1. OVERVIEW

1.1 Volcanic ash exercises should be conducted by ICAO on a regional basis in order to practice and develop inter-agency response to volcanic activity, in order to maintain safety, regularity and efficiency of aviation in the event of a volcanic eruption. This guidance recognizes that there is significant regional variation in the nature, frequency, observation of and response to volcanic eruptions. The frequency and scope of volcanic ash exercises is the responsibility of the ICAO region concerned. Where frequent volcanic activity results in adequate information about system performance, exercises may be omitted or constrained to infrequent, extraordinary situations or be held only to test revised procedures.

1.2 Volcanic ash exercises should be facilitated via the ICAO Regional Office concerned and support the regular assessment of system performance (in accordance with quality management principles), in particular the assessment of the safety performance which is required by ICAO safety management provisions.

1.3 Reports of the exercises or performance assessments should be reviewed by an appropriate sub-group or sub-groups within the ICAO region concerned. The focus of these reviews should be the development of improved provisions. Recommendations for improvements to global ICAO provisions, based on the regional review of the exercises, should be brought to the attention of the ICAO Planning and Implementation Regional Group (PIRG) concerned and/or to the International Airways Volcano Watch Operations Group (IAVWOPSG).

1.4 A volcanic ash exercises steering group may be established by a PIRG to coordinate all aspects of the organization and conduct of the exercises. The steering group should have representatives from, as a minimum, the volcanic ash advisory centres (VAACs) concerned, air navigation service providers (ANSPs), airspace users and regulators.

2. EXERCISES AND PERFORMANCE ASSESSMENTS

2.1 Volcanic ash exercises should be held at a frequency to be determined by the ICAO region concerned. They should be held at least every three years where the frequency of real eruptions is low and additionally as soon as practicable when significant changes to the procedures have been implemented.

2.2 Volcanic ash exercises should be designed to test volcanic activity alerting, aeronautical information service (AIS) and meteorological (MET) message routing, volcanic ash information, air traffic control procedures, air traffic flow and capacity management and aircraft operator response and the collaborative decision making (CDM) between the various actors in accordance with regional and global procedures.

2.3 Exercises can only simulate a real event, while operation of the aviation system must continue normally and be unaffected by the exercise. The planning of the exercise needs to ensure that detrimental effects on the system performance are avoided, but that nevertheless useful experience and information is generated.

2.4 A complete, system-wide exercise for volcanic ash contamination is an extremely complex undertaking since such an event involves a great number and variety of stakeholders. It might therefore be useful to constrain exercises to specific parts of the whole system, with other parts of the system being subject to testing at subsequent exercises.

3. OBJECTIVES

- 3.1 The exercises should be designed to:
- a) practice the conduct of volcanic activity response in accordance with the regional reference documents;
 - b) verify existing information, AIS and MET message routing via AFTN addresses, relevant e-mail addresses, telephone and fax numbers, and internet addresses (URLs);
 - c) maintain appropriate information and message routing between all involved agencies and organizations;
 - d) provide volcanic activity response training for key personnel involved;
 - e) allow regulators to assess the preparedness and operational response in terms of planning, process and procedures of operators; and
 - f) provide, when appropriate, recommendations for amendment of the reference documents, in accordance with the lessons learned and conclusions contained in the final exercise report.
- 3.2 Exercises may also be designed to test suggested new procedures on a limited scale before regional/global implementation.
- 3.3 Exercise and system performance assessments should be aimed at a critical review of existing provisions and their further improvement.

4. CONCEPTS

- 4.1 Each exercise should involve a simulated volcanic contamination (e.g. eruption of a volcano or re-suspended ash) affecting air navigation. Simulated ash clouds may cross international boundaries, depending on the objectives of the exercise and may affect more than one VAAC area of responsibility. Exercises may utilize real-time meteorological conditions, archived data or a scenario.
- 4.2 Each exercise may have different objectives, which the scenario will be designed to address. For example, any or all of the activities listed below may be tested depending on the scope of the exercise:
- a) AFTN, e-mail addresses, websites, message routing and voice communications;
 - b) alerting and observation of ash (e.g. use of VONA and VAR);
 - c) VAAC response (e.g. volcanic ash information);
 - d) ATS response (including air traffic control and AIS for NOTAM issuance);
 - e) air traffic management (ATM) response;
 - f) aircraft operator response (including safety risk assessment);
 - g) meteorological watch office response (i.e. SIGMET); and
 - h) suitability of information, its frequency, format and content.

5. PLANNING AND REPORTING

5.1 Each ICAO region should establish an appropriate structure (e.g. focal point or steering group) for the conducting of regional volcanic ash exercises and system performance assessments. For each exercise, an exercise leader should be appointed and a planning meeting held approximately three months before the exercise is due to take place.

5.2 An exercise directive should be published prior to the exercise which clearly describes the exercise scenario, participating agencies and any special instructions.

5.3 After the exercise, initial exercise reports should be prepared by all participating agencies. A debrief meeting should be held soon after the exercise to discuss the exercise reports. The exercise leader should then produce a consolidated final exercise report for consideration by the relevant ICAO group.

6. ICAO REFERENCE MATERIAL

Annex 3 — Meteorological Service for International Air Navigation

Annex 11 — Air Traffic Services

Annex 15 — Aeronautical Information Services

Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444)

Manual on Volcanic Ash, Radioactive material and Toxic Chemical Clouds (Doc 9691)

Global Air Navigation Plan (Doc 9750)

Global ATM Operational Concept (Doc 9854)

Flight Safety and Volcanic Ash (Doc 9974)

| TERMS OF REFERENCE | |
|----------------------------------|--|
| Name of group | <p>The Asia/Pacific volcanic ash exercises steering group (APAC VOLCEX/SG).</p> <p>The APAC VOLCEX/SG was established at the twenty-fifth meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/25) [Decision 25/47 – <i>Establishment of a Volcanic Ash Exercises Steering Group in the APAC Region</i>, refers].</p> |
| Objective | Maintain safety, regularity and efficiency of aviation in the event of a volcanic eruption. |
| Benefits | Demonstrated, coordinated provision and exchange of, and response to, volcanic ash/activity information within the international civil aviation system. |
| Membership and appointment | <p>Open to all ICAO Contracting States providing or using air navigation services in the Asia/Pacific Region, international organizations recognized by the Council and other international organizations and/or bodies invited specifically by the APANPIRG.</p> <p>Representation should be by specialists in the provision and exchange of, or operational response to, or regulatory governance of, volcanic ash information for international civil aviation.</p> <p>Composition shall be such that, while being kept as small as possible to ensure the efficiency of the group's work and the informality of proceedings, all States and organizations that can make valid contributions are given the opportunity to participate in the group.</p> |
| Chairing | <p>A Chairperson shall be elected from the representatives designated by member States of the Group. A Vice-Chairperson may be elected from the said representatives if necessary.</p> <p>The term of the Chairperson/Vice-Chairperson shall be for a maximum period of four years.</p> |
| Frequency of meetings and quorum | <p>The Chairperson, in consultation with Members and the Secretary of the group, shall call meetings of the group when deemed necessary to do so, and determine the date and duration of meetings.</p> <p>As a rule, the group should agree, at each meeting, on the date and duration of the next meeting.</p> <p>Quorum: the volcanic ash advisory centres (VAACs) concerned, air navigation service providers (ANSPs), airspace users and regulators.</p> |
| Record of meetings | Proceedings of meetings of the group should be recorded in the form of a Report or a Summary prepared by the Chairperson (or Vice-Chairperson) and the Secretary with assistance from the meeting. |
| Reporting mechanism | Reports or Summaries on meetings of the group shall be posted on the ICAO Asia and Pacific Office website and submitted to the Meteorology Sub-group and the Meteorological Services Working Group for review and further action. |
| Functions & delegated authority | <p>The group shall coordinate all aspects of the organization and conduct of volcanic ash exercises in the APAC region to practice and develop inter-agency response to volcanic activity and mitigate the risks to aviation. Specifically, the group shall:</p> <ol style="list-style-type: none"> 1. Decide on a programme for volcanic ash exercises to address the challenges faced by the APAC Region in responding to volcanic ash events; 2. Design the volcanic ash exercises in accordance with ICAO Doc 9766 – <i>Handbook on the International Airways Volcano Watch</i>, Appendix F – <i>Guidance for conducting volcanic ash exercises in ICAO Regions</i>; |

3. Conduct planning meetings for each volcanic ash exercise to:
 - 3.1. Appoint a volcanic ash exercise leader;
 - 3.2. Develop and publish a volcanic ash exercise directive (including scenario, procedures, instructions, participants);
4. Conduct debrief meetings for each volcanic ash exercise to:
 - 4.1. Discuss reports (from participants);
 - 4.2. Review the lessons learned;
 - 4.3. Revise and improve the volcanic ash exercise directive (based on lessons learned);
 - 4.4. Recommend improvements to the regional volcanic ash ATM contingency plan and other relevant regional and global ICAO provisions; and
5. Advise the MET/S WG, MET SG and ATM SG, as necessary, on issues concerning the development of the Asia/Pacific Regional Air Navigation Plan and the implementation of air navigation services in the APAC Region.

Note: The group shall ensure that detrimental effects of volcanic ash exercises on the aviation system performance are avoided, but that nevertheless useful experience and information is generated.
