International Civil Aviation Organization
Fourteenth Meeting of the Pan America - Regional Aviation Safety Team (PA-RAST/14 – WP/02)
Lima, Peru, 25-26 September 2013

Agenda Item 13: Other Business

13.3 RASG-PA Projects

SUPPORT THE CREATION OF A VOLCANIC ACTIVITY PILOT GROUP AS A NEW RASG-PA PROJECT

(Presented by the Secretariat)

SUMMARY

Considering that volcanic ash clouds could potentially impact safety of operations and the on-going activity of Popocatepetl volcano in Mexico, the RASG-PA/ASTT conducted a RASG-PA Aviation Safety Seminar in Mexico on the *Impact of Volcanic Activity in Aviation* to raise aviation community awareness on safety and the operational and economic impact of CAR Region volcanic activity.

The RASG-PA Secretariat supports establishing a volcanic activity pilot group as a new RASG-PA Project.

References:

- ICAO Annex 3 - *Meteorological Service for International Air Navigation*
- ICAO Doc 9766 - *Handbook on the International Airways Volcano Watch (IAVW), Operational Procedures and Contact List*
- Annex 15 *Aeronautical Information Services*
- ICAO Doc 8126 - *Aeronautical Information Service Manual*
- ICAO Doc 9691 - *Manual on Volcanic Ash, Radioactive Materials and Toxic Chemical Clouds*
- ICAO Doc 9974 - *Flight Safety and Volcanic Ash*
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Strategic Objectives	*This working paper is related to Strategic Objectives A – Safety Enhance global civil aviation safety; and C. Environmental protection and sustainable development of air transport*

1. Introduction

1.1 The exposure of aviation to potential volcanic ash hazards from volcanoes in the Pan American Region (NAM/CAR and SAM) is significant.

1.2 The behavior of erupting volcanoes ranges from the quiet, steady effusion of lava to highly explosive eruptions. The larger scale eruptions may eject many cubic kilometers of glass particles, pulverized rock (volcanic ash) and corrosive/hazardous gases high into the atmosphere, potentially over a wide area for time scales ranging from hours to weeks or months.

1.3 Volcanic ash clouds can spread thousands of miles from the site of eruption. In addition, not only air routes would be affected, but the terminal areas and airport operations are vulnerable as well.

1.4 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 pilot 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 maneuvered in a manner that conflicts with other aircraft; and
h) volcanic ash deposits on a runway may degrade aircraft braking performance, especially if the volcanic ash is wet; in extreme cases, this can lead to runway closure.

1.5 In the last decade, significant air traffic disruption occurred from volcanic activity from the Grimsvötn volcano, Iceland, in 2004 and especially the Eyjafjallajökull volcano, Iceland, in April 2010. Those events had negative operational and economic consequences not only for the air transport industry, but the world economy.

1.6 During 2013, volcanic ash clouds from Popocatepetl volcano, Mexico, in July, and El Fuego volcano, Guatemala, were a safety concern for flights operating in the Central American and Mexico FIRs to avoid the encounter with volcanic ash clouds.

1.7 Volcanic ash can also affect the operation of aircraft at aerodromes. Volcanic ash deposits at an aerodrome, even in very small amounts, can result in the closure of the aerodrome until all deposited ash has been removed. In extreme cases, the aerodrome may be closed, resulting in repercussions in the ATM system, e.g., diversions, revised traffic flows, etc.

1.8 The permanent activity of Popocatepetl volcano since 2012 and its vicinity to Mexico City International Airport (MMMX), Puebla Airport (MMPB), Cuernavaca Airport (MMCC), and Toluca Airport (MMTO) in Mexico, among others, has created a safety concern in the domestic and international aviation community for en-route and terminal flight operations. This scenario has the potential to eventually disrupt aviation activity at the main airports of the CAR Region.

2. Discussion

2.1 Considering that volcanic ash clouds could potentially impact the safety of flight operations, the RASG-PA Secretariat considered, upon request by some stakeholders, to conduct a RASG-PA Aviation Safety Seminar in Mexico on the *Impact of Volcanic Activity in Aviation.*

2.2 The objective of the seminar was to raise aviation community awareness on safety, and the operational and economic impact of CAR Region volcanic activity. The seminar was held at Volaris Airline Headquarters, the sponsor of the event, in Mexico City, Mexico, from 15 to 16 August 2013.

2.3 Volcanic activity was covered from different perspectives from local and international stakeholders present at the seminar such as: regulators, service providers, manufacturers, and international organizations. Over 70 representatives from the CAR Region attended the seminar.

2.4 The participants considered that volcanic contamination, of which volcanic ash is the most serious, is a safety hazard for flight operations, and 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 concerned stakeholders.

2.5 The participants highlighted the leadership role of ICAO with the publication of appropriate and relevant documentation, the on-going actions regarding volcanic activity, and RASG-PA for organizing the event. The participants also:

a) Acknowledged the importance of compliance with ICAO SARPs
b) Recognized the role of every stakeholder when dealing with volcanic activity (en-route, terminal area, airport, International NOTAM office and MET Offices)
c) Acknowledged the relevance of proper and timely issuance of SIGMETs and ASHTAM/NOTAMs for safety enhancement, appropriate decision-making process and risk management based on information
d) Recognized the need of initial and recurrent training of all involved staff and stakeholders to deal with volcanic activity
e) Recognized the availability and usage of technology as a mitigation measure regarding volcanic activity
f) Acknowledged the relevance of cooperation by all stakeholders in dealing with volcanic activity contingencies including the airports network, airlines, service providers, etc.

3. Conclusion

3.1 After deliberations among the participants of the seminar, they agreed:

a) To create a pilot group under the leadership of the Mexican DGAC with participation of the Mexico International Airport (AICM) authorities, SENEAM, CENAPRED, CANAERO, ALTA, IFALPA, airlines, Colegio de Pilotos Aviadores de Mexico (CPAM), etc., with the objective to address the impact of volcanic activity on aviation and take appropriate actions
b) That considering the constant activity and vicinity of Popocatepetl volcano to Mexico City International Airport and surrounding airports, and that this volcano is used as a laboratory for global scientific studies, the outcome of the activity of the group be

shared and become a reference for other locations in the world operating under similar conditions

c) That the RASG-PA Secretariat act as facilitator for the establishment of the group, and monitor and report outcomes to RASG-PA

3.2 The coordination process with the DGAC of Mexico is in progress to set the date for the first meeting of the group.

4. Recommendation

4.1 The PA-RAST is invited to:

a) note the information provided in this working paper; and

b) support the creation of the volcanic activity pilot group as a RASG-PA Project for enhancing aviation safety in the Region.
