



## WORKING PAPER

# INTERNATIONAL VOLCANIC ASH TASK FORCE (IVATF)

## FIRST MEETING

Montréal, 27 to 30 July 2010

**Agenda Item 2: Organizational matters**

**Agenda Item 3: Results of the EUR/NAT VATF Meeting (Plenary)**

**Agenda Item 4: Review of operational response to volcanic ash aircraft encounter and notification and warning for VA (ATM sub-group)**

**Agenda Item 5: Development of ash concentration thresholds (AIR sub-group)**

**Agenda Item 6: Improvement of ash detection/avoidance systems (Science sub-group)**

**Agenda Item 7: Improvement and harmonization of dispersion models and their visual presentation (IAVW Coordination Group)**

## IFALPA PROPOSALS FOR ISSUES TO BE ADDRESSED BY IVATF

(Presented by the International Federation of Air Line Pilots' Associations)

### 1. INTRODUCTION

1.1 IFALPA has over many decades contributed to the development of aviation standards by ICAO and is pleased to be invited to participate in the International Volcanic Ash Task Force. The IFALPA delegates to IVATF meetings and the IFALPA experts for its subgroups are backed up by the IFALPA standing committees (most noteworthy the *Aircraft Design and Operations Committee* and the *Air Traffic Services Committee*) that draw on the global experience of IFALPA's more than 100.000 pilot members.

1.2 The IFALPA expert groups have developed IFALPA's *Position Paper on Volcanic Ash Operations* that summarizes in plain text format the view points of the professional pilots in the context of the knowledge on this subject available in June 2010, i.e. after the eruption of the Icelandic volcano Eyjafjallajökull in April and May. The paper is available as IVATF/1-IP07.

### 2. STRUCTURE OF THIS PAPER

2.1 This Working Paper has been structured in line with the provisional agenda for IVATF/1, as contained in IVATF/1-WP/1. This should allow the IVATF Subgroups to easily select those items that fall into their area of responsibility.

3. **ACTION BY THE IVATF**

3.1 The IVATF is invited to:

- a) note the information provided in this paper; and
- b) consider the specific proposals by IFALPA as contained in the Appendix to this paper.

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## APPENDIX

### IFALPA PROPOSALS ON THE AGENDA ITEMS

#### Agenda item 2: Organizational matters

1. IFALPA welcomes and fully supports that the IVATF is tasked to (assist the Secretariat to) develop a **global safety risk management framework** that will make it possible to determine the safe levels of operation in airspace contaminated by volcanic ash. (State letter AN 10/18.3-IND/10/5 refers). ICAO Annexes 1, 6, 8, 11, 13 and 14 require State Safety Programs and that service providers<sup>1</sup> implement Safety Management Systems. It is therefore appropriate that the work and results of the IVATF shall be in line with these principles (details can be found in ICAO Doc 9859, the Safety Management Manual).
2. As **volcanic ash is an operational problem** (in so far as it affects the operation of aircraft), the **primary focus of IVATF's efforts** should be **to find solutions for the safe operation of aircraft** in case of airspace contamination by volcanic ash (ICAO Annexes 2, 6 and 8 contain relevant SARPs). The necessity of avoiding Volcanic Ash creates a **problem for the Air Traffic Services (ATS)**. They play a significant role in the **information distribution** and have to **prevent collisions** between aircraft and to **maintain an orderly flow of air traffic** (ICAO Annex 11, Objectives of the Air Traffic Services), even in situations where Volcanic Ash restricts operations in large portions of airspace. **ATS Contingency Plans** addressing all aspects of Air Traffic Management for Volcanic Ash situations should be available for all regions of the world and be **based on the needs of aircraft in flight**.
3. It is noted that ICAO Docs 9691 (Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds) and 9766 (Handbook on the International Airways Volcano Watch) respect this principle ("*provide the necessary air traffic support to ensure the safety of aircraft*").
4. According to ICAO Annex 2 paragraph 2.4, "*The pilot-in-command of an aircraft shall have final authority as to the disposition of the aircraft while in command.*" The qualification in the Responsibility of pilot-in-command (paragraph 2.3.1) that "*the pilot-in-command may depart from these rules in circumstances that render such departure absolutely necessary in the interests of safety*" indicates that a pilot may also ignore air traffic control clearances. As the person ultimately responsible for the safety of a flight **the pilot-in-command must be given the necessary tools, training, information and guidelines in order to carry out that requirement**.
5. It is interesting to note that provisions for the establishing of danger/restricted/prohibited areas are also contained in ICAO Annex 2.

#### Agenda Item 2.3: Establishment of Task Force sub-groups

1. IFALPA nominates Capt Heinz Frühwirth for the ATM sub-group
2. IFALPA nominates Capt Carlos Royo for the AIR sub-group

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<sup>1</sup> The term "service provider" refers to any organization providing aviation services. The term includes approved training organizations that are exposed to safety risks during the provision of their services, aircraft operators, approved maintenance organizations, organizations responsible for type design and/or manufacture of aircraft, air traffic service providers and certified aerodromes, as applicable. (Doc9859)

3. IFALPA nominates MSc Jochem van Koppen for the Science subgroup
4. IFALPA nominates Capt Frank Lumnitzer for the IAVW Coordination Group

**Agenda Item 3: Results of the EUR/NAT VATF Meetings (Plenary)**

1. As the EUR/NAT VATF has developed a consolidated EUR and NAT Volcanic Ash Contingency Plan, IFALPA suggests that IVATF reviews the amendment proposal from the EUR/NAT VATF (that was already accepted by the NATSPG) rather than EUR Doc 019 and NAT Doc 006.
2. IFALPA believes that a template for a global Volcanic Ash Contingency Plan can be based on the revised EUR/NAT proposal, but that a global plan needs to go beyond a document that is mainly focussed on ATM issues.
3. IFALPA believes that the values for acceptable volcanic ash concentration levels (airspace contamination) need to be determined by scientific research. IVATF should review existing data and determine whether these allow the acceptance of the proposed values or require further research or different values.
4. IVATF should review Docs 9691 and 9766, as well as the proposed EUR/NAT Volcanic Ash Contingency Plan for consistent wording and propose harmonization of all ICAO documents, as necessary. This should include the latest scientific knowledge about hazardous substances that can be contained in volcanic ash clouds and resulting hazards to aircraft and its occupants.

**Agenda Item 4: Review of operational response to volcanic ash aircraft encounter and notification and warning for VA (ATM sub-group)**

1. IFALPA believes that the “operational response” should start with a flight operations perspective. The response of the ATM/ATS components of air navigation should be based on the needs of the airspace users. Therefore close cooperation with the AIR sub-group that will also address flight operations issues is required.
2. One central element of the needs of airspace users is the reliable and fast (ideally real-time) information on hazards that affect flight operations.
3. ATS/ATM procedures should be based on optimum support for the airspace users and endeavour to minimise disruption to air travel.
4. Initial reaction to a volcanic eruption that affects aviation should be to establish a danger area of fixed, conservative, dimension to warn aircraft of the hazard. As soon as more information about the extent of the eruption becomes available and is validated by measurements, the VAACs will estimate the dispersion of the volcanic ash and expected concentration levels by use of scientific models.
5. As only danger areas can be established over the High Seas, IFALPA believes that for the sake of consistency States should refrain from establishing restricted airspace over their sovereign territory in order to avoid confusion. Due to the dynamic nature of the volcanic ash, the respective airspace volumes are difficult to determine and promulgation is consequently affected. Operational procedures for flight operations established by the competent Safety Oversight Authority should ensure that aircraft are not operated into airspace that has unacceptable concentration of volcanic ash for the aircraft concerned. As acceptable ash concentration is

dependent on a multitude of factors (aircraft/engine type, certification, operator's safety risk management, maintenance procedures, crew qualification; ...) it is nearly impossible for Air Traffic Control to "police" airspace access. The Air Traffic Services (including ATM and ATCFM) should focus on their objectives, as specified in ICAO Annex 11; i.e. to provide "*advice and information useful for the safe and efficient conduct of flights, to prevent collision between flights and to expedite and maintain an orderly flow of traffic*".

6. In the event of a volcanic warning or eruption contingency plans previously established by Regional Air Navigation Agreement should ensure coordinated and effective airspace management.
7. Information distribution procedures should meet the requirements of operators and pilots for flight planning and execution as well as for aircraft maintenance.
8. As volcanic ash can have serious effects on aerodromes (both destinations and alternates) located in the vicinity of the eruption site or downstream of the ash plume these factors should be part of the regional contingency planning.
9. At the flight planning stage comprehensive VA forecast information must be available in an easily understandable form to allow evaluation of the proposed operation. In-flight significant changes to the forecast must be communicated to the crew in a timely manner. The flight crew must have continuous information of relevant NOTAMs/ASHTAMs and SIGMETs/AIREPs and other means should be considered such as a three dimensional map(s) reflecting the observed ash cloud location, extension and/or trajectory forecast, an upper wind analysis and forecast at selected flight levels and satellite images.
10. Paragraph 4.8 of ICAO Annex 3 (Observations and Reports of Volcanic Activity) should be upgraded from a Recommendation to a Standard.
11. The provisions of ICAO Annexes 3 (Volcanic Activity Report) and 15 (ASHTAM, NOTAM) should be harmonized to avoid duplication and provide clear procedures for the notification process.
12. It should be investigated why some States do not use the ASHTAM provisions. Depending on the outcome of the investigation States should be encouraged to provide ASHTAMS as required and a global agreement on using ASHTAM as a distinct piece of information within a wider "NOTAM" context should be pursued.

**Agenda Item 5: Development of ash concentration thresholds (AIR sub-group)**

1. What are the hazardous substances?
2. What are the hazards to aircraft and its occupants? What composition or concentration is acceptable from a technical point of view? What composition or concentration is acceptable from a human point of view?
3. IFALPA strongly supports research to validate a safe and practicable boundary for acceptable ash concentration exposure. Once such values have been scientifically determined they should form a global basis for uniform application of reporting procedures and airspace management.
4. IFALPA believes that new Standards are required in ICAO Annexes 6 (Operation) and 8 (Airworthiness) concerning the operation of aircraft in airspace that is contaminated by volcanic ash. These Standards should be accompanied by appropriate Recommended Practices and guidance material. The SARPs and the guidance material should relate to different engine (e.g.

turbine, piston, ...) and aircraft systems (e.g. air-conditioning, sensors, ...).

5. Operational procedures should be based on avoidance of unacceptable ash concentrations. Appropriate emergency escape procedures should be available to all pilots.
6. Operation in contaminated airspace should be based on a safety risk assessment performed by the operator and accepted by the appropriate safety oversight authority to meet the Acceptable Level of Safety (AoS).
7. Operational procedures for intended flight in a low-concentration ash area must be specified and trained. These procedures must include an explicit guideline ~~on~~ for identifying the presence of volcanic ash, the level of threat, the acceptable exposure times and ash concentration and escape/contingency procedures.
8. The Aircraft Operations Certificate (AOC) holder must conduct a safety risk assessment prior to planned operations within or in the vicinity of volcanic ash. The risk assessment must include all affected stakeholders and must satisfy the acceptable level of safety prescribed by the safety oversight authority. The risk assessment must include clearly definable threat scenarios, actions, training and other risk mitigations.
9. Safety implications must be resolved by increased engine, airframe and systems maintenance inspections covering ~~also new~~ ash susceptible areas not routinely checked in normal situations and possibly earlier component renewal. Aircraft performance and systems data monitoring, inspection and maintenance checks should be adopted in order to prevent, monitor and mitigate possible damage related to volcanic ash.
10. Maintenance procedures and inspections required prior to and after operation in approved volcanic ash densities must be completed and notified to the crew. Specific MEL items must be serviceable. Extra contingency fuel should be considered.
11. The operator and (where available) flight dispatch are responsible for a safe flight plan free from significant ash hazards. This requires a tailor made risk assessment for the specific flight operation. Contingency routes, alternate aerodromes (e.g. upwind) and decompression, engine and other failures must be considered.

#### **Agenda Item 6: Improvement of ash detection/avoidance systems (Science sub-group)**

1. Relevant parameters to be measured or forecast are plume vertical and horizontal dimensions, ash/gas composition, ash/gas concentration and mean particle size.
2. Where volcanic ash concentration forecasting is based on computer models, measurements should verify the actual concentration in the airspace concerned. Where unverified values are used, the potential deviations (e.g. "accuracy +/- one order of magnitude") from the nominal value should be published and taken into account in the safety risk assessments.
3. Visual detection of volcanic ash is not a reliable means to determine that ash concentration is outside safe levels.

**Agenda Item 7: Improvement and harmonization of dispersion models and their visual presentation (IAVW Coordination Group).**

1. If different modelling tools are used by individual Volcanic Ash Advisory Centres, it is of utmost importance that the results are consistent globally.
2. IFALPA believes that ash dispersion models should provide reliable and precisely defined volumes of contaminated airspace. The vertical dimensions of contaminated airspace should be defined so that operationally useful airspace volumes are determined and published. This should include the following principles: volumes should be as small as possible (without creating a problem for transferring and interpreting the data); vertical demarcation should be based on operationally useful levels (e.g. typical cruising levels in the airspace concerned; and FL 100 which is used after decompression events; )
3. VAAC charts should contain geographical features (including FIR boundaries, where appropriate) to enable pilots to easily relate volcanic ash areas to navigational features.
4. VAAC charts should be issued at suitable intervals to avoid overly conservative dimensions for affected airspace; e.g. every 3 or 4 hours instead of currently every 6 hours.
5. Volcanic Ash Advisories should be made available for time horizons supporting ultra long-haul operations (approximately 24 hour forecasts).
6. Volcanic Ash Advisories should be available for operator medium-term planning, e.g. 72 hours

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