



Safety Information Bulletin

SIB No.: 2010-17R6

Issued: 21 August 2014

Subject: Flight in Airspace with Contamination of Volcanic Ash

Ref. Publications:

- Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds, ICAO Document 9691-AN/954 (ISBN 92-9194-888-8), second edition 2007, or later editions.
- ICAO Volcanic Ash Contingency Plan EUR and NAT Regions (EUR Doc 19)
- ICAO Document 9974: Risk Management of Flight Operations with known or forecast volcanic ash contamination.

Abbreviations:

ICAO:	International Civil Aviation Organisation
IAWOPSG:	International Airways Volcano Watch Operations Group
VAAC:	Volcanic Ash Advisory Centre(s)
SIB:	Safety Information Bulletin
AMC:	Acceptable Means of Compliance
ATO:	Approved Training Organisation
ATS:	Air Traffic Services
IMC:	Instrument Meteorological Conditions
NAA:	National Aviation Authority
VA SRA:	Volcanic Ash Safety Risk Assessment
TC:	Type Certificate

Revision 6: This SIB revises EASA SIB 2010-17R5 dated 11 March 2013 for the following reasons:

- update on the results from various Rulemaking tasks incl. reference to the operational guidance material implementing the VA SRA methodology in the requirements for Safety Management Systems for operators of complex aircraft
- further clarification on the reporting of volcanic ash encounters
- deletion of Appendix B.

Applicability: All NAAs, and operators, owners and maintenance organisations of aircraft operating into airspace that is known or suspected to be contaminated with volcanic ash.

Description: The recommendations in this revised EASA SIB are based on the progress that has been made in reviewing and discussing

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the volcanic ash airspace contamination threat with the associations from the manufacturing industry, operators, the scientific community, the VAAC, the Air Traffic Management Service Providers and Aviation Authorities in the ICAO IAVWOPSG.

ED Decisions 2013/009/R and 2013/008/R (dated 16/04/2013) amending AMC/GM to EU Regulation 965/2012, introduced GM3 ORO.GEN.200(a)(3) for aircraft operators and GM3 ORA.GEN.200(a)(3) for ATOs, implementing the VA SRA methodology in the requirements for Safety Management Systems for operators of complex aircraft. This guidance material is a direct transposition of the methodology provided in ICAO Document 9974 "Risk Management of Flight Operations with known or forecast volcanic ash contamination";

- CS-25 Amendment 13 (dated 17/06/2013) introduced (for new TC) § CS 25.1593 and related AMC on exposure to volcanic ash hazards.

This SIB will be revised, following the completion of the open EASA rulemaking tasks.

Recommendations: EASA makes the following recommendations:

- (1) Avoid operation in visible volcanic ash or, where visibility of the ash is impaired (IMC, night), avoid operation in discernible volcanic ash.
- (2) Forecasted presence of volcanic ash should primarily be presented in the form of a zoning system that depicts areas of low, medium and high concentrations in 3 altitude bands.

EASA continues to recommend that ash concentration charts provided by the London VAAC and Toulouse VAAC should, for operations in European airspace, identify the three zones as described in the ICAO Volcanic Ash Contingency Plan EUR and NAT Regions (EUR Doc 019), being:

- Area of Low Contamination (to be displayed in Cyan): an airspace of defined dimensions where volcanic ash may be encountered at concentrations greater than $0,2 \times 10^{-3}$ grams/m³, but less than or equal to 2×10^{-3} grams/m³.
- Area of Medium Contamination (to be displayed in Grey): an airspace of defined dimensions where volcanic ash may be encountered at concentrations greater than 2×10^{-3} grams/m³, but less than 4×10^{-3} grams/m³.
- Area of High Contamination (to be displayed in Red): an airspace of defined dimensions where volcanic ash may be encountered at concentrations equal to or greater than 4×10^{-3} grams/m³, where no ash concentration guidance is available.

- (3) When ash is forecast to be present within European airspace, it is recommended that an operator conduct flight

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operations in areas with Medium or High Forecast Ash Contamination, only if they have established a safety risk assessment for such operations.

- (i) For European operators, a Safety Risk Assessment should be developed, and agreed with the respective NAA, in accordance with the guidance provided in GM3 ORO.GEN.200(a)(3) for aircraft operators or GM3 ORA.GEN.200(a)(3) for ATOs.
- (ii) Non-European operators should establish their Volcanic Ash Safety Risk Assessment in accordance with ICAO Document 9974: 'Risk management of flight Operations with known or forecast volcanic ash contamination'.
- (iii) EASA will collect information received from NAAs (volcano@easa.europa.eu) to compile a list of operators known to have developed an acceptable Volcanic Ash Safety Risk Assessment.

EASA will keep a database of VA SRA as a living document, to assist and facilitate in time of eruptions and volcanic ash exercises.

- (iv) It is recommended that Member States will not normally close airspace that is forecast to contain ash contamination, except for conditions under (v), in order to allow the safety assurance process vested in the VA SRA approach to have effect. Airspace closure should be an action of last resort contemplated only in situations in which the VA SRA approach can no longer be relied upon to secure safe operations.
- (v) Member States may decide to close airspace in the immediate vicinity of a volcano where volcanic ashes and gasses form a direct threat for the safety of flight.

(4) DELETED.

- (5) In close vicinity to volcanoes that are observed on a 24 hour, 7 days a week basis, and where such equipment is present to accurately observe the movement of the plume and volcanic ash, local airport and air traffic management procedures may exist to guide the aircraft outside airspace where volcanic ash is present. The short range continuous observation of the volcanic ash may produce an equivalent result as the ash dispersion modelling and concentrations charts that are in principle for the longer distances from the volcano. Such local procedures should be acceptable to the Competent Authority.

- (6) When the aircraft and engine TC-Holders have not developed instructions for continued airworthiness for operation in airspace with a low contamination of volcanic ash, EASA recommends the inspections to be performed as listed in Appendix A, attached to this SIB.

- (7) In case of encounter with volcanic ash in flight, flight crew should immediately report it to the ATS Unit providing

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service in that airspace. This real-time information will facilitate providing operational feedback to the VAAC(s).

In addition to the established reporting lines, notably to the engine and aircraft TC holders, the State of Registry of the aircraft and to the NAA of the State(s) through which the flight was conducted, operators should report to EASA (report@easa.europa.eu) any encounter with volcanic ash or any other relevant maintenance and airworthiness related findings.

Such information will enable EASA to respond adequately to possible airworthiness or maintenance issues, or to update the recommended procedures in this SIB.

In the absence of any specific form for reporting volcanic ash encounters, operators may use the form attached to the record of this SIB on the [Agency website](#).

EASA requests the feedback from EU Member States and associated countries, the airspace management organisations and operators for improvement of this SIB, and to be informed of any difficulties that are being experienced on implementing the safety recommendations contained in this SIB. The SIB will be revised as necessary.

Contacts:

For further information contact the Safety Information Section, Executive Directorate, EASA; E-mail: ADs@easa.europa.eu.

Any comments or queries can be submitted to EASA by E-mail to: volcano@easa.europa.eu.

To obtain a copy of ICAO Documents, contact the ICAO Customer Services Unit, telephone +1 514-954-8022, facsimile +1 514-954-6769, or by e-mail request to sales@icao.int.

Websites:

Additional information on the subject addressed by this SIB can be found on the following websites:

www.icao.int

www.easa.europa.eu

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Appendix A – General advice for aircraft (all turbine and piston powered aircraft, including rotorcraft) **maintenance inspections when operating in airspace with a low contamination of volcanic ash**

- (1) The following is provided as advice to operators if their aircraft and/or engine TC Holders have not developed instructions for continued airworthiness for operation in airspace with a low contamination of volcanic ash.
- (a) Accomplish daily inspections when operating in an area of low volcanic ash airspace contamination, to detect any erosion, accumulation of volcanic ash, or any aircraft- and/or engine damage or system degradation. Turbine engines as well as piston engines operation can be adversely affected by volcanic ash on the ground or in the air.

The inspections should include the following:

- wing leading edges
- navigation and landing lights, radomes
- landing gear
- horizontal stabiliser
- all extruding structure
- pitot tubes and static ports
- windows and windshields
- engine inlets and nacelles (turbine), induction air filter (piston)
- engine cooling system components
- engine compressor and turbines
- engine oil systems
- fuel tank venting system
- rotor blades
- ventilation and pressurization systems (e.g., the air cycle machines, ozone converter, recirculation fans, HEPA filters, etc.)
- smoke detectors (e.g., detectors located in the cargo compartment, lavatory, electrical equipment bay, remote crew rest areas, etc.)

Based on the findings of the above inspections, more detailed inspections (such as boroscope inspections of the engine, oil analysis, inspection of filters, cleaning of parts) may be necessary.

Unless specific instructions have already been provided by aircraft and engine TC holders to be applied after encountering a volcanic ash, the above inspections should also be performed after each flight, whenever the following phenomena are observed or detected or experienced during flight.

- Acrid odours similar to electrical smoke
- Rapid onset of engine problems
- St. Elmo's fire
- Bright white/orange glow appearing at the engine inlets
- Dust in the cockpit or cabin
- Sudden (unexpected) outside darkness
- Airspeed fluctuations
- Landings lights casting sharp, distinctly visible beam

- (b) Protect and cover aircraft that are parked in areas that may be contaminated by the fall out or settling of volcanic ash in accordance with the aircraft- and engine TC-holder's advice where possible. Any volcanic ash residues must be removed prior to operations and following the TC Holder's recommendations when available.

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