

Safety Information Bulletin

Airworthiness – Operations – ATM/ANS

SIB No.: 2023-13

Issued: 19 December 2023

Subject: Flight in Airspace with Contamination of Volcanic Ash

Revision / Cancellation: This SIB replaces EASA SIB 2010-17R7 dated 02 July 2015, which is withdrawn.

Ref. Publications:

- Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds, ICAO Document 9691-AN/954 (ISBN 92-9194-888-8), Third Edition 2015, or later editions, reg. 965/2012, 1178 and CS25.
- ICAO Volcanic Ash Contingency Plan EUR and NAT Regions (EUR Doc 019).
- ICAO Document 9974: Risk Management of Flight Operations with known or forecast volcanic ash contamination.
- ICAO Crisis Management Framework Document (EUR Doc 031) Edition November 2023.

Applicability:

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

Abbreviations:

ICAO:	International Civil Aviation Organisation
IAVWOPSG:	International Airways Volcano Watch Operations Group
VAAC:	Volcanic Ash Advisory Centre(s)
SIB:	Safety Information Bulletin
AIC:	Aeronautical Information Circular
AIP:	Aeronautical Information Publication
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

Description:

The content of this SIB is based on the progress that has been made following previous events concerning the impact of volcanic ash activity on aviation and the subsequent discussions with aviation stakeholders. Its purpose is to raise awareness on the impact on aviation and to formulate recommendations for affected parties.

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In the case of a volcanic eruption, with the exception of the area directly affected by the event, it is difficult to predict which geographical area will be contaminated and affected by an ash cloud.

A reasonably detailed prediction will usually be available only after the eruption. It is, therefore, of fundamental importance that key stakeholders continuously monitor the information available from reliable sources, which would support the definition of the scenario for the ash trajectory evolution, to update their risk assessments and determine as precisely as possible the impact on aviation operations, as a support for decision making by the appropriate organisations. Furthermore, it is necessary that involved stakeholders establish a coordinated approach concerning the measures to be taken so as to prevent or to minimise the adverse effects on aviation operations.

The following should be taken into account:

- Close cooperation between European authorities, Member States, and the aviation industry in managing and overcoming crisis events, specifically those related to volcanic eruptions impacting air transportation, is crucial. There is a need to avoid unnecessary airspace closures and recognise operators' decisions based on their Volcanic Ash Safety Risk Assessment (VA SRA). Additionally, the existing database for VA SRA information may be not fully adequate for non-EU operators, necessitating more clarity on the implementation of the VA SRA principle for both EU and non-EU operators.
- Systematic and efficient coordination of all involved national stakeholders, including public health, through national air transport facilitation committees, is key for preparedness and crisis response.
- Information sharing on safety, security and other risks and risk mitigation measures between States and industry is a key element to ensure readiness for a crisis. States and industry players should actively engage in the existing or yet to be established national and regional mechanisms for information sharing.
- To address these issues in the longer-term, it would be beneficial to establish effective communication channels and collaboration mechanisms among European authorities, Member States, and the aviation industry. This could involve creating a standardised and comprehensive database that considers the specific needs of non-EU operators. Clear guidelines and procedures should be developed to ensure that operators, regardless of their origin, can make informed decisions based on their risk assessments during volcanic eruptions. The goal is to enhance coordination and streamline crisis management efforts in the aviation sector. Considering the international nature of civil aviation, there is a need for efficient regional cooperation mechanisms to tackle major events affecting air transportation regardless of their source (safety, security, health etc.) at technical and political level.

For the reasons outlined above, it has been decided to provide additional clarifications in this SIB.

The recommendations in this EASA SIB are based on the progress that has been made in reviewing and discussing the volcanic ash airspace contamination threat with stakeholders from the

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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 April 2013) amending AMC/GM to EU Regulation 965/2012, introduced GM2 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 June 2013) introduced (for new TC) § CS 25.1593 and related AMC on exposure to volcanic ash hazards.

CS-E Amendment 4 (dated 12 March 2015) introduced (for new TC) a requirement to establish the susceptibility of turbine engines to volcanic cloud hazards.

At this time, the safety concern described in this SIB is not considered to be an unsafe condition that would warrant Airworthiness Directive (AD) action under Regulation (EU) [748/2012](#), Part 21.A.3B, or the issuance of an operational directive under Regulation (EU) [965/2012](#), Annex II, ARO.GEN.135(c), or that would warrant Safety Directive (SD) action under Article 13 of Regulation (EU) [1034/2011](#).

Recommendation(s):

EASA recommends :

- (1) Air operators should:
 - a) Develop a VA SRA:
 1. For European operators, in accordance with the guidance provided in GM2 ORO.GEN.200(a)(3) for aircraft operators and in accordance with GM3 ORA.GEN.200(a)(3) for ATOs, and have it accepted by the respective competent authority;
 2. For non-European operators, in accordance with ICAO Document 9974: ‘Risk management of flight Operations with known or forecast volcanic ash contamination’. The development of a separate SRA specifically for Europe is not required.
 - b) Avoid operation in visible volcanic ash or, where visibility of the ash is impaired (IMC, night), avoid operation in discernible volcanic ash;
 - c) Conduct flight operations in accordance with their established VA SRA when volcanic ash is forecasted to be present within European airspace;
 - d) Monitor airspace developments in the region and follow all available aeronautical publications, in particular airspace closures or restrictions issued by State authorities, alongside available guidance or direction from their national authorities;
 - e) Ensure that a robust risk assessment is in place together with a high level of contingency planning for their operations and be ready for short notice instructions from the State authorities and/or Eurocontrol;

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- f) Ensure that in case of encounter with volcanic ash in flight, flight crew report it to the ATS Unit providing service in that airspace. This real-time information will facilitate providing operational feedback to the VAAC(s) and to Eurocontrol/NM.
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.
- g) Follow the instructions for continued airworthiness developed by aircraft and engine TC holders for operation in airspace contaminated by volcanic ash. In case no such instructions are available, Appendix A of this SIB provides recommended maintenance inspections when operating in airspace with a low contamination of 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 $0,2 \times 10^{-3} \text{ gr/m}^3$, but less than or equal to $2 \times 10^{-3} \text{ gr/m}^3$.
 - Area of Medium Contamination (to be displayed in Grey): an airspace of defined dimensions where volcanic ash may be encountered at concentrations greater than $2 \times 10^{-3} \text{ gr/m}^3$, but less than $4 \times 10^{-3} \text{ gr/m}^3$.
 - 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 $4 \times 10^{-3} \text{ gr/m}^3$.
- (3) Member States should not close airspace that is forecasted to contain ash contamination in the short term 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.
- a) Member States are recommended to close airspace in the immediate vicinity of a volcano where volcanic ashes and gases form a direct threat for the safety of flight.
- b) Eurocontrol/Network Manager (NM) has been collecting information on policies of States in the NM area of responsibility regarding the VA SRA approach. This information is gathered from the national AIPs (including AICs), as well as the latest state intention as provided to the NM, and summarised in maps. Registered users can access these maps on the NM Network Operations Portal (NOP), otherwise the published information on States' policies may be retrieved from the national AIP (including AIC) publications.

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- (4) 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 aircraft outside of the 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 NAA.

Additionally, the Agency recommends that the respective authorities of the affected Member States, working in a coordinated manner with the relevant stakeholders of neighbouring States, identify and implement protective measures to prevent any adverse impact on the safety of aviation operations, e.g. issuance of NOTAM, airspace restrictions when so determined based on the available information and safety assessment outcomes.

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

Contact(s):

For further information contact the EASA Safety Information Section, Certification Directorate.

E-mail: ADs@easa.europa.eu.

For any comments or queries contact 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.

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

www.icao.int

[VA webpage](#)

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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 engine as well as piston engine 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 pressurisation 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/or engine TC holders to be applied after encountering 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
- Landing lights casting sharp, distinctly visible beam

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- (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/or 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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