EASA Safety Information Bulletin

SIB No.: **2010-17R2**
Issued: **21 May 2010**

Subject: **Flight in Airspace with a low 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.
- ICAO NATSPG NAT OPS Bulletin, number 2010-009, Temporary Addendum to NAT Doc 006.
- London VAAC NWP Volcanic Ash Concentration Charts.
- UK CAA DAP/PR/IcelandicEruptionHighAshConcentration of 17 May, 2010

Reason for revision: An ENHANCED PROCEDURES ZONE (a - GREY) Zone has been added to Volcanic Ash Concentration Charts. In agreement with Eurocontrol and the European Commission, EASA has developed this revised SIB to inform the National Competent Authorities of some important elements that EASA considers should be taken into account by those authorities that decide to allow flight operations in the ENHANCED PROCEDURES ZONE (a - GREY).

Applicability: All aircraft operating into airspace that is known or suspected to be contaminated with volcanic ash.

Description: Flight in Airspace with a low contamination of Volcanic Ash may have medium and long term consequences for the airworthiness of aircraft. It is therefore essential that priority be given to maintain the continuing airworthiness of aircraft in order to support the continuation of safe operations in airspace contaminated with volcanic ash.

Aircraft and Engine TC-Holders are being requested by EASA to develop the instructions necessary for continued safe flight, such as specific pre- and post-flight inspections, and those for continued airworthiness, taking into account the effects of operation of aircraft in airspace with low contamination volcanic ash. Special emphasis is requested for those systems that are most sensitive to any exposure to volcanic ash.

The sensitive systems are known to be, but may not be limited to, engine compressors and turbines, engine oil systems, aircraft pitot- and air data systems, aircraft environmental control systems, and those aircraft systems that provide cooling air for computer systems installed on the aircraft.

The VAAC in London, in accordance with international regulations, produces volcanic ash concentration charts that predict and depict areas of contamination with volcanic ash. The charts show forecast ash concentration levels in 3 altitude bands and in 3 different zones. This information is produced for the purpose of facilitating the decisions to be taken by the national authorities with regards to their respective airspace. The zones are based on volcanic ash tolerance levels defined by aircraft and engine manufacturers to ensure continued safe flight. The zones are identified as follows:

Definitions:

NO FLY ZONE (BLACK): Flight in this zone is prohibited due to predicted ash concentration levels exceeding acceptable engine manufacturer's tolerances.

ENHANCED PROCEDURES ZONE:
(a) **GREY**: In this zone, flight operations can be authorised by the Competent National Authority of the operator under certain conditions, and provided they are manageable by the National Air Traffic Management Organisation (or Air Traffic Management Service Provider). Flight in the Grey Zone may be limited by operational and/or technical restrictions.

(b) **RED**: in this zone flight operations are allowed without restrictions, provided the operator follows either the recommendations for flights into airspace with a low contamination of volcanic ash produced by the aircraft and engine manufacturers, or the inspections recommended by EASA, as detailed in this SIB.

NORMAL ZONE (**WHITE)** Normal flight operations apply.

The ash contamination thresholds pertaining to the respective zones identified herewith can be referenced in the Volcanic Ash Concentration Charts produced by the London VAAC.

Recommendations: When operating in airspace that is known or suspected to be contaminated with volcanic ash (ENHANCED PROCEDURES ZONE) the following should apply:

Unless specific pre- and post-flight inspections and ICA have been defined by the aircraft and engine TC holders, and until those instructions have been made available to the operators and owners,

(1) Accomplish daily inspections when operating in an area of low volcanic ash contamination, to detect any erosion,

accumulation of volcanic ash, or aircraft- and/or engine damage or system degradation:

- 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
- engine compressors and turbines
- engine oil systems
- rotor blades

Based on the results of the above inspections, more detailed inspections 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

(2) Report any encounter with volcanic ash, or any other relevant findings, to the engine- and aircraft TC holders, the National State of Registry of the aircraft and to the National Authority of the State through which flight was conducted.

In addition, operators should report to EASA for EASA to produce a synthesis of findings and trends resulting from these inspections so that improvements could be brought to the procedures recommended by this SIB.

Recommendations introduced by Revision 2 of this SIB:

(3) In addition to the above, to enable flight in the ENHANCED PROCEDURES ZONE (a - GREY), the following recommendations are provided, subject to approval of the Competent Authority of the EU Member State or associated country. Two approaches (A or B) are recommended:

(A) Operators may be authorised to resume flight operations in the ENHANCED PROCEDURES ZONE (a - GREY), by

presenting to their National Competent Authority an acceptable safety case. The safety case should contain, but is not limited to, the following

(i) An assessment of the risks for flight operations, per aircraft type, in the ENHANCED PROCEDURES ZONE (a - GREY) prior to the planned operations(A description of safety risk assessment methodology can be found in ICAO NATSPG NAT OPS Bulletin, number 2010-009).

(ii) Data from the engine and aircraft manufacturers that support flight operations, per aircraft type, in this zone, and when applicable, the limitations that may apply.

(iii) Additional (health monitoring) inspections are carried out that have been determined by the aircraft and engine manufacturers to ensure continued safe flight.

(B) The National Competent Authority of the Member State or associated country may decide to allow all flights within the ENHANCED PROCEDURES ZONE (a - GREY) airspace, with or without limitations (e.g. geographic area, limitation in duration), following recognisance/clearance flights performed to support and justify that safe operations in the ENHANCED PROCEDURES ZONE (a - GREY) can continue.
This airspace, based on recognisance/clearance flights, should then be re-classified as a ENHANCED PROCEDURES ZONE (b - RED).

The data and analysis from the recognisance/clearance flight(s) together with the subsequent decision to allow flights in the airspace in full or in part should be reported without delay to the Volcanic Ash Advisory Centres, Eurocontrol and EASA.

(4) In both cases (A) and (B) flights in the ENHANCED PROCEDURES ZONE (a - GREY) may then be carried out at the operators discretion provided flight into visible ash is avoided.

(5) In both cases (A) and (B) above any necessary enhanced operational procedures should be developed and implemented by the operator. Such enhanced operational procedures should include:
- a briefing to pilots on the concept of flights in the ENHANCED PROCEDURES ZONE (a - GREY),
- additional fuel as a contingency to allow re-routing once airborne due to the changing environmental conditions, as applicable.
- the selection of en-route and/or destination alternates and/or ETOPS requirements considering special circumstances, and

- consideration to engine-out service ceiling and decompression before overflying areas containing volcanic ash

(6) Operations in airspace with any contamination of volcanic ash may result in degradation of aircraft and engine components or systems which is higher than normal. Piston engine aircraft and gliders may be less susceptible to volcanic ash.

(7) EASA requests the feedback from EU Member States and associated countries, the airspace management organisations and operators for improvement of this SIB and the Agency would like 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:

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Reports can be submitted to EASA by E-mail: volcano@easa.europa.eu.

To obtain a copy of the ICAO Document 9691-AN/954, 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.

The London VAAC NWP Volcanic Ash Concentration Charts can be accessed at:
http://www.metoffice.gov.uk/corporate/pressoffice/2010/volcano/ashconcentration/