



MINISTRY OF DEFENCE

**Secretariat General of Defence and National Armaments Directorate
Directorate of Air Armaments and Airworthiness**

OPERATIONS IN AIRSPACE WITH CONTAMINATION OF VOLCANIC ASH

NOTE

This Technical Publication (TP) cancels and replaces its previous edition
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ATTENTION: This regulation is valid if composed by the pages listed below, duly revised.
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1. Introduction

1.1 General

Flying in airspace contaminated by volcanic ash may jeopardize the airworthiness of the aircraft.

Therefore, such consequences should be assessed and treated with priority to ensure the continuing airworthiness.

1.2 Aim

This Technical Publication (TP), in order to ensure the continuing airworthiness, regulates the aircrafts operation in the airspace with low, medium and/or high concentration of volcanic ash (visible or suspected).

In particular, it defines:

- The process and the requirements for the certification of an aircraft (type certification) to operate in airspaces with presence of low, media and/or high concentration of volcanic ash;
- The maintenance actions that have to be carried out on the military aircraft that have operated in airspaces with low concentration volcanic ash, when the aircraft is not yet certified by D.A.A.A. for these operations.

1.3 Applicability

This TP is applicable to aircrafts under D.A.A.A. Authority.

The Air Forces (AF)/State Corps (SB) and Companies that manage and/or operate and/or perform maintenance on the aircraft identified above and the relevant System Design Responsible Companies (SDR), have to follow the instructions specified below.

1.4 Validity

This TP shall come into effect as of its approval date.

This TP cancels and replaces its previous edition dated 04 May 2010.

1.5 Definitions

All the abbreviations, acronyms and terms in the TP AER.Q-2010 apply to this TP, supplemented by the following definitions:

- **Area of Low Contamination:** An airspace of defined dimensions where volcanic ash may be encountered at concentrations greater than $0,2 \times 10^{-3} \text{ g/m}^3$ but less than or equal to $2 \times 10^{-3} \text{ g/m}^3$.
- **Area of Medium Contamination:** An airspace of defined dimensions where volcanic ash may be

encountered at concentrations greater than 2×10^{-3} g/m³ but less than 4×10^{-3} g/m³.

- **Area of High Contamination:** An airspace of defined dimensions where volcanic ash may be encountered at concentrations equal to or greater than 4×10^{-3} g/m³, or airspace in which the concentration is not know.

1.6 Publications source

EASA Safety Information Bulletin No. 2010-17R5 issued on 11 April 2013

1.7 Reference documents

- AER(EP).P-2 *Omologazione, Certificazione e Qualificazione di Tipo Militare, Idoneità alla Installazione* - Herein translated into: "Military Type Certificate and Qualification, System Qualification, Suitability for Installation"
- AER(EP).P-6 *Istruzioni per la compilazione dei Capitolati Tecnici per Aeromobili Militari* – Herein translated into: "Instructions for compiling Capitolati Tecnici for military aircrafts";
- AER(EP).00-00-5 *Controllo configurazione. Processi per l'elaborazione, valutazione, ed autorizzazione delle modifiche da introdurre nei materiali di competenza della D.G.A.A.* – Herein translated into: "Configuration Control. Preparation, assessment and approval of configuration changes to be implemented in materials for which D.A.A.A. is responsible"
- AER(EP).P-2005 *Mantenimento della Aeronavigabilità* – Herein translated into: "Continuing Airworthiness";
- AER.Q-2010 *Definizione delle sigle, dei vocaboli e delle locuzioni comunemente impiegati nelle Pubblicazioni Tecniche (PP.TT.) della D.G.A.A.* – Herein translated into: "Definition of the acronyms, terms and locutions generally used in the Technical Publications (PP.TT.) of the D.A.A.A."

2. Volcanic ash forecasting

Forecasted presence of volcanic ash is presented in charts that depicts in 3 altitude bands, areas of low, medium and high concentrations as defined in paragraph 1.5.

These charts are prepared by the various Volcanic Ash Advisory Centres (VAAC), that for Europe are in London and Toulouse.

The following figure shows the various VAACs and related areas of responsibility.

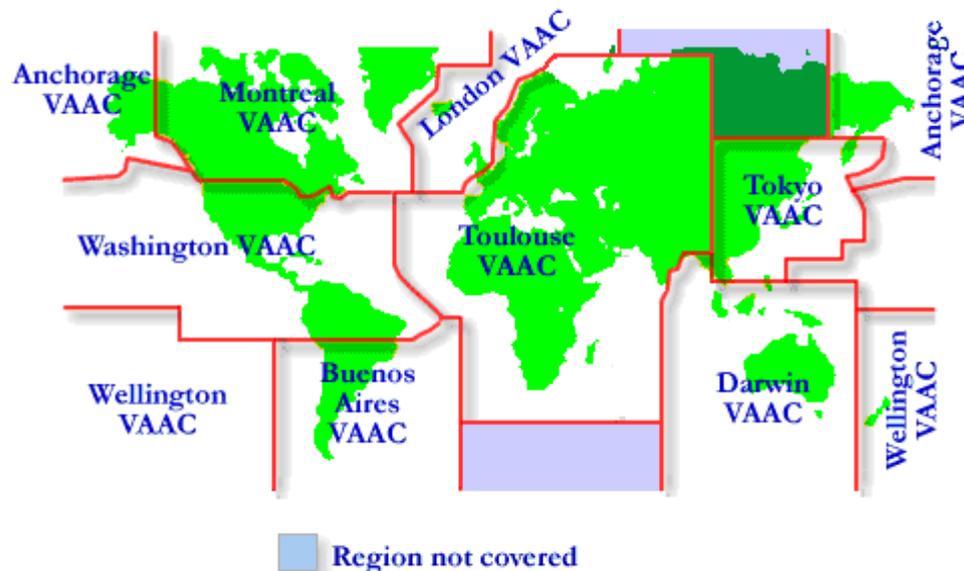


Figure 1: VAACs and related areas of responsibility

3. Certification of the capability to operate in airspaces with presence of volcanic ash

The certification of the capability of an aircraft (Type) to operate in airspaces with presence of volcanic ash in low, medium and high concentration may concern aircrafts:

- not yet certified by the D.A.A.A.;
- already certified by the D.A.A.A..

In both cases, this TP treats the possibility for the D.A.A.A. to recognize any certification to operate in airspaces with presence of volcanic ash, issued by other Aeronautical Authorities.

3.1 Aircrafts not yet certified by D.A.A.A.

3.1.1 Requirement

For aircrafts which D.A.A.A. certification process has not started or completed yet, if required, the aircraft capability to operate in airspaces with presence of volcanic ash in low, medium and high concentration shall be specified in the *Capitolato Tecnico* (Statement Of Work).

3.1.2 Requirement compliance

The aircraft capability to operate in airspaces with presence of volcanic ash in low, medium and high concentrations, shall be demonstrated by the SDR or a delegate through a dedicated safety analysis aimed at guaranteeing all the safety requirements (hazard risk matrix, probability of catastrophic event, single failure) defined for the aircraft (Capitolato Tecnico/ guidelines of the PT AER (EP).P-6).

The safety analysis shall identify the necessary suitable procedures to mitigate the risk and the operations to be performed on the aircraft to ensure that airworthiness is maintained.

Based on the analysis of the documentation submitted by the SDR, if the requirement is verified as compliant, D.A.A.A. will report in the Type Certificate this capability, indicating the relevant limitations/procedures, if any (AER(EP).P-2).

3.2 Aircrafts already certified by D.A.A.A.

For aircrafts already certified by D.A.A.A., the certification of the capability to operate in airspace with presence of volcanic ash in low, medium and high concentration shall be performed in accordance with the TPs AER(EP).P-2 (revision/addendum to the certificate) or AER(EP).00-00-5 (issue of *Prescrizione Tecnica Ditta* (PTD) and related *Prescrizione Tecnica Applicativa* (PTA) – Service Bulletin).

The SDR or a delegate thereof shall issue a dedicated safety analysis to ensure the compliance with all the aircraft safety requirements as defined stated in the *Capitolato Tecnico/Technical Specification*. The safety analysis shall identify the necessary suitable procedures to mitigate the risk and the operations to be performed on the aircraft to ensure that airworthiness is maintained. This safety analysis have to be developed in accordance with AER.P-2 of 19 January 2005 or subsequent editions (AER(EP).P-6).

If the safety analysis of the aircraft was not performed in accordance with the AER.P-2 dated 19 January 2005 or subsequent editions, the SDR or its delegate shall provide a safety analysis for the entire aircraft aimed to guarantee the safety requirements defined for the aircraft type in the current PT AER(EP).P-6 guidelines.

3.3 Aircraft with capability already certified by other Aeronautical Authority

For an aircraft already certified by another Authority (civilian or military) to operate in airspaces with presence of volcanic ash, the D.A.A.A. may decide to:

- Recognize that certification, requiring a specific safety analysis of the configuration differences, if any;
- proceed in accordance with para 3

4. Operations of aircrafts with certified capability

4.1 Operations in airspaces with visible volcanic ash

For aircraft with certified capability, the operations in airspace where volcanic ash is visible are always prohibited.

4.2 Operations in airspaces with forecasted presence of volcanic ash

To operate in airspaces where the presence of the volcanic ash is forecasted in low, medium or high concentration, the aircrafts shall be operated in accordance with the results of the certification issued by the D.A.A.A. which will be implemented in the appropriate technical manuals (specific procedures / limitations).

5. Operations of aircrafts with not certified capability

5.1 Operations in airspaces with visible volcanic ash

For aircraft with non-certified capability, the operations in airspaces where the presence of volcanic ash is visible are always prohibited.

5.2 Operations in airspaces with forecasted presence of volcanic ash

5.2.1 Areas with medium and high concentration

An aircraft with capability not certified by the D.A.A.A. can never operate in airspaces where the presence of medium and high concentration volcanic ash is forecasted.

5.2.2 Areas with low concentration

An aircraft with a capability not certified by the D.A.A.A. can operate in airspaces where the presence of volcanic ash at low concentration is forecasted, according to the following instructions:

- 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 can be adversely affected by volcanic ash on the ground or in the air.

Daily inspection shall 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.

Moreover the above daily inspections shall be performed after each flight, whenever the following phenomena are observed or detected 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 case of encounter with volcanic ash in flight, it is necessary to immediately report it to D.A.A.A., to SDRs and to the National Airworthiness Authority of the State in which the fly was carried out, about any encounter with volcanic ash or any other relevant maintenance and airworthiness related findings.