How IACA carriers do volcanic ash risk assessment

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IACA
The International Air Carrier Association

IACA carriers
Profile of IACA carriers

- original low-cost carriers
- high seat density, high load factor, modern fleet
- high aircraft utilization rate
- optimal use of airspace, slots and airport capacity
- central role in tourism development & economic growth
- very low cost per ASK
- price sensitive customers

Volcanic ash operations

"Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius - and a lot of courage - to move in the opposite direction."

Albert Einstein

"Everything should be made as simple as possible, but not simpler."
Volcanoes aren’t new but everywhere

Old approach (qualitative - binary)

- **Airspace:**
  either contaminated or not

- **Safety advise:**
  do not fly into visible ash
New approach (quantitative)

- **Ash contamination levels**
  - Low, Medium or High contamination

- **Danger Area**
  - around volcano declared by NOTAM

- **States may declare in their Regions**
  - Danger Areas regardless contamination level
  - Hazard Areas
  - Restricted Areas
  - Prohibited Areas

Volcanic ash in high traffic density areas

[Map of volcanic ash concentration]
ICAO

- Contingency Plan Europe/North Atlantic
  ICAO EUR Doc 019 / NAT Doc 006, Part II
  Volcanic Ash Contingency Plan EUR and NAT Regions, December 2010

- Guidance International Volcanic Ash Task Force
  Preliminary Issue Draft Version 3.1
  Guidance Material – Management of Flight Operations with known or forecast Volcanic Cloud Contamination, 19 December 2010

ICAO IVATF Guidance

- Flight Operations
  - in airspace with know/forecast volcanic ash contamination
  - at aerodromes with runway volcanic ash contamination

- Aircraft Operators
  - assessing the risk of such operations
  - determining appropriate mitigations measures

- National Aviation Authorities
  - formally accepting safety risk assessment operator
  - without further investigation, being confident in ability operators to undertake operations with minimal risk
Risk assessment - process

- Hazard identification
- Risk likelihood
- Risk severity
- Risk tolerability
- Mitigating actions

Risk assessment - elements

- **Data sources**
  - likely accuracy and competence/capability to interpret
  - OEM specific information

- **Procedures and Policies**
  - for crew, planning, dispatching, operations, maintenance
  - acceptable to the NAA

- **Reporting**
  - Pilot reports
  - Mandatory occurrence reports
  - Maintenance reports
Data source – volcanic ash charts

London VAAC  
Eurocontrol CFMU

- new CFMU tool EVITA?

Data source – OEM guidance (non exhaustive)

- **Airbus**
  AMM Chapter 05 – Volcanic Ash Conditional Inspection  
  FCOM/FCTM – Adverse Weather – Operations in Volcanic Ash  
  QRH – Miscellaneous – Volcanic Ash Encounter  
  FOBN – Flight Operations Briefing Notes  
  OIT SE 999.0047/10 – Operations in Volcanic Ash, May 19, 2010

- **Boeing**
  AMM 05 – Volcanic Ash Conditional Inspection  
  MOM-MOM-010-0277 Aircraft Volcanic Ash Exposure due to Iceland Volcano Eruption, April 16, 2010  
  MOM-MOM-10-0281-01B(R2) Exposure to Volcanic Ash – Guidance for Return to Service, May 18, 2010

- **CFM**
  AOW 10/CFM56-637-R1 Engine Operation in a Volcanic Ash Environment, April 15, 2010

- **GE**
  AOW 10/CF6/009 Engine Operation in a Volcanic Ash Environment, April 16, 2010

- **IAE**
  News Flash NF-004 Recommended Precaution for Exposure to Volcanic Ash, April 15, 2010

- **PW**
  CACTUS C0106-G61604 Recommendations for Engines Exposed to Volcanic Ash, April 16, 2010

- **RR**
  WW/10835/1/16 Apr 10 Engine Operation in a Volcanic Ash Environment, April 16, 2010
### Data sources - summary

**Revised Safety Zones 18 May 2010**

<table>
<thead>
<tr>
<th>Ash concentration</th>
<th>ICAO (old)</th>
<th>ICAO Doc 019 (new)</th>
<th>VAAC charts</th>
<th>IATA SIBGXX-17R2</th>
<th>OEM Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.2 mg/m³</td>
<td>NOZ</td>
<td>Normal Operation Zone</td>
<td>≥0.2 mg/m³</td>
<td>VAAC charts</td>
<td>Normal operation and inspection intervals apply. (*)</td>
</tr>
<tr>
<td>0.2 mg/m³ – 2 mg/m³</td>
<td>EPZ</td>
<td>Enhanced Procedures Zone</td>
<td>L Area of LOW Contamination</td>
<td>≥0.2 mg/m³ ≤2 mg/m³</td>
<td>Enhanced procedures zone: flight operations are allowed. Operators must follow the manufacturer's guidelines for flight operations into ash, and they must conduct an inspection of the engine and produce the results and submit them to IATA. Flight operations must be conducted only with the engine manufacturer's approval. (* *)</td>
</tr>
<tr>
<td>&gt;2 mg/m³ – 4 mg/m³</td>
<td>TLZ</td>
<td>Time Limited Zone</td>
<td>M Area of MEDIUM Contamination</td>
<td>&gt;2 mg/m³ ≤4 mg/m³</td>
<td>Enhanced procedures 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 Service Provider. Flight in the Grey Zone may be limited by operational and technical restrictions. Transient operations are accepted at operators’ discretion, provided flight into visible ash clouds is avoided. Operators must have OEM approval for each airframe/engine combination. (*)</td>
</tr>
<tr>
<td>24 mg/m³</td>
<td>NFZ</td>
<td>No Fly Zone</td>
<td>H Area of HIGH Contamination</td>
<td>&gt;4 mg/m³</td>
<td>NO FLY ZONE: Flight in this area is prohibited due to the predicted ash contamination levels. Operators must have OEM approval for each airframe/engine combination. If inadvertent incursion, perform inspection per AMM 05 and AMM 71. (*)</td>
</tr>
</tbody>
</table>

(*) Should volcanic ash contamination be confirmed, perform inspection per AMM 05 and AMM 71.
Data sources – IACA scores

- allowable flying time versus ash concentration?
- availability PIREPs other operators?
- detail contamination destination/alternate?

Procedures – IACA scores

- statements MEL / DDG?
Policies – IACA scores

- Includes Routings?
- Includes Diversion?
- Includes Enhanced Flight Watch?
- Includes Extra fuel?

Reporting – IACA scores

- Pleas?
- Mandatory Occurrence Reports?
- Maintenance findings to NAA?
- Maintenance findings to DfM?

- extend reporting to alleviate flight restrictions?
- FDM to monitor in-flight effects?
Conclusion – about operators
Operators are used to operate in volcanic active regions with existing OEM manuals.
In areas with high density air traffic:
- volcanic ash charts (are/will be) more accurate and detailed, operators use them
- OEM published guidance, operators implemented
- Operators’ procedures reviewed and updated
- Operators’ policies include routeing, diversion, enhanced flight watch, extra fuel...
- Operators report in-flight volcanic ash encounters and maintenance finding
hence, safe flight operations are achievable!

Recommendation – for States
Plea for an harmonised (European) approach:
- uniform volcanic ash concentration areas
  (Low, Medium, High)
- standard terms and conditions Danger Areas
  (if still required ?)
- acceptance risk assessment methodology
  without further investigation,
  being confident in operators’ ability
Volcanic ash operations

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Thank you!