

# Volcanic Ash Operator Experience

## Eyjafjallajokull

**AIRFRANCE** 



Eme Tillema  
Dep VP ATM  
KLM Flight  
Operations

Cologne  
9 Sept 2010



# Facts Eyjafjallajökull

- Eruption on the 14<sup>th</sup> of April 2010
- European Airspace Closure 15<sup>th</sup> – 21<sup>st</sup> April 2010
- About 10 million stranded passengers

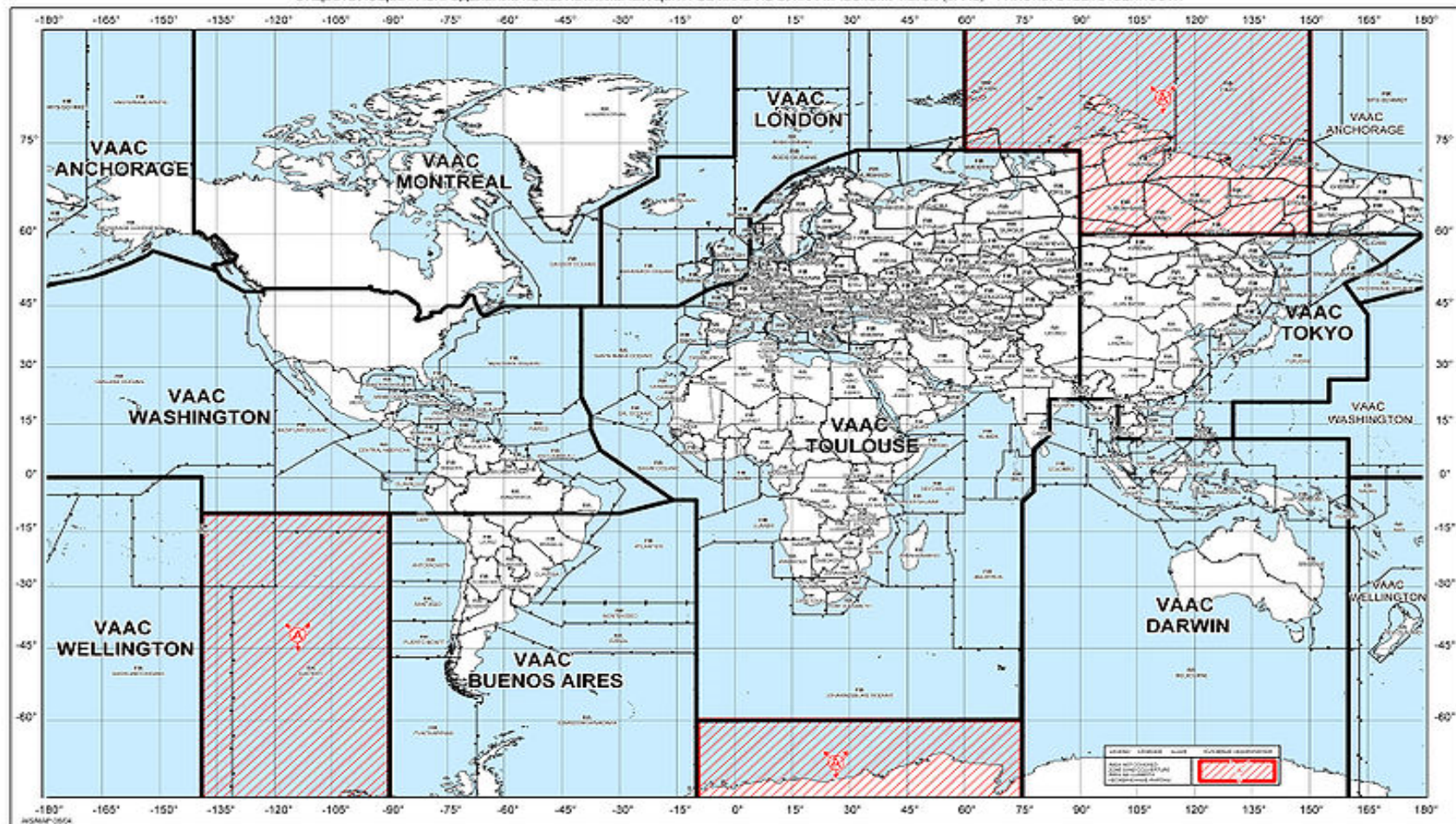
## Financial impact SkyTeam

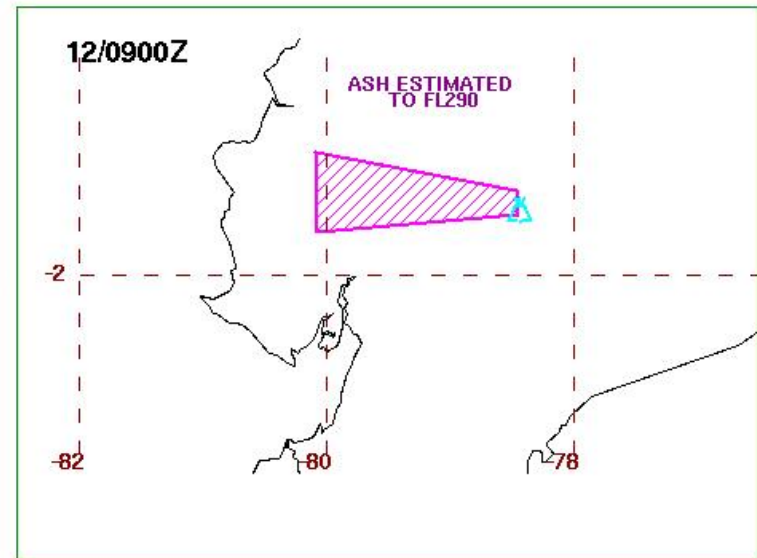
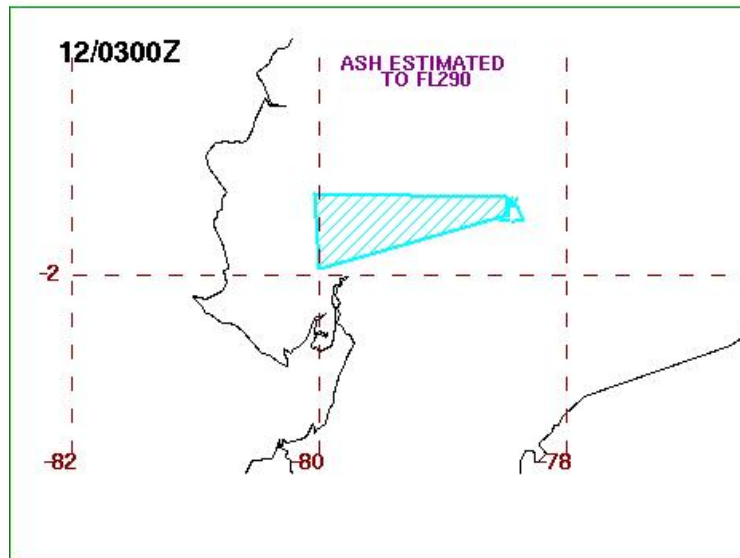
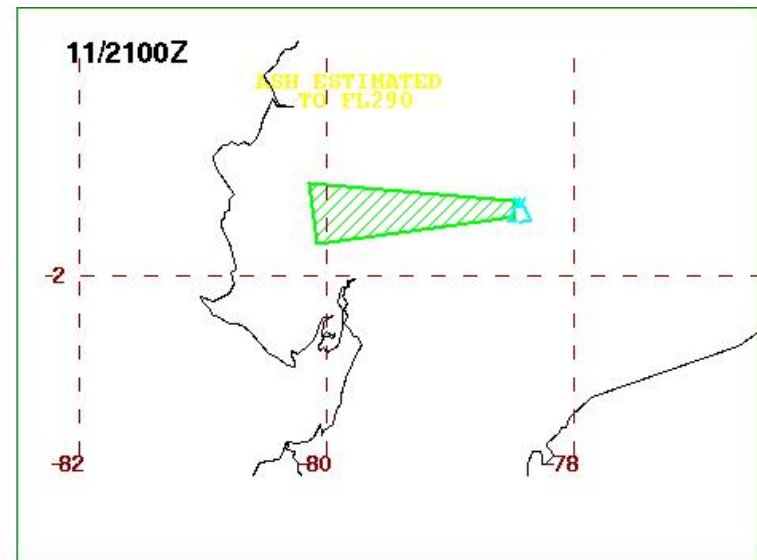
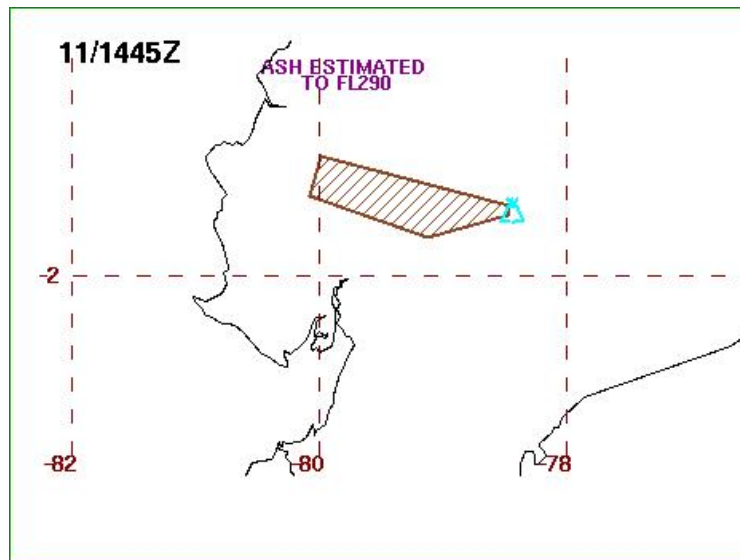
- KLM only €80mio
- KLM/Air France €250mio
- Worldwide about US\$1.8billion
- Pending:  
'Denied Boarding Compensation for European Airlines'

# Worldwide

- Various models used by the 9 different VAAC's
  - HYSPLIT by Washington (36hrs propagation)
  - NAME by London and Toulouse (more than 80 hrs propagation/no threshold value applicable mid April)
- Flight-based and ground-based observations as well as PIREPS used to validate maps
- Different Rulemaking
  - Closure of only the summit  
vs
  - Closure of the so-called NO-FLY (DANGER) zone

CURRENT STATUS OF ICAO VOLCANIC ASH ADVISORY CENTRES (VAAC) - AREAS OF RESPONSIBILITY  
 SITUATION ACTUELLE DES CENTRES D'AVIS DE CENDRES VOLCANIQUES (VAAC) - ZONES DE RESPONSABILITÉ  
 ESTADO ACTUAL DE LOS CENTROS DE AVISOS DE CENIZAS VOLCANICAS (VAAC) - AREAS DE RESPONSABILIDAD  
 СУЩЕСТВУЮЩЕЕ РАСПРЕДЕЛЕНИЕ КОНСУЛЬТАТИВНЫХ ЦЕНТРОВ ИКАО ПО ВУЛКАНИЧЕСКОМУ ПЕЛУ (ВААК) - РАЙОНЫ ОТВЕТСТВЕННОСТИ





VOLCANIC ASH ADVISORY  
DTG: 20100611/1519Z  
VAAC: WASHINGTON  
VOLCANO: TUNGURAHUA 1502-08  
AREA: ECUADOR  
SUMMIT ELEV: 16480 FT (5023 M)  
ADVISORY NR: 2010/298

INFO SOURCE: GUAYAQUIL MWO. GOES-13. GFS WINDS. GEOPHYSICAL  
INST. PILOT REPORT.  
ERUPTION DETAILS: ONGOING EMISSIONS  
RMK: INDICATION OF ASH EXTENDING ABOUT 175KM W OF THE  
VOLCANO IN GOES VIS IMAGERY. MAY BE ANOTHER EXHALATION AT  
1425Z. ...RUMINSKI  
NXT ADVISORY: WILL BE ISSUED BY 20100611/2115Z

# European Development

- Initial airspace closure of all effected areas based on conservative model/no scaling
- Airlines convinced governments that safe flying was ensured through affected areas
- OEM data 2mg/m<sup>3</sup> followed by 4mg/m<sup>3</sup> is the basis of the BLACK/GRAY/RED/WHITE zone's presently used, but this is not the final step
- Member states are developing their own competence centers
- EASA workshops
  - Operators
  - OEM's
  - Research community



# Alternatives presented to Ministers of Transport of the European Commission

1. Use the worldwide model. Only closure of the volcano summit and advisories to the AO. The AO is responsible for ash avoidance based on all available information (not only VAAC data, but also PIREPS etc.)  
Uniformity in procedures makes it easier for an operator to cope with volcanic eruptions worldwide.
2. Use the before mentioned model with an additional safety-zone around the ash cloud/plume. Source of MAPS is besides VAAC London eg NWS, WSI.  
The area involved will be closed for air-transport.  
UK added color coding: BLACK/GREY/RED/WHITE  
Diversity in procedures is more difficult to handle with for an operator.

# Aircraft Operators Experience

- KLM encountered VA cloud of Mt. Redoubt in 1989





# Aircraft Operators Experience

- KLM developed procedures how to operate in areas of known or suspected volcanic ash
  - *Dispatch in areas of (expected) Volcanic Activity*
- Procedures have been changed throughout the years based on experience in eg. Indonesia/Ecuador/Mexico
- Leave the decision to the operator to fly or not to fly in the affected area based on timely information
- Safe operation is assured

# What needs to be done

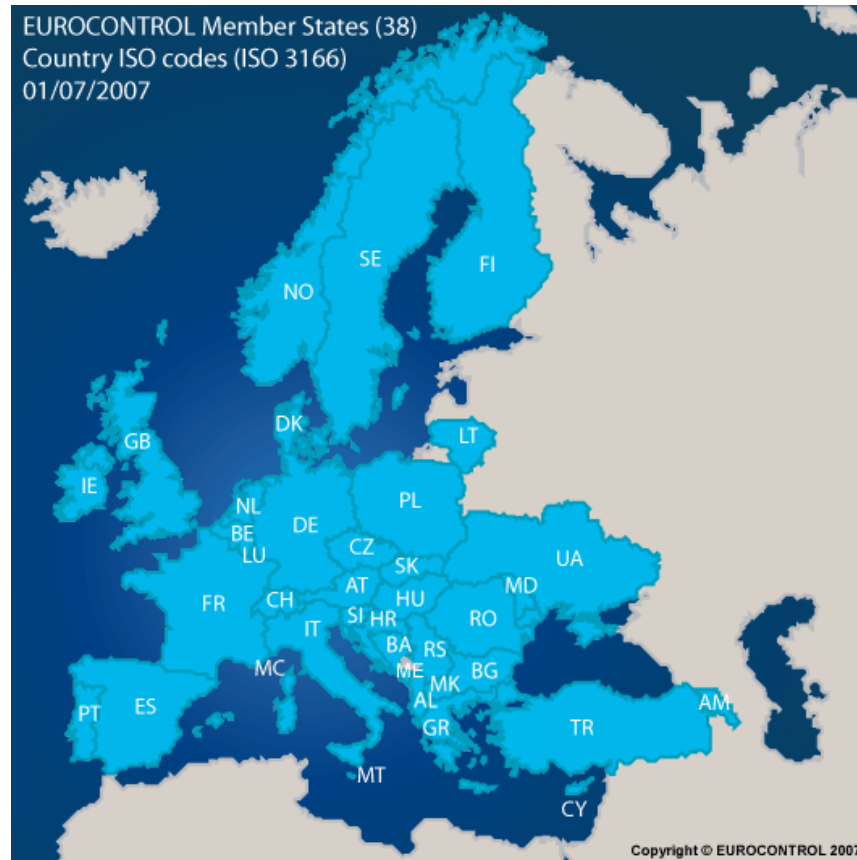
- Lining up all involved organizations  
'COLLABORATIVE DECISION MAKING'

- ICAO
- EASA
- IATA
- AEA
- Ectrl
- Etc



# What needs to be done

- Uniformity in procedures throughout Europe/World
- Competence Centers in EU countries should work together



# What needs to be done

- Information about eruptions should be delivered sooner to the Aircraft Operator



# Montserrat eruption on the 11th of February



Montserrat



Pointe à Pitre





# VA Advisory published (16:30)

VA ADVISORYDTG: 20100211/1629Z VAAC: WASHINGTON  
VOLCANO: SOUFRIERE HILLS 1600-05PSN: N1642 W06210AREA: W\_INDIES  
SUMMIT ELEV: 3002 FT (915 M)ADVISORY NR: 2010/188INFO SOURCE: GOES-10.  
RADIOSONDE. MONTSEERRAT OBSERVATORY.  
ERUPTION DETAILS: PYROCLASTIC FLOWS OBS VA DTG: 11/1545Z  
OBS VA CLD: SFC/FL040 N1726 W06201 - N1640 W06204- N1638 W06234 - N1714  
W06231 - N1726 W06201 MOVN 5-10KT SFC/FL070 N1858 W06114 - N1732 W06047  
-N1639 W06116 - N1639 W06203 - N1729 W06201 -N1858 W06114 MOV E 5-10KT  
SFC/FL190 12NM WID LINEBTN N1643 W06210 - N1633 W06205. MOV S 5-10KT  
FCST VA CLD +6HR: 11/2200Z SFC/FL040 N1749 W06159- N1645 W06204 - N1644  
W06226 - N1733 W06224 -N1749 W06159 SFC/FL070 N1820 W06028 - N1638W06026  
- N1640 W06213 - N1749 W06159 - N1820W06028 SFC/FL190 12NM WID LINE BTN  
N1644 W06211 -N1619 W06158.  
FCST VA CLD +12HR: 12/0400Z FCST VA CLD +18HR: 12/1000Z  
RMK: MVO REPORTS PYROCLASTIC FLOWS AS OF 15Z. STLT IMAGERY SHOWS VA TO  
FL190 MVG S...VA TOFL040 MVG N AND VA TO FL070 MVG E AT 1545ZRESULTING  
IN VA 20NM W...50NM N...125NMNE...60NM E...AND 10NM S OF THE SUMMIT.  
MODELFCST WINDS DO NOT AGREE WITH THIS OBSERVED MOTIONS ONLY A 6HR FCST  
BO CONTINUITY IS PROVIDED. ...



**Montserrat 11th February 15:00**

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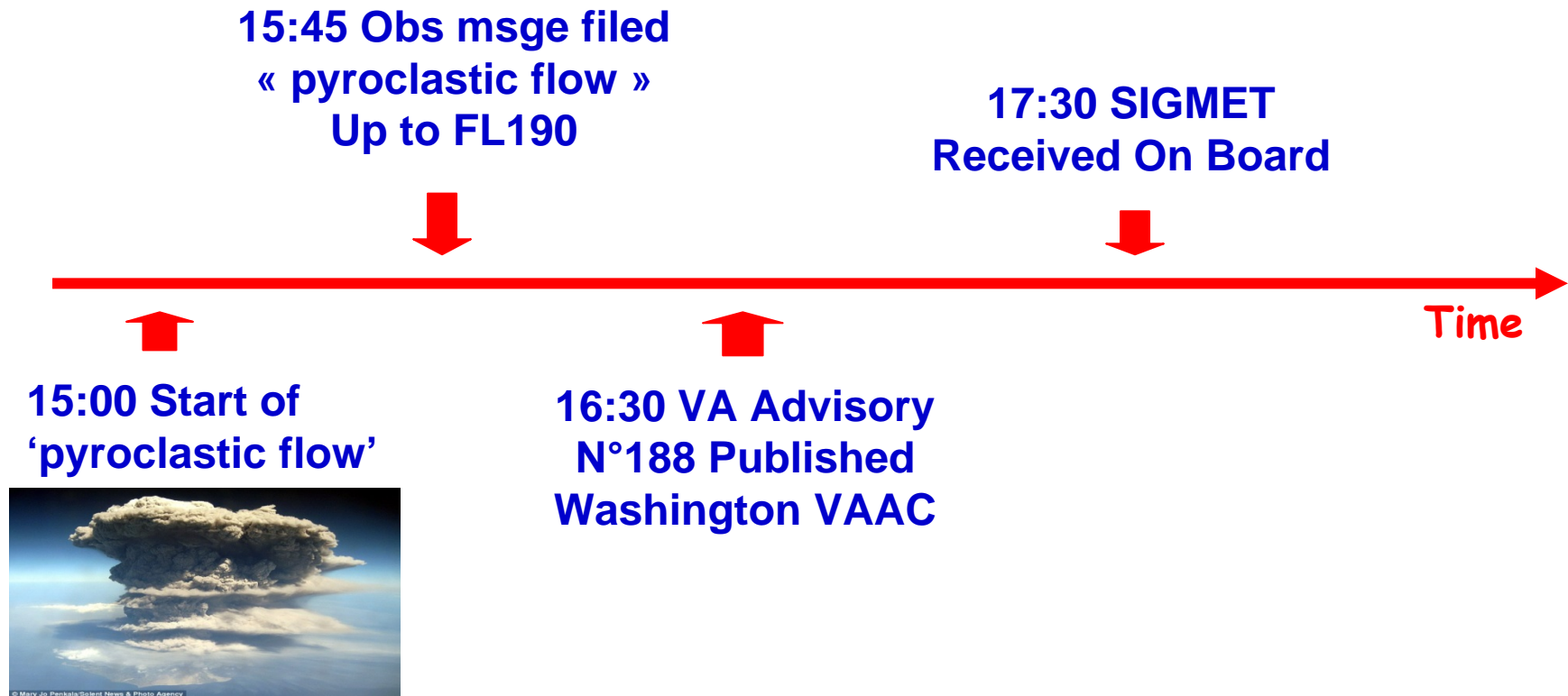
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# Communication timing



# Proposed improvements

- ✓ **More explicit** warning to pilots, ATC and dispatchers

Montserrat case :

- Daily messages for low altitude and light ash and gas clouds
- Permanent NOTAM about possible “collapse of lava dôme”
- Feb 10 eruption initially named « pyroclastic flow »
- “Possible collapse of lava dome” and « Pyroclastic flow » are not warning non specialists people



# What needs to be done

- Responsibility to fly laid down with the Aircraft Operator

