

Seventh meeting of the WMO-IUGG Volcanic Ash Scientific Advisory Group (VASAG/7)

Outcomes of ICAO METP WG-MOG/5 (IAVW) and WG-MISD (VASD) of relevance to the VASAG



WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

*21 to 23 August 2017
USGS, Vancouver, WA, United States*

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A reminder of these ICAO groups...

METP WG-MOG (IAVW)

- METP: Meteorology Panel
 - WG-MOG: Working Group on Meteorological Operations Groups
 - IAVW: Work stream on the international airways volcano watch

METP WG-MISD (VASD)

- METP: Meteorology Panel
 - WG-MISD: Working Group on Meteorological Information and Service Development
 - VASD: Work stream on volcanic ash sulphur dioxide

WG-MOG and WG-MISD are two out of the five working groups of the METP

ICAO METP WG-MOG/5 (IAVW) and WG-MISD/3 (VASD)

- Held 12 to 14 June 2017 @ JMA, Tokyo
 - 2.5 days MOG, 0.5 days MISD
- Representation from all 9 VAAC Provider States
 - Plus China, ICAO, WMO, IATA and Rolls-Royce



- Accepted all relevant outcomes of preceding WMO VAAC BP/5 (held 7 to 9 June 2017)



Reference documentation

Final reports

- WG-MOG/5 (IAVW)
 - [Link](#)
(open access)
- WG-MISD/3 (VASD)
 - [Link](#)
(requires ICAO Portal credentials)

Study notes

- Aircraft encounter information
[SN/13 [link](#)] (open access)
- Aviation colour codes
[SN/12 [link](#)] (open access)
- Quantitative VA contamination information
[SN/04 [link](#)] (open access)
- SO₂
[SN/2401 [link](#) and SN/2402 [link](#)]
(requires ICAO Portal credentials)

Outcomes

WG-MOG/5 (IAVW)

- 15 decisions and actions agreed on:
 - Terms of reference (minor update)
 - VAAC KPIs implementation
 - Discontinuation of T+0 confidence trial
 - Discontinuation of T+24 VAG trial
 - Annex 3 model charts update (projections)
 - ‘No ash’ reporting processes
 - Re-suspended VA qualifier in VAA/VAG
 - [Aircraft encounter information \(AA 5/7\)](#)
 - [Aviation colour codes \(AA 5/10\)](#)
 - [Quantitative VA contamination information and forecasts \(AA 5/12\)](#)
 - IAVW Roadmap and ConOps progression
 - IAVW Handbook update (backup info)
 - CTBTO re-engagement (infrasound issue)
 - Consolidation of VAAC management reports

WG-MISD/3 (VASD)

- 3 decisions and actions agreed on:
 - [VA SO2 ‘state of science’ review \(AA 3/1\)](#)
 - Job card update
 - Work plan update

Items specifically requiring WMO-IUGG VASAG attention and follow-up are highlighted in [blue](#)

Aircraft encounter information

- Doc 9691 Appendix F
 - static rather than dynamic
- Database of encounters up to August 2008
 - But, additional DLR and USGS investigations available through to 2016

VASAG action: *Lead a review of the findings with aim to collaboratively update Doc 9691*

- Proposed new VA encounter severity index
 - Includes consideration of the effect of volcanic clouds on aircraft occupants

VASAG action: *Lead a review of the severity index in view of its potential inclusion in Doc 9691*



Aviation colour codes

- Proposal to amend Annex 3:
 - Appendix 2, Table A2-1 to remove aviation colour codes from the VAA/VAG
 - Chapter 4, §4.1, Note 2 to elevate the status of the VONA to a recommended practice (plus supporting IWXXM schema considerations)
- Plus development of supporting guidance

VASAG action: Assist activity co-leads (Don and Patrick) and others in development of a proposed amendment to Annex 3 and the supporting guidance



Quantitative VA contamination info and forecasts

- Scientific and technical advancement
 - multi-spectral techniques, algorithms, etc.
- Rolls-Royce position
 - *“Engines exposed to a cumulative volcanic ash dose of 14.4 g s/m³ or lower, between actual ash concentrations of 0.2 to 4 mg/m³ should not lead to a significant reduction in engine related flight safety margins (e.g. 2 hours at 2 mg/m³)”*



Quantitative VA contamination info and forecasts (continued)

- The future of the IAVW...
 - ‘Richer’ data requirements
 - Associated with ICAO’s Global Air Navigation Plan (GANP)/aviation system block upgrades (ASBU) methodology
 - Quantitative data
 - Ash concentrations forecasts
 - Forecast confidence level assessments
 - Extended forecast period

VASAG action: *Lead a further ‘state of science’ review related to the global development and use of quantitative VA contamination information and forecasts*



VA SO₂ 'state of science' review

- Most but not all VAACs currently have SO₂ detection, monitoring and/or prediction capabilities
 - Where capability does exist, it's mainly in the research/non-operational area
- Past 25 years, several events/encounters:
 - Hot corrosion in engines, window crazing, etc.
 - Negative impact on aircraft occupant health
- WHO maximum exposure guidelines
 - Not all States support
 - Intended for ground-level exposure not at altitude or within the aircraft



VA SO₂ 'state of science' review (continued)

- US (FAA Civil Aerospace Medical Institute) recommendations
 - Apply only at surface-based atmospheric pressure levels
 - No studies within aircraft at altitude
 - Aircraft environmental control system design (e.g. gaseous filtration) varies – can affect levels
- Studies on air cabin quality – e.g. EASA
- Further studies and tests should be pursued

VASAG action: Assist activity lead (Tammy) and others in a further review of the 'state of science' related to VA SO₂ that poses a threat to aircraft occupants as well as investigate possible impacts to the aircraft



Thank you Merci



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