



International Civil Aviation Organization

**EIGHTEENTH MEETING OF THE METEOROLOGY
SUB-GROUP (MET SG/18) OF APANPIRG**

ICAO Regional Sub-Office, Beijing, China
18 – 21 August 2014

Agenda Item 3: Review outcomes from ICAO global groups

REVIEW OUTCOMES OF IAVWOPSG/8

(Presented by the Secretariat)

SUMMARY

This paper presents a summary of outcomes from the Eighth Meeting of the International Airways Volcano Watch Operations Group, held in Melbourne, Australia, from 17 to 20 February 2014.

1. Introduction

1.1 The Eighth Meeting of the International Airways Volcano Watch Operations Group (IAVWOPSG/8) was held in Melbourne, Australia, from 17 to 20 February 2014. The participation of thirty-five (35) experts from eight (8) volcanic ash advisory centre (VAAC) Provider States, user States, the International Air Transport Association (IATA), the International Coordinating Council of Aerospace Industries Associations (ICCAIA), the International Federation of Air Line Pilots' Associations (IFALPA), the International Union of Geodesy and Geophysics (IUGG) and the World Meteorological Organization (WMO), provided the group the opportunity to address, as a whole, issues concerning the operation and development of the IAVW and its effectiveness in meeting current and evolving global and regional operational requirements, and the development of international arrangements for the provision of warnings to aircraft of radioactive materials, toxic chemicals in the atmosphere and space weather.

1.2 All available documentation pertaining to IAVWOPSG/8 is at the following website:
<http://www.icao.int/safety/meteorology/iavwopsg/Pages/default.aspx>.

2. Discussion

2.1 The group is reminded that IAVWOPSG meetings have been held once every eighteen months (approx.) since the first meeting (IAVWOPSG/1) in March 2004. They necessarily serve as an integral part of the IAVWOPSG coordination and work programme where conclusions and decisions related to the operation and development of the IAVW and information on radioactive materials, toxic chemicals in the atmosphere and space weather are adopted and progress on the IAVWOPSG deliverables is monitored and reported.

2.2 With reference to the IAVWOPSG/8 discussions, agenda items 1 to 3 addressed meeting organizational matters and follow-up to previous meetings; agenda item 4 principally addressed IAVW-related provisions contained in the air navigation plan/facilities and services implementation document (ANP/FASID) and those proposed in draft Amendment 77 to Annex 3 to the Convention on International Civil Aviation, and also reviewed the guidance material in the *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List (Doc 9766)*, the *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691)* and the *Flight Safety and Volcanic Ash Manual — Risk management of flight operations with known or forecast volcanic ash contamination (Doc 9974)*; agenda items 5 and 6 principally addressed issues related to the operation of the IAVW and its effectiveness in meeting the operational requirements and the development of the IAVW in order to ensure that it continues to meet the operational requirements; agenda item 7 principally addressed development of the draft concept of operations for the provision of information on radioactive material; agenda item 8 principally addressed issues related to space weather including the development of a *Manual on space weather for international air navigation* and the draft concept of operations for the provision of space weather information in support of international air navigation; agenda item 9 addressed the regular review and update of the IAVWOPSG work programme; and agenda item 10 addressed other business including issues related to the on-going eruption of the Indonesian volcano Kelut.

2.3 Outcomes from IAVWOPSG/8 included the adoption of 5 decisions and 21 conclusions related to the operation and development of the IAVW and development of guidance on radioactive materials, toxic chemicals in the atmosphere and space weather.

2.4 The group is reminded that follow-up action to IAVWOPSG/8 Conclusion 8/2 – *Amendment to IAVW-related procedures in the ANP/FASID* is expected to result in proposed amendments to the ASIA/PAC Air Navigation Plan, which may include updates to the FASID Table MET 3B and FASID Chart MET 2 to realign the area of responsibility of the VAACs with current requirements. *Note: the aforementioned amendment proposals would necessarily be distributed (by State letter) to States and International organizations for comment before approval.*

2.5 The group is reminded that IAVWOPSG/8 Decision 8/10 — *Operational implementation of a standardized international volcano database for the preparation of volcanic ash advisories* required, effective 1 March 2014, the VAACs to implement operational use of the standardized international volcano database as provided by the Smithsonian Institution.

2.6 For ease of reference, a copy of the IAVWOPSG/8 Executive Summary is in **the Attachment** to this paper. The full report of the meeting discussions is available at the website listed at 1.2, above.

2.7 The group is reminded that a decision on the location and date for the next meeting of the IAVWOPSG (or successor expert group) was deferred until the outcomes are known of the review of the recommendations of the MET Divisional Meeting by the Air Navigation Commission during its 197th session.

3. Action by the Meeting

3.1 The meeting is invited to note the information contained in this paper.

EIGHTH MEETING**INTERNATIONAL AIRWAYS VOLCANO WATCH OPERATIONS GROUP
(IAVWOPSG)**

(Melbourne, Australia, 17 to 20 February 2014)

EXECUTIVE SUMMARY**1. INTRODUCTION**

1.1 The Eighth Meeting of the International Airways Volcano Watch Operations Group (IAVWOPSG/8), held at the premises of the Australian Bureau of Meteorology, 17 to 20 February 2014, was attended by thirty-five experts from eight volcanic ash advisory centre (VAAC) Provider States, user States, the International Air Transport Association (IATA), the International Coordinating Council of Aerospace Industries Associations (ICCAIA), the International Federation of Air Line Pilots' Associations (IFALPA), the International Union of Geodesy and Geophysics (IUGG) and the World Meteorological Organization (WMO).

1.2 Mr. Peter Lechner, the Chairman of the IAVWOPSG, presided over the meeting throughout its duration. Mr. Raul Romero, Technical Officer Meteorology, from ICAO Headquarters, Montréal was Secretary of the meeting, assisted by Mr. Michael Berechree, National Manager Aviation Weather Services, Bureau of Meteorology.

2. FOLLOW-UP OF IAVWOPSG/7 CONCLUSIONS

2.1 Regarding the follow-up action of IAVWOPSG/7 conclusions, the group noted that, except for Conclusions 6/23, 7/13, 7/19, 7/20, 7/22, 7/23, 7/30, 7/34, 7/36 and 7/37 which are still valid since work was still underway, action was considered to be complete on all the issues (Decision 8/1 refers).

**3. REVIEW OF ICAO PROVISIONS RELATED TO THE
INTERNATIONAL AIRWAYS VOLCANO WATCH (IAVW)**

3.1 The group reviewed the IAVW-related regional procedures contained in the Basic Air Navigation Plan (ANP) and Facilities And Services Implementation Document (FASID) to render them compatible with Annex 3 — *Meteorological Service for International Air Navigation*. In this regard, the group amended the procedures which will be referred to the ICAO Regional Offices for processing (Conclusion 8/2 refers).

3.2 With regard to IAVW-related guidance material, the group agreed to further review the conclusions and state of the science related to the development and use of “agreed techniques” for remotely sensed and in-situ volcanic ash observations and to develop associated guidance material for the VAACs (Conclusion 8/3 refers).

3.3 The group agreed to include changes to the guidance material relating to phases of an eruption into the *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List* (Doc 9766) to ensure consistency with the manual on *Flight Safety and Volcanic Ash* (Doc 9974) (Conclusion 8/4 refers).

3.4 To develop protocols on coordination of operational response, specifically in the case of large events the group agreed to progress discussions concerning the definition of a “lead VAAC” in order to achieve consensus in developing examples to illustrate how to coordinate the VAACs operational response for inclusion in Doc 9766, *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List* (Conclusion 8/5 refers).

3.5 The group agreed to include guidance for VAACs regarding collaborative decision analysis and forecasting (CDAF) process in the *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List* (Doc 9766) (Conclusion 8/6 refers).

3.6 To allow the participation of stakeholders in a ATM collaborative decision making process the group tasked an ad-hoc group to assess the possibility for expanding the guidance for the CDAF process for volcanic ash advisories by the VAACs, to include State volcano observatories and meteorological watch offices (MWOs), in order to provide CDAF outcomes to other stakeholders (Conclusion 8/7 refers).

3.7 The group tasked the Secretary, in coordination with the METWSG Secretary as necessary, to include in the regional SIGMET guides proposed guidance material for the provision of SIGMET information for a complex volcanic ash cloud (Conclusion 8/8 refers).

3.8 The group invited WMO in coordination with ICAO to update model chart for SIGMET for volcanic ash in graphical form (Model SVA) in Annex 3 – *Meteorological Service for International Air Navigation*, Appendix 1, with an example that allows for the display of observed and forecast volcanic ash (Conclusion 8/9 refers).

3.9 Regarding the development of a standardized international volcano database the group agreed, in order to give users certainty and to remove any confusion with the preceding database, that effective 1 March 2014, the VAACs that have not already done so implement operational use of the standardized international volcano database as provided by the Smithsonian Institution to assign volcano name and number in volcanic ash advisories (Decision 8/10 refers).

4. OPERATION OF THE IAVW

4.1 To extend the IAVW coverage to near-global the group invited VAAC London to extend its area of responsibility to Northern Europe to cover Finland, Kobenhavn, Norway and Sweden flight information regions (FIRs) and the area North of N71 between E060 and E090 (Conclusion 8/11 refers). Additionally the group tasked an ad-hoc group to develop a proposal for the coverage of the unmonitored area north of the area of responsibility of VAAC Tokyo (Conclusion 8/12 refers). Finally VAAC Toulouse was invited to extend its area of responsibility southward from S60 to the South Pole (Conclusion 8/13 refers).

4.2 In relation with situational awareness for aviation operators and to facilitate the non-operational aspects of global volcanology, including services to aviation and the establishment of appropriate arrangements, the group tasked an ad-hoc group to continue to assess the feasibility of the establishment of a “volcanology desk” (Conclusion 8/14 refers).

4.3 The group endorsed version 1.0 of the Roadmap for IAVW in Support of International Air Navigation (Decision 8/15 refers).

4.4 To address the issue of errors introduced by representing areas affected by volcanic ash (or any feature) on map projections other than the projection on which the forecast was originally

prepared the group tasked an ad-hoc group to further progress work on updating the Model VAG and Model SVA contained in Appendix 1 to Annex 3 — *Meteorological Service for International Air Navigation* taking into account the need for consistency with the requirement that the volcanic ash advisory and SIGMET for volcanic ash are based upon accepted map projections (Conclusion 8/16 refers)

4.5 To update the WMO abbreviated header lines used by VAAC London when providing back-up for VAAC Toulouse the group tasked the secretary to update Table 4-3 (Volcanic ash advisory bulletin headers) of the *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List* (Doc 9766) (Conclusion 8/17 refers).

4.6 Regarding the provision of volcanic ash information beyond the current T+18 hours the group supported the provision of simple graphical depiction of the ash cloud by the VAACs at the T+24 hours timeframe. In this regard the group tasked an ad-hoc group, consisting *inter alia* of all the VAACs, to jointly develop and produce a trial T+24 hour forecast of volcanic ash clouds, to compile the results of the trial, as well as the feedback from the users, in order to provide a progress report (Conclusion 8/18 refers).

4.7 With regard to the allocation of forecast confidence in the production of volcanic ash advisories the group tasked all VAACs Provides States, in coordination with IATA and IFALPA, to undertake a collaborative operational trial of the provision of confidence information in the remarks section of volcanic ash advisories (conclusion 8/19 refers).

4.8 With regard to possible ways to address the improvement of the reporting of no volcanic ash the group tasked the Secretary to update the *Handbook on the International Airways Volcano Watch — Operational Procedures and Contact List* (Doc 9766) by adding a new paragraph 4.6 concerning the dissemination of aircraft reports of volcanic ash to VAACs (Conclusion 8/20 refers). In addition the group tasked an ad-hoc group to further assess the feasibility and means to improve the dissemination of aircraft reports of volcanic ash to VAACs (Conclusion 8/21 refers).

5. DEVELOPMENT OF THE IAVW

5.1 Concerning existing aerosol monitoring capabilities that could be beneficially employed in the framework of a composite observing system for volcanic ash in support of the IAVW the group invited the World Meteorological Organization (WMO)-International Union of Geodesy and Geophysics (IUGG) Volcanic Ash Scientific Advisory Group (VASAG) to further progress aerosol observation capabilities and related activities, such as improved volcanic ash monitoring, as part of the on-going science work items relating to volcanic cloud thickness and stratification and reducing dispersion model output uncertainty (Conclusion 8/22 refers)

6. MATTERS RELATED TO THE ASSESSMENT OF THE NEED TO PROVIDE INFORMATION ON SOLAR RADIATION STORMS AND OTHER BIO-HAZARDS

6.1 With regard to the amendment proposal concerning the introduction of space weather services for international air navigation, to be reviewed by the Meteorology Divisional Meeting as part of Amendment 77 to Annex 3 (with intended applicability in November 2016) the group agreed that it should make progress as far as possible and therefore tasked an ad-hoc group to develop a *Manual on Space Weather for International Air Navigation* that should include information to support the required space weather services and their associated effects and impacts on international air navigation (Conclusion 8/23 refers).

6.2 The group endorsed version 3.0 of the concept of operations for space weather information in support of international air navigation (Decision 8/24 refers).

7. **FUTURE WORK PROGRAMME**

7.1 Regarding the future work programme, the group reviewed the work programme and proposed changes based on the discussions under Agenda Items 4 to 8 (Decision 8/25 refers).

8. **ANY OTHER BUSSINESS**

8.1 With regard to the eruption of the Indonesian volcano Kelut in February 2014 the group invited the International Coordinating Council of Aerospace Industries Associations (ICCAIA) to coordinate the collection and sharing of engineering and/or technical data from at least one aircraft that encountered the Kelut volcanic ash cloud to help improve the understanding of volcanic cloud related impacts on aircraft components including engines (Conclusion 8/26 refers).

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