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**Agenda Item 3: Implementation of the International Airways Volcano Watch (IAVW)**

(Presented by the Secretariat)

**Summary**

This working paper presents information on the status of implementation of the International Airways Volcano Watch (IAVW) in the CAR/SAM States/Territories.

**References:**

- Report of the Fourteenth Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/14, San José, Costa Rica, 15 to 20 April 2007); and
- Report of the Third Meeting of the International Airways Volcano Watch Operations Group (IAVWOPSG/3, Thailand, Bangkok, 19 to 23 March 2007).

**1. Introduction**

1.1 As the meeting may recall, the IAVWOPSG was established in response to Recommendation 1/22 of the Meteorology (MET) Divisional Meeting (2002), to ensure that the operation and development of the IAVW continue, in order to meet current and evolving operational requirements in a cost effective manner. The Air Navigation Planning and Implementation Groups (PIRGs) should review the results of the IAVWOPSG meetings and identify any necessary follow-up action at regional level. Additionally, issues related to IAVW planning raised by the PIRGs should be referred to the IAVWOPSG for consideration.

1.2 Likewise, the group should develop proposals for the development of the IAVW in order to ensure that it continues to meet evolving operational requirements, under ICAO procedures for the amendments to Annex 3.

## 2. Discussion

### a) review the outcome of IAVWOPSG/3 Meeting

2.1 The Third Meeting of the International Airways Volcano Watch Operations Group (IAVWOPSG/3) was carried out from 19 to 23 March 2007 in Thailand, Bangkok. The meeting formulated 29 Conclusions and 4 Decisions. The executive summary was sent to CAR/SAM States; however, in order that the meeting is aware of the discussions, agreements and decisions of this group, is reproduced at **Appendix A**. Complete information regarding IAVWOPSG meetings can also be found at IAVWOSG website: <http://www.icao.int/anb/iavwopsg>.

2.2 When reviewing, during its third meeting (IAVWOPSG/3), the IAVW-related regional procedures, formulated Conclusion 3/2 – Amendment to the IAVW-related regional procedures in the ANP/FASID. In this regard, it was considered necessary to amend Table MET 3B in order to group it by States and to render it compatible with Annex 3 - *Meteorological Service for International Air Navigation*, it was agreed also the deletion of the requirement for an outlook giving information for an additional period of up to 12 hours in the special cases of SIGMET messages for volcanic ash cloud and tropical cyclones.

2.3 Following the referred Conclusion, the Lima Regional Office consolidated and processed these amendments (SAM07/3-MET, FASID and SAM 07/2-MET, ANP Basic), in accordance with the procedures approved by ICAO Council, which included amendments to CAR/SAM FASID Tables MET 3B and MET 3C and to ANP Basic, with regard to International Airways Volcanic Watch (IAVW). The approval of these amendments was sent to the States on 28 September and 11 October 2007, respectively.

2.4 In accordance with its terms of reference, the group, through different conclusions, requested the Secretariat to update Doc 9766-AN/968, *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List*, which is available at IAVWOPSG website.

2.5 In addition, updates to Doc 9691-AN/954, *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds*, were also requested. Both manuals were updated to align them with Amendment 74 to Annex 3 - *Meteorological Service for International Air Navigation*, as a follow-up of Conclusion 3/3.

### b) review the status of implementation of IAVW

2.6 The updates to Doc 9766-AN/968, *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List*, based on IAVWOPSG Conclusions 2/15 and 3/9, and following GREPECAS Conclusions 12/59 and 13/22, included, among others:

- a) the new level of alert colour code (page 4-4);
- b) the template proposed format of volcano observatory notice for aviation – VONA (Appendix E); and

- c) a sample of letter of agreement presented in Appendix A to the referred document.

2.7 In this regard, the meeting may be aware that Doc 9766-AN/968, *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List*, includes the operational procedures and necessary guidelines for the dissemination of information on volcanic eruptions and associated volcanic ash clouds in areas which could affect routes used by international flights, and necessary pre-eruption measures. Therefore, the full use of this document by meteorological authorities is required, as well as the need to draw up letters of agreement between parties involved. Consequently, the subgroup may wish to formulate the following draft conclusion:

**DRAFT**

**CONCLUSION 09/XX - LETTERS OF AGREEMENT BETWEEN THE CIVIL AVIATION AND METEOROLOGICAL AUTHORITIES AND THE VULCANOLOGICAL AGENCY**

That, in order to notify, with the speed required, all the parties involved to mitigate the greatest hazard to jet transport aircraft within the first few hours following an eruption:

- a) the States make full use of Doc 9766-AN/968, *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List*; and
- b) draw up letters of agreement between the parties involved, in particular, the civil aviation and meteorological authorities and the vulcanological agency, to record the agreed responsibilities of each party.

*Note: a sample of letter of agreement is presented in Appendix A to doc 9766-AN/968.*

**3. Action required**

3.1 The subgroup is invited to:

- a) consider the information presented in this working paper, as well as in **Appendix A**; and
- b) based on the deliberations, the meeting may wish to approve the draft conclusion presented in paragraph 2.7.

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## THIRD MEETING

### IAVW OPERATIONS GROUP

(Bangkok, Thailand, 19 to 23 March 2007)

### EXECUTIVE SUMMARY<sup>1</sup>

#### 1. INTRODUCTION

1.1 The third meeting of the International Airways Volcano Watch Operations Group (IAVWOPSG/3), held in the ICAO Asia and Pacific Office, 19 to 23 March 2007, was attended by eighteen experts from the seven volcanic ash advisory centres (VAAC) Provider States, International Air Transport Association (IATA), International Federation of Air Line Pilots' Associations (IFALPA), International Union of Geodesy and Geophysics (IUGG) and the World Meteorological Organization (WMO).

1.2 Mr. P. Lechner, the Chairman of the IAVWOPSG, presided over the meeting throughout its duration. Mr. R. Romero from ICAO Headquarters, Montreal, was Secretary of the meeting, assisted by Mr. Dimitar Ivanov, Regional Officer, Meteorology from the Asia and Pacific Regional Office.

#### 2. FOLLOW-UP IAVWOPSG/2 CONCLUSIONS

2.1 Regarding the follow-up action of IAVWOPSG/2 conclusions, the group noted that action was completed on all issues except for Conclusions 2/6 and 2/23 (Decision 3/1 refers). Regarding the proposal developed by the group at its second meeting for the inclusion of the smell of sulphur as a condition prompting the issuance of special air-reports, the group noted that the Air Navigation Commission had withdrawn the proposal from Amendment 74 to Annex 3 — *Meteorological Service for International Air Navigation* for further study by the group.

#### 3. REVIEW OF ICAO PROVISIONS RELATED TO IAVW

3.1 The group reviewed the IAVW-related regional procedures contained in the air navigation plan (ANP)/facilities and services implementation document (FASID) which would render them compatible with Annex 3. The amended procedures would be referred to the ICAO Regional Offices for processing (Conclusion 3/2 refers).

3.2 With regard to the *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds* (Doc 9691) and the *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List* (Doc 9766), the group noted that the manual was compatible to Amendment 73 to Annex 3. The group considered it essential that both documents be aligned with Amendment 74 to Annex 3 (applicable in November 2007) and that the draft amendment be sent to the group for comments (Conclusion 3/3 refers). Also, due to the perishable nature of the data contained in

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<sup>1</sup> The full report is available in English at the following open website: [www.icao.int/anb/IAVWOPSG](http://www.icao.int/anb/IAVWOPSG).

the handbook, the group requested that the Secretariat seek approval to maintain the handbook as an on-line publication only (Conclusion 3/4 refers).

3.3 Regarding the distribution of volcanic ash SIGMETs and volcanic ash advisories originating outside the EUR Region to volcanic ash advisory centres (VAAC), the group agreed with the European Air Navigation Planning Group (EANPG) that there was a problem, largely of a communication nature. In order to alleviate this problem, the addressing used should be defined in the ANPs concerned (Conclusion 3/5 refers).

#### 4. OPERATION OF THE IAVW

4.1 The group reviewed the management reports prepared by the VAAC Provider States, noted their contents and expressed satisfaction with the scope of the information provided.

4.2 The group reviewed the report of the ad hoc working group on the evaluation of the usefulness and appropriateness of the information provided by the volcanic activity form (Model VAR). The group concluded that the information contained in the model was complete and that only an item indicating “fumes” should be further examined in view of its inclusion therein (Conclusion 3/6 refers). In view of the increased availability of electronic communications and the existence of alternative ways to file post-flight reports, the group felt that there was a need to further involve pilots and airlines in increasing the use of the Model VAR and felt that the issues related to the dissemination of information contained in the Model VAR should be further studied (Conclusion 3/7 refers).

4.3 The group felt that, in order to improve the efficiency of the IAVW with regard to the provision of special air-reports for volcanic ash to VAACs and MWOs, that the Secretariat should develop guidance material for inclusion in the *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List* (Doc 9766) to reemphasize the importance of timely reporting of volcanic activity by IATA and IFALPA using special air-reports and Model VAR as part of post-flight reporting (Conclusion 3/8 refers).

4.4 The group endorsed a template developed jointly by the IUGG and the Secretariat for inclusion in the *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List* (Doc 9766) for the provision of information by volcanological observatories on significant pre-eruption volcanic activity, a volcanic eruption and/or volcanic ash in the atmosphere to ACCs, MWOs and VAACs (Conclusion 3/9 refers). In order to foster implementation of the template, the group agreed that guidance material regarding its use (including cost recovery) be developed for review at its next meeting (Conclusion 3/10 refers). In order to assess the degree of implementation of the volcanic observatory reporting template, the group agreed that the VAACs include in their management reports information about its use (Conclusion 3/11 refers).

4.5 The group agreed that the PNG format should be used for the transmission of volcanic ash graphical advisories and that all VAACs should make available their advisories in PNG format for distribution via the satellite distribution system for information relating to air navigation (SADIS) and the international satellite communications system (ISCS) broadcasts. A proposal for the use of the PNG chart form should be prepared (Conclusion 3/12 refers).

4.6 With reference to the format of volcanic ash advisories, the group felt that in order to address the lack of definition of observation and other minor related issues, appropriate guidance material should be developed (Conclusion 3/13 refers). With regard to the need for a uniform approach related to the cessation of a volcanic ash advisory when significant volcanic ash clouds were almost unidentifiable

from satellite data, the group agreed that this issue should be further studied and guidance material developed (Conclusion 3/14 refers).

4.7 With respect to a proposal for amendment to Annex 3 for improving the description of winds contained in the volcanic ash advisory, in particular, in lower latitudes and in the refining of the direction of movement, the group agreed that it should be further studied and a proposal prepared for consideration at the next meeting (Conclusion 3/15 refers).

4.8 With regard to SIGMET implementation issues, the group requested the Secretariat to assess the value of the inclusion of movement in graphical SIGMETs for volcanic ash (Conclusion 3/16 refers). In a related issue, the group felt that the revision of SIGMET provisions could increase the efficiency of the IAVW and contribute to the safety of air navigation and requested the Secretariat to evaluate the feasibility and desirability of rationalizing the issuance of volcanic ash warnings and advisories (Conclusion 3/17 refers).

4.9 Regarding the need to have a harmonized presentation of aviation products on the VAAC websites, the group requested the Secretariat to develop guidance to facilitate user's access to the information (Conclusion 3/18 refers).

4.10 With regard to the development of a new daily volcano status product aimed for users to provide a coherent picture of the status of all the volcanoes in a particular region, the group concurred that it was necessary to explore further this concept and evaluate its operational benefits (Conclusion 3/19 refers).

4.11 The group reviewed a concept discussed by the CAR/SAM Regional Planning and Implementation Group (GREPECAS) for the development of a call-down list to be used in case of volcanic eruption affecting aviation. It was concurred that there was a need to further study the matter (Conclusion 3/20 refers).

4.12 With regard to the assessment of the use of the smell of sulphur as an indicator of the presence of volcanic ash in the atmosphere, the group was of the opinion that the addition of a special AIREP for SO<sub>2</sub> would not resolve the shortfall in detecting volcanic ash clouds. The group agreed, however, that additional guidance material was needed for flight crews so that they will understand better the importance of the smell of SO<sub>2</sub> as an indicator of the possibility of volcanic ash (Conclusion 3/21 refers).

4.13 With regard to the updating of the worldwide ash encounter database, in view of the operational routine arrangements already in place, the group agreed that there was no need to develop additional provisions (Decision 3/22 refers). With regard to the accuracy of the database, the group agreed that the updates received between meetings should be presented at each IAVWOPSG meeting (Conclusion 3/23 refers).

## **5. DEVELOPMENT OF THE IAVW**

5.1 With regard to the detection of volcanic ash using satellite data, the group noted that the National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA) were funding projects to develop near real-time data products related to sulphur dioxide to identify volcanic ash clouds for use by VAACs. The group concurred that these projects would provide highly useful data.

5.2 With regard to the assessment of the usefulness of seismic and infrasonic data from the Comprehensive Nuclear Test-Ban Treaty Organization (CTBTO) observing networks to the IAVW, the group requested that ICAO invite CTBTO Provisional Technical Secretariat to finalize the assessment and to consider granting access of the International Monitoring System (IMS) data to VAAC Provider States (Conclusion 3/24 refers). The group reviewed one example on the use of infrasound data to detect eruptions that was operating in Ecuador since late 2005 (Canada – USA Acoustic Surveillance for Hazardous Eruptions (ASHE) Project) and agreed that VAACs Members from Canada and the United States to evaluate the results (Conclusion 3/25 refers).

5.3 With regard to volcanic ash deposition at aerodromes, the group agreed that amendment proposal to Annexes 3 and 15 — *Aeronautical Information Services* be developed which would require the inclusion of this information in aerodrome warnings and NOTAMs (Conclusion 3/26 refers).

5.4 Concerning the development of eruption source parameters (ESP), the group was pleased to accept the offer from the Volcano Hazards Program of the U.S. Geological Survey (USGS) to support a volcano scientist to produce analysis of ESP for use in atmospheric volcanic ash transport and dispersion models and that a dataset of 20 to 30 well-studied cases of volcanic eruptions of various cases should be used for that purpose (Conclusion 3/27 refers).

## 6. **MATTERS RELATED TO THE MONITORING AND PROVISION OF WARNINGS TO AIRCRAFT OF RADIOACTIVE DEBRIS AND TOXIC CHEMICAL CLOUDS**

6.1 Regarding the current operational procedures and notification practices on the accidental release of radioactive material into the atmosphere the group noted that the database linking geographical coordinates to a FIR, provided by ICAO to VAAC London, had been tested in trials during 2006 and worked satisfactorily. The group agreed to invite VAAC London to be designated as a focal point for forwarding the direct notification received from the International Atomic Energy Agency (IAEA) to the ACC concerned related to the accidental release of radioactive material, to fine-tuning details and procedures and that a draft amendment be developed for inclusion in Annex 3 (Conclusion 3/28 refers).

6.2 With regard to the development of international arrangements related to the accidental release of toxic chemicals into the atmosphere, the group agreed with the view of the WMO Expert Team on non-nuclear aspects of the Emergency Response Activities Programme in the sense that it was a local issue. Regarding the message format, the group agreed that an aerodrome warning would be the most appropriate message and therefore agreed that a draft amendment be prepared for inclusion in Annex 3 (Conclusion 3/29 refers).

6.3 Regarding the message format for the provision to aircraft of information on radioactive and hazardous materials accidentally released into the atmosphere, the group concurred that with the inclusion of radioactive clouds in SIGMETs and toxic chemicals in aerodrome warnings, this sub-task was considered completed (Decision 3/30 refers).

6.4 With regard to the assessment of the need to provide information on solar radiation storms and other bio-hazards, the group recognized that there was a need to establish a future course of action and that a proposal be prepared by the United States member for consideration at the next meeting (Conclusion 3/31 refers).

**7. FUTURE WORK PROGRAMME**

7.1 The group noted the new format for the follow-up table compatible with the ICAO Business Plan, reviewed the work programme and proposed additional changes based on the discussions under Agenda Items 5, 6, 7 and 9 (Decision 3/32 refers).

**8. ANY OTHER BUSINESS**

8.1 Under this agenda item, the group agreed that the secure website used by New Zealand was a useful tool to be maintained for the time being. Regarding the sponsored workshops on scientific development of the volcanic ash in the atmosphere organized by the World Meteorological Organization (WMO), the group agreed that its frequency should be formalized by WMO in consultation with ICAO (Conclusion 3/33 refers).

— END —