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ORGANIZACIÓN DE AVIACIÓN CIVIL INTERNACIONAL

ORGANISMO ESPECIALIZADO
DE LA ONU



CAR/SAM Workshop on the Proposal for PANS-MET Document - Procedures for Air Navigation Services - Meteorology (Doc 10157)

Lima, Peru, October 30–November 01, 2023

Presented by Claudia Ribero, SMN

ARG

CAR/SAM WORKSHOP on the proposal of the PANS-MET DOCUMENT WORK PROGRAM

01 Adoption of the Provisional Agenda and Timetable

02 Significant changes to the new amendment to Annex 3.

Background – Initial Proposal 3

Quantitative information on volcanic ash and updates from the IAVW, especially regarding the process associated with Volcano Observatories (SVO) and VONA notifications

03 Constituent parts of the PANS-MET

- Index
- Chapter 1 – PANS MET
- Chapter 2 – PANS MET (Appendix 2)
- Chapter 3 – PANS MET (Appendix 3)

TALLER CAR/SAM sobre la propuesta del Documento PANS-MET

PROGRAMA DE TRABAJO

03

Constituent parts of the PANS-MET

04

PANS-MET Workshop

- a) Establish Work Teams
- (b) Preparation of PANS-MET
- c) Presentations by Work Teams
- (d) Evolution of the PANS-MET.

(e) Chapter 4 – PANS MET (Appendices 2 and 4)

(f) Chapter 5 – PANS MET (Appendices 5, 6 and 8)

(g) Chapter 6 – PANS MET (Appendix 7 and 8)

h) Chapter 7 – PANS MET

(f) Chapter 8 – PANS MET (Appendices 1 and 5)

g) Chapter 9 – PANS MET

h) Chapter 10 – PANS MET

05

Questions & Answers.

Survey.

02
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SVO-VONA

**QVA Deadlines in
REVIEW**

Proposals under the ICAO International Airway Volcano Watch (IAVW) – SVO|VONA

3. Quantitative Volcanic Ash Information and IAVW Updates

3.1 Initial proposal 3 in attachments B and C contains the proposed amendments to incorporate a new recommended method for aggregating quantitative volcanic ash information, subject to improved capacity for quantitative monitoring and modelling of volcanic ash dispersion. Initially, it is recommended that only Volcanic Ash Warning Centers (VAACs) that are in a position to do so issue quantitative information on volcanic ash, and that all VAACs do so as of November 27, 2025.

3.2 The proposed amendments also introduce as a recommended method the issuance of notices from aviation volcano observatories (VONAs) and provide better clarification to whom the notice should be disseminated. In response to the introduction of VONAs, it is proposed to remove the aeronautical colour key from the volcanic ash warning. Minor corrections are proposed to the volcanic ash warning template and the corresponding tables in the PANS-METS.

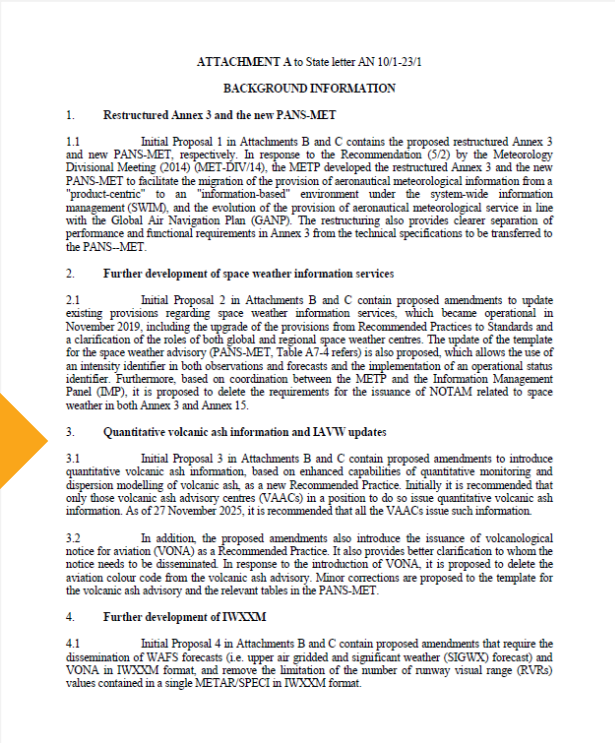


Fig. Columnas respecto de la erupción del año 2010 del Complejo Volcánico Popocatepetl-Cuicatlan-Cauitlan. Der: Foto de un avión detenido en el aeropuerto de San Carlos de Bariloche por la caída de cenizas volcánicas.



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Proposals under ICAO's Monitoring of Volcanoes on International Airways (IAVW) - SVO|VONA

In summary, 3.2 mentions:

- It proposes to make the preparation and issuance of VONA** notices by the volcano observatories of the States* a recommended method and provides that they be disseminated in IWXXM format.
- It clarifies the users to whom the notice is directed.
- In response to the introduction of the VONA notice, it is proposed to remove the aeronautical colour code from the volcanic ash advisory.
- Minor corrections are proposed to the volcanic ash warning template and the corresponding tables in the PANS-METs.

* State volcanoes observatories (SVO) = State volcano observatories

** Volcano observatory notice for aviation (VONA) = Volcano observatory notice for aviation

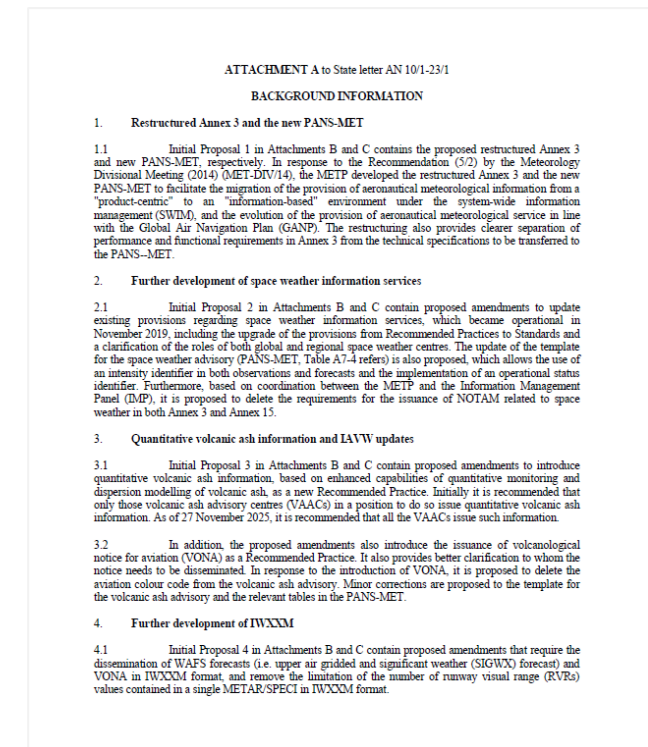


Fig. Columna eruptiva de la erupción del año 2010 del Complejo Volcánico Popocatepec-Cuicatlan, Coahuila. Der: Foto de un avión detenido en el aeropuerto de San Carlos de Bariloche por la caída de cenizas volcánicas.

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ICAO BTI Proposal - Restructured Annex 3 (Appendix B) - SVO|VONA

CHAPTER 1. Definitions
 Definitions Enhancements



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INITIAL PROPOSAL 3
 QUANTITATIVE VOLCANIC ASH INFORMATION AND IAVW UPDATES

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CHAPTER 1. DEFINITIONS

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International airways volcano watch (IAVW). International arrangements for monitoring and providing forecasts and warnings to aircraft of volcanic ash in the atmosphere.

Note.— The IAVW is based on the cooperation of aviation and non-aviation operational units using information derived from observing sources and networks that are provided by States. The watch is coordinated by ICAO with the cooperation of other concerned international organizations.

...

State volcano observatory: A volcano observatory, designated by regional air navigation agreement, to monitor active or potentially active volcanoes within a State and to provide information on volcanic activity to its associated area control centre, flight information centre, meteorological watch office and volcanic ash advisory centre and/or volcanic ash in the atmosphere.

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CHAPTER 3. GLOBAL SYSTEMS, SUPPORTING CENTRES AND METEOROLOGICAL OFFICES

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3.5 Volcanic ash advisory centres

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3.5.2 Recommendation.— *Until 26 November 2025, for significant volcanic ash “clouds”, VAACs in a position to do so should issue forecasts of quantitative volcanic ash concentration information in a volcanic ash “cloud” to meteorological authorities and other users, as approved by the Contracting State on advice from the meteorological authority.*

3.5.2 Recommendation.— *As of 27 November 2025, for significant volcanic ash “clouds”, VAACs should issue forecasts of quantitative volcanic ash concentration information in a volcanic ash “cloud” to meteorological authorities and other users, as approved by the Contracting State on advice from the meteorological authority.*



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CHAPTER 3. Global Systems, Support Centres and Meteorological Offices

Drafting improvements and further clarifications in 3.6 "State Volcano Observatories"



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Note 1— The VAACs in a position to provide quantitative volcanic ash concentration information are included in the Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List (Doc 9766).

Note 2— Significant volcanic ash "clouds" in this context means an ash "cloud" that poses a widespread impact to aircraft operations and air navigation. Guidance on the criteria is provided in the Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List (Doc 9766).

3.5.23 VAACs shall maintain a 24-hour watch.

3.5.24 In case of interruption of the operation of a VAAC, its functions shall be carried out by another VAAC or another meteorological centre, as designated by the VAAC Provider State concerned.

Note— Back-up procedures to be used in case of interruption of the operation of a VAAC are included in the Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List (Doc 9766).

3.6 State volcano observatories

3.6.1 Contracting States with active or potentially active volcanoes shall arrange, in accordance with regional air navigation agreement, that State volcano observatories monitor these volcanoes, and when observing:

Note— The Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List (Doc 9766) contains guidance material about active or potentially active volcanoes.

3.6.2 State volcano observatories shall send information on volcanic activity and/or volcanic ash in the atmosphere as quickly as practicable to their associated VAAC, MWO, NOTAM office, ACC/FIC and, in accordance with regional air navigation agreement, international OPMET databanks, when observing:

- a) significant changes in pre-eruption volcanic activity, ~~or a cessation thereof~~;

Note. — Pre-eruption volcanic activity in this context means unusual and/or increasing volcanic activity that could presage a volcanic eruption.

- b) a volcanic eruption, or a significant change in eruptive activity ~~cessation thereof~~; and/or
- c) volcanic ash in the atmosphere.

~~shall send this information as quickly as practicable to their associated ACC/FIC, MWO and VAAC.~~

Note. — Where capability exists, State volcano observatories may include re-suspended volcanic ash in the context of c) above. The Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List (Doc 9766) contains guidance material about ~~active or potentially active volcanoes~~ re-suspended volcanic ash.

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ICAO BTI Proposal - Restructured Annex 3 (Appendix B) - SVO|VONA

CHAPTER 7. Weather information containing warnings,
alerts, and notifications

Annex 3
Restructured -
Initial Proposal 3

Annex 3
Restructured -
Initial Proposal 3

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**CHAPTER 7. METEOROLOGICAL INFORMATION
CONTAINING ADVISORIES, ALERTS, AND WARNINGS AND NOTICES**

... 7.1 Volcanic ash advisory information and information from State volcano observatories

Note.— Procedures and technical specifications related to this section are given in the PANS-MET (Doc 10157), Section 6.1.

7.1.1 The advisory information on volcanic ash shall be issued by a volcanic ash advisory centre.
...

7.1.2 **Recommendation.**— *Information should be issued by a State volcano observatory on:*

- a) *significant pre-eruption volcanic activity;*
- b) *volcanic eruptions; and*
- c) *volcanic eruption cessation.*

7.1.2 **Recommendation.**— *Information on volcanic activity, including re-suspended volcanic ash, should be issued by a State volcano observatory as a Volcano Observatory Notice for Aviation (TONA).*

...

Annex 3
Restructured -
Initial Proposal 1

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NEW PANS-MET (Appendix C) Chapter 6 & Appendix 7 - SVO|VONA

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CHAPTER 1. DEFINITIONS

...

International airways volcano watch (IAVW). International arrangements for monitoring and providing forecasts and warnings to aircraft of volcanic ash in the atmosphere.

Note.— The IAVW is based on the cooperation of aviation and non-aviation operational units using information derived from observing sources and networks that are provided by States. The watch is coordinated by ICAO with the cooperation of other concerned international organizations.

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State volcano observatory. A volcano observatory, designated by regional air navigation agreement, to monitor active or potentially active volcanoes within a State and to provide information on volcanic activity to its associated area control centre, flight information centre, meteorological watch office and volcanic ash advisory centre and/or volcanic ash in the atmosphere.

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NEW PANS-MET (Appendix C) Chapter 6 - SVO|VONA

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CHAPTER 6. METEOROLOGICAL INFORMATION CONTAINING ADVISORIES,
ALERTS, AND WARNINGS AND NOTICES

...

6.1 VOLCANIC ASH ADVISORY INFORMATION
AND INFORMATION FROM STATE VOLCANO OBSERVATORIES

6.1.1 The advisory information on volcanic ash shall be issued in abbreviated plain language, using approved ICAO abbreviations and numerical values of self-explanatory nature, in accordance with the template shown in Appendix 7, Table A7-42. When no approved ICAO abbreviations are available, English plain language text, to be kept to a minimum, shall be used to describe elements for which the template allows the use of free text.

...

6.1.3 The volcanic ash advisory information listed in Appendix 7, Table A7-42, when prepared in graphical format, shall be as specified in Appendix 1 and issued using the portable network graphics (PNG) format.

...

6.1.4 The information required to be sent by State volcano observatories to their associated area control centres (ACCs), flight information centres (FICs), meteorological watch office (MWO) and VAAC should comprise:

- a) for significant pre eruption volcanic activity: the date/time (UTC) of report, name and, if known, number of the volcano, location (latitude/longitude), and description of volcanic activity; and
- b) for volcanic eruption: the date/time (UTC) of report and time of eruption (UTC) if different from time of report, name and, if known, number of the volcano, location (latitude/longitude), and description of the eruption including whether an ash column was ejected and, if so, an estimate of height of ash column and the extent of any visible volcanic ash cloud, during and following an eruption; and
- c) for volcanic eruption cessation: the date/time (UTC) of report and time of eruption cessation (UTC); name and, if known, number of the volcano; and location (latitude/longitude).

Note 1 — Pre eruption volcanic activity in this context means unusual and/or increasing volcanic activity which could preface a volcanic eruption.

Note 2 — The State volcano observatories may use the Volcano Observatory Notice for Aviation (VONA) format to send information to their associated ACCs/FICs, MWO and VAAC. The VONA format is included in the Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List (Doc 9766) which is available on the ICAO website.

6.1.4 State volcano observatories should issue information on volcanic activity and/or volcanic ash in the atmosphere as the volcano observatory notice for aviation (VONA).

- ✓ It provides clarifications, in relation to the preparation of the notices of the Observatories of the volcanoes: Text format and graphic format. Refer to templates in Appendix 7.
- ✓ It indicates that the volcano observatories of the States will issue information on volcanic activity and volcanic ash as VONA advisories

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NEW PANS-MET (Appendix C) Chapter 6 - SVO|VONA

Cont.

- ✓ Proposes that VONA be disseminated in IWXXM format
- ✓ It proposes that the coloured aeronautical codes should be used only for VONA, and that they should not be applied to the resuspension of volcanic ash
- ✓ Specifies VONA re-update criteria

It indicates where to find more information about VONAs at:

In the Handbook on Volcano Monitoring on International Airways (IAVW) — Operational Procedures and List of Contact Points (Doc. 9766), available on the public website of the ICAO Expert Group on Meteorology and on the website of the World Organization of Volcano Observatories (WOVO)

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6.15 VONA shall be in abbreviated plain language, using approved ICAO abbreviations and numerical values of self-explanatory nature, and shall be in accordance with the template shown in Appendix 7, Table A7-1. When no approved ICAO abbreviations are available, English plain language text, kept to a minimum, shall be used to describe elements for which the template allows the use of free text.

6.1.6 VONA should be disseminated in IWXXM form in addition to its dissemination in abbreviated plain language in accordance with 6.1.6.

Note.— The technical specifications for IWXXM are contained in the Manual on Codes (WMO-No. 306), Volume I.3, Part D — Representation Derived from Data Models. Guidance on the implementation of IWXXM is provided in the Manual on the Digital Exchange of Aeronautical Meteorological Information (Doc 10003).

6.1.7 Only the following aviation colour codes shall be reported in the VONA:

- a) GREEN — the volcano is in a normal, non-eruptive state; or, volcanic activity is considered to have ceased, and the volcano has reverted to its normal, non-eruptive state;
- b) YELLOW — the volcano is experiencing signs of elevated unrest above known background levels; or, volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase;
- c) ORANGE — the volcano is exhibiting heightened unrest with increased likelihood of an eruption; or a volcanic eruption is underway but with no or minor volcanic ash emission;
- d) RED — a volcanic eruption is expected to be imminent with significant emission of volcanic ash into the atmosphere likely; or, a volcanic eruption is underway with significant emission of volcanic ash into the atmosphere; and
- e) UNASSIGNED — there is insufficient information available to assess the current status of the volcano or volcanic activity.

Note.— The aviation colour code applies only to current volcanic activity associated with a volcano and does not apply to re-suspended volcanic ash.

6.1.8 VONA shall be updated:

- a) whenever there is a change in the aviation colour code; or
- b) at least once every 24 hours whenever the aviation colour code is unchanged at orange or red; or
- c) at least once every seven days whenever the aviation colour code is unchanged at yellow.

Note.— Further information on the VONA is included in the Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List (Doc 9766) which is available on the ICAO METP public website and on the World Organization of Volcano Observatories (WOVO) website.

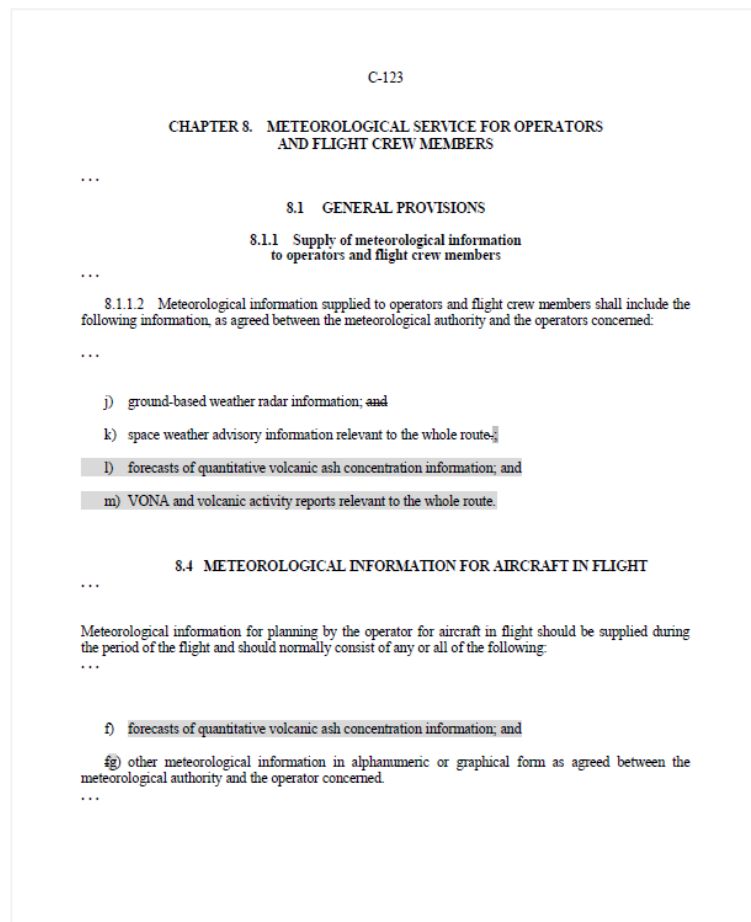
02

Propuesta Inicial 3

Información cuantitativa sobre cenizas volcánicas y actualizaciones de la IAVW

SVO-VONA

NEW PANS-MET (Appendix C) Chapter 8 - SVO|VONA



✓ Proposes to provide VONA to operators and flight crew members

✓ Note: Consider Initial Proposal 6

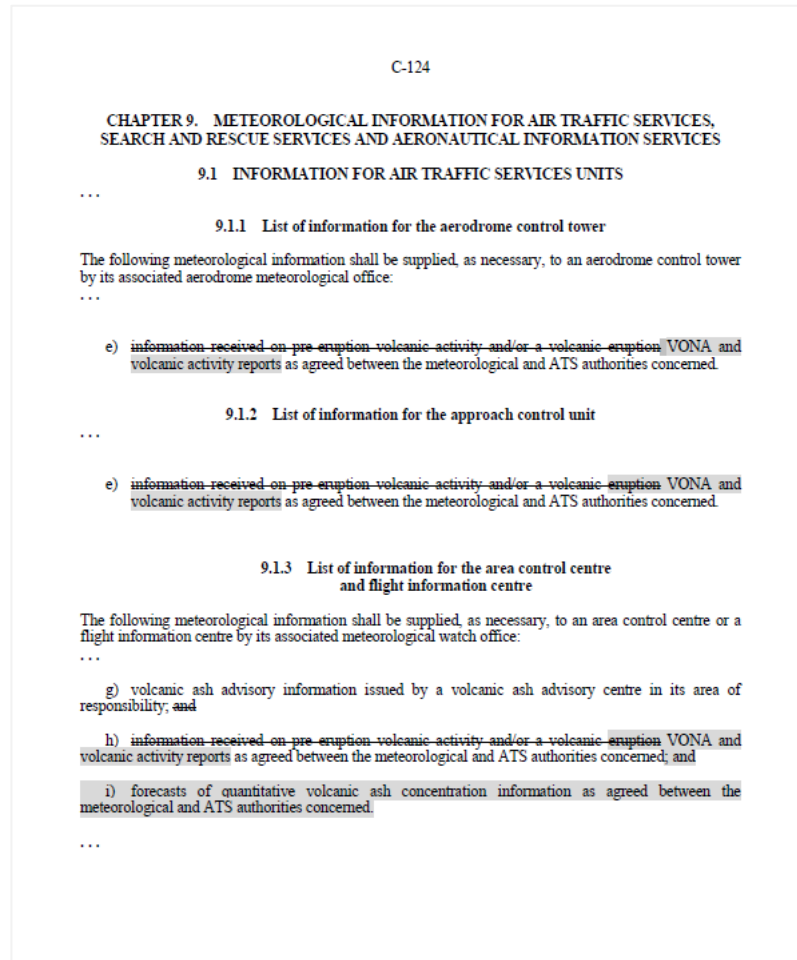
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NEW PANS-MET (Appendix C) Chapter 9 - SVO|VONA



➤ The aerodrome meteorological office associated with the aerodrome control tower will provide VONA and volcanic activity reports

➤ The associated meteorological watch office shall provide VONA and volcanic activity reports to a flight information centre or an area control centre (among other information: VAA, QVA).

Note: Consider Initial Proposal 6

NUEVOS PANS-MET (Apéndice C) Apéndice 7 - SVO|VONA

02

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APPENDIX 7. TECHNICAL SPECIFICATIONS
RELATED TO METEOROLOGICAL INFORMATION CONTAINING ADVISORIES,
ALERTS, AND WARNINGS (SIGMET, AIRMET) AND NOTICES

...

Editorial Note.— Insert new Table A7-1 as follows:

Table A7-1. Template for Volcano Observatory Notice for Aviation (VONA)

Key: M = inclusion mandatory, part of every message;
C = inclusion conditional, included whenever applicable.

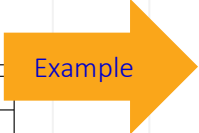
Note 1.— The ranges and resolutions for the numerical elements included in VONA are shown in Table A7-8 of this appendix.

Note 2.— The explanations for the abbreviations can be found in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400).

Note 3.— Inclusion of a colon after each element heading is mandatory.

Note 4.— The numbers 1 to 20 are included only for clarity and are not part of the notice, as shown in the examples.

Element	Detailed Content	Template(s)	Examples
1	Identification of the type of message (M)	VONA	VONA
2	Status indicator (C)	STATUS: TEST or EXER	STATUS: TEST EXER
3	Time of origin (M)	DTG: Nnnnnn/nnnnZ	DTG: 202102230130Z
4	Name of volcano (M)	VOLCANO: nnnnnnnnnnnnnnnnnnn (nnnnn) or UNKNOWN or UNNAMED	VOLCANO: KARYMSKY 300130 UNKNOWN UNNAMED
5	Location of volcano or volcanic ash source (M)	PSN: Nnnnn or Snnnn Wnnnn or Ennnn or Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] or Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] or Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]	PSN: N5403 E15927 UNKNOWN N5400 E15930 - N5400 E16100 - N5300 E15945



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Table A7-67. Template for wind shear warnings

Note 1.— The ranges and resolutions for the numerical elements included in wind shear warnings are shown in Table A7-78 of this appendix.

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Table A7-78. Ranges and resolutions for the numerical elements included in special air-reports, volcanic ash and tropical cyclone advisory information, VONA, SIGMET/AIRMET information and aerodrome and wind shear warnings

Element as specified in Chapter 6	Range	Resolution
Barometric elevation: M	000 – 3 100	1
FT	000 – 27 000	1
Advisory number: for VA (ndes)*	000 – 2 000	1
for TC (ndes)*	00 – 99	1
Notice number: for VONA (ndes)*	000 – 2 000	1
Maximum surface wind: MPS	00 – 99	1
KT	00 – 199	1

...

Editorial Note.— Insert new Example A7-1 as follows and re-number subsequent Examples

Example A7-1. Volcano Observatory Notice to Aviation

VONA	20240216/0130Z
DTG:	KARYMSKY 300130
VOLCANO:	N5403 E15927
PSN:	RUSSIA
AREA:	1536M AMSL
SOURCE ELEV:	20214
NOTICE NR:	YELLOW
CURRENT COLOUR CODE:	ORANGE
PREVIOUS COLOUR CODE:	EBERT
SVO:	DECREASED ACT
ACT STS:	NIL
ONSET:	NIL
DUR:	150M AMSL
VA CLD HGT:	GND OBSERVER
HGT SOURCE:	SW
MOV:	DUTY VOLCANOLOGIST, TEL +123-456-789 EMAIL, DUTY.VOLCANOLOGIST@ATJVOLCANO.COM,
CTC:	WWW.VOLCANO.COM
RMK:	SATELLITE, SURFMO, AND INFRASOUND DATA SHOW NO EVIDENCE OF FURTHER ERUPTIVE ACT. FUTURE EXPLOSIONS AT KARYMSKY ARE LIKELY. THEY OCCUR W/ WIND AND TYPICALLY PRODUCE SMALL VA CLD THAT DISSIPATE QUICKLY, HOWEVER, LARGER ASH EM ARE POSS.
NXT NOTICE:	WILL BE ISSUED BY 20240213/0130Z



Summary Proposals for BTI | SVO-VONA in Initial Proposal 3: 3.2



It proposes **improvements in the definitions** of the "State Volcano Observatory" (SVO) and IAVW (C.1, Annex 3) and **improvements in the content of C.3, 3.6 of Annex 3.**



It clarifies better to **whom the VONA (VAAC, MWO (OVM)), NOTAM office, ACC/FIC and corresponding OPMET international databases** should be disseminated, including VA resuspension. Need for Regional Agreements.



Introduces the issuance of Aviation Volcano Observatories (VONA) notices in Annex 3 Restructured as a recommended method ("Recommendation", C.7, 7.1.2, Annex 3)



In addition, it is proposed to eliminate the aeronautical color code of the volcanic ash warning (VAA), to use it only in VONA.



The SVO process is introduced in the PANS-MET, Chapters and Appendices.



Key Dates:

Effective Date: July 2024

Application Date : November 2024

Upcoming dates for the cycle of amendments to Annex 3 and the NAPs-MET



**Annex 3 (Amendment 81)
and New MET PANS**

July - In force -

November – Application

2024



**Annex 3 (Amendment 82)
and PANS MET**

Review by METP, ANC Review

2024



**Annex 3 (Amendment 82)
and PANS MET**

Review by States

2025



**Annex 3 (Amendment 82)
and PANS MET**

July - Effective

November - Application

2026



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Gracias!