



SAM/MP/3

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
SOUTH AMERICAN REGIONAL OFFICE**

**THIRD MEETING ON PROJECTS OF THE GREPECAS
MET PROGRAMME FOR THE SAM REGION**

(SAM/MP/3)

DRAFT REPORT

Lima, Peru, 17 to 20 June 2019

The designations and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of ICAO concerning the legal status of any country, territory, city or area, of its authorities, or concerning the delimitation of its frontiers or boundaries.

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HISTORY OF THE MEETING

ii-1 PLACE AND DURATION OF THE MEETING

The Third Meeting on Projects of the GREPECAS MET Programme for the SAM Region was held at the ICAO South American Regional Office in Lima, Peru, on 17-20 June 2019.

ii-2 OPENING CEREMONY AND OTHER MATTERS

Mrs. Verónica Chávez, Technical Assistance Officer, welcomed the participants and highlighted the important objectives of the Meeting regarding the implementation of improvements in international meteorological services for air navigation, in line with Amendment 78 to ICAO Annex 3, the objectives of the Global Air Navigation Plan, and GREPECAS programmes.

Mrs. Chávez also highlighted the presence of Mr. Raúl Romero, Secretary of the ICAO Meteorology Panel, and expressed her appreciation for his willingness to cooperate with the SAM Region in the tasks related to MET.

Furthermore, Mrs. Chávez acknowledged the presence of the delegates of Cuba and the United States, which contributed to the joint planning of solutions, thus optimising resources and achieving better performance indicators for the meteorological services provided in the CAR and SAM Regions in support of air navigation.

ii-3 SCHEDULE, ORGANISATION, WORK METHODS, OFFICERS AND SECRETARIAT

The Meeting agreed to hold its sessions between 08:30 and 16:00 hours, with the corresponding breaks, and to work in plenary sessions.

Mr. Iván González, delegate of Cuba, was unanimously elected as Chairman of the Meeting.

Mr. Jorge Armoa Cañete, AIM/MET Regional Officer of the ICAO South American Regional Office, acted as Secretary.

ii-4 WORKING LANGUAGES

The working languages of the Meeting were Spanish and English, with simultaneous interpretation services. The documentation was presented in both languages.

ii-5 AGENDA

The following agenda was adopted:

- Agenda Item 1: Seminar on Space Weather and IWXXM
- Agenda Item 2: Review of Project H2 – Implementation of the International Airways Volcano Watch (IAVW)
- Agenda Item 3: Review of Project H3 – Implementation of the MET information quality management system (QMS/MET)
- Agenda Item 4: Review of Project H4 – OPMET exchange
- Agenda Item 5: Review of Project H5 – MET service improvements in accordance with the new operational requirements in support of ATM
- Agenda Item 6: Planning of new MET projects
- Agenda Item 7: Review of MET national plans and part MET of the CAR/SAM e-ANP
- Agenda Item 8: Other business

ii-6 ATTENDANCE

The Meeting was attended by 28 participants from 10 SAM States (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Panama, Peru, Uruguay, and Venezuela), 2 CAR States (Cuba and United States), 1 international organisation (APADA-IFALDA) and 5 members of the industry.

The list of participants appears on page iii-1.

ii-7 LIST OF CONCLUSIONS ¹

No.	Title	Page
SAM/MP/04-01	OPMET exchange controls	4-1
SAM/MP/08-02	Follow-up to the recommendations of the AN/Conf-13 related to MET	8-2

¹ Conclusions are presented in the format requested by the Air Navigation Commission (ANC) through Working Paper 8993 (6/11/2015) Progress report of the *ad hoc* working group in the PIRG and RASG reports (item No. 20036).

LISTA DE PARTICIPANTES / LIST OF PARTICIPANTS**Lista de Participantes / List of Participants****ARGENTINA**

1. Vanina Lanebere
2. Roxana S. Vasques Ferro
3. Fernando Daniel Calvo

BOLIVIA

4. Paula Ramos Illanes

BRASIL

5. Luiz Carlos Teles Batista
6. Quilson De Aragao Santos

CHILE

7. Rodolfo Vergara

COLOMBIA

8. Juan Carlos Pulido
9. Miguel Aranguren

CUBA

10. Iván González Valdés

ECUADOR

11. Gabriel Arturo Lomas

ESTADOS UNIDOS

12. Matt Strahan

PANAMÁ

13. Celestino A. Lamboglia Tunon
14. Xenia Gabriela Guardia
15. Baldomero Thomas Bermúdez

PERÚ

16. Hugo Rosado Soto
17. Julio Quezada Pacheco
18. Ricardo Reyes Távara
19. Jorge Otiniano Rodríguez
20. Martín Polo Puelles
21. Frank Vega Abad
22. Jorge García Villalobos
23. Julio Villafuerte Osambela
24. Samira Cornejo Ramírez

URUGUAY

25. César Vecino
26. Natali Bentancor Silva

VENEZUELA

27. Antonio Espinoza Gutiérrez
28. Rafael Maluenga Mena

APADA - IFALDA

29. Gustavo Roberto D'Antiochia

OACI

30. Jorge Armoa
31. Raúl Romero

Agenda Item 1: Seminar on space weather and IWXXM

1.1 The Seminar on Space Meteorology was developed through four presentations, which were provided by the State of Argentina and by the Secretariat, available through the following links:

https://www.icao.int/SAM/Documents/2019-06901-MET3/7-%20Space_Weather_Lima_parte1.pdf

https://www.icao.int/SAM/Documents/2019-06901-MET3/8-%20Space_Weather_Lima_parte2.pdf

1.2 The first presentation was on space weather as a branch of science, describing the sun, its structure, properties and characteristics, and the various processes generated inside the sun and the outer effects of the solar mass generated by these processes.

1.3 The second presentation was on the impact of space phenomena, the visual effects of sun storms, the impact of geomagnetic storms, and solar event statistics.

1.4 The third presentation referred to the recommended norms and methods related to space meteorology included in Annex 3- Meteorological Service for International Air Navigation through Amendment 78 applicable since November 2018.

1.5 The fourth presentation referred to the process followed by ICAO for the establishment of the service of provision of information related to space meteorology for the support of international air navigation and for the designation of the centers responsible for the provision of the service.

1.6 The presentations have highlighted that, from an operational perspective, space weather events due to solar activity cause interruptions in aviation communications, navigation and surveillance systems, and raise radiation dose levels at flight altitudes. Space weather events can occur on short time scales with effects that occur from almost instantaneous to a period of a few days.

1.7 The Seminar on IWXXM consisted of a presentation by Venezuela, shown in **Appendix A** to this part of the report. The presentation was on the process followed by the *Servicio de Meteorología de la Aviación de Venezuela* (Aviation Weather Service of Venezuela) for the implementation of a TAC-to-XML/GML converter for OPMET messages.

APPENDIX A

Presentation on IWXXM Seminar

Agenda Item 2: Review of Project H2 – Implementation of the International Airways Volcano Watch (IAVW)

2.1 Under this agenda item, the Meeting reviewed the following paper:

- WP/02 – *Analysis of the implementation of IAVW in the SAM Region* (presented by the Secretariat)

2.2 The Meeting reviewed the status of implementation of Project H2, and noted that its name and scope had been modified by the Second meeting on MET projects through Conclusion MP/2-1, in the terms shown in **Appendix A** to this part of the report, in order to align it to the proposal of amendment 78 regarding improvements to SIGMETs on tropical cyclones and the release of radioactive material in the atmosphere.

2.3 The Project coordinator presented the results of the exercise on the volcanic ash SIGMETs conducted in the SAM Region in June of this year. The results are shown in **Appendix B** to this part of the report. From the report it can be highlighted that all the meteorological surveillance offices (MSOs) involved have participated, but with opportunities for improvement in relation to the cancellation of SIGMET messages, the use of the “EXER” code, the continuity of SIGMET message sequence, and other aspects related to the VAA interpretation (Volcanic Ash Advisory).

2.4 Regarding the SIGMET exercises of Volcanic Ash, the SAM Region States associated with the Washington VAAC, requested to coordinate with the aforementioned VAAC through the NACC Regional Office, in order to also prepare these exercises, because there is volcanic activity very continuous among some of these States and practices are necessary to fix the knowledge for when the real cases happen.

2.5 The Meeting considered it necessary to request the corresponding instances to study the feasibility of redistributing the areas of responsibility of the Volcanic Ash Advisory Centers (VAACs) of Washington and Buenos Aires. This request is due to the fact that important volcanic activities are observed in the states of Peru, Colombia, and Ecuador, there were reports of discrepancies between the products generated by the Washington VACC and the actual conditions in relation to the activity on them. The aforementioned States have been informed, if they wish, that they can prepare working papers for the next project review meeting and/or GREPECAS, where the observed cases of discrepancies are documented in order to describe the problem and formally request its study by ICAO.

2.6 The Meeting was informed by the Secretariat that this area was served by the Washington VAAC and that all aspects related to the operation of this and the remaining component centers for the monitoring of volcanoes in international airways (IAVW) were the responsibility of the Meteorological Panel through its Working Group on Meteorological Operations (METP / MOG). The Meeting was also informed that the tendency of the system was to decrease the number of surveillance centers and not increase it unless there were well-founded reasons for it. The Meeting was also informed that, to the date, the users had not expressed any problem, regarding the operation and provision of information by the corresponding surveillance center, for the aforementioned area.

2.7 Regarding the implementation of VONA, no new implementations have been reported.

2.8 Regarding Regarding the SIGMET messages for the release of radioactive material into the atmosphere, the Secretariat once again highlighted the lack of procedures in the States for cases of release of radioactive material into the atmosphere, radioactive or toxic clouds in the States, except for Argentina and Chile On this point, the Meeting urged the States, first to comply with the provisions set

out in Annex 3 regarding the release of radioactive material into the atmosphere, and then review the contingency procedures. On this point, the Secretariat informed the Meeting that the issue of radioactive material was raised for the consideration of the SAM Implementation Group (SAM/IG), which at its Meeting No. 23, issued the following conclusion in this regard:

CONCLUSION SAM/IG/23-04 Procedures in case of occurrence of radioactive clouds or accidental release of radioactive material	
<p>That:</p> <p>That civil aviation authorities and/or ATS authorities, in coordination with meteorological authorities and/or meteorological watch offices, implement procedures related to the issuance of SIGMETs, in order to:</p> <p>2.7.1.1.1 make sure that their ATS/MET cooperation agreements include information on radioactive material in the messages exchanged between ATS and MET units;</p> <p>2.7.1.1.2 provide for the training of ATS personnel on procedures related to the reception of information on radioactive material from the London VAAC; and</p> <p>2.7.1.1.3 coordinate the inclusion of the accidental release of radioactive material or the presence of radioactive clouds in their contingency plans.</p>	<p>Expected impact:</p> <p><input checked="" type="checkbox"/> Political / Global</p> <p><input checked="" type="checkbox"/> Interregional</p> <p><input checked="" type="checkbox"/> Economic</p> <p><input checked="" type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Technical/Operational</p>
Why: To meet the recommendations of ICAO Doc 9691 and the SARPS contained in Annex 3.	
When: Immediately	Status: Adopted by SAM/IG/23
Who: <input type="checkbox"/> Coordinators <input checked="" type="checkbox"/> States <input type="checkbox"/> ICAO Secretariat <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other: Users/industry	

2.9 The Meeting urged States to invoke this conclusion for developing the necessary procedures to address the occurrence of a release of radioactive material and of radioactive or toxic clouds. Furthermore, the Secretariat requested States to report the procedures implemented for these cases in order to prepare a catalogue of contingency plans on the release of radioactive material.

2.10 Regarding procedures for coordination between adjacent MWOs for monitoring severe phenomena affecting more than one FIR at the same time, no progress was reported for the FIRs that appear in the recommendation of the SAM/COM/MET/2019 meeting. The Meeting urged States to begin these coordination procedures in order to present consistent, homogeneous and seamless information upon the occurrence of severe phenomena affecting more than one FIR.

2.11 The World Meteorological Organization (WMO) presented a study on the occurrence of tropical storms or tropical depressions in the South Atlantic, expressing the concern of the WMO Tropical Cyclone Task Force in the sense that, during the 2019 event (TS Iba), no tropical cyclone advisories, and

therefore no SIGMETs on tropical cyclones, had been available for this phenomenon.

2.12 Taking into account that the Regional specialised meteorological centres that provided tropical cyclone advisories did not cover the Atlantic in their areas of responsibility, the WMO requested the Meeting to consider the need for tropical cyclone advisory requirements for said area.

2.13 In view of the above, the Meeting agreed that it would be necessary to submit to the Regional Planning and Implementation Group for the CAR/SAM Regions (GREPECAS) the aeronautical requirement for tropical cyclone advisory services in the South Atlantic and that this be reflected in the CAR/SAM Regional Air Navigation Plan.

APPENDIX B

VOLCANIC ASH SIGMET EXERCISE



Servicio
Meteorológico
Nacional
Argentina

Proyecto H2: Implantación de la Vigilancia de los volcanes en las aerovías internacionales “Ejercicio Fictitus”



Tercera Reunión sobre Proyectos del Programa MET del GREPECAS
Lic. Roxana S. Vasques Ferro

Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES



VOLCAN: FICTITUS PSN, S5000 – W07400

ALTITUD: 1500 m

INICIO: martes 4 de junio 2019 – 13:00UTC

FINALIZACION: martes 5 de junio 2019 - 13:00UTC

Primer VAA/VAG: Detección erupción por imágenes GOES E.

Involucra todas las FIRs asociadas al VAAC Buenos Aires.



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Apéndice 6

Anexo 3 — Servicio meteorológico para la navegación aérea internacional

Tabla A6-1A. Plantilla para mensajes SIGMET y AIRMET

Clave: M = inclusión obligatoria, parte de cada mensaje;
 C = inclusión condicional, incluido de ser aplicable;
 = = una línea doble indica que el texto que sigue debe colocarse en la línea subsiguiente.

Nota 1.— En la Tabla A6-4 del presente apéndice se indican los valores y las resoluciones de los elementos numéricos incluidos en los mensajes SIGMET/AIRMET.

Nota 2.— De conformidad con 1.1.5 y 2.1.5, no deberían incluirse el engelamiento fuerte o moderado ni la turbulencia fuerte o moderada (SEV ICE, MOD ICE, SEV TURB, MOD TURB) asociados a tormentas, nubes cumulonimbus o ciclones tropicales.



Elementos	Contenido detallado	Plantilla SIGMET	Plantilla AIRMET	Mensaje SIGMET Ejemplos	Mensaje AIRMET Ejemplos
Indicador de lugar de FIR/CTA (M) ¹	Indicador de lugar OACI de la dependencia ATS al servicio de la FIR o CTA a la que se refiere el SIGMET/AIRMET	nnnn		YUCC ² YUDD ²	
Nombre de la FIR/CTA (M)	Indicador de lugar y nombre de la FIR/CTA ⁴ para la cual se expide el SIGMET/AIRMET	nnnn nnnnnnnnn FIR o UIR o FIR/UIR o nnnn nnnnnnnnn CTA	nnnn nnnnnnnnn FIR[n]	YUCC AMSWELL FIR ² YUDD SHANLON ² FIR/UIR ² UIR FIR/UIR YUDD SHANLON CTA ²	YUCC AMSWELL FIR/2 ² YUDD SHANLON FIR ²
SI HÁ DE CANCELARSE EL SIGMET, VÉANSE LOS DETALLES AL FINAL DE LA PLANTILLA					
Indicador de estado (C) ⁵	Indicador de prueba o ejercicio	TEST o EXER	TEST o EXER	TEST EXER	TEST EXER
Fenómeno (M) ⁶	Descripción del fenómeno que lleva a expedir el SIGMET/AIRMET	OBSC ⁷ TS[GR ⁸] EMBD ⁹ TS[GR ⁸] FRQ ¹⁰ TS[GR ⁸] SQL ¹¹ TS[GR ⁸] TC nnnnnnnnn PSN	SFC WIND nnn/nn[n]MPS (o SFC WIND nnn/nn[n]KT) SFC VIS nnnM (nn) ¹⁶	OBSC TS OBSC TSGR EMBD TS EMBD TSGR FRQ TS cnc tscnc	SFC WIND 040/40MPS SFC WIND 310/20KT SFC VIS 1500M (BR) ISOL TS

...



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Inicio del Ejercicio

OVM PUNTA ARENAS SCCI (FIR SCCF)

4 JUNIO

12:47:44

WVCH31 SCCI 041209

SCCZ SIGMET 1 ~~EXER~~ VALID 041209/041809 SCCI-

SCCZ PUNTA ARENAS FIR **EXER** VA ERUPTION MT FICTITUS POS S5000 W07400

VA CLD OBS AT 1200Z=

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VAA

Tabla A2-1. Plantilla para mensaje de aviso de cenizas volcánicas

Clave: M = inclusión obligatoria, parte de cada mensaje;
 O = inclusión facultativa;
 C = inclusión condicional, se incluye cuando sea pertinente;
 = = una doble línea indica que el texto que sigue debería colocarse en la línea siguiente.

Nota 1.— En el Apéndice 6, Tabla A6-4 se presentan los intervalos de valores y las resoluciones de los elementos numéricos incluidos en los mensajes de aviso de cenizas volcánicas.

Nota 2.— En los Procedimientos para los servicios de navegación aérea — Abreviaturas y códigos de la OACI (PANS-ABC, Doc 8400) figuran las explicaciones de las abreviaturas.

Nota 3.— Es obligatoria la inclusión de “dos puntos” después de cada título de elemento.

Nota 4.— Se incluyen solamente para fines de claridad los números 1 a 19 y no forman parte del mensaje de aviso, según lo indicado en el ejemplo.



Anexo 3 — Servicio meteorológico para la navegación aérea internacional

Apéndice 2

Elementos	Contenido detallado	Plantillas	Ejemplos
1	Identificación del tipo de mensaje (M)	VA ADVISORY	VA ADVISORY
2	Indicador de estado (C) ¹	STATUS: TEST o EXER	STATUS: TEST EXER
3	Hora de origen (M)	DTG: nnnnnnnnnZ	DTG: 20080923/0130Z
4	Nombre del VAAC (M)	VAAC: nnnnnnnnnn	VAAC: TOKYO
5	Nombre del volcán (M)	VOLCANO: nnnnnnnnnnnnnnnnnnn [nnnnn] o UNKNOWN o UNNAMED	VOLCANO: KARYMSKY 1000-13 UNNAMED
6	Lugar del volcán (M)	PSN: Nnnn o Snnn Wnnnnn o Ennnn o UNKNOWN	PSN: N5403 E15927 UNKNOWN
7	Estado o región (M)	AREA: nnnnnnnnnnnnnnn	AREA: RUSSIA
8	Elevación de la cumbre (M)	SUMMIT ELEV: nnnm (o nnnmFT)	SUMMIT ELEV: 1536M
9	Número de aviso (M)	ADVISORY NR: nnn[n][n][n][n]	ADVISORY NR: 20084
10	Fuente de información (M)	INFO SOURCE: Texto libre hasta 32 caracteres	INFO SOURCE: MTSAT-1R KVERT KEMSD
11	Clave de colores (O)	AVIATION COLOUR CODE: RED o ORANGE o YELLOW o GREEN o UNKNOWN o NOT GIVEN o NIL	AVIATION COLOUR CODE: RED
12	Detalles de la erupción (M)	ERUPTION DETAILS: Texto libre hasta 64 caracteres o UNKNOWN	ERUPTION DETAILS: ERUPTION 20080923/0000Z FL300 REPORTED
13	Hora de observación (o estimación) de cenizas (M)	OBS (o EST) VA DTG: nnnmZ	OBS VA DTG: 23/0100Z

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Apéndice 2

Anexo 3 — Servicio meteorológico para la navegación aérea internacional

Elementos	Contenido detallado	Plantillas	Ejemplos
14	Nube de cenizas observada o prevista (M) Horizontal (en grados y minutos) y extensión vertical al momento de observación de la nube de cenizas observada o prevista o, si se desconoce la base, el tope de la nube de cenizas observada o prevista; Movimiento de la nube de cenizas observada o prevista	OBS VA CLD o EST VA CLD: TOP FLnnn o SFC/FLnnn o FLnnn [nnKM WID LINE] BTN (nnMM WID LINE BTN]) Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – MOV N nnKMh (o KT) o MOV NE nnKMh (o KT) o MOV E nnKMh (o KT) o MOV SE nnKMh (o KT) o MOV S nnKMh (o KT) o MOV SW nnKMh (o KT) o MOV W nnKMh (o KT) o MOV NW nnKMh (o KT) o VA NOT IDENTIFIABLE FM SATELLITE DATA WIND FLnnnnnn nnnn[nn]MPS (o KT) o WIND FLnnnnnn VRBnnMPS (o KT) o WIND SFC/FLnnn nnnn[nn]MPS (o KT) o WIND SFC/FLnnn VRBnnMPS (o KT)	OBS VA CLD: FL250/300 NS400 E15930 NS400 E16100 NS300 E15945 MOV SE 20KT SFC/FL200 NS130 E16130 – NS130 E16230 – NS230 E16230 – NS230 E16130 MOV SE 15KT TOP FL240 MOV W 40KMh VA NOT IDENTIFIABLE FM SATELLITE DATA WIND FLO50070 180/12MPS
15	Altura y posición de las nubes de ceniza pronosticadas (+ 6 HR) (M) Día y hora (en UTC) (6 horas desde la 'hora de observación (o estimación) de cenizas' indicada en el rubro 13); Altura y posición (en grados y minutos) de cada masa de nubes pronosticadas para el tiempo fijo de validez	FCST VA CLD +6 HR: nnnnnZ SFC o FLnnn[FL]hnn [nnKM WID LINE] BTN (nnMM WID LINE BTN]) Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – NO VA EXP o NOT AVBL o NOT PROVIDED	FCST VA CLD +6 HR: 23/0700Z FL250/350 NS130 E16030 – NS130 E16230 – NS330 E16230 – NS330 E16030 SFC/FL180 N4830 E16330 – N4830 E16630 – NS130 E16630 – NS130 E16330 NO VA EXP o NOT AVBL o NOT PROVIDED



Elementos	detalle	Plantillas	Ejemplos
16	Altura y posición de las nubes de ceniza pronosticadas (+12 HR) (M) Día y hora (en UTC) (12 horas desde la 'hora de observación (o estimación) de cenizas' indicada en el rubro 13); Altura y posición (en grados y minutos) de cada masa de nubes pronosticadas para el tiempo fijo de validez	FCST VA CLD +12 HR: nnnnnZ SFC o FLnnn[FL]hnn [nnKM WID LINE] BTN (nnMM WID LINE BTN]) Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – NO VA EXP o NOT AVBL o NOT PROVIDED	FCST VA CLD +12 HR: 23/1300Z SFC/FL270 N4830 E16130 – N4830 E16600 – NS300 E16600 – NS300 E16130 NO VA EXP o NOT AVBL o NOT PROVIDED
17	Altura y posición de las nubes de ceniza pronosticadas (+18 HR) (M) Día y hora (en UTC) (18 horas desde la 'hora de observación (o estimación) de cenizas' indicada en el rubro 13); Altura y posición (en grados y minutos) de cada masa de nubes pronosticadas para el tiempo fijo de validez	FCST VA CLD +18 HR: nnnnnZ SFC o FLnnn[FL]hnn [nnKM WID LINE] BTN (nnMM WID LINE BTN]) Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn] – NO VA EXP o NOT AVBL o NOT PROVIDED	FCST VA CLD +18 HR: 23/1900Z NO VA EXP o NOT AVBL o NOT PROVIDED
18	Observaciones (M)	RMK: Texto libre de hasta 256 caracteres o NIL	RMK: LATEST REP FM INVERT (0120Z) INDICATES ERUPTION HAS CEASED. TWO DISPERSING VA CLD ARE EVIDENT ON SATELLITE IMAGERY NIL
19	Siguiente aviso (M)	Año, mes, día y hora en UTC NXT ADVISORY: nnnnnnnnnZ o NO LATER THAN nnnnnnnnnZ o NO FURTHER ADVISORIES o WILL BE ISSUED BY nnnnnnnnnZ	NXT ADVISORY: 20080923/0730Z NO LATER THAN nnnnnnnnnZ o NO FURTHER ADVISORIES o WILL BE ISSUED BY

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4 JUNIO VAA

12:51:03

FVAG03 SABM 041300

VA ADVISORY EXER

DTG: 20190604/1300Z

VAAC: BUENOS AIRES

VOLCANO: FICTITUS 999999

PSN: S4959 W07359

AREA: CHILE

SUMMIT ELEV: 4921 FT (1500 M)

ADVISORY NR: 2019/001

INFO SOURCE: SIGMET MWO SCCI

AVIATION COLOR CODE: NOT GIVEN

ERUPTION DETAILS: EXER

OBS VA DTG: 04/1230Z

OBS VA CLD: SFC/FL340 S4229 W07312 - S4310 W06612 - S5006 W07407 - S4229 W07312 MOV NE 20KT

FCST VA CLD +6HR: 04/1830Z SFC/FL340 S3557 W07301 - S3913 W06455 - S5002 W07353 - S3557 W07301

FCST VA CLD +12HR: 05/0030Z SFC/FL340 S2926 W07415 - S3126 W06337 - S3700 W05657 - S4954 W07349 - S2926 W07415

FCST VA CLD +18HR: 05/0630Z SFC/FL340 S2128 W07419 - S2941 W06424 - S3217 W05543 - S5000 W07349 - S2128 W07419

RMK: THIS IS ONLY A EXERCISE. PLEASE

DISREGARD... .SMN

NXT ADVISORY: WILL BE ISSUED BY 20190604/1900Z=

18:58:35 VAA

FVAG03 SABM 041900

VA ADVISORY EXER

DTG: 20190604/1900Z

VAAC: BUENOS AIRES

VOLCANO: FICTITUS 999999

PSN: S4959 W07359

AREA: CHILE

SUMMIT ELEV: 4921 FT (1500 M)

ADVISORY NR: 2019/002

INFO SOURCE: EXER.

AVIATION COLOR CODE: NOT GIVEN

ERUPTION DETAILS: EXER

OBS VA DTG: 04/1900Z

OBS VA CLD: FL200/340 S3316 W06917 - S3801 W04548 - S4405 W06710 - S3316 W06917 MOV NE 15KT

FCST VA CLD +6HR: 05/0100Z FL200/340 S2228 W07035 - S2847 W05811 - S3732 W05107 - S3837 W06511 - S2228 W07035

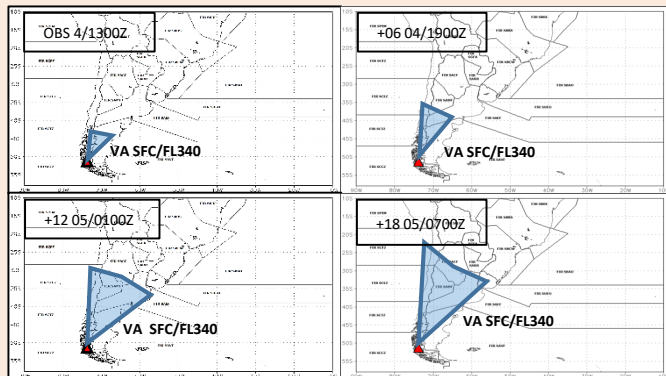
FCST VA CLD +12HR: 05/0700Z FL200/340 S1702 W06458 - S3159 W04950 - S3117 W06615 - S2043 W07323 - S1702 W06458

FCST VA CLD +18HR: 05/1300Z FL200/340 S1416 W06453 - S2637 W04444 - S2519 W07356 - S1522 W07829 - S1416 W06453

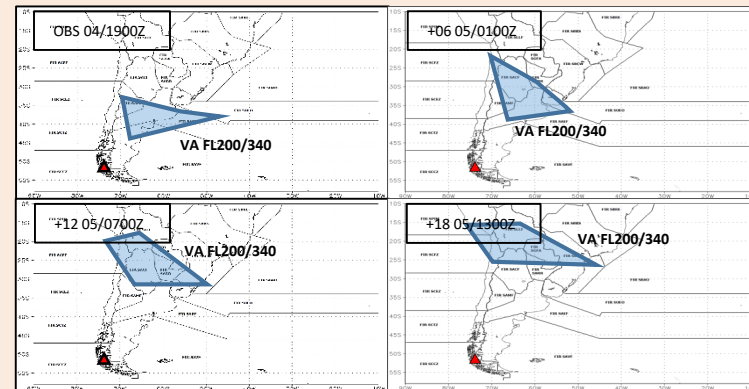
RMK: THIS IS ONLY A VAA EXERCISE. PLEASE DISREGARD...SMN

NXT ADVISORY: WILL BE ISSUED BY 20190605/0100Z=

VAG



VAG



Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES

5 Jun 2019

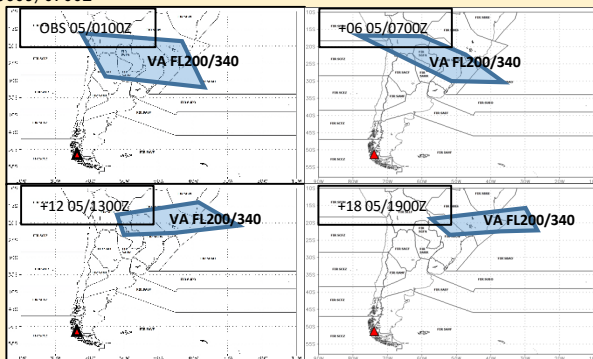
00:59:05

FVAG03 SABM 050100
VA ADVISORY EXER
DTG: 20190605/0100Z
VAAC: BUENOS AIRES
VOLCANO: FICTITUS 999999
PSN: S4959 W07359
AREA: CHILE
SUMMIT ELEV: 4921 FT (1500 M)
ADVISORY NR: 2019/003
INFO SOURCE: EXER.
AVIATION COLOR CODE: NOT GIVEN
ERUPTION DETAILS: EXER
OBS VA DTG: 05/0100Z
OBS VA CLD: FL200/340 S1530 W07328 - S1824 W04244 - S3217 W03814 - S2757 W06658 - S1530 W07328
MOV NE 15KT
FCST VA CLD +6HR: 05/0700Z FL200/340 S1600 W07838 - S1621 W06201 - S2127 W04440 - S2817 W03406 - S2726 W05832 - S1600 W07838
FCST VA CLD +12HR: 05/1300Z FL200/340 S1317 W03712 - S2123 W02559 - S2342 W05748 - S1816 W06414 - S1317 W03712
FCST VA CLD +18HR: 05/1900Z FL200/340 S1229 W02856 - S1952 W02337 - S2422 W05331 - S1910 W05704 - S1229 W02856
RMK: THIS IS ONLY A VAA EXERCISE. PLEASE DISREGARD...SMN
NXT ADVISORY: WILL BE ISSUED BY 20190605/0700Z=

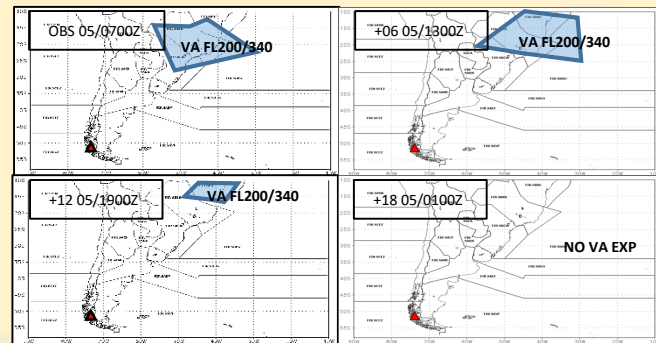
07:00:04

FVAG03 SABM 050700
VA ADVISORY EXER
DTG: 20190605/0700Z
VAAC: BUENOS AIRES
VOLCANO: FICTITUS 999999
PSN: S4959 W07359
AREA: CHILE
SUMMIT ELEV: 4921 FT (1500 M)
ADVISORY NR: 2019/004
INFO SOURCE: EXER.
AVIATION COLOR CODE: NOT GIVEN
ERUPTION DETAILS: EXER
OBS VA DTG: 05/0700Z
OBS VA CLD: FL200/340 S1133 W04018 - S2000 W02248 - S2734 W05127 - S1426 W05731 - S1452 W04635 - S1133 W04018 MOV NE 15KT
FCST VA CLD +6HR: 05/1300Z FL200/340 S1116 W04524 - S1125 W03007 - S2502 W02931 - S1956 W05637 - S1116 W04524
FCST VA CLD +12HR: 05/1900Z FL200/340 S1032 W03455 - S1604 W03743 - S1530 W05105 - S1041 W04417 - S1032 W03455
FCST VA CLD +18HR: 06/0100Z NO VA EXP
RMK: THIS IS ONLY A VAA EXERCISE. PLEASE DISREGARD...SMN
NXT ADVISORY: WILL BE ISSUED BY 20190605/1300Z=

VAG



VAG



Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES

13:00:05

FVAG03 SABM 051300

VA ADVISORY EXER

DTG: 20190605/1300Z

VAAC: BUENOS AIRES

VOLCANO: FICTITUS 999999

PSN: S4959 W07359

AREA: CHILE

SUMMIT ELEV: 4921 FT (1500 M)

ADVISORY NR: 2019/005

INFO SOURCE: EXER.

AVIATION COLOR CODE: NOT GIVEN

ERUPTION DETAILS: EXER

OBS VA DTG: 05/1300Z

OBS VA CLD: VA NOT IDENTIFIABLE FROM
SATELLITE DATA

FCST VA CLD +6HR: 05/1900Z NO VA EXP

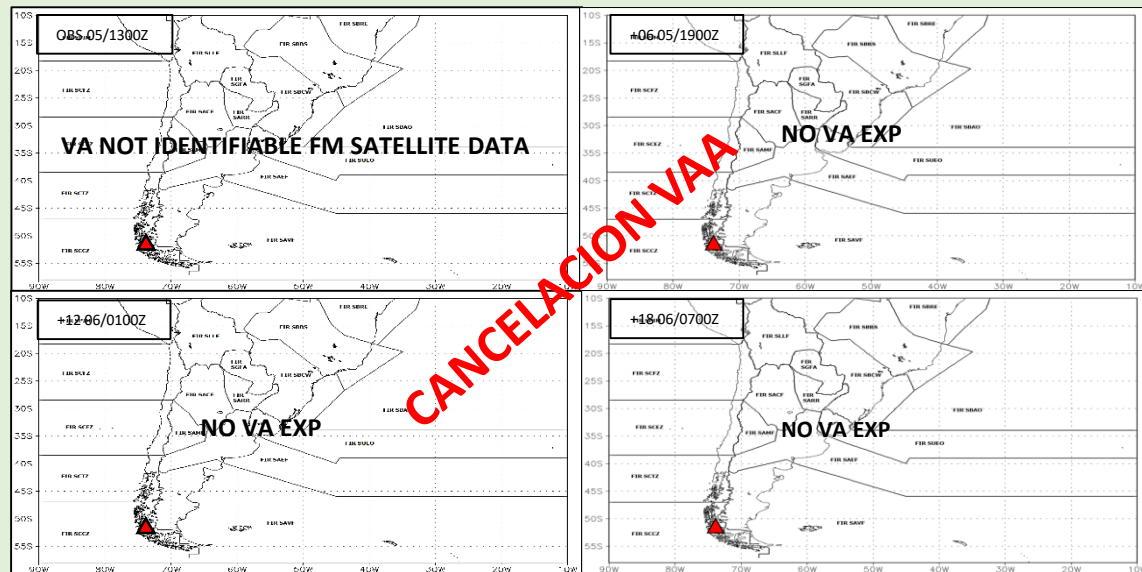
FCST VA CLD +12HR: 06/0100Z NO VA EXP

FCST VA CLD +18HR: 06/0700Z NO VA EXP

RMK: THIS IS ONLY A VAA EXERCISE. PLEASE
DISREGARD...SMN

NXT ADVISORY: NO FURTHER ADVISORIES=

VAG



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FICTITUS 2019			CORRIDAS (Mjes VAA)								
04/05 junio			04/JUN 13Z		04/JUN 19Z		05/JUN 01Z		05/JUN 07Z		05/JUN 13Z
		Niveles	SFC/FL340		FL200/FL340		FL200/340		FL200/340		FL200/ 340
Nombre FIR	SIGLA		OBS	FCST 06HS	OBS	FCST 06HS	OBS	FCST 06HS	OBS	FCST 06HS	OBS
A	Punta Arenas	SCCF	X	X	CNL						
B	Puerto Montt	SCTZ	X	X	CNL						
C	Santiago	SCEZ		X	CNL						
D	Antofagasta	SCFZ				X	X	X	CNL		
E	Comodoro Rivadavia	SAVF	X	X	X			CNL			
F	Ezeiza	SAEF		X	X	X		CNL			
G	Córdoba	SACF				X	X	X	CNL		
H	Mendoza	SAMF		X	X	X		CNL			
I	Resistencia	SAAR				X	X	X	CNL		
J	Montevideo	SUEO			X	X		CNL			
K	Curitiba	SBCW						X	X	X	X
L	Atlántico	SBAO						X	X	X	X
M	Brasilia	SBBS						X	X	X	X
N	Recife	SBRE							X	X	X
O	Asunción	SGFA						X	X	CNL	
P	La Paz	SLLF						X	X	CNL	
Q	Lima	SPIM						X	X	CNL	

Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES

ASHTAM RECIBIDOS CRT Buenos Aires

4 JUNIO

16:42:00

NOTA SABM 041641

VASC0002 SCCZ 06041300

ASHTAM 0002

A) SCCZ

B) 1906040100

C) VOLCAN FICTITUS 0000-00

D) POS S4959 W07359

F) VA CLD OBS AT 1230Z SCF/FL340 WI S4229 W07312 -

S4310 W06612- S5006

W07407 - S4229 W07312

G) MOV NE

H) SFC/FL340

J) SIGMET 2 SCCI

K) THIS IS ONLY AN ASHTAM TEST EXERCISE. PLEASE DISREGARD

16:42:31

NOTA SABM 041642

VASA0197 SAEZ 06041600

A) SAVF

B) 06041600

C) FICTITUS 999999

D) S4959 W07359 CHILE

E) NIL

F) OBS VA CLD SFC/FL340 S4229 WH7312-S4310 W006612-S5006 W07407- S4229 W07312 MOV NE 200KT

G) FCST VA CLD +6HR: 04/1830Z SFC/FL340 S3557 W07301- S3913 W06455- S5002 W07353- S3557 W07301

FCST VA CLD +12HR: 05/0030Z SFC/FL340 S2926 W07415- S31260W06337-S3700 W05657- S4954 W07349- S2926 W07415

FCST VA CLD +18HR: 05/0630Z SFC/FL340 S2128 W07419- S2941 W06424- S3217 W05543- S5000 W07349- S2128 W07419

H) OBS VA CLD SFC/FL390 UT658 UW50 UW39 UT110 UT105 UW40-UT658 UT659 UW58 UT110 UW39 UG550 UW50

+6 HS SE AGREGAN UW39 UW50

+12 HS UW33 SE AGREGAN UA570 UW18 UT693 UT700 UT657 UT106 UW41 UW39 UW44 UT658 UT109 UT108

J) VAAC: BUENOS AIRES

RMK: THIS IS ONLY A EXERCISE. PLEASE DISREGARD..... SMN

NXT ADVISORY.. WILL BE ISSUED BY 20190604/1900Z

5 JUNIO

03:46:19

NOTA SABM 050346

VASA0199 SAEZ 050100

(ASHTAM 0199

A) EXER00

B) 06050100

C) FICTITUS 999999

D) S4959 W07359

E) NIL

F) OBS VA CLD: FL200/340 S1530 W07328 - S1824 W04244- S3217 W03814 - S2757 W06658 - S1530 W07328

G) MOV

H) NIL

I) NIL

J) VAAC:

BUENOS AIRES

K) FCST VA CLD +6HR: 05/0700Z FL200/340 S1600 W07838 - S1621 W06201 - S2127 W04440 - S2817 W03406 -S2726 W05832 - S1600 W07838

FCST VA CLD +12HR: 05/1300Z FL200/340 S1317 W03712 - S2123 W02559 - S2342 W05748 - S1816

W06414 - S1317 W03712

FCST VA CLD +18HR: 05/1900Z FL200/340 S1229 W02856 - S1952 W02337 - S2422 W05331 - S1910

W05704 - S1229 W02856

RMK: THIS IS ONLY A VAA EXERCISE. PLEASE DISREGARD...SMN

NXT

ADVISORY: WILL BE ISSUED BY 20190605/0700Z=)

2019 | Año de la exportación

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Anexo 3 — Servicio meteorológico para la navegación aérea internacional

Apéndice 6



Elementos	Contenido detallado	Plantilla SIGMET	Plantilla AIRMET	Mensaje SIGMET Ejemplos	Mensaje AIRMET Ejemplos
Movimiento o movimiento previsto (C) ^{20, 25}	Movimiento o movimiento previsto (dirección y velocidad) con referencia a uno de los dieciséis puntos de la brújula, o estacionario	MOV N [nnKMH] o MOV NNE [nnKMH] o MOV NE [nnKMH] o MOV ENE [nnKMH] o MOV E [nnKMH] o MOV ESE [nnKMH] o MOV SE [nnKMH] o MOV SSE [nnKMH] o MOV S [nnKMH] o MOV SSW [nnKMH] o MOV SW [nnKMH] o MOV WSW [nnKMH] o MOV W [nnKMH] o MOV WNW [nnKMH] o MOV NW [nnKMH] o MOV NNW [nnKMH] (o MOV N [nnKT] o MOV NNE [nnKT] o MOV NE [nnKT] o MOV ENE [nnKT] o MOV E [nnKT] o MOV ESE [nnKT] o MOV SE [nnKT] o MOV SSE [nnKT] o MOV S [nnKT] o MOV SSW [nnKT] o MOV SW [nnKT] o MOV WSW [nnKT] o MOV W [nnKT] o MOV WNW [nnKT] o MOV NW [nnKT] o MOV NNW [nnKT]) o STNR		MOV SE MOV NNW MOV E 40KMH MOV E 20KT MOV WSW 20KT STNR	
Cambios de intensidad (C) ²⁰	Cambios de intensidad previstos	INTSF o WKN o NC		INTSF WKN NC	
Hora pronosticada (C) ²⁵	Indicación de la hora pronosticada del fenómeno	FCST AT nnnnZ	—	FCST AT 2200Z	—
Posición pronosticada TC (C) ²³	Posición pronosticada del centro TC al final del período de validez del mensaje SIGMET	TC CENTRE PSN Nnn[nn] o Snn[nn] Wnnn[nn] o Ennn[nn]	—	TC CENTRE PSN N1030 TC CENTRE PSN E1600015	—
Posición pronosticada (C) ^{20, 24, 25}	Posición pronosticada del fenómeno al final del período de validez del mensaje SIGMET	Nnn[nn] Wnnn[nn] o Nnn[nn] Ennn[nn] o Snn[nn] Wnnn[nn] o Snn[nn] Ennn[nn]	—	N30 W170 N OF N30 S OF S50 AND W OF	—

Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES

PUNTA ARENAS SCCI (SCCF)

4 JUNIO

12:47:44

WVCH31 SCCI 041209

SCCZ SIGMET 1 EXER VALID 041209/041809 SCCI-

SCCZ PUNTA ARENAS FIR EXER VA ERUPTION MT FICTITUS POS S5000 W07400 VA CLD OBS AT 1200Z=

13:04:08

WVCH31 SCCI 041300

SCCZ SIGMET 2 EXER VALID 041300/041900 SCCI-

SCCZ PUNTA ARENAS FIR EXER VA ERUPTION MT FICTITUS POS S4959 W07359 VA CLD OBS AT 1230Z SFC/FL340 WI S4229 W07312 - S4310 W06612 - S5006 W07407 - S4229 W07312 MOV NE 20KT

FCST AT VA-CLD +6HR: -04/1830Z SFC/FL340 WI S3557 W07301 - S3913 W06455 - S5002 W07353 - S3557 W07301=

13:23:49

WVCH31 SCCI 041322

SCCZ SIGMET 3 EXER VALID 041322/041900 SCCI -

SCCZ PUNTA ARENAS FIR EXER CNL SIGMET 2 VALID 041300/041900=

WVCH31 SCCI 041324

SCCZ SIGMET 4 EXER-VALID 041324/041900 SCCI-

SCCZ PUNTA ARENAS FIR EXER VA ERUPTION MT FICTITUS POS S4959 W07359 VA CLD OBS AT 1230Z SFC/FL340 E OF LINE S4700 W07400 - S5006 W07407 MOV NE 20KT FCST VA CLD AT +6HR: -04/1830Z SFC/FL340 E OF LINE S4700 W07301 - S5002 W07353=

19:09:24

WVCH31 SCCI 041908

SCCZ SIGMET 5 EXER VALID 041908/041908 041908/041918 SCCI-

SCCZ PUNTA ARENAS FIR EXER CNL SIGMET 4 EXER VALID 041324/041900=

PUERTO MONTT SCTZ

4 JUNIO

13:56:52

WVCH31 SCTE 041354

SCTZ SIGMET 01 EXER VALID 041354/041754 041900 SCTE- EL PERIODO DE VALIDEZ DEBERIA SER HASTA LAS 1900

SCTZ PUERTO MONTT FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 04/1230Z WI S4229 W07312 - S4310 W06612 - S5006 W07407 - S4229 W07312 SFC/FL340 MOV NE 20KT FCST AT 04/1830Z VA CLD APRX S3557 W07301 - S3913 W06455 - S5002 W7353 - S3557 W07301=

17:55:02

WVCH31 SCTE 041754

SCTZ SIGMET 02 EXER VALID 041754/042354 SCTE- EMITE UN SEGUNDO SIGMET CON EL MISMO VAA

SCTZ PUERTO MONTT FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 04/1230Z WI S4229 W07312 - S4310 W06612 - S5006 W07407 - S4229 W07312 SFC/FL340 MOV NE 20KT FCST AT 04/1830Z VA CLD APRX S3557 W07301 - S3913 W06455 - S5002 W7353 - S3557 W07301=

19:10:54

WVCH31 SCTE 041910

SCTZ SIGMET 03 EXER VALID 041910/042354 SCTE-

SCTZ PUERTO MONTT FIR EXER CNL SIGMET 02 EXER VALID 041754/042354=

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SANTIAGO SCCZ

4 JUNIO

15:57:12

WVCH31 SCEL 041500

SCCZ SIGMET 1 EXER VALID 041830/050030 SCEL-

SCEZ SANTIAGO FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD FCST AT 04/1830Z SFC/FL340 E OF LINE S3557 W07301 S3830 W07300=

21:05:49

WVCH31 SCEL 042100

SCCZ SIGMET 2 EXER VALID 042100/050030 SCEL-

SCEZ SANTIAGO FIR EXER CNL SIGMET 01 EXER VALID 041830/050030=

ANTOFAGASTA SCFZ

04 JUNIO

19:30:24

WVCH31 SCFA 041930

SCFZ SIGMET 01 EXER VALID 041930/050130 SCFA- **APECTA A LA FIR EN EL PRONOSTICO A 6 horas**

SCFZ ANTOFAGASTA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD ~~FCST WI S3316 W06917~~ -- ~~S3801 W04548~~ -- ~~S4405 W06710~~ -- ~~S3316 W06917 FL200/340 MOV NE 15KT NC~~ **FCST AT 05/0100Z** VA CLD APRX

S2228 W07035- S2847 W05811-S3732 W05107- S3837 W06511-S2228 W07035=

05 JUNIO

01:40:54

WVCH31 SCFA 050140

SCFZ SIGMET 01 EXER VALID 050140/050740 SCFA-

SCFZ ANTOFAGASTA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD **FCST OBS AT 1900Z** WI S1530 W07328 - S1824 W04244 - S3217 W03814 - S2757 W06658 - S1530 W07328 FL200/340 MOV NE 15KT NC

FCST 0700Z VA CLD APRX S1600 W07838 - S1621 W06201 - S2127 W04440 - S2817 W03406 -S2726 W05832 - S1600 W07838=

07:35:34

WVCH31 SCFA 050730 **DEBERIA HABERLO CANCELADO PORQUE NO AFECTA MAS LA FIR (COMO LE FALTA EL = VUELVE A HACER OTRO SIGMET)**

SCFZ SIGMET 02 VALID 050735/051335 SCFA-

SCFZ ANTOFAGASTA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 0700Z WI S1133 W04018 - S2000 W02248 - S2734 W05127 - S1426 W05731 - S1452 W04635 - S1133 W04018 FL200/340 MOV NE

15KT NC FCST 1300Z VA CLD APRX S1116 W04524 - S1125 W03007 - S2502 W02931 - S1956 W05637 -S1116 W04524=

07:38:33

WVCH31 SCFA 050738 **DEBERIA HABERLO CANCELADO-REPITE NUMERO DE SIGMET**

SCFZ SIGMET **02 03** EXER VALID 050738/051338 SCFA-

SCFZ ANTOFAGASTA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 0700Z WI S1133 W04018 - S2000 W02248 - S2734 W05127 - S1426 W05731 - S1452 W04635 - S1133 W04018 FL200/340 MOV NE

15KT NC FCST 1300Z VA CLD APRX S1116 W04524 - S1125 W03007 - S2502 W02931 - S1956 W05637 -S1116 W04524=

12:47:19

WVCH31 SCFA 051247

SCFZ SIGMET 03 VALID 051247/051335 SCFA-

SCFZ ANTOFAGASTA FIR EXER CNL SIGMET 02 050735/051335=

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COMODORO RIVADAVIA SAVF

4 JUNIO

13:03:03

WVAG31 SAVC 041300

SAVF SIGMET B1 VALID 041300/041900 SAVC-

SAVF COMODORO RIVADAVIA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 1230Z WI S4229 W07312 - S4310 W06612 - S5006 W07407 - S4229 W07312 SFC/FL340 MOV NE/20KT KF VA CLD FCST AT 1830Z WI S3557 W07301 - S3913 W06455 - S5002 W07353 - S3557 W07301 SFC/FL340=

13:10:05

WVAG31 SAVC 041309

SAVF SIGMET B1 VALID 041300/041900 SAVC-

SAVF COMODORO RIVADAVIA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 1230Z WI S4229 W07312 - S4310 W06612 - S5006 W07407 - S4229 W07312 SFC/FL340 MOV NE/20KT KT VA CLD FCST AT 1830Z WI S3557 W07301 - S3913 W06455 - S5002 W07353 - S3557 W07301 SFC/FL340=

13:36:01

WVAG31 SAVC 041336

SAVF SIGMET B2 VALID 041336/041900 SAVC-

SAVF COMODORO RIVADAVIA EXER CNL SIGMET B1 041300/041900=

13:41:01

WVAG31 SAVC 041343

SAVF SIGMET B3 EXER VALID 041343/041943 SAVC-

SAVF COMODORO RIVADAVIA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 1230Z WI S4229 W07312 - S4310 W06612 - S5006 W07407 - S4229 W07312 SFC/FL340 MOV NE/20KT KT VA CLD FCST AT 1830Z WI S3557 W07301 - S3913 W06455 - S5002 W07353 - S3557 W07301 SFC/FL340=

14:38:51

WVAG31 SAVC 041437 CCA

SAVF SIGMET B3 EXER VALID 041343/041943 SAVC-

SAVF COMODORO RIVADAVIA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359

VA CLD OBS AT 1230Z WI S4229 W07312 - S4310 W06612 - S5006 W07407 - S4229 W07312 SFC/FL340 MOV NE20KT VA CLD FCST AT 1830Z WI S3557 W07301 - S3913 W06455 - S5002 W07353 - S3557 W07301 SFC/FL340=

19:26:02

WVAG31 SAVC 041925

SAVF SIGMET B4 VALID 041925/VALID 04134 SAVF SAVC-

SAVF COMODORO RIVADAVIA FIR EXER CNL SIGMET B3 VALID=

19:32:03

WVAG31 SAVC 041931

SAVF SIGMET B5 EXER VALID 041931/042331 SAVC-

SAVF COMODORO RIVADAVIA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 1900Z WI S3316 W06917 - S3801 W04548 - S4405 W06710 - S3316 W06917 FL200/340 MOV MOV NE 15KT KF

VA CLD FCST AT 0100ZZ WI S2228 W07035 - S2847 W05811 - S3732 W05107 - S3837 W06511 - S2228 W07035 FL200/340=

01:00:00

FALTO SIGMET CNL SIGMET B5 041931/041940 SAVC-

Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES

EZEIZA SAEF

4 JUNIO

13:09:47

WVAG31 SABE 041300

SAEF SIGMET A1 EXER VALID 041300/041900 SABE-

SAEF EZEIZA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 ~~VA-CLD OBS AT 1230Z WI S4229 W07312 -- S4310 W06612 -- S5006 W07407 -- S4229 W07312 SFC/FL340 MOV NE 20KT~~ VA CLD FCST AT 1830Z WI S3557 W07301 - S3913 W06455 - S5002 W07353 - S3557 W07301 SFC/FL340=

19:05:03

WVAG31 SABE 041907

SAEF SIGMET A2 EXER VALID 041907/050107 SABE-

SAEF EZEIZA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 1900Z WI S3316 W06917 - S3801 W04548 - S4405 W06710 - S3316 W06917 FL200/340 MOV NE 15 KT VA CLD FCST AT 0100Z WI S2228 W07035 - S2847 W05811 - S3732 W05107 - S3837 W06511 - S2228 W07035 ~~FL200/340~~=

5 JUNIO

01:51:02

WVAG31 SABE 050152

SAEF SIGMET 1 EXER VALID 050152/050552 SABE- **SE DEBERIA HABER CANCELADO**

SAEF EZEIZA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359

VA CLD OBS AT 0100Z WI S1530 W07328 - S1824 W04244 - S3217 W03814 - S2757 W06658 - S1530 W07328 FL200/340 MOV NE 15KT ~~KT~~ VA CLD FCST AT 0700Z WI S1600 W07838 - S1621 W06201 - S2127 W04440 - S2817 W03406 - S2726 W05832 - S1600 W07838 ~~FL200/340~~=

07:10:01

WVAG31 SABE 050710

SAEF SIGMET 2 VALID 050710/051310 SABE- **SE DEBERIA HABER CANCELADO**

SAEF EZEIZA FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 0700Z WI S1133 W04018 - S2000 W02248 - S2734 W05127 - S1426 W05731 - S1452 W04635 - S1133 W04018 FL200/340 MOV NE 15 KT VA CLD FCST AT 1300Z WI S1116 W04524 - S1125 W03007 - S2502 W02931 - S1956 W05637 - S1116 W04524 ~~FL200/340~~ =

10:13:04

WVAG31 SABE 051012

SAEF SIGMET 3 VALID 051012/051310 SABE-

SAEF EZEIZA FIR EXER CNL SIGMET 2 050710/051310=

Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES

MENDOZA SAMF

4 junio

13:16:02

WVAG31 SAME 041300

SAMF SIGMET **NUMERO** EXER VALID 041300/041900 SAME-

SAMF MENDOZA FIR **EXER** VA ERUPTION MT FICTITUS PSN S4959 W07359

VA CLD **FCST** AT 1830Z WI S3557 W07301 - S3913 W06455 - S5002 W07353 - S3557 W07301 **BTN-SUP** **SFC** /FL340=

14:00:01

WVAG31 SAME 041359

SAMF SIGMET **E0** VALID 041359/041900 SAME-

SAMF MENDOZA FIR **EXER** CNL SIGMET EXER 041300/041900=

14:03:33

WVAG31 SAME 041401

SAMF SIGMET 2 **EXER**-VALID 041401/041405 SAME-

SAMF MENDOZA FIR **EXER** CNL SIGMET **EXER** VALID 041300/041900=

14:08:17

WVAG31 SAME 041410

SAMF SIGMET 3 EXER VALID 041410/041900 SAME-

SAMF MENDOZA FIR **EXER** VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD **FCST** AT 1830Z WI S3557 W07301 - S3913 W06455 - S5002 W07353 - S3557 W07301 **BTN** **SFC**/FL340=

19:09:01

WVAG31 SAME 041907

SAMF SIGMET 4 VALID 041907/040107 SAME-

SAMF MENDOZA FIR **EXER** VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD **OBS** AT 04/1900Z WI S3316 W06917 - S3801 W04548 - S4405 W06710 - S3316 W06917 FL200/340 MOV NE 15KT **KT-**VA CLD **FCST** AT

05/0100Z WI S2228 W07035 - S2847 W05811 - S3732 W05107 - S3837 W06511 - S2228 W07035 **FL200/340**=

19:34:01

WVAG31 SAME 041933

SAMF SIGMET 2 VALID 041933/040107 SAME-

SAMF MENDOZA FIR **EXER** CNL SIGMET 4 041907/040107=

19:54:04

WVAG31 SAME 041939

SAMF SIGMET 6 EXER VALID 041939/050139 SAME-

SAMF MENDOZA FIR **EXER** VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD **OBS** AT 1900Z WI S3316 W06917 - S3801 W04548 - S4405 W06710 - S3316 W06917 FL200/340 MOV NE 15KT

VA CLD **FCST** AT 0100Z WI S2228 W07035 - S2847 W05811 - S3732 W05107 - S3837 W06511 - S2228 W07035 **FL200/340**=

05 JUNIO

01:30:00

WVAG31 SAME 050129

SAMF SIGMET 1 VALID 050129/050139 SAME-

SAMF MENDOZA FIR **EXER** CNL SIGMET 6 041939/050139=

Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES

CORDOBA SACF

4 Junio

19:12:56

WVAG31 SACO 041900

SACF SIGMET 1 ~~EXER~~-VALID 041900/050100 SACO -

SACF CORDOBA FIR **EXER** VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD **FCST** AT 0100Z S2228 W07035- S2847 W05811 - S3732 W05107 - S3837 W06511 - S2228 W07035 FL200/340=

5 JUNIO

01:17:20

WVAG31 SACO 050100

SACF SIGMET 1 ~~EXER~~-VALID 050100/050700 SACO -

SACF CORDOBA FIR **EXER** VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD **OBS** AT 0100Z WI S1530 W07328 - S1824 W04244 - S3217 W03814 - S2757 W06658 - S1530 W07328 FL200/FL340 MOV NE 15KT

VA CLD **FCST** AT 0700Z WI S1600 W07838 - S1621 W06201 - S2127 W04440 - S2817 W03406 - S2726 W05832 - S1600 W07838 **FL200/340=**

07:12:56

WVAG31 SACO 050700

SACF SIGMET 2 ~~EXER~~ VALID 050700/050700 SACO -

SACF CORDOBA FIR **EXER** CNL SIGMET 1 050100/050700 ~~VA-FICTITUS-EXERCISE=~~

RESISTENCIA SARR

4 JUNIO

19:00:00

FALTA SIGMET SOLO FCST +06

5 JUNIO

01:03:05

WVAG31 SARE 050100

SARR SIGMET 1 ~~EXER~~ VALID 050100/050700 SARE -

SARR RESISTENCIA FIR **EXER** VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD **OBS** AT 0100Z WI S1530 W07328 - S1824 W04244 - S3217 W03814 - S2757 W06658 - S1530 W07328 FL 200/340 MOV NE 15KT

VA CLD **FCST** AT 0700Z WI S1600 W07838 - S1621 W06201 - S2127 W04440 - S2817 W03406 - S2726 W05832 - S1600 W07838 **FL200/340=**

07:10:00

WVAG31 SARE 050700

SARR SIGMET 2 ~~EXER~~ VALID 050700/050800 SARE -

SARR RESISTENCIA FIR **EXER** CNL SIGMET 1 ~~EXER~~ VALID 050100/050700=

Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES

MONTEVIDEO SUEO

4 Junio

19:58:03

WVUY31 SUMU 041950

SUEO SIGMET 1 VALID 041950/050150 SUMU-

SUEO MONTEVIDEO FIR **EXER** VA ERUPTION MT FICTITUS PSN S4959 W07379- VA CLD **OBS** AT 1900Z WI S3316 W06917 - S3801 W04548 - S4405 W06710- S3316 W06917 FL200/340 MOV NE 15KT VA CLD **FCST** AT WI S2228 W07035 - S2847 W05811- S3732 W05107- S3837 W06511 - S2228 W07035 **FL200/340=**

19:59:32

WVUY31 SUMU 042000

SUEO SIGMET 1 VALID 041950/050150 SUMU-

SUEO MONTEVIDEO FIR EXER VA ERUPTION MT FICTITUS EXER PSN S4959 W07379- VA CLD **OBS** AT 1900Z WI S3316 W06917 - S3801 W04548 - S4405 W06710- S3316 W06917 FL200/340 MOV NE 15KT VA CLD **FCST** AT WI S2228 W07035 - S2847 W05811- S3732 W05107- S3837 W06511 - S2228 W07035 **FL200/340=**

5 JUNIO

01:37:05

WVUY31 SUMU 050135

SUEO SIGMET 1 ~~EXER~~ VALID 050135/051035 SUMU-

SUEO MONTEVIDEO FIR **EXER SIGMET 1 VALID 050135/050135** CNL SIGMET 1 VALID 041950/050150=

01:41:08

WVUY31 SUMU 050138

SUEO SIGMET 1 ~~EXER~~ VALID 050138/051038 SUMU-

SUEO MONTEVIDEO FIR **EXER** CNL SIGMET 1 VALID 041950/050150=

01:53:43

WVUY31 SUMU 050150

SUEO SIGMET 1 VALID 050150/051050 SUMU-

SUEO MONTEVIDEO FIR EXER CNL SIGMET 1 VALID 041950/050150=

01:57:12

WVUY31 SUMU 050154

SUEO SIGMET 1 ~~EXER~~ VALID 050154/051054 SUMU-

SUEO MONTEVIDEO FIR **EXER** CNL SIGMET 1 ~~EXER~~ VALID 041950/050150=

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ASUNCION SGFA

5 JUNIO

03:41:19

WVPY31 SGAS 050100

SGFA SIGMET 01 EXER VALID 050100/050600 SGAS- FALTA LA PARTE FCST

ASUNCION FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 0100Z WI S1530 W07328 - S1824 W04244 - S3217 W03814 - S2757 W06658 - S1530 W07328 FL200/340 MOV NE 15KT=

07:10:16

WVPY31 SGAS 050700

SGFA SIGMET 01 EXER VALID 050700/051300 SGAS- SE DEBERIA HABER CANCELADO

SGFA-ASUNCION FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 0700Z WI S1133 W04018 - S2000 W02248 - S2734 W05127 - S1426 W05731 - S1452 W04635 - S1133 W04018 FL200/340 -MOV-NE-15KT=

10:42:14

WVPY31 SGAS 051040

SGFA SIGMET 03 EXER VALID 051040/051640 SGAS-

SGFA ASUNCION FIR EXER CNL SIGMET 02 EXER VALID 050700/051300=

FALTA SIGMET 04

13:40:34

WVPY31 SGAS 051340

SGFA SIGMET 05 EXER VALID 051340/051940 SGAS-

SGFA ASUNCION FIR EXER CNL SIGMET 04 EXER VALID 050700/051300=

LA PAZ SLLF

5 JUNIO

01:12:18

WVBO31 SLLP 050102

SLLF SIGMET 1 VALID 050102/010702 SLLP-

SLLF LA PAZ FIR EXER VA ERUPTION MT FICTITUS POS PSN S4959 W07359 VA CLD OBS AT 0100Z FL200/340 WI S1530 W07328 - S1824 W04244 - S3217 W03814 - S2757 W06658 - S1530 W07328 MOV NE 15KT FCST VA CLD AT 0700Z FL200/340 WI S1600 W07838 - S1621 W06201 - S2127 W04440 - S2817 W03406 - S2726 W05832 - S1600 W07838=

01:48:25

WVBO31 SLLP 050102 CCA

SLLF SIGMET 1 VALID 050102/050702 SLLP-

SLLF LA PAZ FIR EXER VA ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 0100Z FL200/340 WI S1530 W07328 - S1824 W04244 - S3217 W03814 - S2757 W06658 - S1530 W07328 MOV NE 15KT FCST VA CLD AT 0700Z FL200/340 WI S1600 W07838 - S1621 W06201 - S2127 W04440 - S2817 W03406 - S2726 W05832 - S1600 W07838=

13:51:01

WVBO31 SLLP 050702

SLLF SIGMET 2 EXER-VALID 050702/050702 SLLP-

SLLF LA PAZ FIR EXER CNL SIGMET 1 EXER VALID 050102/050702 SLLP=

Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES

LIMA SPIM

5 JUNIO

01:14:17

WVPR31 SPIM 050103

SPIM SIGMET 1 EXER VALID 050114/050714 SPIM-

SPIM LIMA FIR VA EXER ERUPTION MT FICTITUS PSN S4959 W07359 VA CLD OBS AT 0100Z WI S1530 W07328 - S1824 W04244 - S3217 W03814 - S2757 W06658 - S1530 W07328 FL200/340 MOV NE 15KT

FCST AT 0700Z VA CLD WI S1600 W07838 - S1621 W06201 - S2127 W04440 - S2817 W03406 - S2726 W05832 - S1600 W07838=

07:05:34

WVPR31 SPIM 050704

SPIM SIGMET 2 EXER VALID 050704/050714 SPIM-

SPIM LIMA FIR EXER CNL SIGMET 1 EXER VALID 050114/050714=

BRASILIA

5 JUNIO

04:10:59

WVBZ31 SBBS 050410

SBBS SIGMET 1 FESTE-NO-VALID 050100/050700 SBBS -

SBBS BRASILIA FIR EXER VA ERUPTION MT FICTITUS EXERCISE PSN S4959 W07359 VA CLD OBS AT 0100Z WI S1757 W05313 - S1823 W04243 - S1909 W04231 - S2028 W04233 - S2011 W04322 - S2022 W04328 - S2029

W04345 - S2030 W04404 - S2247 W04547 - S2314 W04551 - S2324 W04619 - S2328 W04655 - S2313 W04724 - S2301 W04733 - S2239 W04735 - S2204 W04800 - S2131 W04937 S1757 W05313 BFN FL200/340 MOV NE

15KT VA FCST AT 0700Z WI S1943 W05125 - S2125 W04445 - S2245 W04546 - S2315 W04552 - S2324 W04621 - S2328 W04657 - S2311 W04725 - S2301 W04734 - S2240 W04735 - S2205 W04759 - S2133 W04937 -

S2035 W05031 - S1943 W05125 FL200/340=

07:11:23

WVBZ31 SBBS 050710

SBBS SIGMET 2 FESTE-NO-VALID 050700/051300 SBBS -

SBBS BRASILIA FIR EXER VA ERUPTION MT FICTITUS EXERCISE PSN S4959 W07359 VA CLD OBS AT 0700Z WI

S1437 W05337 - S1451 W04634 - S1403 W04505 - S1540 W04407 - S1704 W04143 - S1836 W04232 - S2027 W04233 - S2012 W04321 - S2029 W04339 - S2030 W04405 - S2246 W04548 - S2317 W04552 - S2329 W04653

- S2305 W04735 - S2242 W04734 - S2204 W04759 - S2133 W04933 - S1720 W05354 - S1642 W05306 - S1437 W05337 BFN FL200/340 MOV NE 15KT VA FCST AT 1300Z WI S1215 W04641 - S1320 W04535 - S1402 W04505

- S1536 W04407 - S1705 W04142 - S1837 W04231 - S2028 W04231 - S2015 W04321 - S2032 W04342 - S2031 W04404 - S2247 W04546 - S2315 W04547 - S2332 W04655 - S2307 W04735 - S2244 W04738 - S2205 W04802

- S2132 W04937 - S1739 W05334 - S1215 W04641 FL200/340=

13:00:00

NO SE RECIBIO CANCELACION SIGMET 2 050700/051300 SBBS

CURITIBA SBCW

5 JUNIO

01:00:00

NO SE RECIBIO SIGMET SBCW OBS Y FCST

07:15:15

WVBZ31 SBCW 050703 REALIZA EL POLIGONO SOBRE SU FIR

SBCW SIGMET 4 FESTE-NO-VALID 050700/051300 SBCW - SBCW CURITIBA FIR EXER VA ERUPTION MT FICTITUS EXERCISE PSN S4959 W07359 VA CLD OBS AT 0700Z WI S1741 W05607 - S2733 W05128 - S2553 W04237 -

S2226 W03812 - S2044 W03949 - S2054 W04032 - S2025 W04101 - S2037 W04202 - S2014 W04322 - S2026 W04340 - S2028 W04405 - S2240 W04548 - S2313 W04552 - S2327 W04656 - S2300 W04737 - S2241 W04738 -

S2153 W04833 - S2134 W04935 - S1934 W05134 - S1715 W05354 - S1733 W05441 - S1741 W05607 BFN FL200/340 MOV NE 15KT VA FCST AT 1300Z S1116 W04524 - S1125 W03007 - S2502 W02931 - S1956 W05637 -

S1116 W04524 FL200/340=

13:00:00

NO SE RECIBIO CANCELACION SIGMET 2 050700/051300 SBCW

Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES

RECIFE

5 JUNIO

08:08:37

WVBZ31 SBRE 050806

SBRE SIGMET 1 ~~FEST-NO-VALID~~ 050700/051300 SBRE-

SBRE RECIFE FIR **EXER** VA ERUPTION MT FICTITUS EXERCISE PSN S4959 W07359 VA CLD **OBS** AT 0700Z WI S1134 W04016 - S1322 W03637 - S1829 W03858 - S1849 W03738 - S2113 W03922 - S2043 W03949 - S2053 W04033 - S2025 W04100 - S2037 W04200 - S2027 W04233 - S1837 W04229 - S1704 W04143 - S1542 W04407 - S1403 W04504 - S1134 W04016 BTN FL200/340 MOV NE 15KT VA FCST AT 1300Z S1217 W04635 - S1117 W04528 - S1118 W03534 - S1506 W03739 - S1635 W03805 - S1819 W03903 - S1854 W03737 - S2107 W03926 - S2040 W03950 - S2055 W04029 - S2027 W04104 - S2037 W04201 - S2024 W04232 - S1833 W04234 - S1659 W04145 - S1531 W04409 - S1313 W04537 - S1217 W04635 ~~FL200/340=~~

13:00:00

NO SE RECIBIO CANCELACION SIGMET 2 050700/051300 SBRE

ATLANTICO

5 JUNIO

FALTA SIGMET DE 01:00Z

08:18:46

WVBZ31 SBRE 050817

SBAO SIGMET 4 ~~FEST-NO-VALID~~ 050700/051300 SBAO-

SBAO ATLANTICO FIR **EXER** VA ERUPTION MT FICTITUS EXERCISE PSN S4959 W07359 VA CLD **OBS** AT 0700Z WI

S2458 W04120 - S1959 W02247 - S1320 W03639 - S1506 W03739 - S1635 W03805 - S1819 W03903 - S1854 W03737 - S2107 W03926 - S2225 W03816 - S2458 W04120 ~~BTN~~ FL200/340 MOV NE 15KT VA FCST AT 1300Z WI S2310 W03904 - S2503 W02926 - S1127 W03006 - S1119 W03536 - S1507 W03738 - S1637 W03802 - S1824 W03859 - S1857 W03742 - S2108 W03922 - S2227 W03816 - S2310 W03904 ~~FL200/340=~~

13:00:00

NO SE RECIBIO CANCELACION SIGMET 2 050700/051300 SBRE

Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES

Referencias de las correcciones:

- En verde: correcciones realizadas
- ~~En rojo~~: texto incorrecto

Conclusiones:

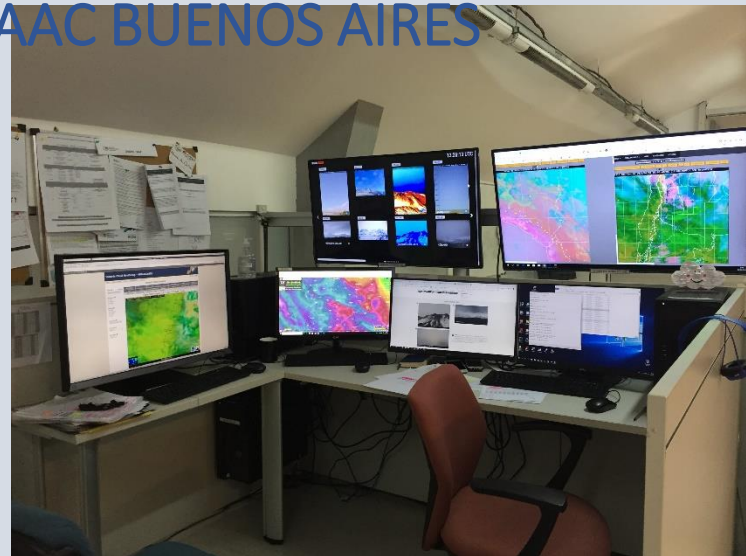
Mensajes SIGMET

- La palabra **EXER** estaba en la posición incorrecta en el ejemplo para mensaje SIGMET (Anexo 3, AP. 6, Tabla A6-1A).
- FCST **AT** ~~VA-CLD+6HR: 04/~~1830Z, (Anexo 3, AP. 6, Tabla A6-1A)
- El período de validez es desde la hora de emisión del mensaje SIGMET hasta la hora de emisión del próximo VAA,
- El período de validez de una CNL SIGMET tiene que ser de aproximadamente 5 a 10 minutos,
- Si existe una parte OBS y FCST, la parte FCST no lleva nivel de vuelo ni movimiento,
- Hubieron varios casos en los cuales sólo estaba afectada la FIR por la nube en el FCST+06 y sin embargo enviaban datos de la nube OBS cuando no afectaba a la FIR.
- En ocasiones sucedió que no enviaron SIGMET cuando les afectaba FCST+06.
- En otros casos enviaron SIGMET cuando sin que la nube afectara la FIR bajo su responsabilidad.
- En el caso que se cometieron errores y fueron identificados en el momento, no utilizaron el CCA.
- No se utiliza el TESTE NO VALID

ASHTAM

- Solo se recibieron ASHTAM de Chile (1) y de Argentina (2) en el CRT Buenos Aires.

Ejercicio FICTITUS 2019 – VAAC BUENOS AIRES



FVAG03 SABM 041300
VA ADVISORY EXER
DTG: 20190604/1300Z
VAAC: BUENOS AIRES
VOLCANO: FICTITUS 999999
PSN: S4959 W07359
AREA: CHILE
SUMMIT ELEV: 4921 FT (1500 M)
ADVISORY NR: 2019/001
INFO SOURCE: SIGMET MWO SCCI
AVIATION COLOR CODE: NOT GIVEN
ERUPTION DETAILS: EXER
OBS VA DTG: 04/1230Z
OBS VA CLD: SFC/FL340 S4229 W07312 - S4310 W06612 - S5006 W07407
- S4229 W07312 MOV NE 20KT
FCST VA CLD +6HR: 04/1830Z SFC/FL340 S3557 W07301 - S3913 W06455
- S5002 W07353 - S3557 W07301
FCST VA CLD +12HR: 05/0030Z SFC/FL340 S2926 W07415 - S3126
W06337 - S3700 W05657 - S4954 W07349 - S2926 W07415
FCST VA CLD +18HR: 05/0630Z SFC/FL340 S2128 W07419 - S2941
W06424 - S3217 W05543 - S5000 W07349 - S2128 W07419
RMK: THIS IS ONLY A EXERCISE. PLEASE
DISREGARD... ..SMN
NXT ADVISORY: WILL BE ISSUED BY 20190604/1900Z=





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Ministerio de Defensa
Presidencia de la Nación

2019 | Año de la exportación

Agenda Item 3: Review of Project H3 – Implementation of the MET information quality management system (QMS/MET)

3.1 Under this agenda item, the Meeting reviewed the following paper:

- WP/05 – *Analysis of the implementation of QMS/MET in the SAM Region* (presented by the Secretariat).

3.2 The Meeting reviewed the status of implementation of Project H3 – Implementation of QMS/MET.

3.3 The Meeting recalled that MP/2 had taken note of the status of implementation of QMS/MET in the SAM Region. States took note that all implementations had to be in ISO 9001 2015. The Secretariat also reminded States that QMS/MET certification had to include all meteorological units of all international airports listed in Table AOP of the CAR/SAM e-ANP.

3.4 The Meeting took note that, by December 2018, the States that had implemented and certified their QMS/MET, including the new requirements, were: **Brazil, Chile, Panama, Paraguay and Peru**. During the Meeting, the States that had not yet completed the implementation and certification of their QMS/MET provided information, as shown in Table 1.

3.5 Brazil reported that they have implemented the QMS/MET with the 2015 version of the ISO 9001 Standard. Certification audits will have it for the second half of 2020.

3.6 Furthermore, it was noted that Mr. Pablo Malve no longer worked in ANAC-Argentina and, therefore, should be removed as coordinator of Project H3 for the SAM Region. Mr. Baldomero Thomas, delegate of Panama, was designated as Project Coordinator.

3.7 Likewise, Venezuela reported that Mr. Edward León no longer worked in SERMETAVIA, and thus should be replaced in the H3 project team.

3.8 The Secretariat also noted that the project had been extended, without meeting its objectives, because of the new requirements introduced by ISO 9001 2015. Accordingly, the Meeting urged the States to meet the target date of the Project, set for December 2020.

3.9 The project description is shown in **Appendix A** to this part of the report.

Table 1: Status of implementation of QMS/MET in the SAM Region

QMS/MET implementation – SAM Region			
STATE	Implemented	Certified	In process of certification
Argentina	In process of alignment to ISO 9001 2015	Certification audits scheduled for June 2019 for the Ezeiza, Aeroparque and Córdoba airports	
Bolivia	Implementation completed	Audit scheduled for August 2019 for the La Paz, Santa Cruz de la Sierra and Cochabamba airports	70%
Brazil	✓	✓	
Chile	✓	✓	
Colombia	IDEAM – MET group implemented – UAEAC - Implemented	IDEAM- Certified UAEAC – No	MET-related processes should be certified. Accordingly, certification was extended
Ecuador	In process of implementation		Not started
Guyana	✓	In process	Not started
French Guiana	✓	✓	
Panama	✓	✓	
Paraguay	✓	✓	
Peru	✓	✓	
Suriname	No information on alignment to ISO 90001 2015	No information on alignment to ISO 90001 2015	
Uruguay	✓	No information on alignment to ISO 90001 2015	
Venezuela	Implementation was based on version 2008. Processes have been updated to ISO 9001 2015. Audits cannot be carried out because the certifying body does not have a MET expert among its auditors.	Support will be requested from the Regional Office for the provision of a MET auditor.	Not started

APPENDIX A

PROJECT FOR THE IMPLEMENTATION OF THE MET INFORMATION QUALITY MANAGEMENT SYSTEM (QMS/MET)

SAM Region	PROJECT DESCRIPTION (DP)	DP N° H3	
Programme	Title of the Project	Start	End
Aeronautical Meteorology (Programme coordinator: Jorge Armoa)	Implementation of the QMS/MET <i>Project coordinator: Pablo Malvé (Argentina)</i> <i>Experts contributing to the project: César Acosta (Ecuador)</i> <i>Baldomero Thomas (Panamá)</i> <i>Jorge Sánchez (Paraguay)</i> <i>Hugo Rosado (Perú)</i> <i>Ricardo Reyes (Perú)</i> <i>Edward León (Venezuela)</i>	January 2016	December 2020
Objective	Assist States in the implementation of the QMS/MET and certification, where applicable, and establish guidelines for the transition to the standard ISO 9001: 2015, aligned to ASBU and projected to the interoperability of meteorological information, in compliance with Annex 3.		
Scope	Establishment and application of a quality management system of meteorological data safety-oriented at each MET unit of all SAM aerodromes listed in CAR/SAM ANP and compliance with the standards and recommended practices of Annex 3 and the CAR/SAM e-ANP, Vol. I and Vol. II.		
Metrics	Number of AOP aerodromes certified under ISO 9001 in force.		
Strategy	All tasks will be carried out by experts nominated by SAM States participating in the project, led by the Project Coordinator and under the supervision of the MET Programme Coordinator through the “GoToMeeting” tool. Upon completion of the tasks, the results will be sent to the MET Programme Coordinator as a final document for submission to, and if necessary approval by, the GREPECAS CRPP through the GREPECAS fast-track procedure. For the purpose of collaborative decision-making, meetings will be held with the areas involved.		
Goals	<ul style="list-style-type: none"> a) 100% of SAM States have established QMS/MET system in accordance with standard ISO 9001:2008 on 30 June 2016; b) 70% of SAM States apply and certify QMS/MET system in accordance with standard ISO 9001:2015 on 31 December 2017; and c) 100% of SAM States have QMS/MET system certified by an organization in accordance with standard ISO 9001:2015 in June 2019. 		
Rationale	More accurate and timely meteorological information will optimise flight path planning and prediction, thus improving ATM safety and efficiency; improved aerodrome reports and forecasts will optimise the use of available aerodrome capacity; and meteorological information will minimise the environmental impact of air traffic. Performance management will be an important part of meteorological information quality assurance.		
Related projects	<ul style="list-style-type: none"> ➤ Automation ➤ Improved ATM situational awareness 		

Project Deliverables	Relationship with the regional performance-based plan (PFF)	Responsible Party	Status of Implementation	Date of Delivery	Comments
Guidelines for the transition to Standard ISO 9001:2015	PFF SAM MET 02, 03, and 04	MET programme coordinator and project director		September 2016	The guidelines will facilitate the drafting of ISO 9001: 2015 documentation by MET service provider States.
Survey to States on MET personnel completed	PFF SAM MET 02, 03, and 04	MET programme coordinator and project director		November 2016	One of the main problems facing MET service provider States is the lack of personnel with the qualifications and competencies required by WMO and ICAO. State requirements will be officially communicated to ICAO contracting States.
Prepare the assessment plan of personnel competency, qualifications, professional education and aeronautical meteorology personnel training.				Diciembre 2019	Follow up on the tasks related to this item in order to take note of compliance of Standard 2.1.5 of Annex 3 and to the requirements of WMO Technical Regulations No. 49, Part V and Part VI.
Table of compliance with Eanp CAR/SAM, Part VI – MET, Vol I.	PFF SAM MET 02, 03, and 04	MET programme coordinator and project director		June 2016	Close monitoring of compliance with Part MET of Volume I of the e-ANP CAR/SAM.
Report of the MET service risk management workshop	PFF SAM MET 02, 03, and 04	MET programme coordinator and project director		August 2016	June 2016 has been scheduled as a possible date for the development of the workshop seminar on “Risk Analysis”.
Update course in Leader Auditor	PFF SAM MET 02, 03, and 04	Project Director		October 2017	An update course for the auditors trained under the standards of ISO 9001:2008 should be developed in order to have the required knowledge in the new standards introduced in version 2015.
Review of implementations and certifications of QMS/MET updated to the requirements of ISO 9001:2015	PFF SAM MET 02, 03 y 04	Project Director		December 2019 June 2020	The certifications issued under the 2015 version of ISO 9001 will be requested to all the States to be sent.

Installation and on-site training in SAETAF for the CAR/SAM States requiring it.		States requiring it		September 2020	Cuba in coordination with WMO and ICAO will provide on-site installation and training to the CAR States at no cost. The States must cover the cost of transportation and per diem of the experts according to the norm of the agencies of the United Nations.
Final report of the Project		MET Program Coordinator and Project Director		December 2020	
Resources needed		Availability for GoTo Meeting teleconferences is required.			

¹

- Grey* Task not started yet
- Green* Activity being implemented as scheduled
- Yellow* Activity started with some delay, but will be implemented on time
- Red* Activity not implemented on time; mitigation measures are required

Agenda Item 4: Review of Project H4 – OPMET exchange

4.1 Under this agenda item, the Meeting reviewed the following papers:

- WP/06 - *OPMET exchange* (presented by the Secretariat).
- WP/07 - *OPMET exchange in IWXXM format* (presented by the Secretariat).
- WP/08 – *Guide for the drafting and dissemination of SIGMET messages for the CAR/SAM Regions and OPMET Guide* (presented by the Secretariat).
- WP/09 – *SWIM MET Plan and Roadmap* (presented by the Secretariat).
- Presentation on the operation of the Brasilia International OPMET Data Bank (presented by Brazil)

4.2 In this agenda item, the Meeting addressed issues related to the exchange of OPMET messages in the SAM Region.

4.3 The Region analysed the results of the OPMET exchange carried out by the Brasilia International OPMET Data Bank (IODB). It was noted that, according to the last controls performed this year, there had been a reduction in the performance of some States located in the northern part of the SAM Region.

4.4 The Secretariat noted that the IODB had been requested to provide the OPMET message reception tests to see if they had reached the server. Likewise, it was noted that OPMET control tables contained aeronautical meteorological offices and meteorological watch offices that were no longer operational in the States.

4.5 When reviewing the IODB data catalogue, the States noted inconsistencies between the data sent and the data shown in the Tables. Colombia, Panama, Ecuador, and Chile identified airports that were no longer operational or that had changed ICAO designator, or whose operating schedule was only H-J.

4.6 Given these inconsistencies, and in order to update the IODB data catalogue and accurately reflect the transmitted data, the Meeting formulated the following conclusion:

CONCLUSION SAM/MP/04-01: OPMET exchange controls	
<p>That, in order to establish updated OPMET exchange control procedures and verify the status of transmission circuits, the following activities be carried out:</p> <p>a) the Brasilia international OPMET data bank (IODB) update the IODB data catalogue;</p> <p>b) the IODB update the OPMET exchange control tables, taking into account Tables AOP I-1, MET II-1 and MET II-2;</p> <p>c) the States that have not done it yet, follow the procedure to verify the arrival of OPMET data to the IODB, by requesting the results from the OPMET data</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Interregional</p> <p><input checked="" type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Technical/Operational</p>

<p>bank;</p> <p>d) that States that have not done it yet, communicate the results of these tests to the Secretariat by 15 July 2019; and</p> <p>e) the Secretariat organise a teleconference for the second half of September 2019 to discuss the results of the tests.</p>	
<p>Why: To update the OPMET data catalogue of the Brasilia International OPMET Data Bank, and capture the actual performance of OPMET message exchange</p>	
<p>When: Immediately</p>	<p>Status: Adopted by SAM/MP/3</p>
<p>Who: <input type="checkbox"/> Coordinators <input checked="" type="checkbox"/> States <input checked="" type="checkbox"/> ICAO Secretariat <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Others: Users/Industry</p>	

4.7 Regarding OPMET exchange in IWXXM format, the Meeting noted that this would become a standard on 5 November 2020. The Meeting took note of Conclusion SAM/IG/23-04, whereby the SAM Implementation Group urged States to adapt AMHS terminals of aeronautical meteorology users for transmission and reception of OPMET messages in IWXXM GML format.

4.8 Regarding the Guides for the drafting of OPMET messages for the CAR and SAM Regions, it was noted that they had been updated to the format required by the ICAO Secretariat and the Meteorology Panel. Likewise, the OPMET Guide had been aligned with Amendments 77 and 78 to ICAO Annex 3. Both documents had been updated with the support of the regional projects of the SAM Regional Office.

4.9 The Meeting noted that the SIGMET Guide had been aligned with Amendments 77 and 78, and with the template proposed by the ICAO MET Panel, but introducing some appendices not contemplated in the proposals of the MET Panel. The MET Panel Secretariat indicated that each Region was free to insert the appendices it deemed appropriate and that the template was only a proposal. The updated Guide had been sent to the NACC Office for comments. The Meeting requested that the two Offices work together with the States, *via* teleconferences, in order to approve the document and report to Headquarters.

4.10 Regarding the OPMET Guide, the Meeting recommended that it be reviewed by the authorities and other areas of the States, and that comments be sent to the Secretariat by 30 August of this year. A review was especially required of the exchange table in order to show the actual air traffic flow. Accordingly, the Meeting recommended to work with the NACC Office and the States *via* teleconferences for the approval of the document.

4.11 The Meeting took note of the SWIM MET Plan and Roadmap developed by the ICAO MET Panel. The Meeting recalled that the MP/2 meeting had urged States to design procedures to allow aeronautical meteorological service providers to develop plans for the implementation of meteorological message exchange models, and implementation of XML/GML messages for the introduction of meteorological messages into the SWIM environment.

4.12 The Meeting noted that the ICAO MET Panel had reviewed this issue, and, with a view

to supporting the required implementations for the exchange of OPMET messages in a SWIM environment, had decided to develop a SWIM MET plan and roadmap. This document is shown in **Appendix A** to this part of the report (available only in English). The Secretariat urged States to review it and analyse the implementation procedures recommended therein with the areas involved in each State.

APPENDIX A

MET-SWIM Plan and Roadmap

**Plan for Meteorology in System Wide
Information Management (SWIM)**

First Edition — October 2018

International Civil Aviation Organization

FOREWORD

This first edition of the *Plan for Meteorology in System Wide Information Management (SWIM)* is published to complement the introduction of the *Manual on System Wide Information Management (Doc 10039)*. This plan describes the role of meteorological information in a SWIM environment, and the relationship of MET SWIM to other components of the overall system.

As of November 2016, many aeronautical meteorology products from ICAO Annex 3 – *Meteorological Service for International Air Navigation* are recommended for exchange in ICAO Meteorological Information Exchange Model (IWXXM) form by States. This exchange will initially take place outside of a SWIM environment of Service Oriented Architecture (SOA) and web services, but as SWIM implementation takes place these exchanges will be transitioned to a SWIM environment.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIM	Aeronautical information management
AIXM	Aeronautical information exchange model
AMQP	Advanced message queuing protocol
Annex 3	Annex 3 – <i>Meteorological Service for International Air Navigation</i>
ASBU	Aviation system block upgrade
ASP	ATM service provider
ATM	Air traffic management
CRS	Coordinate reference system
FIXM	Flight information exchange model
FL	Flight Level
GANP	ICAO Doc 9750 – <i>Global Air Navigation Plan</i>
GML	Geography markup language
GRIB	Gridded binary format
HTTP	Hypertext transfer protocol
ICAO	International Civil Aviation Organization
ISO	International Organization for Standardization
IWXXM	ICAO meteorological information exchange model
MET	Meteorology or Meteorological
METAR	Aerodrome routine meteorological report (in meteorological code)
NetCDF	Network common data form
OGC	Open Geospatial Consortium
OPMET	Operational meteorology, usually operationally-used aeronautical meteorology data products
SOA	Service-oriented architecture
SOAP	Simple object access protocol
SWIM	System-wide information management
TAC	Traditional alphanumeric codes
TCP/IP	Transmission control protocol / internet protocol
WCS	Web coverage service
WFS	Web feature service
WMS	Web map service
XML	Extensible markup language

GLOSSARY OF TERMS

When the subsequent terms are used in this manual, they have the following meanings:

Authorization. Permission to engage in a specific activity. A SWIM-enabled application is authorized if it has permission to engage in a specific activity, such as subscribing to a publication service.

Consumer. See *Information consumer*.

Core Services. Functional capabilities of the SWIM Infrastructure such as interface management, request-reply and publish-subscribe messaging, service security, and enterprise service management.

Discoverable. An information service that may be discovered by a potential user is discoverable.

Discovery. See *Service Discovery*.

Information Dissemination. The act of distributing information to one or more recipients.

Domain. A set of business activities that: (a) have a common mission or purpose; (b) share common operational and functional requirements and capabilities; and (c) needs to be considered separately from other activities, while maintaining the relevant relationships with them. For example, the MET and AIM information domains

Enterprise. See *SWIM Enterprise*.

Enterprise Service Management (ESM). The SWIM core service addressing the management of SWIM-enabled services, including performance and availability. ESM provides the ability to monitor, manage, and scale services within the enterprise to ensure the capability offerings are available, responsive and scalable to the operational environment supported.

Expose. To make a service interface discoverable. In SWIM, information services are exposed via one or more SWIM Service Registries.

Information Consumer. The person, application or system consuming an information service. Also called *consumer*.

Information Domain. Focused on identifying, defining, and satisfying the information needs of the set of business activities associated with a specific domain.

Information Exchange Model. An Information Exchange Model is designed to enable the management and distribution of information services data in digital format. Normally this is defined for a specific domain such as aeronautical information.

Information Model. An information model is a representation of concepts and the relationships, constraints, rules, and operations to specify data semantics for a chosen domain.

Information Producer. The person, application or system producing an information service. Also called *producer*.

Information Provider. Information service provider. Also called *provider*.

Information Service. An information service is a web service which provides information consumers access to one or more applications or systems by means of the SWIM core services. It encapsulates a distinct set of operations logic within a well-defined functional boundary.

Infrastructure. The logical and physical (i.e., hardware and software) elements that together provide (SWIM) functionality.

Message. A structured information exchange package consisting of a header and payload.

Messaging. The SWIM core service that provides delivery of data and notifications between applications and systems.

Notification. An indication presented to a user regarding the status of a system or an element in a system. In a publish-subscribe system, a publication may consist of notifications about data rather than the data itself.

Operational Pattern. An operational pattern describes the essential flow of a SWIM-enabled service. It is based on the term pattern, which describes the essential features of a common solution to a common problem in software development.

Publication. An information service based on the publish-subscribe operational pattern.

Publisher. An information service provider utilizing the publish-subscribe operational pattern.

Publish-subscribe. A one-to-many operational pattern in which an information provider called a *publisher* makes its services available (i.e. publishes) on a subscription basis. An information consumer in this paradigm called a *subscriber* requests access to the publication service via a subscription request. Based on the nature of their subscriptions, subscribers will continue to receive updates from the publisher until they request the termination of their subscription.

Reliable Delivery. A characteristic of information transfer in which the transfer is either successful or the sender of the information is notified of the failure of the transfer.

Request/Reply. The operational pattern distinguished by a two-way interaction between a requesting entity and a responding entity. This pattern is also called request/response.

REST. A REpresentational State Transfer (REST) architecture is an alternative to SOAP for implementing web services over HTTP.

Security. The SWIM core service responsible for the protection of information, operation, assets and participants from unauthorized access or attack.

Service. Attention is drawn to the dual meaning of “service” in an ICAO context. In the context of SWIM and this document, “service” refers to a web service (also see *Information Service*) rather than an ICAO service which is provided by States or other ICAO organizations.

Service Discovery. The act of locating and accessing the metadata (such as a web address) for a specific information service. Also referred to as *discovery*.

Service-Oriented Architecture (SOA). An approach to integrate applications running on heterogeneous platforms using industry-wide acceptable standards. Each application is exposed as one or more web services where each information service provides a particular function. Information services (applications) communicate with each other in a coordinated sequence that is defined by a business process.

Service Provider. An organization or entity providing a service. Refers (in this document) to ASPs or vendors that provide network or other value-added services; distinct from an information provider.

Service Registration. The act of creating an entry in the SWIM Service Registry.

Service Registry. SWIM web service registry.

SOAP. A SOAP architecture is an alternative to REST for implementing web services over HTTP.

State. An ICAO Member State.

Subscriber. A consumer of a publication service.

Subscription. The process of becoming a subscriber to a publication service. Subscription consists of subscription administration and subscription activation.

Subscription Administration. The act of administering a subscription, including authorization, access list and other database updates, etc.

System-Wide Information Management (SWIM). SWIM consists of standards, infrastructure and governance enabling the management of ATM related information and its exchange between qualified parties via interoperable services.

SWIM Access Point. A SWIM access point is a logical entity which bundles a number of technical capabilities (e.g. messaging, security, logging, interface management, etc.).

SWIM core services. The fundamental SWIM mechanisms that enable information sharing: Interface Management, Messaging, Enterprise Service Management (ESM) and Security. These services are solution-agnostic (not limited to a single process or solution environment) and have a high degree of autonomy so that they support reuse. Also referred to as “core services”.

SWIM core services infrastructure. Hardware and software elements that provide the SWIM core services. Also referred to as “core services infrastructure”.

SWIM-enabled application. A SWIM enabled application consumes or provides SWIM information services using SWIM standards. Also referred to as “application”.

SWIM-enabled service. An information service that may be accessed via SWIM.

SWIM Enterprise. A SWIM enterprise can be an ATM service provider (ASP), a group of ASPs, or an Airspace User, or an ATM support industry that has full control of the implementation planning and execution within the enterprise.

SWIM Region. A collection of SWIM enterprises that have agreed upon common regional governance and internal standards. A region will be delineated by the area of influence of a given governance structure that defines the standards, policies, etc. that are applicable to all the participants within the region.

SWIM Registry. A registry or directory containing entries with the information necessary to discover and access services. The Registry utilizes a formal registration process to store, catalog and manage metadata relevant to the services, thereby enabling the search, identification and understanding of resources. Also referred to as “Service Registry” or “Registry”.

SWIM User. Depending on context, a person, organization or application authorized to provide and/or consume services via SWIM.

Web Service. A software system which provides request/reply support to consumers for querying data or generating results. Web services commonly communicate using HTTP and often work with and return XML, JSON, and binary data.

Chapter 1

INTRODUCTION

1.1 BACKGROUND

1.1.1 ICAO Doc 10039 - *Manual on System Wide Information Management (SWIM) Concept*, describes general SWIM concepts and characteristics. This document provides further detail on the role of aeronautical meteorology in SWIM, such as the relationship between meteorology and other SWIM domains (such as aeronautical information management (AIM)) in the system.

1.2 SCOPE

1.2.1 The scope of the plan is limited to the following:

- a) identifying required infrastructure (IP network, security capabilities, etc.);
- b) identifying interfaces and relationships with the other SWIM Air Traffic Management (ATM) information domains, such as AIM;
- c) identifying technologies and required high-level capabilities (web services, XML, and messaging) required for MET SWIM information exchange;
- d) describing information flows and high-level data types; and
- e) describing the roles and responsibilities of aeronautical meteorological system stakeholders, such as regional centers and member states.

1.2.2 The scope of the plan excludes the detailed description of specific products. It is anticipated that data products will be able to be modified over time without substantial changes to the concepts and infrastructure described in this plan.

1.3 PURPOSE/OBJECTIVE

1.3.1 This document, the *Plan for Meteorology in System Wide Information Management (SWIM)*, describes the role of aeronautical meteorology (MET) in SWIM. In particular, approaches and concepts for the exchange of meteorological information (such as web services), high-level concepts regarding aeronautical meteorological information exchange models and XML/GML are discussed. This document supplements the broader SWIM concept described in the *Manual on System Wide Information Management (SWIM) Concept* (Doc 10039) with approaches and technologies specifically relevant to the exchange of meteorological information in SWIM.

1.4 TARGET AUDIENCE

1.4.1 This plan has been developed for ICAO States seeking information on integrating their MET SWIM information management within a global SWIM construct. The plan does not specifically address any individual member of the ATM community with interested parties to be found in all of the following communities:

- a) ICAO;
- b) regulatory authorities; and
- c) States.

1.5 ORGANIZATION OF THE PLAN

1.5.1 The plan is organized as follows:

- a) Chapter 1 gives the background and the purpose and scope of the document;
- b) Chapter 2 considers the MET SWIM global interoperability framework and its details, including interoperability and governance at the information exchange services, the information exchange models and at the SWIM infrastructure level. The functions and representative standards are provided;
- c) Chapter 3 considers the transition to MET SWIM and operations in a mixed environment; and
- d) The appendices provide supporting material.

1.6 RELATIONSHIP TO OTHER DOCUMENTS

1.6.1 The *Global Air Traffic Management (ATM) Operational Concept* (Doc 9854) describes a future concept in which information is managed system-wide. Based upon this concept, the *Manual on Air Traffic Management System Requirements* (Doc 9882) explicitly identifies the implementation of SWIM as a requirement for the future ATM System.

1.6.2 The *Manual on Flight and Flow Information for a Collaborative Environment (FF-ICE)* (Doc 9965) provides a vision specifically for flight information that relies on SWIM as a mechanism for exchange of flight information while managing the consistency and timeliness of the information. The *Manual on Collaborative Air Traffic Flow Management* (Doc 9971) describes the importance of information exchange in establishing a collaborative environment.

1.6.3 There are two aviation system block upgrade (ASBU) modules within the *Global Air Navigation Plan (GANP)* (Doc 9750) that focus on SWIM development: B1-SWIM and B2-SWIM. The ASBU module B1-SWIM is termed 'Performance Improvement through the application of SWIM' and applies to the "implementation of SWIM services (applications and infrastructure) creating the aviation intranet based on standard data models, and internet-based protocols to maximize interoperability". The ASBU module B2-SWIM is termed 'Enabling Airborne Participation in collaborative ATM through SWIM' and applies to the "connection of the aircraft as an information node in SWIM enabling participation in collaborative ATM processes with access to rich voluminous dynamic data including meteorology".

1.6.4 The *Manual on System Wide Information Management (SWIM) Concept* (Doc 10039) describes the overall SWIM concept, along with key goals and characteristics of the system. This plan provides further detail on this general concept, and how aeronautical meteorological information is exchanged and used within the broader system.

1.6.5 The *Manual on the Digital Exchange of Aeronautical Meteorological Information* (Doc 10003) provides implementation guidance on aeronautical meteorological information exchange models and XML/GML. This plan addresses the long-term concept of the MET SWIM system beyond implementation of the information exchange models and beyond initial implementation of XML/GML and digital exchange.

Chapter 2

THE MET SWIM CONCEPT

2.1 MET SWIM CONCEPTS

2.1.1 Meteorological information exchange takes place in SWIM utilizing the core concepts described in Doc 10039. MET SWIM exchanges are enabled by the following more specialized concepts:

Information: The aeronautical meteorology contents being utilized and exchanged in SWIM. In the MET SWIM system there are three types of information: gridded data, non-gridded data, and imagery data. Information is exchanged using a data exchange format, of which one type is an Information Exchange Model. Further detail on the full range of MET information is provided in Section 2.3. Data exchange formats are typically returned from information exchange services (request/reply) or sent as a portion of publish/subscribe messages. The primary information exchange model in MET SWIM is the IWXXM.

Information Exchange Services: An information service which is used to exchange MET information. An information exchange service enables interoperability by following well-defined standards and governance specifications agreed upon by stakeholders and implemented via commonly agreed means. In the MET SWIM system, information exchange services are used to distribute, filter, and transform MET information for use in SWIM.

2.2 SWIM INTERFACES

2.2.1 MET SWIM is a portion of the larger SWIM system and will interface with other SWIM components. There are two primary relationships: a MET SWIM utilization and reliance upon SWIM infrastructure (such as reliable messaging); and MET SWIM use of AIM SWIM information services and data. MET SWIM utilizes the common SWIM infrastructure for TCP/IP network communications, publish/subscribe messaging, request/reply communications, security, registry and metadata, and other facilities.

2.2.2 MET SWIM may interface with AIM SWIM for the following:

- a) meteorological observing station metadata at aerodromes (such as location);
- b) aerodrome reference points;
- c) aerodrome runways;
- d) flight information region (FIR) data and locations; and
- e) links to further metadata regarding aeronautical service providers such as: meteorological watch offices, air traffic service units, world area forecast centres volcanic ash advisory centres and tropical cyclone advisory centres.

2.3 INFORMATION AND DATA EXCHANGES

2.3.1 Traditional OPMET exchanges have relied on textual data formats, also known as Traditional Alphanumeric Codes (TAC). TAC data exchanges are being replaced by IWXXM XML exchanges in MET SWIM, and new data forms will be exchanged.

2.3.2 INFORMATION EXCHANGE MODELS (NON-GRIDDED DATA)

2.3.2.1 MET SWIM will utilize IWXXM for information exchanges, one of several existing XML/GML exchange models intended for use in the aeronautical domain. As MET SWIM implementation proceeds, current data products in IWXXM will migrate away from the restrictions of traditional alphanumeric code (TAC) towards the exchange of observations, forecasts and warnings with broader utility. One example of such a change is the reporting of the raw observed meteorological values coming from the sensor instead of “binned” data values, such as is reported today with METAR ceiling values. These types of improvements allow for multiple uses of MET SWIM data products, including different visualizations, ready ingest into weather forecast models and direct utilization by both information exchange web services and potentially higher-level decision support web services.

2.3.3 GRIDDED DATA

2.3.3.1 While many data products are adequately specified with non-gridded exchange models, MET SWIM stakeholders will also need to exchange gridded data. Gridded data (also known as raster data) is often, but not always, a regularly spaced set of values such as a satellite image or a set of temperature values over a large geographic area. While gridded data values may also be represented in exchange models in XML format, gridded data is generally too voluminous to be transported efficiently in XML.

2.3.3.2 A graphic showing gridded data with nearby map location information (such as highways) is shown in Figure 1. The individual grid cells are visible, as is the regular spacing of each data value. Gridded data is geo-located on a CRS, such as the world geodetic system (WGS-84) geographic CRS (latitude/longitude) or a Mercator projection CRS.

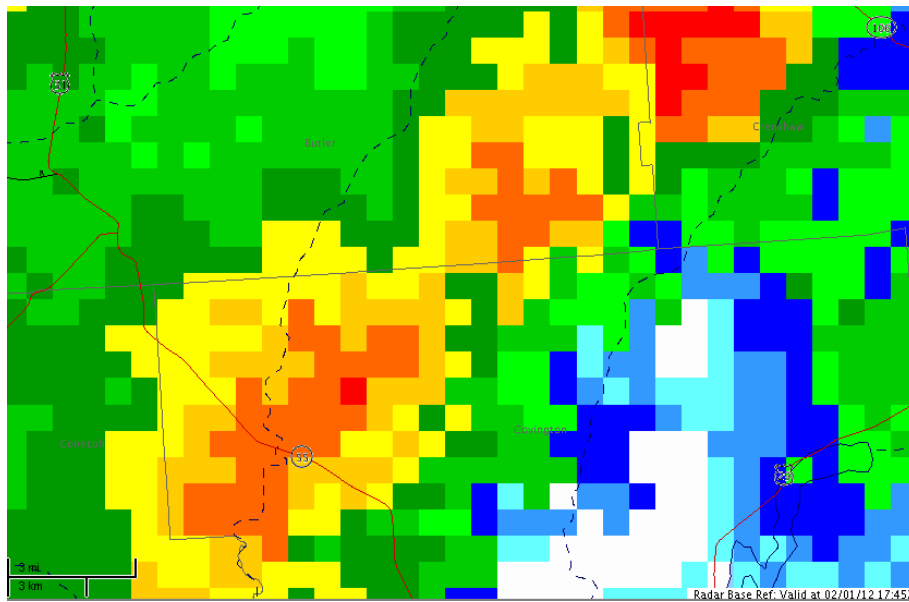


Figure 1 – Rendered geographic map with gridded data cells

2.3.3.3 Gridded data is an efficient representation of raw data values (i.e., not rendered values such as the colored pixels seen in imagery) representing data values from data types such as satellite, radar and numerical weather models, including fields such as wind speed and air temperature.

2.3.3.4 In aeronautical meteorology, gridded data is often exchanged in either the GRIB or netCDF file formats. While other formats are used, few of these are as broadly utilized. Gridded data in the meteorological domain is usually updated over time and is comprised of either two or three spatial dimensions (2-D or 3-D) depending upon whether there is a vertical component.

2.3.4 IMAGE DATA

2.3.4.1 While most of the MET SWIM requirements are met with the raw data values exchanged within gridded and non-gridded data, some MET SWIM products may be disseminated as rendered, geo-located images. Examples of image data formats include JPEG, PNG, and SVG files, such as those seen embedded in web mapping tools and other web sites. Image data may be useful in cases where data consumers need an authoritative and/or globally consistent visualization of raw data.

2.3.4.2 Image data can be used to visualize both gridded and non-gridded data. An example of both types of data can be seen in Figure 1, which shows the rendered gridded radar values overlain with non-gridded road and political boundaries. Due to the simple representation of images it can easily be combined with other images (layered) with little effort or much knowledge of the details of the data being represented.

2.4 REGISTRIES AND METADATA

2.4.1 Doc 10039 describes the need for a registry for use in SWIM. The fundamental purpose of the SWIM registry (also known as a catalog) is to provide a repository of information about who are the available data service providers, what data services they each provide and what data sets they each provide. MET SWIM will utilize many of the resources identified for the SWIM registry, including:

- a) web service instances (list of services available in SWIM from the various SWIM information service providers);
- b) web service description documents;
- c) reference models (common models for the implementation of services and information structures, i.e., the Aeronautical information reference model - AIRM);
- d) information exchange standards (e.g., AIXM, IWXXM, FIXM);
- e) policies (constraints to be respected in SWIM for security or other purposes);
- f) compliance (describe levels of conformity e.g., SWIM compliance); and
- g) participants (e.g., information service providers).

2.4.2 In addition, MET SWIM will store and access aeronautical meteorology-specific metadata in the SWIM registry for the following:

- a) meteorological data products (e.g., update rate, data quality characteristics, data lineage, detailed data structure descriptions, list of included data fields);
- b) static publish/subscribe messaging topics and/or queues available from providers;
- c) sensor metadata (e.g., location, quality characteristics); and
- d) semantic metadata relating to web services and data products available in the MET SWIM system.

2.5 INFORMATION EXCHANGE SERVICES (WEB SERVICES)

2.5.1 There are two main mechanisms by which data will flow from producers to consumers: data which may be requested through web services as needed, and on-going real-time feeds of messages (notifications or actual data). The former describes the request/reply message exchange pattern described in this section, and the latter the publish/subscribe or messaging exchange pattern discussed in the next section. Both mechanisms will be utilized in MET SWIM.

2.5.2 MET SWIM information exchange services will be utilized to exchange and filter data. MET SWIM information exchanges can be quite voluminous and information exchange services can be utilized to trim down exchanged data to the exact needs of consumers. Due to the different nature of data being exchanged (gridded, imagery, and non-gridded) a specialized information exchange service is required for each. MET SWIM will utilize the OGC Web Feature Service (WFS) for non-gridded data, the OGC Web Coverage Service (WCS) for gridded data, and the OGC Web Map Service (WMS) for image data.

2.5.3 For all information exchange web services (gridded, non-gridded, and imagery web services) the following capabilities are supported:

- Requesting the set of data product(s) offered by the web service;
- Requesting the high-level capabilities of the web service;
- Requesting the detailed structure and content of the offered data products, such as geographic region of the data and the structure of offered data (such as the XML schema that describes offered non-gridded data);
- Requesting metadata regarding the data provider, such as contact information and organization name; and
- Requesting metadata regarding the operational status of the web service and/or data product, such as metadata indicating experimental products.

2.5.4 For non-gridded information exchange using the Web Feature Service, the following capabilities are supported in addition to the common capabilities identified above:

- Requesting data filtered by a geographic bounding box;
- Requesting data within a time range or at a time instant;
- Requesting data within a fixed distance from a route of flight; and
- Requesting data that matches free-form queries, such as all aircraft observations where altitude is greater than FL400 and where the aircraft type is 'Boeing 747'.

2.5.5 For gridded information exchange using the Web Coverage Service, the following capabilities are supported in addition to the common capabilities identified above:

- Requesting data filtered by a geographic bounding box;
- Requesting data within a time range or at a time instant;
- Requesting data which was generated at a specific forecast run time (for forecast model run data);
- Requesting data within a fixed distance from a route of flight (i.e., returning a vertical cross section, 4-D corridor, or horizontal slice); and
- Requesting data that is re-sampled to a new grid spacing.

2.5.6 For imagery information exchange using the Web Map Service, the following capabilities are supported in addition to the common capabilities identified above:

- Requesting data filtered by a geographic bounding box;

- Requesting data within a time range or at a time instant;
- Requesting data which was generated at a specific forecast run time (for gridded forecast model run data);
- Requesting imagery that is at a different image resolution than the original data;
- Requesting data with custom rendering options such as color ranges, transparency, and symbology; and
- Requesting data in different image formats, such as SVG, JPEG, and PNG.

2.5.7 While the information exchange services as described above address the basic needs for the data exchange requirements of MET SWIM, other more specialized web services are also possible in a MET SWIM environment. These web services can be built to utilize data from the information exchange web services to address more specialized requirements. Because these web services are built atop of the data made available from the information exchange services, information exchange web services may be considered the first tier (Tier 1) and a necessary building block for a second tier (Tier 2) of specialized web services.

2.5.8 An example of one such “Tier 2” web service is a warning service which would enable customized warnings to be pushed (over publish/subscribe communications) to consumers. The warning web service would allow consumers to receive crucial information for decision-making without needing access to large amounts of raw aeronautical meteorology information. As MET SWIM information is updated, thresholds and geographic areas would be checked and warnings pushed to consumers as appropriate. Consumers could submit the following to the warning web service:

- any number of data variable names (such as composite reflectivity or observed wind speed);
- geographic area(s) of interest (bounding box, flight path and distance, or polygon area);
- time period(s) of interest; and
- rules describing when warnings are issued, such as the relationships between data variables, upper and lower data variable thresholds, geographic areas, and time periods.

2.5.9 Another example of a “Tier 2” web service would enable authoritative conversion from XML to TAC for transition purposes and human display. This would remove potential ambiguities in the conversion process, and assist with a smooth transition away from TAC having the role of an data exchange format towards TAC having the role of a display format (potentially among many).

2.5.10 Tier 2 web services can be used to address global needs for complex decision-making, authoritative and consistent decisions, and/or a synthesis of multiple sources of SWIM data including data from outside the MET domain, such as AIM. Due to their dependence upon Tier 1 information exchange services for basic data access, implementation of Tier 2 web services in the MET SWIM system will follow the deployment of Tier 1 web services. Given the unique and aviation-specific nature of these web services, they may not fit well into existing standardized web service protocols such as WCS, WFS, and WMS, but will be implemented using web services and fit into the general SWIM architecture.

2.6 MESSAGING AND PUBLISH/SUBSCRIBE

2.6.1 While information exchange services provide advanced capabilities for accessing MET data, they are insufficient to address all MET SWIM scenarios of real-time information exchange. The *Manual on System Wide Information Management* (Doc 10039) describes common messaging capabilities (the publish/subscribe messaging pattern) to be used throughout SWIM and MET SWIM will utilize this capability to reliably distribute data, notifications, and status updates. Messaging is particularly useful with

data that is issued at an unpredictable rate, data that must be delivered as quickly as possible, or data that represents a series of frequent and small updates. Publish/subscribe messaging technology is generally not well suited to distributing large data files/messages directly, and as such will be utilized in MET SWIM for:

- notifying data consumers that data is available for access through a web service such as when a new gridded forecast is available for retrieval;
- pushing relatively small data files directly to consumers as they become available on the provider, such as non-gridded data like aerodrome observations; and
- mission-critical service updates to data consumers, such as notifications of a web service outage, data outage, service/maintenance windows, or degraded provider capabilities.

2.6.2 There are many messaging broker implementations, such as ActiveMQ and RabbitMQ, but relatively few open and standard messaging protocols. As a programming application program interface (API), the Java Message Service (JMS) does not provide network level interoperability between implementations, merely a convenient way for software written in the Java programming language to be written to operate against different messaging broker implementations.

2.6.3 While messaging capabilities are considered a cross-cutting SWIM capability, States and other SWIM participants will communicate directly with other participants. No central messaging brokers will be utilized, and similarly to other SWIM components will be built upon standards that support heterogeneous information exchanges between multiple broker and/or client implementations. Of the messaging protocol standards, the Advanced Message Queueing Protocol (AMQP) is the most general-purpose and well suited to support MET SWIM requirements, and is supported by many existing messaging broker implementations. MET SWIM publish/subscribe messaging will utilize AMQP directly between SWIM participants, which allows stakeholders to choose their message broker and client software as appropriate for their requirements but allow for broad system-wide interoperability.

2.6.4 Publish/subscribe messaging can be utilized to publish information in either a static or dynamic fashion. Static publish/subscribe configurations may be considered a design-time configuration regarding what information is published to predefined topics and/or queues. In the case of static configurations, SWIM providers publish to a fixed set of topics and/or queues which do not change while the system is running. With a dynamic publish/subscribe configuration, the set of published data and the destination topics and/or queues can be modified as the SWIM system is running. For example, a filtered meteorological observation within a specific geographic area could be delivered to a small group of interested Consumers as needed. Dynamic configuration requires an additional request/reply web service on each SWIM Provider to allow modifications to published information at runtime such as described in the OASIS WS-Notification and OGC Publish/Subscribe Interface standards. There are currently no identified requirements for dynamic subscription capabilities, and as such all publish/subscribe messaging will be published in a static, pre-defined manner.

2.7 TESTING AND VALIDATION

2.7.1 As advanced capabilities (and particularly web services) are implemented in SWIM, they introduce the possibility of new types of interoperability problems when implemented incompletely or incorrectly. Therefore, as States and Regional OPMET Centres (ROCs) implement MET SWIM capabilities testing software will be available for evaluating the correct functioning of both web services and data products.

2.7.2 Testing and validation will occur on all components of the system, including web services, messaging capabilities, real-time data flow, and data products. The specific techniques to evaluate the

correct functioning of MET SWIM services are beyond the scope of this document, but will be developed and described in a subsequent document.

Appendix A

MET SWIM Standards

This appendix describes the MET SWIM standards which should be implemented by MET States and Regions.

A.1 Standards

Capability	Standard
Request/reply network connectivity	Transmission Control Protocol version 4 (IETF RFC 793) Internet Protocol version 6 (IETF RFC 2460) and Internet Protocol version 4 (IETF RFC 791) Hypertext Transfer Protocol -- HTTP/1.1 (IETF RFC 2616)
Publish/subscribe network connectivity	Advanced Message Queuing Protocol (AMQP) 1.0
Gridded information exchange	OGC Web Coverage Service Interface Standard – Core v2.0.1 OGC Web Coverage Service Interface Standard – Range Subsetting Extension v1.0.0 OGC Web Coverage Service Interface Standard – Scaling Extension v1.0.0 OGC Web Coverage Service Interface Standard – CRS Extension v1.0.0 OGC Web Coverage Service Interface Standard – Interpolation Extension v1.0.0 OGC Web Coverage Service Interface Standard – XML/SOAP Protocol Binding Extension v1.0.0 OGC Web Coverage Service Interface Standard – Key Value Pair (KVP) Protocol Binding Extension v1.0.1
Non-gridded information exchange	OGC Web Feature Service Interface Standard v2.0.0 (also ISO 19142)
Imagery information exchange	OGC Web Map Service Implementation Specification v1.3.0 OGC Styled Layer Descriptor (SLD) Profile of the Web Map Service Specification v1.1.0 OGC Symbology Encoding Implementation Specification v1.1.0

— END —

Appendix C

MET-SWIM Plan and Roadmap (continuation)

**Roadmap for Meteorology in System Wide
Information Management (SWIM)**

2 October 2018

Version 1.3

International Civil Aviation Organization

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LIST OF ABBREVIATIONS AND ACRONYMS

AFTN	Aeronautical Fixed Telecommunication Network
AMHS	Aeronautical Message Handling System
AMQP	Advanced message queuing protocol
ASBU	Aviation system block upgrade
FTBP	File Transfer Body Part
GANP	Global Air Navigation Plan (Doc 9750)
HTTP	Hypertext transfer protocol
IP	Internet protocol
IROG	International Regional OPMET Gateway
IWXXM	ICAO meteorological information exchange model
MET	Meteorology or Meteorological
MWO	Meteorological Watch Office
NOC	National OPMET Centre
RHWAC	Regional Hazardous Weather Advisory Centre
ROC	Regional OPMET Centre
RODB	Regional OPMET Data Bank
RQM	Request/reply query for meteorological databank data in TAC format
SWXC	Space Weather Centre
SWIM	System-wide Information Management
TAC	Traditional Alphanumeric Code
TCAC	Tropical Cyclone Advisory Centre
VAAC	Volcanic Ash Advisory Centre
WAFC	World Area Forecast Centre
WCS	Web Coverage Service
WFS	Web Feature Service
WMS	Web Map Service

Chapter 1 – MET SWIM Roadmap

1.1 INTRODUCTION

1.1.1 The System Wide Information Management (SWIM) will complement human-to-human communications with machine-to-machine communications and improve data distribution and accessibility. However, the flexibility inherent in human communication is not intrinsically included in Information Technology (IT) systems and must be specified and included in the system design. To enable the desired flexibility, IT systems will increasingly need to “ask for / discover” operationally relevant facts, depending on the circumstances, rather than remain “being informed” by pre-agreed messages. Increased machine-to-machine capabilities will enable many new software applications while continuing to support existing human usages.

1.1.2 ICAO Doc 10039 - *Manual on System Wide Information Management (SWIM)*, describes general SWIM concepts and characteristics. The MET SWIM Plan – *Plan for Meteorology in System Wide Information Management (SWIM)* - provides further detail on the role of aeronautical meteorology in SWIM, such as the relationship between meteorology and other SWIM domains (such as aeronautical information management (AIM)) in the system, along with design concepts.

1.1.3 This document, the MET SWIM Roadmap, describes the transition plan and associated timelines for implementing MET in SWIM, including the necessary timelines and strategies for implementing necessary non-MET components such as IP networking and HTTP support.

1.1.4 Transition to MET SWIM can be summarized as the following phases:

- a) Provision of meteorological products in ICAO Meteorological Exchange Model (IWXXM) format;
- b) Provision of meteorological via MET SWIM information exchange services, including Web Feature Service (WFS), Web Coverage Service (WCS), and Web Map Service (WMS), over HTTP;
- c) Additional data types beyond IWXXM (non-gridded), including gridded data and imagery;
- d) Replacement of AFTN and AMHS “message push” communications with AMQP; and
- e) Additional data products beyond those currently distributed in IWXXM.

1.2 TRANSITION PLAN

1.2.1 MET SWIM implementation and transition will proceed based upon the Global Air Navigation Plan (GANP) Block upgrade schedule. IWXXM messages will also become a standard practice in 2020.

1.2.2 There are several components of the MET SWIM transition: physical network connectivity, communications protocols (AFTN, AMHS, AMQP, HTTP), information exchange services (WCS, WFS, WMS), and data types exchanged (gridded, non-gridded, and imagery). The following table summarizes the MET SWIM implementation timeline, this is expanded upon in sections below.

Table 1 - MET SWIM Timeline

	Block 0	Block 1	Block 2	Block 3
Communication protocols (AFTN, AMHS, AMQP)	AFTN (legacy) AMHS FTBP (transitional) AMQP/HTTP (optional)	AFTN (legacy) AMHS FTBP (transitional) AMQP/HTTP (optional)	AFTN (legacy) AMHS (legacy) AMQP/HTTP	AMQP/HTTP
Request/Reply at Regional OPMET Data Banks (RODBs)	AFTN/AMHS request/reply	AFTN request/reply (legacy) WFS, WCS, WMS (optional) AMHS request/reply	AMHS request/reply (legacy) WFS, WCS, WMS	WFS, WCS, WMS
Data Types	Non-gridded	Non-gridded Gridded (optional) Imagery (optional)	Non-gridded Gridded Imagery	Non-gridded Gridded Imagery
Data Addressing	NOC, ROC, RODB, IROG	NOC, ROC, RODB, IROG	IP and SWIM Registry	IP and SWIM Registry

1.2.3 In addition to the technology changes, a transition to MET SWIM will also result in modifications to the organizational roles involved in aeronautical meteorological exchanges. The most significant changes are:

- a) IP communications and the SWIM Registry will greatly reduce the need for data aggregation; and
- b) More organizations (especially States) will offer web services and data directly to data consumers.

Table 2 - MET SWIM Roles

Function/Role	Block 0	Block 1	Block 2
Data Producer	MWO, VAAC, TCAC, WAFC	MWO, VAAC, TCAC, WAFC, SWXC, RHWAC	MWO, VAAC, TCAC, WAFC, SWXC, RHWAC
Data Aggregator and Validator	NOC, ROC, RODB, IROG	NOC, ROC, RODB, IROG	NOC, ROC, RODB
Data Repository	WAFC, RODB	WAFC, RODB	WAFC, RODB, and State/NOC

Block 0: Current System

1.2.4 The current, mixed system of AFTN and AMHS communications will continue through the end of Block 0. States, ROCs, RODBs, and IROGs in a position to implement AMQP communications in addition to AMHS File Transfer Body Part (FTBP) may do so for IWXXM dissemination. AMHS is considered a transitional communications technique and AMQP implementation plans should be prioritized.

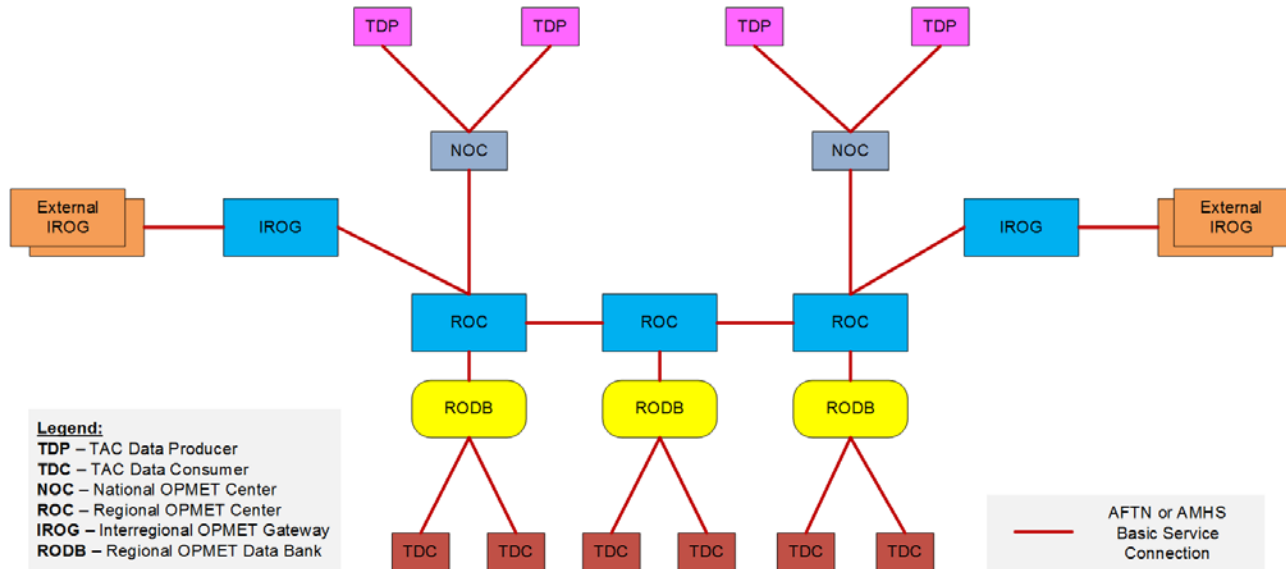


Figure 1 - MET SWIM Block 0

1.2.5 RODBs will utilize the existing RQM method for providing request/reply access to data, and States/RODBs may also offer information exchange services. Most States should be exchanging non-gridded IWXXM and TAC messages and some States may have commenced gridded and imagery information services.

Block 1 and 2: Transition to MET SWIM

1.2.6 States, ROCs, RODBs, and others may commence SWIM technology adoption in Block 1. As a transition Block, both legacy and SWIM communications technologies, data formats, and technology will co-exist for the duration. States, ROCs, RODBs, and others should commence and complete SWIM technology adoption in Block 2. Due to the transition being undertaken in both of these Blocks, the technology will be a mixture of traditional and SWIM-based approaches throughout both Blocks.

1.2.7 States shall implement IWXXM message production as of 2020, but TAC message production will continue throughout Block 1. States, ROCs, and RODBs in a position to do so will introduce gridded and imagery product dissemination on a regional basis.

1.2.8 For those RODBs and States in a position to do so, adoption of AMQP and HTTP (SWIM) communications should be adopted with a preference over AMHS-related communications for publish/subscribe messages and request/reply communications in Block 1. Specifically, ROCs and IROGs should prioritize the adoption of AMQP communications to facilitate State SWIM progress, RODBs should utilize Web Feature Services for request/reply access as an alternative to the AFTN and AMHS FTBP request response interface, and IWXXM data consumers should use the Web Feature Service to consume messages from RODBs and implement AMQP message consumption.

1.2.9 By the end of Block 2, adoption of AMQP and HTTP (SWIM) communications will be complete. ROC and IROG adoption of AMQP communications will be complete, RODBs will utilize Web Feature Services for request/reply access, and IWXXM data consumers will use the Web Feature Service to consume messages from RODBs and implement AMQP message consumption.

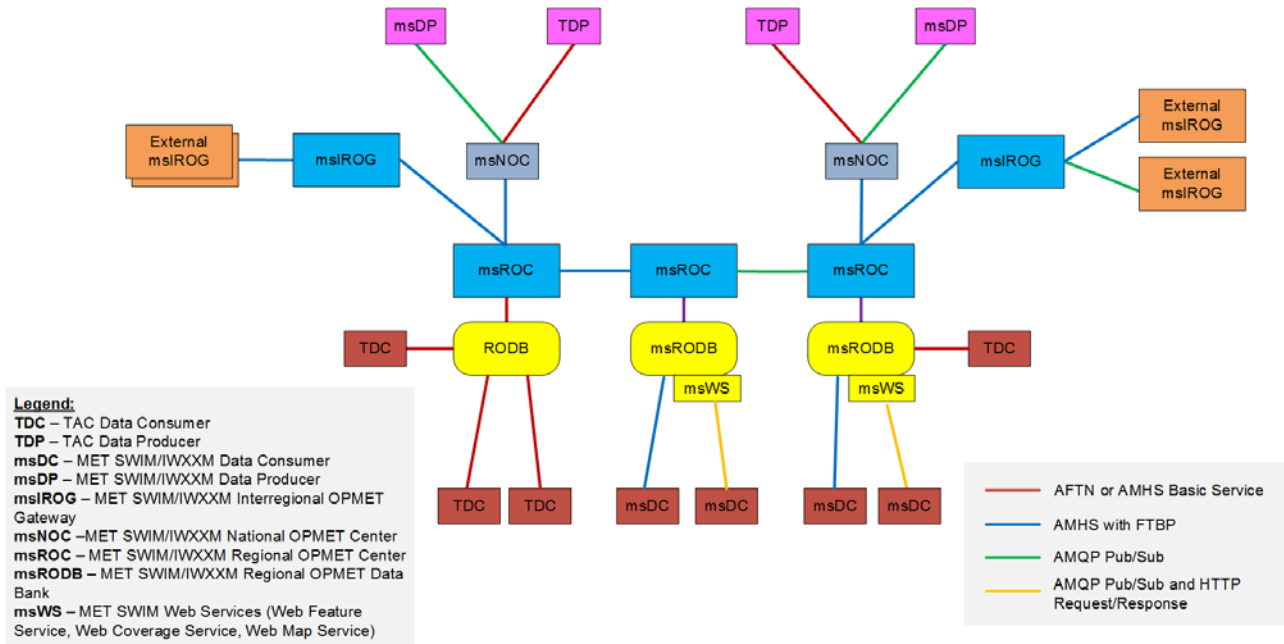


Figure 2 - MET SWIM Block 1 and 2

Block 3: MET SWIM Implementation

1.2.10 In Block 2 the protocol and data exchange transitions are completed and both IWXXM messages and gridded/image data notifications are distributed with AMQP. Gridded and image data consumers retrieve data using HTTP request/response to MET SWIM information exchange services.

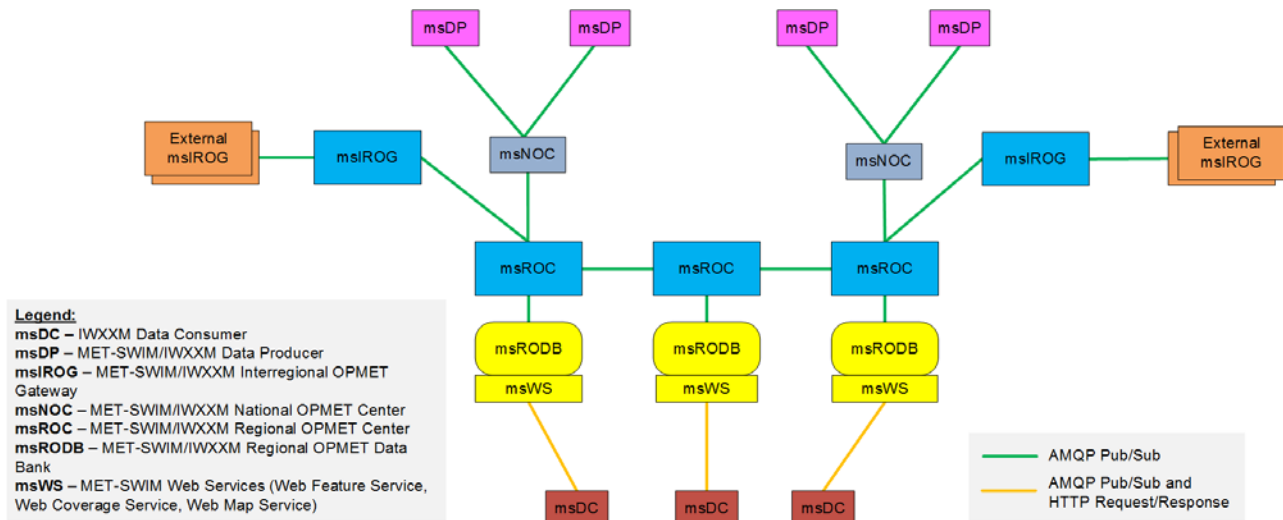


Figure 3 - MET SWIM Block 3

1.3 TIMELINES

1.3.1 As part of the SWIM activity and as part of the Global Air Navigation Plan, MET SWIM implementation will proceed in accordance with the GANP and ASBU schedule. The [current ASBU timelines](#) are as follows:

ASBU Block 0 – 2013 to 2018

ASBU Block 1 – 2019 to 2024: B1-SWIM and B1-AMET

ASBU Block 2 – 2025 to 2030: B2-SWIM and B2-AMET

ASBU Block 3 – 2031 and beyond

1.3.2 All MET SWIM pre-requisite interfaces are included in ASBU Module B1-SWIM and therefore MET SWIM Phase 1 can proceed concurrently with ASBU Module B1-SWIM.

Table 3 - MET SWIM Implementation Timelines

	ASBU Module	Implementati on Start	Implementation End
SWIM Registry	B1-SWIM	2019	2024
Service security	B1-SWIM	2019	2024
MET SWIM Block 1 (Early Adoption/Transition)	B1-AMET	2019	2024
MET SWIM Block 2 (Transition)	B2-AMET	2025	2030
MET SWIM Phase 3 (Operation)	B3-AMET	2031	-

Agenda Item 5: Review of Project H5 – MET service improvements in accordance with the new operational requirements in support of ATM

5.1 Under this agenda item, the Meeting reviewed the following papers:

- WP/10 – Analysis of ATM requirements and the ASBU methodology (presented by the Secretariat).

5.2 The Meeting reviewed the status of implementation of Project H5, consisting of the design and conduction of surveys among international air navigation stakeholders to identify the MET services required in the CDM and A-CDM environment, as discussed at the MP/2 meeting.

5.3 The Meeting took note that the MET Panel had been working on this topic. The last meeting of the Panel (METP/4) issued Recommendation 3/1 – New approach for the definition of new MET requirements, tasking the rapporteur of the WG-MRI with preparing, on behalf of the METP, a work document for the upcoming ATM RPP meeting, to ask for approval of the proposed new approach, consisting in the identification of three areas of information service development (long-haul flight operations, aircraft ground de-icing operations, and aerodrome observations). The Meeting recommended that the Coordinator of Project H5 and the Secretariat follow up on the development of the aforementioned document, and consider it for the provision of aeronautical meteorological services in support of trajectory-based operations within the context of Project H5.

5.4 The Meeting took note that some States had performed tasks related to MET in support of a CDM and A-CDM environment and of ATFM. Such was the case of Argentina, Brazil and Colombia. In this regard, Colombia made a presentation describing the services provided, such as “nowcasting” for the Bogota TMA, and other support services for air navigation in Colombia. Brazil noted that, at the *Centro de Gerenciamiento de Navegación Aérea* (Air Navigation Management Centre), the aeronautical meteorological service had a coordination position to support air flow management decisions.

5.5 Regarding survey assessment, a teleconference was scheduled for 30 July 2019 to assess meteorological requirements of the States, to support air navigation in an CDM environment and aerodrome operations in an A-CDM environment.

Agenda Item 6: Planning of new MET projects

6.1 Under this agenda item, the Meeting reviewed the following papers:

- WP/03 – *Implementation of a common procedure and platform for coordination between adjacent MWOs for the emission of SIGMETs* (presented by Chile and Argentina).
- WP/13 – *Effect of meteorological conditions on flight operations and how to prevent their risk* (presented by the Secretariat).

6.2 The Meeting took note of the proposal submitted by Argentina and Chile on coordination between adjacent FIRs to improve consistency, continuity and quality of SIGMET information in the SAM Region, in support of safe and efficient air navigation operations when adverse phenomena affect more than one FIR at the same time.

6.3 The project was presented in view of the fact that meteorological watch offices (MWOs) were associated (or restricted) to a given flight information region (FIR). SIGMET reports were prepared taking into account those boundaries, sometimes disregarding the extent of the meteorological phenomenon in the atmosphere, which could encompass several FIRs. Consequently, this could generate significant differences between the SIGMET messages thus prepared (or not) by the MWOs responsible for the adjacent FIRs. The problems observed refer to inconsistencies in the information of affected areas, differences in the levels of cloud caps and inconsistencies in the information related to severe phenomena between the boundaries of the flight information region (FIR).

6.4 The Meeting noted the existence of several multinational projects or SIGMET coordination alliances at the global level, which provide SIGMET messages with coverage to all adjacent FIRs, and meet the objectives pursued.

6.5 The Meeting agreed that the MWO coordination proposal could be considered as a new project. It also considered the holding of a planning meeting to implement the tools, platforms and procedures related to SIGMET coordination between adjacent MWOs. The purpose would be to analyse the different options available and the feasibility of establishing implementation agreements between the States of the Region for coordination between adjacent MWOs for the production of consistent and quality SIGMETs. In this regard, and considering that a Regional Workshop on SIGMET was scheduled for 2020, the Secretariat was requested to extend the workshop one more day to accommodate the meeting proposed by Argentina and Chile.

6.6 The Meeting took note of the aircraft incidents occurred in recent years in the SAM Region and the mitigation measures that the Regional Aviation Safety Group – Pan America was planning to take in coordination with GREPECAS.

6.7 The Meeting reviewed the project proposal to analyse these occurrences and to produce a document containing procedures to mitigate these aircraft incidents related to meteorological phenomena, with the participation of air navigation service providers, aeronautical meteorological service providers, aircraft operators, safety oversight agencies, and other stakeholders. Under the RASG-PA umbrella, they would carry out teleconferences and face-to-face meetings to develop the deliverable. The Meeting agreed that, in order to carry out these tasks, the recommended standards and methods included in Annex 3 - *Meteorological Services for International Air Navigation*, and the manuals that support the implementation of the aforementioned Annex, should be taken into account.

6.8 The aeronautical meteorological service providers interested in participating in the project were:

- Argentina
- Panamá
- Perú
- Ecuador
- Brazil
- Venezuela
- Colombia
- Uruguay

6.9 The Secretariat would coordinate with the RASG-PA focal point at the SAM Regional Office to report on the tasks and initial teleconference dates.

Agenda Item 7: Review of MET national plans and part MET of the CAR/SAM e-ANP

7.1 Under this agenda item, the Meeting reviewed the following paper:

- WP/11 – *Determination of an aeronautical requirement for tropical cyclone advisory information in the Western South Atlantic* (presented by WMO)

7.2 When reviewing this agenda item, the Meeting took note of the new e-ANP format that had been submitted to the consideration of the CAR/SAM Regions and that had been approved by the GREPECAS/17 meeting. The format had the following structure:

- Volume I, containing the stable elements of the plan, whose amendment required the approval of the Council;
- Volume II, containing the dynamic elements of the plan, whose amendment did not require the approval of the Council (approval was by regional agreement of the relevant PIRGs);
- Volume III, containing the dynamic/flexible elements of the plan, providing guidance for the implementation and upgrading of air navigation systems, taking into account emerging programmes, such as ASBU, and the roadmap of the associated technologies described in the GANP.

7.3 The Meeting took note that the ICAO Council had approved Vol. I in April 2016, and Vol. II had been approved that same year. The implementation of Vol. III had been postponed by decision PPRC/4-3, awaiting approval of the sixth edition of the GANP. It should also be noted that, with the approval of e-ANP Volume I and II, which replaced Doc. 8733, the reference field of air navigation deficiencies should be revised and updated.

7.4 The Meeting urged States to review Table MET I-1, and Tables MET II-1 and MET II-2, and report to the Secretariat any discrepancy with the information available in the State before 30 September 2019.

7.5 With the approval of the sixth edition of the GANP, it is imperative to develop Vol. III by 2020. In this regard, the Meeting was informed that the Secretariat had sent SL LT 1/4.1.4-SA214 dated 31 May 2019, requesting States to designate a national team, representing the five areas (ATM, CNS, AGA/AOP, AIM and MET), to prepare Vol. III.

7.6 The Meeting urged States to consult with their civil aviation authorities about the process to be followed for the establishment of the national teams responsible for developing Vol. III, so as to include aeronautical meteorological service providers.

7.7 The Secretariat will follow up on the responses sent by the States to SL LT 1/4.1.4-SA214 in order to count on the participation of MET experts in these teams formed for the preparation of Vol. III of the e-ANP CAR/SAM.

Agenda Item 8: Other business

8.1 Under this agenda item, the Meeting reviewed the following papers:

- WP/14 – *Follow-up to the recommendations of AN/Conf-13 related to MET* (presented by the Secretariat).
- IP/02- *WMO Activities in Aeronautical Meteorology of relevance to ICAO (English only)* (presented by WMO).
- IP/03 - *Replacement of text Area Forecasts (FAs) with Graphical Forecasts for Aviation (GFA) (English only)* (presented by the United States).
- IP/04 - *Regional Hazardous Weather Advisory demonstration project (English only)* (presented by the United States).
- IP/05 - *Upcoming improvements to the World Area Forecast System (English only)* (presented by the United States).
- Presentation on the Meteorology Panel (presented by the Secretariat)
- Presentation on ICAO Space Weather (presented by the Secretariat)
- Presentation on the establishment of the space weather information service for international air navigation (presented by the Secretariat)

8.2 Upon addressing this agenda item, the Meeting took note of the recommendations of the Thirteenth Air Navigation Conference, held in Montreal, Canada on 9-19 October 2018, related to MET.

8.3 The Meeting considered that the recommendations related to the MET area were:

- Recommendation 1.2/1, item b), related to the ASBU framework and the BBBs;
- Recommendation 1.3/1, item a), related to modernisation plans;
- Recommendation 1.4/1, item a) and b), related to the cost-benefit study for investment projects;
- Recommendation 2.3/1, item a), related to the future provision of aeronautical meteorological services;
- Recommendation 2.3/2, item a) related to further development of IWXXM for the exchange of OPMET information;
- Recommendation 2.3/3, item a) related to the provision of space weather services;
- Recommendation 3.1/1, items a), b), c) and d), related to SWIM implementation;
- Recommendation 3.2/1, items a), b), and c), related to support to TBO;
- Recommendation 4.2/1, items a) and b) related to the implementation of minimum navigation services; and
- Recommendation 4.3/1, items a) and b) related to the development of national air navigation plans

8.4 Upon reviewing the recommendations of the Thirteenth Air Navigation Conference related to MET, the Meeting agreed on the following conclusion:

CONCLUSION SAM/MP/08-02: Follow-up to the recommendations of AN/Conf-13 related to MET

<p>That States that have not yet done so:</p> <ul style="list-style-type: none"> a) review and update the ASBU framework and the BBBs related to MET; b) conduct a cost-benefit study for the implementation of MET improvements; c) support and prepare roadmaps for SWIM implementation; and d) plan the implementation of the basic services defined in the basic building block (BBB) framework in their national air navigation plans 	<p>Expected impact:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Political / Global <input type="checkbox"/> Interregional <input checked="" type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Technical/Operational
<p>Why: To comply with the recommendations of AN/Conf-13</p>	
<p>When: Immediately</p>	<p>Status: Adopted by SAM/MP/3</p>
<p>Who: <input type="checkbox"/> Coordinators <input checked="" type="checkbox"/> States <input type="checkbox"/> ICAO Secretariat <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Others: Users/Industry</p>	

8.5 The United States informed the Meeting about upgrades planned for the WAFS system, the replacement of text area forecasts with the new graphical format, and the project to create a Regional hazardous weather advisory centre for the Caribbean Region.

8.6 Regarding WAFS upgrades, the Meeting took note of inconsistencies detected in the graphs generated by the two world centres. In this regard, the WAFCs were planning to resolve issues with the current generation significant weather charts (SIGWX). The WAFCs would resolve both of these issues by using the WAFS grids to produce charts in many more time steps than currently available.

8.7 Improvement to the WAFS grids were also planned. The grids would have higher vertical and horizontal resolution, which would lead to more accurate fuel load calculations, and more accurate placement of hazards. There would also be more time steps, making them more suitable for shorter and longer duration flights. Finally, icing and turbulence severity forecasts would become available in 2020, followed by probabilities of icing, turbulence and thunderstorms in 2024.

8.8 However, States would have to consider that, due to the increase in horizontal, vertical and temporal resolutions, the file size of the grids would increase by over 230 times the current size of files. This would require a more sophisticated dissemination system than the existing WIFS and SADIS. Both of these systems would be upgraded to allow users to request only the flight levels, time steps and areal coverage of the gridded data that they wished to download. The systems would then create custom files according to each user's request. The upgraded dissemination systems would also provide this selective downloading capability for IWXXM OPMET data.

8.9 Regarding the creation of a regional hazardous weather advisory centre for the Caribbean Region, the United States presented the project and requested feedback from the States regarding the products generated. It was noted that these centres would improve the process of warning aviation users about immediate weather hazards. The desired improvements were that advisories would be more consistent between issuing centres, both in time and space, as well as in the methodology for issuance of the warnings.

8.10 Regarding the replacement of text area forecasts with the new graphical format, it was noted that the old text FA format contained a broad overview of expected conditions, but provided very little detail. Thanks to satellite imagery and high resolution modelling, a much higher level of detail could be provided to the users. The Meeting was requested to provide feedback on the products currently being tested, which are available at: <https://testbed.aviationweather.gov/gfa> and on the operational version, available at: <https://www.aviationweather.gov/gfa>. Feedback should be sent to Matt Strahan, at Matt.Strahan@noaa.gov. On this issue, Panama requested the United States to consider the possibility of expanding the area of coverage of the products being tested to cover the Tocumen FIR.

8.11 The World Meteorological Organization provided an overview of some of the relevant recent and upcoming activities of WMO in the context of aeronautical meteorology, including the outcomes of the Sixteenth Session of the Commission for Aeronautical Meteorology (CAeM-16) and its Technical Conference, the WMO Regional Association session, the WMO's contribution to global and regional initiatives in aeronautical meteorology, including those of ICAO, and expected outcomes of the Eighteenth World Meteorological Congress (Cg-18).

8.12 The Secretariat reported on the activities of the MET Panel. In this regard, it gave a detailed description of the process followed for the creation of the Panel after the 2014 MET Divisional Meeting, and explained the work methodology and the process for the formulation of ICAO standards and recommended practices in the MET area.