



ICAO | UNITING AVIATION

Establishment of Space Weather Information Service For International Air Navigation

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Presentation Outline

- Introduction and background
- Requirements
- Guidance on Criteria for SW Providers
- Schedule for the implementation
- Next steps





Background

State

Representation



ICAO



WMO

METP



METEOROLOGY PANEL



Expert

Members





METEOROLOGY PANEL



- The Meteorology Panel (METP) was established (ANC 197-5) to define and elaborate concepts and to develop ICAO provisions for aeronautical meteorological (MET) services consistent with operational improvements envisioned by the *Global Air Navigation Plan (GANP)*, (Doc 9750) and in keeping with the working arrangements between ICAO and the *World Meteorological Organization (WMO)* (Doc 7475).
- The METP shall collaboratively determine operational requirements for aeronautical MET service provision as an enabling function for a future globally interoperable air traffic management system and identify solutions, in coordination with WMO, to effectively and efficiently fulfil the requirements through sound scientific and/or technological capabilities



Background-Overall Mandates

- *Annex 3 – Meteorological Service for International Air Navigation*
- *WMO Technical Regulations Pub 49*
- *Working Arrangements between the International Civil Aviation Organization and the World Meteorological Organization*
 - Doc 7475
- **Meteorology Panel**
 - Terms of Reference





Requirements

- IAVWOPSG
- 2014 Meteorology (MET) Divisional Meeting
- Meteorology Panel (METP/2) Meeting
- Air Navigation Commission (ANC)

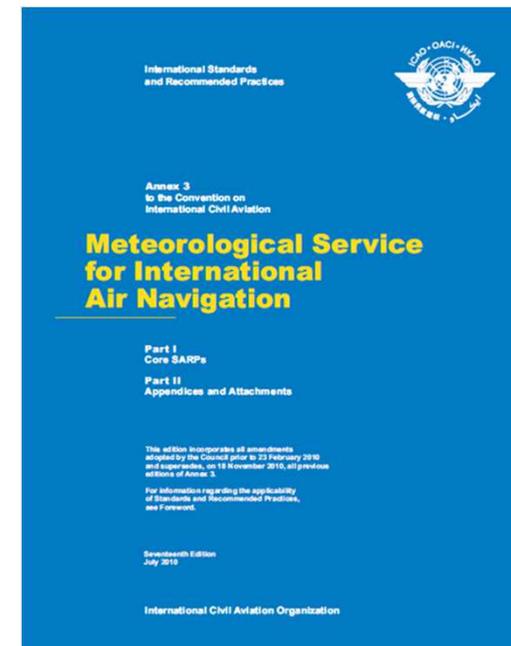




Annex 3-Requirements

SARPs In Annex 3- *Meteorological Service for International Air Navigation*

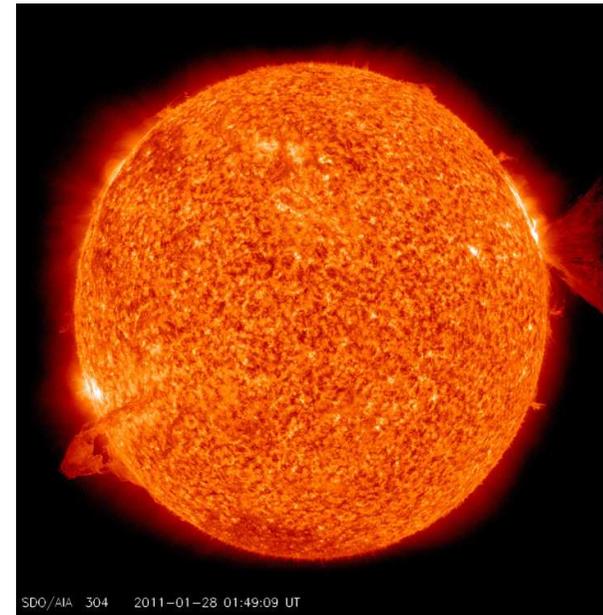
- Chapter 1-Definitions;
- Chapter 3- Specific SW requirements;
- Chapter 9- Service for operators and flight crew members;
- Appendix 2- New Space Weather Centres and Table A2-3. Template for advisory message for space weather information;
- Appendix 8- Specifications related to flight documentation; and
- Attachment E- Spatial ranges and resolutions for space weather advisory information
- SL Ref.:AN 10/1-17/41, Dated: April 2017
 - Subject: Proposals for the amendment of Annex 3 and consequential amendments to Annex 15, PANS-ABC and PANS-ATM





Guidance on Criteria for SW Providers

To ensure quality, reliability, and integrity of the space weather information service for international air navigation, a space weather information provider should demonstrate and/or provide evidence that it meets the following criteria:





Guidance on Criteria for SW Providers

1-Institutional Criteria

- a) Experience as a designated national space weather information provider
- b) A Quality Management System (Annex 3 - Meteorological Service for International Air Navigation, Chapter 2, Paragraph 2.2.2)
- c) Appropriate qualifications of personnel and an ongoing competency and training program (WMO-No 49, WMO-No 258)
- d) Adherence to all applicable data rights
- e) Procedures to liaise with aviation decision-makers and gather feedback on the space weather information service
- f) Procedures to coordinate with other space weather information providers
- g) A source of funding and an adequate level of funding to provide the space weather information service for a period of at least 3 years



Guidance on Criteria for SW Providers

2-Operational Criteria

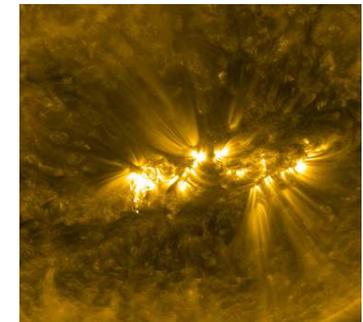
- a. 24/7 operational capability
- b. A system reliability of 99.9 percent with no single failure exceeding 90 minutes in a 24-hour period
- c. A system availability of 98.0 percent with no single outage exceeding 4 hours in a 1-year period
- d. A system maintainability of 95.0 percent for a 2-hour interval



Guidance on Criteria for SW Providers

3-Technical Criteria

- a) Ability to provide the space weather information service, both near real-time and forecast information, as defined in the draft SARPs for Amendment 78 of ICAO Annex 3 Meteorological Service for International Air Navigation.
- b) Ability to access observations (own observations and received from other space weather providers) of:
 - Coronal mass ejections and high-speed streams
 - Geomagnetic storms
 - Solar radiation storms
 - Solar flares
 - Solar radio bursts
 - Ionospheric activity
- c) Ability to produce near real-time and forecast information regarding the potential impacts of space weather using numerical models capable of ingesting observation data from multiple sources.
- d) Ability to produce near real-time and forecast information that meets the proposed functional and performance requirements.
- e) Ability to coordinate and harmonize information with the space weather information providers for adjacent areas of responsibility, as necessary.
- f) Ability to conduct forecast verification





Guidance on Criteria for SW Providers

4-Communication/Dissemination Criteria

- a) Ability to provide the space weather information service to aviation decision-makers, as defined in the draft SARPs for Amendment 78 of Annex 3 -Meteorological Service for International Air Navigation.
- b) Ability to provide a communications system and infrastructure that supports the availability, maintainability, and reliability criteria in section 2.
- c) Ability to provide the space weather information service via the following means of dissemination:
 - ICAO Aeronautical Fixed Service
 - World Area Forecast System Internet File Service
 - Secure Aviation Data Information Service
 - Regional OPMET centres

Note: The criteria in paragraphs 1, 2, 3 and 4 above may be met by a single entity or a consortium of multiple space weather information providers with appropriate arrangements for coordination and harmonization



Schedule for Establishing Space Weather Information Capability

Start Date	End Date	Description	Responsibility
May 2017	June 2017	Issue State Letter requesting interest in providing the space weather information service.	ICAO
May 2017	June 2017	a) Request WMO assistance to evaluate candidate Provider States through site assessment visits and audits (without list of candidates States); and; b) Provide WMO with a list of candidates States.	ICAO
September 2017	October 2017		
June 2017	September 2017	Respond to State Letter indicating ability to meet criteria for space weather information providers, including funding for site assessment visit and audit (to be conducted by WMO).	Candidate Provider States
October 2017	February 2018	Conduct site assessment visits and audits of candidate Provider States for space weather information capability.	WMO
March 2018	April 2018	Complete report to ICAO on candidate Provider States for space weather information capability.	WMO
April 2018	April 2018	Review of WMO audits report and recommend optimal number of space weather information providers.	METP
May 2018	June 2018	Review METP recommendations and provide proposals for designation of providers of space weather information for Council consideration.	ICAO ANC
June 2018	July 2018	Designate provider(s) of space weather information capability.	ICAO Council
July 2018	November 2018	Commence production and dissemination of space weather information.	Space Weather Provider(s)



Next Steps

- ANC Final Review of States and Intl. Organizations reply to SL
- ANC Report To Council
- Council approval of Annex 3 Amendment





Conclusion

The civil aviation network is projected to double its volume of flights and passenger by 2030, therefore the importance of a strong and efficient MET service provision, in this case of space weather information, is of paramount importance to support the safe achievement of such projection.



