



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**Third Meeting of APIRG Infrastructure and Information Management Sub Group (IIM/SG/3)
(Virtual Meeting, 12-14 October 2020)**

Agenda Item 5.3: Other Air navigation issues

**REGIONAL PROVISION OF SPACE WEATHER INFORMATION IN SUPPORT OF
INTERNATIONAL AIR NAVIGATION**

(Presented by South Africa)

SUMMARY
<p>This working paper discusses the implementation of the requirement for the provision of a space weather information service to support international air navigation as part of ICAO’s Global Air Navigation Plan (Doc 9750). ICAO amended Annex 3, Annex 15, PANS-ABC and PANS-ATM to include the provision of space weather information from designated centres. South Africa has been designated a regional centre for the provision of space weather information to national and regional Air Navigation Service Providers (ANSPs) and operators. The discussion point of this paper will deal with the progress made in implementing this required service, the regional coordination requirements, and the implications for civil aviation.</p> <p>Action by the meeting is at paragraph 3</p>
<p>REFERENCE(S):</p> <ul style="list-style-type: none">▪ Annex 3▪ Annex 15, PANS-ABC and PANS-ATM▪ Manual on Space Weather Information in Support of International Air Navigation (Doc 10100)
<p>Related ICAO Strategic Objective (s): A - <i>Aviation Safety</i> B - <i>Air Navigation Capacity and Efficiency</i></p> <p>Related ASBU KPIs & B0 Modules: <i>All applicable to AIM, and MET</i></p>

1. INTRODUCTION

1.1 Annex 3 – Meteorological Service for International Air Navigation – provides Standards and Recommended Practices (SARPs) for Contracting States in the provision of Meteorological Information for International Air Navigation. As of 2018, the requirement for the provision of space weather services is included as part of air navigation plans. These requirements have been incorporated into Annex 3, which now puts forward that measures of safety should include the ability of the operators and air navigation service providers (ANSPs) to effectively manage the risks of space weather impact on communications, navigation and surveillance systems, as well as radiation exposure.



- 1.2 The amendments were included into Amendment 78 of Annex 3, through State letter AN 10/1.1-18/32, which become applicable on 8 November 2018 and is further supported through the Manual on Space Weather Information in Support of International Air Navigation (Doc 10100).
- 1.3 In response to ICAO State Letter AN10/1-17/11, dated 9 June 2017, calling for States to indicate their candidature to be designated centres for the provision of space weather information, South Africa put forward the South African National Space Agency (SANSA) as a viable candidate to become a designated centre. On 13 November 2018, ICAO announced five designated centres (AN 10/1–IND/18/9, dated 21 December 2018) for the provision of space weather information to the aviation sector, of which South Africa, through SANSA, was one of the Regional Centres.
- 1.4 This Working Paper is being put forward as a discussion point around the implications of these amendments for the aviation sector, and the role that South Africa will be playing as the ICAO designated Regional Space Weather Centre for Africa.

2. DISCUSSION

- 2.1 ICAO has recognised the need for the adoption of procedures related to mitigating the impact of space weather on civil aviation. During the 2014 Montreal Meeting of the ICAO Meteorology Division, a recommendation was passed for the development of provisions for information concerning space weather. Included in the recommendation was the requirement that space weather information be integrated into global air traffic navigation information systems. ICAO recommended that all aviation providers and users become familiar with the impacts of space weather on the aviation sector and requested that pertinent space weather information be filed with all flight plans by 2017. This was later amended to November 2018.
- 2.2 SANSA has been given the mandate to operate the Space Weather Regional Warning Centre for Africa, under the International Space Environment Service (ISES), which aims to coordinate global space weather activities. SANSA has been providing a space weather service and undertaking space weather research for more than a decade. Since 2014 SANSA has been working with ICAO and ISES to understand the impact that Space Weather events can have on the aviation sector and to advise on the provision of Space Weather information to the aviation sector.
- 2.3 It is important to note that space weather is a global phenomenon with regional impact. SANSA has been collaborating with South Africa's Air Traffic and Navigation Services Company (ATNS) and the South African Weather Service (SAWS) for the past five years on the Space Weather for Aviation Project, in a bid to prepare the South African aviation community for the proposed amendments.



- 2.4 In April 2016, SANSA published a policy brief entitled “Space Weather Impacts on Aviation” which can be used as background information to the proposed amendments and South Africa’s ability to comply with the amendments. This document can assist AFI States in dealing with the proposed amendments.
- 2.5 In terms of amendment 78 to Annex 3 and consequential amendments to Annex 15, PANS-ABC and PANS-ATM, a requirement has been introduced for the provision of space weather information that is expected to affect communications, navigation and surveillance systems and/or pose a radiation risk to flight crew members and passengers.
- 2.6 Space weather service providers who are supporting the aviation sector with compliance to Annex 3 will be required to monitor the existence and extent of relevant space weather observations, and to issue and supply advisory information in the prescribed formats and to the agreed standard on a 24/7 basis.
- 2.7 Operators and flight crew members will be required to include information pertaining to space weather phenomena relevant for the entire route. Flight documentation would then need to include this information.
- 2.8 With the expected addition of space weather information to the existing suite of meteorological information, as defined in Annex 3, there will be a need for operators and regulatory authorities to consider space weather in their operational policies.
- 2.9 SANSA implemented a 3-year plan in 2019 to meet the required ICAO standards for delivering the service as a designated regional centre by 2022. In this regard, infrastructure and capability are being put in place to ensure that the requirements of the African aviation sector are understood, and that SANSA can provide the necessary expertise, knowledge and information pertaining to the impacts of space weather on international air navigation.
- 2.10 The ICAO designated Regional Space Weather Centre for Africa (SANSAC) will be collaborating with designated State representatives to arrange information sessions and discuss training needs for the understanding of space weather and its impacts on aviation operations and systems.

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to:
 - a) Take note of the information contained in this working paper including State Letter AN10/1-17/41, dated 7 April 2017, and the designation of SANSAC as the Regional Centre for Space Weather Information provision.
 - b) Consider the implications of space weather requirements for AFI States regulatory authorities, ANSP’s and operators’ operational policies.
 - c) Urge States to work with the Regional Space Weather Centre (SANSAC) to develop action plans to meet the implementation requirements as defined in State Letter AN10/1-17/41, dated 7 April 2017, and to participate in arranged information sessions to ensure adequate awareness and understanding.



3.2 Draft Conclusion/Decision 3/xx: *Development of action plans to meet the Space Weather implementation requirements*

That;

- a) States consider the implications of Annex 3 space weather requirements for AFI States' regulatory authorities, ANSPs and operators' operational policies;**
- b) the Secretariat, with the support of the designated Regional Space Weather Centre (SANSa), take appropriate actions to assist States to meet the space weather implementation requirements.**

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