



**Twenty First Meeting of the Africa-Indian Ocean Planning and Implementation Regional Group (APIRG/21)
(Nairobi, Kenya, 9 – 11 October 2017)**

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.5 Status of ASBU Implementation and evolution of the Global Air Navigation Plan

ITEM

SPACE WEATHER AND NEW REQUIREMENTS FOR ANNEX 3
(Presented by South Africa)

SUMMARY
This working paper discusses 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 has recently invited comments from the State on proposed amendments to Annex 3 and consequential amendments to Annex 15, PANS-ABC and PANS-ATM. These amendments deal with the provision of a space weather information service to national and regional Air Navigation Service Providers (ANSPs) and operators. The discussion point of this paper will deal with the requirements that these amendments will impose and subsequent implications for civil aviation.
REFERENCE(S): Annex 3 Annex 15, PANS-ABC and PANS-ATM
Related ICAO Strategic Objective(s): Safety (A)

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 included 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 International Civil Aviation Organization (ICAO) issued State Letter AN10/1-17/41, dated 7 April 2017, requesting comments on proposed amendments to Annex 3 and consequential amendments to Annex 15, PANS-ABC and PANS-ATM.

1.3 This working paper is being put forward as a discussion point around the implications of these proposed amendments for the aviation sector.

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.

2.2 The South African National Space Agency (SANSA) operates the Space Weather Regional Warning Centre for Africa, under the International Space Environment Service (ISES), which aims to coordinate global space weather activities. The SANSA Space Weather Centre was established in 2010 with the mandate to:

- i. Develop space weather capabilities within South Africa,
- ii. Improve the understanding and awareness of space weather within Africa, and
- iii. Provide a space weather operational service to government, industry and the public.

2.3 It is important to note that space weather is a global phenomenon with regional impact. The proposed amendments to Annex 3 follow from the ICAO recommendations made at the Montreal meeting in 2014 (Report on Agenda Item 2. Met/14-WP/64 CAeM-15/Doc.64 Recommendation 2/7). 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. In addition, SANSA has been collaborating with the Air Traffic and Navigation Services Company (ATNS) for the past two years on the Space Weather for Aviation Project, in a bid to prepare the South African aviation community for the proposed amendments.

2.5 SANSA has published a policy brief entitled “Space Weather Impacts on Aviation”¹ in April 2016 which can be used as background information to the proposed amendments and South Africa’s ability to comply with the amendments. In addition, SANSA has been the state representative on the World Meteorological Organisation Inter-Programme team on Space Weather (WMO-IPTSW) and more recently the World Meteorological Inter-Programme Team on Space Weather Information, Systems and Services (IPT-SWISS). It was through both these bodies that the proposed amendments to Annex 3 were developed.

2.6 In terms of the proposed amendments to Annex 3 and consequential amendments to Annex 15, PANS-ABC and PANS-ATM, a requirement will be 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.

2.7 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.

2.8 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.

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[http://www.sansa.org.za/images/resource_centre/publications/PolicyBriefs/Policy%20Brief%20Space%20Weather%20Impacts%20on%20Aviation%20\(2016\).pdf](http://www.sansa.org.za/images/resource_centre/publications/PolicyBriefs/Policy%20Brief%20Space%20Weather%20Impacts%20on%20Aviation%20(2016).pdf)

2.9 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.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

1. Note the information contained in this paper.

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