


<p style="text-align: center;">SOUTH AFRICAN</p>  <p style="text-align: center;">CIVIL AVIATION AUTHORITY</p>	<p>REPUBLIC OF SOUTH AFRICA</p> <p>CIVIL AVIATION AUTHORITY</p> <p>AERONAUTICAL INFORMATION CIRCULAR</p>	<p>CAA Private Bag x73 Halfway House 1685</p>
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AIR NAVIGATION SERVICES

METEOROLOGICAL SERVICES

SPACE WEATHER IMPACTS ON AVIATION

1. PURPOSE

To provide an awareness of the potential impacts that space weather events can have on various aspects of concern to the South African aviation community. To work towards a common understanding of the compliance requirements recommended by the International Civil Aviation Organisation (ICAO) concerning the provision of space weather information to the aviation industry.

2. BACKGROUND

- 2.1 *Space weather refers to the conditions on the Sun, in the solar wind, magnetosphere, ionosphere and thermosphere that can influence the performance and reliability of space – borne and ground based technological systems.*
- 2.2 *The impact from space weather events are known to affect the areas of communications, navigation, radiation exposure, and avionics within the aviation sector.*
- 2.3 *South African National Space Agency (SANSA), as the custodian of the only regional warning centre for space weather in Africa, can provide space weather related information, training and key impact factors that may be of concern to the aviation community.*
- 2.4 *To ensure that accurate and relevant space weather information is provided, SANSA needs to understand how the aviation sector operates as well as their user requirement specifications. To achieve this aim, SANSA has embarked together with ATNS, on a research project to investigate the impacts of space weather within the aviation sector.*
- 2.5 *The aviation industry has indicated a requirement to be educated on the potential impact of space weather to their operations.*

3. GENERAL

3.1 *The following questions need to be addressed:*

- *In what way, and to what level, does space weather affect aviation operations over the African region?*
- *What would be the relevant inputs for a space weather prediction model design specifically for the aviation sector?*
- *What information, and in what format, should be provided to aviation users to meet the ICAO compliance requirements?*

3.2 *For SANSA to be able to provide the required space weather information as introduced by State Letter: AN10/1-17/41, dated 7 April 2017, the following information on Communication, Navigation and Surveillance outages experienced within the Johannesburg (FAJA), Cape Town (FACA) and Johannesburg Oceanic (FAJO) FIR would need to be supplied by the South African Aviation Community:*

- *Date and Time*
- *Identified/Reported by*
- *Type of outages (Communications, Navigation or Surveillance)*
- *Location/area of outages (preferably coordinates in Degree, Min, Sec with radius)*
- *Duration of outages*

- 3.3 *Information obtained from this feedback would allow for the development of an appropriate model capable of predicting the severity of a space weather phenomenon and its potential impact on aviation on South Africa.*
- 3.4 *The information is required to be sent to:
Dr Rendani Nndanganeni; Tel: +27 28 312 1196; e-mail: rnndanganeni@sansa.org.za*
- 3.5 *Airlines interested in forming part of the initiatives undertaken by SANSA are also requested to forward their nominations to Dr Rendani Nndanganeni at SANSA.*

4. CONCLUSION

- 4.1 *The aviation sector needs to be prepared for implementing the relevant ICAO recommendations.*
- 4.2 *SANSA has undertaken to work with the aviation sector to develop knowledge, expertise and appropriate applications to ensure capability for providing accurate and reliable information.*
- 4.3 *There is a requirement for SANSA to receive appropriate data and information pertaining to challenges experienced within the aviation sector to allow for an investigation into possible space weather causes.*
- 4.4 *SANSA also requires appropriate engagement with the relevant aviation stakeholders to facilitate the exchange of information and build the appropriate know-how, as has previously been requested at OPSCOM 26 and OPSCOM 27 meetings.*



DIRECTOR OF CIVIL AVIATION