

**AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP
(APIRG)**



**INFRASTRUCTURE AND INFORMATION MANAGEMENT (IIM)
SUB-GROUP**

METEOROLOGY PROJECT 3

TERMS OF REFERENCE (ToR)

Version 1.0

REVISION INDEX SHEET

Version	Revision	Date	Reason for Change	Affected Pages
1	1	01/06/2021	First Edition	All

ABBREVIATIONS

Term	Definition
AFI	Africa and Far East Indian Ocean
APIRG	AFI Planning and Implementation Regional Group
APCC	APIRG Projects Coordination Committee
ATM	Air Traffic Management
CNS	Communication Navigation Surveillance
COM	Communication
GANP	Global Air Navigation Plan
ANP	Air Navigation Plan
ICAO	International Civil Aviation Organization
IIM	Infrastructure and Information Management
OPMET	Operational Meteorological
PANS	Procedure for Air Navigation
SARPs	Standards and Recommended Practices
SWx	Space Weather

EXECUTIVE SUMMARY

These Terms of Reference outline the requirements needed for the implementation of information concerning en-route space weather phenomena which may affect the safety of aircraft operations. The MET Project 3 (**Space Weather**) is aimed at ensuring correct and relevant provision of space weather service to international air navigation within the ICAO AFI region.

The IIM Sub-Group MET Project 3 (Space weather) is responsible for recommendations and assistance to States with respect to activities that will assist States to improve the implementation of Space weather information/ advisory, address deficiencies and corrective action.

Contents

ABBREVIATIONS	3
EXECUTIVE SUMMARY	4
1. INTRODUCTION	6
2. PROJECT COMPOSITION	8
3. MEETING PROCEDURE.....	8
4. PROXIES AND REPRESENTATIVES	9
5. RESPONSIBILITIES OF TEAM MEMBERS	9
6. DECISION MAKING	10
7. DISPUTE RESOLUTION.....	10
8. ATTENDANCE AND APOLOGIES.....	10
9. PERFORMANCE EVALUATION.....	10
10. DECLARATION OF INTEREST AND NON-DISCLOSURE.....	10
11. REVIEW OF TERMS OF REFERENCE.....	10
APPENDIX A: TEAM MEMBERS IIM SUB-GROUP MET PROJECT 3.....	Erreur ! Signet non défini.

1. INTRODUCTION

1.1 Background:

Research efforts, both nationally and internationally, are underway to gain a better understanding of the causes of space weather and its impacts on the environment, economy, public health and safety, and national security. In addition, increased collaboration between meteorological and space weather communities is showing the benefits of shared data, analysis techniques, and warnings. Due to our increasing reliance on technologies susceptible to space weather and the demonstrated importance of space weather to society, this Project promotes activities that further our understanding of this cross-disciplinary science and its practical applications.

Space Weather (SWx) refers to the variable conditions on the sun and in the space environment that can influence the performance and reliability of space-borne and ground-based technological systems, as well as endanger life or health. Most SWx occurs because emissions from the sun influence the space environment around Earth, as well as other planets. SWx events can have a considerable and significant impact on meteorological satellite and radio-communications- the two components of that are of most importance for aviation operations. The provision of space weather information will be a significant contribution to the achievement of the safety levels needed by civil aviation, especially in light of the remarkable traffic growth that is forecasted.

The information and services required for safe and efficient aircraft operations will be provided by designated global centres, assisted by regional centres passing relevant information to the global centres for dissemination. The working principle for the centres is to provide space weather advisory information that users can employ for decision-making. In this regard, the designated SWx Centres are required to provide information to satisfy the needs of the future Air Traffic Management (ATM) systems. As the future ATM system evolves, the demands on aeronautical meteorology (MET) will require improved or new systems, information, and products to support it.

The APIRG Infrastructure and Information Management Sub Group (IIM/SG) MET Project 3 has the task to assist States with the implementation of:

- a) SIGMET and standards and recommended practices of Annex 3 and Part V – MET of the AFI Air Navigation Plan (ANP), Volumes I, II, III concerning the issuance and distribution of en-route space weather phenomena including solar flares and coronal mass ejections; radiation storms, disturbances in Earth's magnetic field; atmospheric heating and ionospheric storms which are likely to affect the safety of aircraft operations, and the evolution of such phenomena in time and space;
- b) An action plan to assist concerned States in their effort to implement systems that will enable the dissemination and provision of space weather information,
- c) Create awareness and provide information and expertise in relation to the implementation of the Annex 3 requirements for space weather.
- d) Develop a draft AFI Concept of Operations for the dissemination of space weather information in the AFI Region.

This will be in accordance with the Standards and Recommended Practices (SARPs) of ICAO Annex 3, - *Meteorological service for international air navigation* and relevant guidance documents.

1.2 Purpose and Objectives

The IIM/SG MET Project 3, was established and mandated by APIRG to support the implementation of ICAO Annex 3 SARPs on SWx and to carry out specific activities aimed at enabling APIRG to discharge its functions and responsibilities in the area of space weather information provision.

The purpose of the IIM/SG MET Project 3 is to assist States with the implementation of the requirement for the provision of SWx information service to support international air navigation as part of ICAO's Global Air Navigation Plan (Doc 9750).

The objectives of the MET Project 3 are to:

- Carry out the activities and tasks defined by APIRG;
- Assist States with the implementation of the requirement for the provision of SWx information service to support international air navigation;
- Create awareness of the space weather information requirement within the aviation sector in the AFI region.
- support States with the requirements for the provision of space weather information for the safety of aircraft operations

The Mission of the MET Project 3 is to provide technical expertise to the AFI region in matters related to space weather science, services, and impacts.

1.3 Key Functions

The Project shall perform its function as guided by APIRG.

- a) Raise awareness, encourage, and support efforts relating to space weather within ICAO AFI region and the broader weather and climate enterprise.
- b) Foster the implementation of the provision of space weather information to the region.
- c) Provide advice and information to the ICAO AFI region on matters concerning space weather and assist in formulating statements and positions on related issues.
- d) Review the aeronautical requirements for space weather information services, as defined in the Standards and Recommended Practices (SARPs) of ICAO Annex 3/ Global Air Navigation Plan (Doc 9750), Technical Regulations, Volume II – *Meteorological Service for International Air Navigation*, to ensure a common understanding amongst team members.
- e) Ability to provide the space weather information service to aviation decision-makers, as defined in the SARPs of Annex 3 -*Meteorological Service for International Air Navigation*.

1.4 Tasks

- a) Coordinate and conduct meetings of MET Project 3.
- b) Hold workshops, and information sessions on SWx information provision for States within the AFI region to increase knowledge and understanding of the ICAO requirements.
- c) Review and update the list of deficiencies with regards to the provision of space weather information to international air navigation within ICAO AFI region and propose remedial actions.
- d) Develop a draft AFI Concept of Operations for the dissemination of SWx information within the African continent.

2. PROJECT COMPOSITION

The Project is made up of the Project Team Coordinator (PTC), Team members and the Secretary. Only permanent members or proxies have the voting rights. The IIM/SG MET Project 3 PTC is nominated by APIRG meeting and can serve a maximum of period as communicated by the IIMSG Chairperson.

3. MEETING PROCEDURE

3.1 Frequency

The frequency of the IIM Sub-Group Meteorology project shall be once every two months. The frequency may be reduced by mutual consent of the committee should the need arise.

3.2 Notice of meeting

The MET Project 3 PTC shall manage and schedule the frequency, date, and venue of the project meeting.

3.3 Reporting to the IIMSG Chair

The PTC shall submit the project progress report of the group's activities to the IIM Sub-Group Chair and/or Vice Chair during the IIMSG meeting or when requested.

The report shall include the following:

- Status of the project and activities completed.
- Project challenges encountered; and
- Recommendations to address challenges.

3.4 Minutes

The project meeting minutes shall be prepared by the Secretary for approval at the next MET Project 3 meeting

3.5 Quorum

The quorum for convening the meeting shall be determined by at least five team members confirming their attendance to the meeting.

4. PROXIES AND REPRESENTATIVES

- If a permanent member of the Project is unable to attend a meeting, he/she shall nominate a proxy by way of notifying the Project Secretary. The alternate must ideally be of appropriate seniority with delegated authority to participate in the decision-making process at the same level as the permanent member.
- The Project Secretary will inform the Project team members of the substitution at the beginning of the relevant meeting.
- The nominated proxy shall have all the rights of the permanent member at the attended meeting.
- The nominated proxy shall provide relevant comments/feedback of the Project team member they are representing, to the attended meeting.
- Other persons may be invited or co-opted as observers by the PTC or Team members.
- Due to the importance of the meeting and in the pursuit of the Project tasks and deliverables meeting attendance is essential. Should such attendance not be possible the rescheduling of such meeting shall be considered, but on an agreed date.
- In the event there is no quorum, the meeting may be cancelled.

5. RESPONSIBILITIES OF TEAM MEMBERS

5.1 Project Team Coordinator (PTC)

- In the absence of PTC, the meeting is cancelled, unless an acting PTC is appointed.
- The Acting PTC shall be appointed by the PTC.
- The PTC is responsible for confirming that the quorum is present at every meeting.

5.2 Project Team Secretary

- The Secretary shall distribute the meeting documentation, agenda, and previous minutes to all Team members at least seven (7) working days before the meeting.
- The secretary is responsible for minutes' decisions or resolutions and submits the draft minutes of the Project meeting to the coordinator within two (2) working days after the meeting, for review.

5.3 Project Team Members

- To provide participation and support to the Project, particularly with respect to the area of space weather information provision to international civil aviation.
- Ensure that there is collective ownership and promotion of common principles, standards, policies, guidelines as well as end-to-end technology strategies and roadmaps as it relates to Space weather information provision in the ICAO AFI region.

6. DECISION MAKING

The decision shall be taken on consensus of all Team members present at the meeting. The PTC is responsible for communicating the decision made. Any objections to either approval or rejection of a submission under consideration shall be raised so that, such objections where necessary, can be recorded in the proceedings of the Project meeting.

Matters can be cleared outside the meeting for approved submissions provided that such matters do not have material bearing on the submission or decision.

7. DISPUTE RESOLUTION

Any dispute/issue on which consensus cannot be reached will be settled through voting by the members. Team members have the right to note their objection to a decision with a reason.

8. ATTENDANCE AND APOLOGIES

The Project meeting attendance is compulsory for all Team members or their proxies. The Project members that cannot attend shall tender their apology to the Secretary before the scheduled meeting.

9. PERFORMANCE EVALUATION

The Project shall perform and carry out a self-assessment annually to assess its effectiveness in carrying out its functions set out in these ToR and shall report its conclusions and recommend any changes it considers necessary to the IMSG.

10. DECLARATION OF INTEREST AND NON-DISCLOSURE

All permanent and invited members shall declare any conflict of interest where applicable.

11. REVIEW OF TERMS OF REFERENCE

The terms of reference shall be reviewed by the Project –every two years or as and when required.

These Terms of Reference were approved by and signed on behalf of the Met Project 3 by the:

---END---

IIMSG-MET PROJECT TEAM 3

IMPLEMENTATION OF SPACE WEATHER REQUIREMENTS Project Team Coordinator: South Africa (*Dr. Rendani Nndanganeni*)

NO	STATE/ORGANIZATION	NAME	DESIGNATION/ ORGANIZATION	OFFICIAL EMAIL	TELEPHONE	PERSONAL EMAIL
1.	SOUTH AFRICA	Lebogang Makgati	Meteorologist South African Weather Service	Lebogang.Makgati@weathersa.co.za	+27 11 533 3359	
2.	SOUTH AFRICA	Khonzumusa Hlophe	Manager: Infrastructure R&D ATNS	khonzumusah@atns.co.za	+27 11 607 1332	
3.	SOUTH AFRICA	Menzi Mkhize	Engineer: Infrastructure R&D ATNS	menzim@atns.co.za	+27 11 607 1332	
4.	SOUTH AFRICA	Raoul Bester	Specialist: Aeronautical Information ATNS	RaoulB@atns.co.za	+27 11 607 1248	
5.	SOUTH AFRICA	Mpho Tshisaphungo	Space Weather Practitioner South African National Space Agency	mtshisaphungo@sansa.org.za	+27 28 312 1196	
6.	SOUTH AFRICA	Keenan Janneker	Space Weather Practitioner South African National Space Agency	kjanneker@sansa.org.za	+27 28 285 0072 / +27 71 354 6881	
7.	TANZANIA	John Mayunga	Manager Aviation and Marine Services Tanzania Meteorological Authority (TMA)	john.mayunga@meteo.go.tz	+255 22 246 0706	
8.	TANZANIA	Ally Mussa	Head of Aeronautical at Julius Nyerere International Airport Tanzania Meteorological Authority (TMA)	ally.mussa@meteo.go.tz	+255 22 246 0706	
9.	ZIMBABWE	Naboth Sifiso Craig Chaibva	Aeronautical Meteorologist Meteorological Services Department		+263 777 967 121	nchaibva@gmail.com
10	BOTSWANA	Olebile Kodule	Civil Aviation Authority of Botswana	olebile@gmail.com / kodule@caab.co.bw	+26772852540/7376 5455	
11	ZAMBIA	Alex Sinyangwe	Zambia Civil Aviation Authority	Alex.Sinyangwe@caa.co.zm		
12	ZAMBIA	Lyson Phiri	Senior Aeronautical Meteorologist/Zambia Meteorological Department.	phirilydon2013@gmail.com		
13	BENIN	Justin Noukpozoukou	Inspecteur MET	j.noukpozoukou@anac.bj	+229 95 86 78 16	

14	BENIN	Cedric Koussikan	Cadre du service de la navigation aérienne	c.koussikan@anac.bj	+229 64 36 15 31	
15	BURKINA FASO	Nebnoma Alexandre Kabore	Inspecteur des services de la navigation Aérienne spécialisé en communications navigation et surveillance (CNS)		+226 701 634 35 / +226 691 634 35	nebnoma@gmail.com
16	COTE D'IVOIRE	Gouamene Rock Levis	Inspecteur ANS-MET A' l'ANAC Cote d'Ivoire	rgouamene@anac.ci	+225 27 21 58 69 00 poste 3334 / +225 07 57 14 72	
17	COTE D'IVOIRE	Kouakou Khan Abraham	Inspecteur ANS-MET A' l'ANAC Cote d'Ivoire	kkouakou@anac.ci	+225 21 58 62 97 3334 / +225 07 77 78 92 21	
18	GABON	Leonel Mba Nkilli	Cadre MET a' l'ANAC Gabon	Leonel.mba@anac-gabon.com	+241 749 496 91 / +241 651 314 33	
19	MALI	Sekou Sienta	Inspecteur MET à l'Agence Nationale de l'Aviation Civile (ANAC) MALI		+223 20 20 55 24 +223 73 02 98 59	ssienta@yahoo.fr
20	SIERRA LEONE	Mohamed Yangbay Kamara	Air Navigation Services Officer – MET Sierra Leone Civil Aviation Authority Freetown, Sierra Leone	mykamara@slcaa.gov.sl	+232 76 430 429	
21	SIERRA LEONE	Ahmed Kallon	Air Navigation Services Officer – MET Sierra Leone Civil Aviation Authority Freetown, Sierra Leone	akallon@slcaa.gov.sl	+232 76 520 585	
22	UGANDA	<i>Khalid Muwembe</i>	UGANDA CIVIL AVIATION AUTHORITY	kmuwembe@caa.co.ug	+256 312 352118/ +256 703 829013	
23	ANGOLA	Lutumba Tima	ANS MET INSPECTOR	lutumba.tima@gmail.com	+244931867807	
24	ASECNA	Koffi Améwouga GUENOUKPATI,	Engineers in Aeronautical Meteorology	Guenoukpati.koffi.a.r odolphe@gmail.com	(+229) 67 07 19 29/ (+229)65027272	
25	ASECNA	Moustapha Hamidi	Engineers in Aeronautical Meteorology	Moustaphaham@asecna.org	(+221) 786381242 (+221) 771630435	