International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)

Fifth GREPECAS–RASG-PA Joint Meeting

and

Twenty-Third Meeting of the CAR/SAM Regional Planning and Implementation Group

GREPECAS/23

Draft Report

Asynchronous Session: 19 January to 17 February 2026
In person Session: Mexico City, Mexico, 4 to 6 March 2026

Prepared by the Secretariat

April 2026

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HISTORICAL

ii.1 Place and Date of the Meeting

ii.1.1 The Twenty-Third Meeting of the CAR/SAM Regional Planning and Implementation Group **(GREPECAS/23)** was held in two phases: one as an asynchronous virtual session from 19 January to 17 February 2026; and the second as an in-person session held at the offices of CIASA/ SENEAM in Mexico City, Mexico, from 4 to 6 March 2026.

ii.1.2 The Fifth GREPECAS–RASG-PA Joint Meeting **(GREPECAS–RASG-PA/5)** brought together the plenary sessions of RASG-PA and GREPECAS and was held on the afternoon of 4 March 2026 at the same venue as the GREPECAS/23 meeting.

ii.2 Opening Ceremony

ii.2.1 Mr. Orlando Nevot, Vice Chair of GREPECAS, delivered the opening address of the asynchronous online session of the **GREPECAS/23** on 19 January 2026, emphasizing the importance of the role of GREPECAS and the interaction between States and industry for the successful implementation of Air Navigation Services (ANS).

ii.2.2 The **GREPECAS–RASG-PA/5** was opened on 4 March 2026 by Mr. Michel Roy, Co-Chair of the RASG-PA States, Mr. Javier Vanegas, Co- Chair of the RASG-PA Industry and Mr. Orlando Nevot, Vice Chair of GREPECAS. The Meeting expressed its appreciation for the significant support provided by Brigadeiro Eduardo Jansen, Chair of GREPECAS, who recently retired from the Brazilian Administration and was unable to attend the meeting.

ii.2.3 For the in-person session, welcome remarks were provided by Mr. Fabio Rabbani, Regional Director of the ICAO South American (SAM) Regional Office and Secretary of GREPECAS, who emphasized the activities of the GREPECAS work programme and the need for greater coordinated work and planning of new operational improvements in Air Navigation Services (ANS). In turn, Mr. Christopher Barks, Regional Director of the ICAO North America, Central America and Caribbean (NACC) Regional Office and Secretary of the RASG-PA, highlighted the importance of planning and implementation work aligned with the Global Air Navigation Plan. Finally, Cap. Carlos Manuel Merino Campos, General Director of Airports and Auxiliary Services (ASA), thanked the delegates for their presence in Mexico City and reiterated the commitment of Mexico to support any initiative that increases safety, efficiency and environmental benefit through the implementation of the corresponding Regional Plans.

ii.3 Officers of the Meeting

ii.3.1 **GREPECAS–RASG-PA/5** was chaired by Mr. Michel Roy, Co-Chair of the RASG-PA States, Mr. Javier Vanegas, Co- Chair of the RASG-PA Industry and Mr. Orlando Nevot, Vice Chair of GREPECAS. Mr. Fabio Rabbani, Regional Director of the ICAO South American (SAM) Regional Office, and Mr. Christopher Barks, Regional Director of the ICAO North America, Central America and Caribbean (NACC) Regional Office, served as Secretaries of the meeting, supported by Mr. Oscar Quesada, Deputy Director

of the ICAO SAM Regional Office, and Mr. Julio Siu, Deputy Regional Director of the ICAO NACC Regional Office, and assisted by the following staff members from ICAO Headquarters and the SAM and NACC Regional Offices:

Marco Merens	Chief, Implementation Support Section, ICAO Headquarters
Saulo Da Silva	Chief, Global interoperable Systems, ICAO Headquarters
Elie Tanious EL Khoury	Technical Officer, Airspace Management and Optimization, Headquarters
Jorge Armoa	Regional Officer, Aeronautical Information Management / Aeronautical Meteorology and Environment, SAM Regional Office
Luis Sánchez	Regional Officer, Aeronautical Information Management / Aeronautical Meteorology and Environment, NACC Regional Office
Fernando Hermoza	Regional Officer, Air Traffic Management and Search and Rescue, SAM Regional Office
Mayda Ávila	Regional Officer, Communication, Navigation and Surveillance, NACC Regional Office
Eddian Méndez	Regional Officer, Air Traffic Management and Search and Rescue, NACC Regional Office
Javier Puente	Regional Officer, Regional Officer, Safety Implementation SAM Regional Office
Fernando Camargo	Regional Officer, Technical Assistance, NACC Regional Office
Marcelo Orellana	Regional Officer, Safety Implementation, NACC Regional Office
Sereya Schotborgh	Regional Officer, Safety Implementation, NACC Regional Office
Josué González	Regional Officer, Air Traffic Management and Search and Rescue, NACC Regional Office
Fabiana Todesco	Regional Officer, Strategic Planning and Implementation, SAM Regional Office
Rodrigo Ribeiro	Regional Officer, Aerodromes and Ground Air Specialist, SAM Regional Office
Javier Vittor	Regional Officer, Communication, Navigation and Surveillance, SAM Regional Office
Fabio Salvatierra	Regional Officer, Aerodromes and Ground Aids, NACC Regional Office
Maidy Plana	Regional Officer, Aeronautical Information Management, NACC Regional Office
Judit De Leon	Regional Officer, Environment, NACC Regional Office

ii.3.2 **GREPECAS/23** was chaired by Mr. Orlando Nevot, Vice Chair of GREPECAS. Mr. Fabio Rabbani, Regional Director of the ICAO South American (SAM) Regional Office, served as Secretary of the Meeting, supported by Mr. Christopher Barks, Regional Director of the ICAO North America, Central America and Caribbean (NACC) Regional Office, and Mr. Oscar Quesada, Deputy Director of the ICAO SAM Regional Office, and Mr. Julio Siu, Deputy Regional Director of the ICAO NACC Regional Office, and with

the assistance of officials from ICAO Headquarters and the NACC and SAM Regional Offices, as indicated below:

Marco Merens	Chief, Implementation Support Section, ICAO Headquarters
Saulo Da Silva	Chief, Global interoperable Systems, ICAO Headquarters
Elie Tanious EL Khoury	Technical Officer, Airspace Management and Optimization, Headquarters
Jorge Armoa	Regional Officer, Aeronautical Information Management / Aeronautical Meteorology and Environment, SAM Regional Office
Luis Sánchez	Regional Officer, Aeronautical Information Management / Aeronautical Meteorology and Environment, NACC Regional Office
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Judit De Leon	Regional Officer, Environment, NACC Regional Office

ii.4 Working Languages

The working languages of the Meeting were English and Spanish. The working papers, information papers, presentations and report of the meeting were available to participants in both languages.

ii.5 Schedule and Working Arrangements

ii.5.1 Asynchronous Phase: the discussion of the Working Papers was carried out supported by a Virtual platform (MS TEAMS) from 19 January to 17 February 2026.

ii.5.2 The Meeting agreed that the working hours for the in-person GREPECAS/23 session of the meeting would be from 08:30 to 16:20 hours daily with adequate breaks.

ii.6 Agenda

Agenda Item 1: Adoption of the Draft Agenda and Schedule

Agenda Item 2: Follow-up on the Valid GREPECAS Conclusions and Decisions

Agenda Item 3: Updates on GREPECAS-RASG-PA Joint activities

Agenda Item 4: Assembly 42nd results; Global Aviation Safety Plan and Global Air Navigation Plan

Agenda Item 5: Assembly 42nd Results; Matters Concerning Air Navigation Initiatives

a) Outcomes of the Fourteenth Air Navigation Conference (AN-Conf/14) and the follow-up actions undertaken by ICAO
b) ICAO policy on Radio Frequency (RF) spectrum matters
c) Global Navigation Satellite System (GNSS) vulnerabilities and resilience
d) Meteorology and System-Wide Information Management (SWIM)
e) Aerodrome operations and obstacle limitation surfaces
f) Aerodrome infrastructure and certification
g) Space transport operations

Agenda Item 6: Progress on Regional and National Air Navigation Planning

Agenda Item 7: GREPECAS Work Programme and Projects

Agenda Item 8: CAR/SAM Air Navigation Implementation

Agenda Item 9: Other business to be addressed in the virtual phase

Agenda Item 10: Preliminary Results from GREPECAS23 Virtual Phase

Agenda Item 11: Strategic Approach Towards the Implementation of Air Navigation Improvements

Agenda Item 12: Review of GREPECAS Work Programme

Agenda Item 13: Any Other Business

Agenda Item 14: Draft GREPECAS 23 Conclusions and Decisions

ii.7 Attendance

The Meeting was attended by 20 States/Territories from the NAM/CAR/SAM Regions, 22 International Organizations/industry, totalling 130 delegates as indicated in the list of participants.

ii.8 Conclusions and Decisions

ii.8.1 GREPECAS records its action in the form of conclusions and decisions as follows:

Conclusions deal with matters, which in accordance with GREPECAS´ terms of reference require direct attention of States/Territories and/or International Organizations, or on which further action will be initiated by ICAO in accordance with established procedures.

Decisions deal with matters of concern only to the GREPECAS and its Contributory Bodies organization.

ii.8.2 **List of Conclusions**

ii.8.3 **List of Decisions**

ii.9 List of working papers, information papers and presentations

Please refer to the internet page of the Meeting:

https://www.icao.int/SAM/meetingdocs?fid=24925#block-icao-page-title

WORKING PAPERS

Number	Agenda Item	Title	Prepared and presented by
WP/1.1	1	Adoption of the provisional agenda and schedule.	Secretariat
WP/2.1	2	Follow-up on the Valid GREPECAS Conclusions and Decisions	Secretariat
WP/3.1	3	Updates on RASG-PA/GREPECAS joint activities	Secretariat
WP/3.2	3	Report on the results of the RVSM airspace monitoring programme in the CAR/SAM regions for 2024 and GTE activity report for 2024-2025	Scrutiny group - GTE Rapporteur
WP/3.3	3	Strengthening aviation safety management in the NACC and SAM Regions by enhancing ANSP and regulatory engagement, collaboration, coordination and harmonization.	United States
WP/4.1	4	RASG-PA activities and alignment with Air Navigation Commission (ANC) global challenges.	CANSO
WP/4.2	4	Eighth edition of the Global Air Navigation Plan (GANP, 8th Ed.).	Secretariat
WP/5.1	5	Follow-up action taken by ICAO on recommendations of the Fourteenth Air Navigation Conference (AN-CONF/14).	Secretariat
WP/5.2	5	*(Number was not assigned)*	
WP/5.3	5	Meteorology and system-wide information management (SWIM).	Secretariat
WP/5.4	5	Aerodrome operations and obstacle limitation surfaces. Aerodrome infrastructure and certification.	Secretariat
WP/5.5	5	Space transport operations.	Secretariat
WP/5.6	5	Inclusion of women in air traffic management: a competency-based strategy.	Brazil
WP/5.7	5	Cyber resilience enhancements: The role of contingency planning and cyber exercises.	Brazil
WP/5.8	5	Brazilian plan for the implementation of a minimum operating network (MON) in response to GNSS disruption and the benefits of the project DME/DME/INERTIAL.	Brazil
WP/5.9	5	Recommended actions for administrations concerning WRC-27 Agenda Items.	Brazil
WP/6.1	6	Development for KPIs management	Secretariat
WP/6.2	6	Volume III RANP CAR/SAM - Improving implementation planning and monitoring	Secretariat

WORKING PAPERS

Number	Agenda Item	Title	Prepared and presented by
WP/6.3	6	Development and application of a Mathematical Methodology for the calculation of instantaneous aircraft capacity (PIAC) as a KPI in terminal control areas: case study in the Cancún TMA	Mexico
WP/6.4	6	progressive development of capabilities in advanced analytics and Artificial Intelligence for the processing of key performance indicators (KPIs) and early risk detection in Air Traffic Services.	Mexico
WP/6.5	6	A comprehensive aviation infrastructure gap analysis and continuous monitoring for the CAR/SAM Regions	Secretariat
WP/6.6	6	Effective KPIs for informing operational improvements.	United States and IATA
WP/7.1	7	GREPECAS Work Programme and Projects.	Secretariat
WP/8.1	8	ATM – Improvement of the Airspace in CAR/SAM Regions	Secretariat
WP/8.2	8	ATM - Implementation of the Air Traffic Flow Management (ATFM) Service in CAR/SAM Regions.	Secretariat
WP/8.3	8	Update on ATM contingency activities.	Secretariat
/8.4	WP 8	Progress report on activities to support Search and Rescue Implementation in the CAR/SAM Regions.	Secretariat
WP/8.5	8	Cooperation and joint advances in Communications in CAR and SAM.	Secretariat
WP/8.6	8	Cooperation and joint advances in CAR and SAM Navigation.	Secretariat
WP/8.7	8	*(Withdrawn by the Secretariat)*	
WP/8.8	8	Meteorology – Implementation	Secretariat
WP/8.9	8	Aeronautical Information Management (AIM).	Secretariat
WP/8.10	8	System Wide Information Management (SWIM).	Secretariat
WP/8.11	8	CAR/SAM implementation – Aerodromes and Ground aids (AGA) Programme Projects	Secretariat
WP/8.12	8	Environmental Protection	Secretariat

WORKING PAPERS

Number	Agenda Item	Title	Prepared and presented by
WP/8.13	8	Cooperation and joint progress in CAR and SAM Surveillance.	Secretariat
WP/8.14	8	FPL 2012 best international practices as a transition to FF-ICE.	IATA
WP/8.15	8	D-ATIS and DCL implementation.	IATA
WP/8.16	8	GNSS radiofrequency interference and minimum operating network.	IATA
WP/8.17	8	IATA A-CDM TOOLKIT.	IATA
WP/8.18	8	Pending improvements to FAA managed Caribbean airspace.	United States
WP/8.19	8	A new air traffic control system in the United States.	United States
WP/8.20	8	Sharing contingency routes and use of routes without surveillance and communication capabilities.	United States
WP/8.21	8	Update of the ATM contingency plans of the Central American States and COCESNA.	COCESNA
WP/8.22	8	Diagnosis of Central American Airspace.	COCESNA
WP/8.23	8	Impact of climate change on the provision of air traffic services in the MHCC FIR.	COCESNA
WP/8.24	8	PBN landings safety.	France
WP/8.25	8	The implementation of FF-ICE/R1 services worldwide and challenges for the SAM Region.	Brazil
WP/8.26	8	Environmental analysis of operational improvements in Brazilian air navigation.	Brazil
WP/8.27	8	Sustainability: reducing fuel consumption and Co2 emissions through operational improvement measures.	Brazil
WP/8.28	8	Enhancing operational effectiveness and punctuality through independent parallel simultaneous departures (IPSD).	Brazil
WP/8.29	8	Performance-based deliverables of the “Agile” initiatives in Brazil.	Brazil
WP/8.30	8	Transition altitude harmonization in Brazilian airspace.	Brazil
WP/8.31	8	Brazilian PBCS implementation status and regional responsibilities for CAR/SAM States.	Brazil

WORKING PAPERS

Number	Agenda Item	Title	Prepared and presented by
WP/8.32	8	SAM ATFM Portal	Brazil
WP/8.33	8	Enhancing CPDLC adoption in the CAR/SAM region through improved flight plan filing practices and operator engagement.	Brazil
WP/8.34	8	CARRANCA: Brazilian SAREX.	Brazil
WP/8.35	8	BR-UTM PROJECT: Unmanned Traffic Management in Brazil.	Brazil
WP/8.36	8	Regional collaboration at the Tulum, Mexico meteorological watch office	Mexico
WP/8.37	8	Adoption of RF Legs as the default design option in PBN/RNP approaches without AR: application at Mexico City INTERNATIONAL airport (MMMX)	Mexico
WP/8.38	8	Evolution of GNSS events in the SAM Region.	Argentina
WP/8.39	8	Extension of Strategic direct routing in the South Pacific and the commencement of trials between the states of Ecuador, Chile, and Peru	Peru
WP/9.1	9	Enhancing operational safety through the CERTIFICATION Of technical and Linguistic competencies for NOTAM Office (NOF) personnel.	Mexico
WP/9.2	9	Introduction of Separation Criteria during an aircraft interception	Ecuador
WP/9.3	9	Creation of a regional repository on regulations and technical documentation on management of wildlife hazard impacting in Aviation in the CAR and SAM regions.	CARSAMPAF
WP/9.4	9	Operational transition to the new terminal at Jorge Chávez international airport and commencement of segregated Two-runway Operations	Peru
WP/10.1	10	Preliminary results from GREPECAS/23 Virtual Phase	Secretariat
WP/13.1	13	Elections of GREPECAS chairperson and vice-chairperson	Secretariat
WP/14.1	14	Draft Conclusions and Decisions	Secretariat

INFORMATION PAPERS

Number	Agenda Item	Title	Prepared and presented by
IP/1.1	Gen	General Information on the Presential Meeting	Secretariat
IP/1.2 Rev	1	List of Working, Information Papers and Presentations	Secretariat
IP/6.1	6	Proposal for the RANP Volume III Template – improvement for ASBU implementation AND Monitoring	Secretariat
IP/8.1	8	Airspace concept development in the Rio de Janeiro and Belo Horizonte TMAS: operational optimization and environmental benefits.	Brazil
IP/8.2	8	ViraCO_2pos Project: operational efficiency and environmental benefits in the São Paulo TMA.	Brazil
IP/8.3	8	Review and update of instrument approach procedures (IAP).	Brazil
IP/8.4	8	Evolution of Brazilian airspace surveillance: advances in the implementation of ADS-B and multilateration technologies.	Brazil
IP/8.5	8	ATN-BR implementation progress.	Brazil
IP/8.6	8	Update on the implementation status of the tropical cyclone advisory center (TCAC) in Brazil.	Brazil
IP/8.7	8	Cooperation and joint progress in CAR and SAM Regions on Communications – Navigation – Surveillance activities.	Secretariat
IP/8.8	8	Development of ADS-B systems in the Air traffic Surveillance systems modernization program in Argentina	Argentina
IP/9.1	9	Regional ATM training initiatives - “No country left behind”.	Brazil
IP/9.2	9	Some activities that will be developed by the CAR/SAM Regional committee for the prevention of bird and wildlife hazard – CARSAMPAF. (**Spanish only**)	CARSAM PAF

PRESENTATIONS

Number	Agenda Item	Title	Prepared and presented by
P01	3	Regional Implementation Challenges in Pan-America - GASP 2026-2028	Secretariat
P02	4	Plan Global de Navegación Aérea (GANP)	Secretariat

PRESENTATIONS

Number	Agenda Item	Title	Prepared and presented by
P02A	4	Global Developments in Air Navigation	Secretariat
P02B	4	Outcomes of the 42nd ICAO Assembly (A42)	Secretariat
P02C	12	Review of the action taken by the Air Navigation Commission on the report of GREPECAS/22 and RASG-PA/14 meetings and overview of the PIRGs and RASGs Consolidated Report to Council for 2024-2025	Secretariat
P03	12	Work Programme and Projects	Secretariat
P04	11	Strategic Approach Towards the Implementation of Air Navigation Improvements	Secretariat

LIST OF PARTICIPANTS

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127. Maidy Plana
128. Fabio Salvatierra
129. Judit De León
130. Josué González

Agenda Item 1 Adoption of the Draft Agenda and Schedule

1.1 Under papers WP/1.1. and IP 1.2 REV.1, the Secretariat submitted the Draft Agenda, working method and schedule of GREPECAS/23 for consideration and approval by the Meeting.

1.2 During the virtual (asynchronous) phase of the Meeting, held from 19 January to 17 February 2026, the States and International Organizations approved the agenda and schedule, as reflected in this report.

Agenda Item 2: Follow-up on the Valid GREPECAS Conclusions and Decisions

2.1 **Under WP/2.1,** the Secretariat presented an executive summary of follow-up actions, which included the Conclusions and Decisions from previous GREPECAS meetings and from joint RASG-PA and GREPECAS meetings. This follow-up reflects the progress achieved over the past year in relation to the activities requested in these Conclusions and Decisions, resulting in the need to extend the reporting deadline to the next GREPECAS meeting.

2.2 The Meeting analyzed and reviewed the status of the valid GREPECAS Conclusions and Decisions. The Meeting identified 12 completed Items and agreed to extend the deadlines for 24 selected items until the GREPECAS/24, as reflected in the table below:

Title	Status
DECISION GREPECAS/21/03 TCAS-RA AND LHD REDUCTION	**COMPLETED**
CONCLUSION GREPECAS/21/04 ACTIONS FOR THE PROGRESS OF VOLUME III OF CAR/SAM REGIONAL AIR NAVIGATION PLAN	**VALID** New target date: GREPECAS/24
CONCLUSION GREPECAS/21/06 UPDATE OF THE INFORMATION OF PART III (CNS) OF VOLUME II OF THE AIR NAVIGATION PLAN CAR/SAM	**VALID** New target date: GREPECAS/24
DECISION GREPECAS/21/07 APPROVAL OF THE CAR/SAM AIRSPACE OPTIMIZATION PROGRAMME AND THE NEOSPACE-1 PROJECT	**COMPLETED**
CONCLUSION GREPECAS/21/08 OPERATIONAL DEVELOPMENT OF THE ATFM SERVICE IN CAR/SAM REGIONS	**VALID** New target date: GREPECAS/24
CONCLUSION GREPECAS/21/09 ACTIONS TO STRENGTHEN CONTINGENCY PLANNING IN THE CAR/SAM REGIONS	**COMPLETED**
CONCLUSION GREPECAS/21/10 STRENGTHENING OF FREQUENCY MANAGEMENT FOR THE USE OF AIR NAVIGATION SERVICES	**VALID** New target date: GREPECAS/24
CONCLUSION GREPECAS/21/11 DEVELOPMENT OF TERMS OF REFERENCE FOR A TOOL FOR THE ASSESSMENT OF SURVEILLANCE DATA FROM THE CAR AND SAM STATES	**VALID** New target date for completion: GREPECAS/24
CONCLUSION GREPECAS/21/12 USE OF THE FREQUENCY FINDER 2023 APPLICATION AS A MANAGEMENT TOOL FOR VHF NAV AND VHF COM FREQUENCIES USED IN THE AERONAUTICAL CONTEXT	**COMPLETED.**
CONCLUSION GREPECAS/21/13 ACTIONS TO ADVANCE THE IMPLEMENTATION OF THE D-ATIS AND THE DCL	**VALID** New target date: GREPECAS/24

Title	Status
CONCLUSION GREPECAS/21/17 STATE IMPLEMENTATION OF NEW ICAO ANNEX 3 STANDARDS AND RECOMMENDED PRACTICES (SARPs) AND RELEVANT MET REQUIREMENTS	**COMPLETED.**
CONCLUSION GREPECAS/21/18 COMPLETION OF PHASE 2 OF THE AIS ROADMAP TO AIM AND AIS AND INCLUSION OF SNOWTAM IN GREPECAS DASHBOARDS	**VALID**. New target date: GREPECAS/24
DECISION GREPECAS/21/19 REVISION OF DOCUMENT 7383 - AERONAUTICAL INFORMATION SERVICE PROVIDED BY THE STATES	**COMPLETED**
CONCLUSION GREPECAS/21/21 DEVELOPMENT OF AN ACTION PLAN FOR THE ADS-B IMPLEMENTATION	**VALID** New target date: GREPECAS/24
CONCLUSION GREPECAS/21/23 SUPPORT THE WORK OF THE GREPECAS GTE	**VALID** New target date: GREPECAS/24
DECISION GREPECAS/21/24 UPDATES TO PROJECT GREPECAS A2 GNSS AUGMENTATION	**VALID** Secretariat will circulate a proposal for consideration on a reviewed Project on SBAS potential benefits. New target date: Q2 2026
DECISION GREPECAS/22/1 AD-HOC GROUP TO ASSESS THE COORDINATION OF PA-RAST/MAC –GTE SAFETY ISSUES (DECISION RASG-PA/14 D03)	**VALID** New target date: GREPECAS/24
CONCLUSION GREPECAS/22/2 PROGRESS ON THE DEVELOPMENT OF VOLUME III OF THE RANP CAR/SAM	**VALID** New target date: GREPECAS/24
CONCLUSION GREPECAS/22/3 SUPPORT FOR INSTRUMENT FLIGHT PROCEDURES DESIGN IN THE CAR/SAM REGIONS	**VALID.** New target date for completion: GREPECAS/24
CONCLUSION GREPECAS/22/4 SUPPORT FOR SEARCH AND RESCUE EXERCISES	**COMPLETED**
CONCLUSION GREPECAS/22/5 HARMONIZATION OF THE REGIONAL CAR/SAM ATM CONTINGENCY MANAGEMENT FRAMEWORK	**VALID** New target date for completion: GREPECAS/24
CONCLUSION GREPECAS/22/6 NEOSPACE-1 PROJECT HARMONIZED DOCUMENTS	**COMPLETED**
CONCLUSION GREPECAS/22/7 EVALUATION PROCESS OF THE NEW AIRSPACE CONCEPTS	**VALID**

Title	Status
	Processing has not yet started; extension requested at GREPECAS/24
CONCLUSION GREPECAS/22/8 DIGITAL AIRSPACE SYSTEM ANALYSIS (DASA) WORKSHOP IN BRAZIL	**VALID** New target date for completion: GREPECAS/24
CONCLUSION GREPECAS/22/9 DISSEMINATION OF THE IMPACTS OF SEVERE WEATHER PHENOMENA ON THE SAFETY OF AIR OPERATIONS	**VALID** New target date for completion: GREPECAS/24
CONCLUSION GREPECAS/22/10 PERIODICAL VERIFICATION OF THE BASIC BUILDING BLOCKS OF MET, AIM, SAR, ATM AND AGA SERVICES	**VALID** New target date for completion: GREPECAS/24
DECISION GREPECAS/22/11 REGIONAL AGREEMENT FOR THE IMPLEMENTATION OF A TROPICAL CYCLONE ADVISORY CENTRE (TCAC)	**VALID** New target date for completion: GREPECAS/24
CONCLUSION GREPECAS/22/12 ENVIRONMENTAL STRATEGY IN THE NAM/CAR/SAM REGIONS	**VALID** New target date for completion: GREPECAS/24
CONCLUSION GREPECAS/22/13 MODIFICATIONS APPROVAL TO CAR/SAM F3 PROJECT	**COMPLETED**
CONCLUSION GREPECAS/22/14 REVIEW OF THE CURRENT GREPECAS WORK PROGRAMME AND PROJECTS	**COMPLETED**
DECISION GREPECAS/22/15 APPROVAL OF THE UPDATE OF THE GREPECAS PROCEDURAL HANDBOOK	**COMPLETED**
CONCLUSION GREPECAS/22/16 ENHANCE CAR/SAM REGIONS RVSM AIRSPACE SAFETY	**VALID** New target date for completion: GREPECAS/24
DECISION GREPECAS/22/17 UPDATE OF THE GUIDANCE MANUAL FOR CONTACT POINTS ACCREDITED TO CARSAMMA	**VALID** New target date: GREPECAS/24
CONCLUSION GREPECAS/22/18 TCAS/RA EVENTS REDUCTION AND MITIGATION STRATEGY IN CAR/SAM FIRs (DECISION RASG-PA/14 D04)	**VALID** The results will be presented at the RASG-PA/16 and GREPECAS/24 Plenary Sessions

Title	Status
DECISION GREPECAS/22/19 ACTIVATION OF AN AD-HOC GROUP FOR THE DEVELOPMENT OF KPIS OF GANP (KAHG)	**COMPLETED**
CONCLUSION GREPECAS/22/20 ACTION ITEMS RELATED AN-CONF/14 RECOMMENDATIONS 3.1/1, 3.1/4 AND 3.2/2	**VALID** New target date for completion: GREPECAS/24

Agenda Item 3 Updates on GREPECAS-RASG-PA Joint activities

3.1 **Under WP/3.1,** the Meeting reviewed the status of coordinated safety activities between RASG-PA and GREPECAS since the previous plenary. This update advancements in the monitoring of Mid-Air Collision (MAC) and Large Height Deviation (LHD) through the PA-RAST and Scrutiny Working Group (GTE) interface, as well as progress in the CAR/SAM Runway Safety Team (RST) project, Air Traffic Services (ATS) language proficiency initiatives, and Controlled Flight into Terrain (CFIT) mitigation activities. It also covered other agreed areas of coordination, including Unmanned aircraft system(s)/ Remotely Piloted Aircraft Systems (UAS/RPAS) activities and turbulence-related accidents activities. The document emphasized the stability of the joint coordination framework and its role in harmonizing regional safety data outputs, thereby avoiding duplication of efforts. These elements were further confirmed during the subsequent joint RASG-PA/GREPECAS session, reinforcing the effectiveness of the established coordination framework.

3.2 The Meeting endorsed the progress achieved and discussed technical enhancements to optimize the ongoing projects. Canada and ALTA proposed integrating the Global Action Plan Prevention Runway Incursions (GAPPRI) tracking system to improve the monitoring of RST project results. El Salvador emphasized the need for a consolidated root cause analysis of Traffic Collision and Avoidance System-Resolution Advisory (TCAS-RA) events to better identify if risks stem from human factors or procedural gaps. Furthermore, IATA highlighted the importance of strengthening the coordination between RST activities and GREPECAS initiatives regarding stabilized approaches, specifically under the NEOSPACE/APTA project and the SAMIG/GESEA/SG 2 implementation group, to ensure a harmonized regional approach, as also emphasized during the joint session discussions.

3.3 Participants also explored the evolution of safety oversight mechanisms. IATA and other stakeholders recommended that CAR/SAM States consider the creation or consolidation of safety groups with a broader scope than the traditional RST, citing successful models such as Brazilian Commercial Aviation Safety Team (BCAST) and the United States Commercial Aviation Safety Team (CAST) as references tailored to each State's needs and capacities. Additionally, Guatemala expressed its intention to resume Go Team missions in coordination with the NACC Regional Office, with a view to strengthening safety implementation at the local level.

3.4 The Meeting noted PA-RAST's progress in Controlled Flight Into Terrain (CFIT) mitigation, including the amendment of RSA-07B to reference RSIA-01 on TAWS limitations, now available in English and Spanish. Development of RSA-07C also has begun to address risks from incorrect altimeter settings during Area Navigation (RNAV) Barometric Vertical Navigation (BARO-VNAV) approaches at non-ILS airports. Furthermore, the Working Group is analysing TAWS alert clusters near Mexico City to further refine regional safety guidance.

3.5 Under the activities related to Unmanned Aircraft System(s) (UAS)/ Remotely Piloted Aircraft System (RPAS), the Meeting discussed regulatory challenges following a proposal for a coordinated regional framework to harmonize regulations and registries. Participants emphasized the need to align UAS safety governance with national standards and to implement risk-proportional Safety Management Systems, reflecting ongoing regional efforts to integrate drone operations through collaborative risk management. Although initially addressed under a separate agenda item, this initiative was transferred to the joint RASG-PA and GREPECAS framework due to the air navigation nature of

proposed measures like dedicated air corridors, ensuring regional interoperability and a harmonized approach to integration into controlled airspace. During the joint session, participants further noted the diversity of regulatory approaches across States and emphasized the importance of regional harmonization, including the possible establishment of common registries and strengthened regional oversight mechanisms.

3.6 Activities related to the ATS Language Proficiency Project continued during the period. The training provider selected for the project remained engaged in the development of the course material, which was adjusted from the originally planned content. As noted in the latest PA-RAST update, the course is still under development and has not yet been finalized. Work continues on completing the technical revisions required for the delivery of the course, and further updates will be provided once the material is ready for implementation.

3.7 **Under WP/3.3**, the Meeting considered a proposal presented by the United States to enhance aviation safety management through improved engagement between Air Navigation Service Providers (ANSPs) and regulators. The paper identified a lack of effectiveness in current coordination mechanisms and advocates for structured, harmonized processes to share and analyse ATM safety data. It emphasizes that regional Safety Enhancement Initiatives (SEIs) must better reflect the operational realities managed by stakeholders across the NACC and SAM regions. This issue was also discussed during the joint session, where participants reiterated the need for stronger and more structured coordination mechanisms between ANSPs and regulators.

3.8 Member States, including Brazil, Chile, Costa Rica, Guatemala, and Panama, expressed strong support for the formalization of these coordination processes. IATA emphasized the importance of establishing a systematic mechanism within RASG-PA to clearly identify safety priorities requiring action by ANSPs. This approach would enable implementation groups to better align their initiatives with operational needs, creating a feedback loop in which RASG-PA evaluates the impact of operational improvements on regional safety levels.

3.9 Venezuela underscored the necessity of ensuring the sustained and meaningful participation of both ANSPs and regulators in PA-RAST, to ensure that regional safety analyses reflect operational realities and that proposed mitigations are effective. Regarding the proposed updates to the Procedural Handbooks, it was noted that while the current RASG-PA Procedural Handbook includes a section on coordination and communication, there is a significant opportunity to document specific coordination processes in greater detail. Consequently, the Meeting adopted the following:

<table>
<tr><td colspan="2">DECISION
GREPECAS/23/01
[RASG-PA/15/C03]</td><td colspan="2">STRENGTHENING OF THE RASG-PA/GREPECAS JOINT COORDINATION MECHANISM</td></tr>
<tr><td colspan="2">What:
That, with a view to ensuring a synchronized and harmonized approach to regional safety management and avoiding duplication of efforts between regional groups, and subject to the alignment of procedural frameworks, the Secretariat shall:
a) conduct a comprehensive review of the existing coordination processes mandated by the RASG-PA and GREPECAS Procedural Handbooks to identify gaps in the sharing of operational safety information;
b) develop a proposal for a more robust and clearly defined coordination mechanism that enhances engagement between Air Navigation Service Providers (ANSPs) and Regulators; and
c) present the proposed mechanism and necessary handbook amendments to the next RASG-PA/GREPECAS Joint Session for formal approval.</td><td colspan="2">Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why:
a) To allow implementation groups to better align their initiatives with operational needs, creating a feedback loop in which RASG-PA evaluates the impact of operational improvements on regional safety levels.
b) To resolve the current lack of effective coordination in sharing ATM safety data and to ensure that regional Safety Enhancement Initiatives (SEIs) are accurately informed by operational realities.</td></tr>
<tr><td>When:</td><td>By RASG-PA/GREPECAS/6 Joint Session</td><td>Status:</td><td>☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☐ States ☒ ICAO ☐ Other:</td><td colspan="2"></td></tr>
</table>

3.10 **Under WP/3.2**, the Meeting reviewed the results of the RVSM airspace monitoring programme in the CAR/SAM regions for 2024 and the activity report of the Scrutiny Working Group (GTE) for the 2024—2025 period. The paper highlighted that, while the Target Level of Safety (TLS) remains a challenge in several Flight Information Regions (FIRs), the GTE has strengthened its role in the consolidation and analysis of LHD data. The report emphasizes the critical need for States to provide timely and accurate data to CAR/SAM Monitoring Agency (CARSAMMA) to ensure the reliability of regional safety assessments.

3.11 During the discussion of **WP/3.2,** the Meeting noted that the vertical Collision Risk Model (CRM) for the 2024 period was 1.255×10^{-9}, remaining within the acceptable Target Level of Safety (TLS) of 5×10^{-9} fatal accidents per flight hour. However, it was highlighted that the FIRs of La Paz, Panama, Curaçao, Port-au-Prince, and Santo Domingo presented risk levels exceeding this threshold. The analysis identified that Large Height Deviations (LHDs) attributed to ATC coordination failures (Code E) were the

most frequent, with 477 occurrences, followed by operator transfer errors (Code F) and unauthorized RVSM operations (Code L). IATA recalled that, among other measures, the implementation of AIDC connections in ACCs, is fundamental to mitigating risks linked to ATS coordination failures.

3.12 Participants and international organizations emphasized the need for systemic mitigation. IATA expressed its readiness to work with CARSAMMA and North American Approvals Registry and Monitoring Organization (NAARMO) to ensure members´ RVSM approvals are accurately recorded and recommended prioritizing the implementation of Air Traffic Services Inter-Facility Data Communication (AIDC) to address the identified Air Traffic Services (ATS) coordination failures. Furthermore, Venezuela and COCESNA advocated for the use of LHD data (Codes E, F, and L) as proactive indicators within ANSP Safety Management Systems (SMS) to foster early identification of root causes rather than maintaining purely statistical records.

3.13 Cuba and Panama reaffirmed their commitment to enhancing the quality and timeliness of data provided to the RMAs. Panama specifically underscored the necessity of reflecting initiatives related to early detection and timely reporting to ensure a balanced interpretation of safety indicators. The Meeting concluded that maintaining effective and timely communication among States, CARSAMMA, NAARMO, and the GTE is essential to ensuring that RVSM airspace operations remain within established acceptable risk levels.

The Meeting

Agenda Item 4 Assembly 42nd results; Global Aviation Safety Plan and Global Air Navigation Plan

Global Aviation Safety Plan

4.1 The analysis for the **WP/4.1** was addressed as part of the report of the RASG-PA/15 Virtual phase meeting, under the corresponding WP/03 "RASG-PA activities and alignment with Air Navigation Commission (ANC) global challenges" presented by CANSO.

4.2 As reported, the RASG PA/15 reviewed the alignment of Regional Aviation Safety Group – Pan America (RASG-PA) activities with the global challenges identified by the Air Navigation Commission. The paper demonstrated that RASG-PA's outcomes meet the expectations of the Global Aviation Safety Plan (GASP) through a strategy focused on risk and collaborative implementation. The RASG-PA/15 endorsed the progress achieved in risk reduction and regional cooperation, while members emphasized the need to restore the official website to ensure access to historical records and safety documentation

Global Air Navigation Plan

4.3 **Under WP/4.2**, the Secretariat highlighted the commitments adopted by the 42nd ICAO Assembly and the need for the CAR/SAM Regions to strengthen the alignment between the GANP, the CAR/SAM Regional Air Navigation Plan (RANP), and the National Air Navigation Plans (NANPs). It underscores global priorities—safety, sustainability, resilience, and seamless mobility—and emphasizes the urgency of harmonizing regional and national planning, adopting performance-based frameworks, incorporating environmental and resilience objectives, and ensuring that no State is left behind.

4.4 The Meeting supported concrete actions such as promoting the development of NANPs aligned with the GANP and RANP, enhancing regional integration, preventing technological fragmentation, modernizing planning tools through the GANP Portal, and reinforcing capacity-building, training, and implementation support across CAR/SAM Regions.

4.5 The Meeting also supported for defining a "Minimum Implementation Path," improving aeronautical information digitization (e-AIP), strengthening MET data exchange (IWXXM), and initiating SWIM to support future FFICE capabilities.

4.6 The meeting expressed broad support for the proposed actions, highlighting the importance of updating regional plans, advancing national planning efforts, adopting both ASBU and non-ASBU improvements, and ensuring coherence across planning activities. Many emphasize the value of strengthened information exchange and the need for interoperable, resilient digital systems in the region.

4.7 Venezuela confirmed its readiness to proceed with its national implementation plan, make use of the global portal, and apply performance indicators appropriately, while also emphasizing the importance of conducting safety impact assessments when introducing new ASBU elements.

4.8 IATA strongly supported the working paper as an important reference for regional planning and highlighted the need to complete the remaining volume of the regional plan, while encouraging continued progress even as global guidance continues to evolve.

4.9 United States expressed support for the Working Paper while cautioning against the establishment of new technical coordination groups, suggesting instead that the regional offices should ensure cross-regional harmonization through existing mechanisms rather than by creating additional structures.

4.10 Overall, the combined comments showed strong regional and industry endorsement for the working paper's recommendations and confirm commitment to harmonized planning, digital transformation, and effective implementation of the Eighth Edition of the GANP across the CAR/SAM regions.

4.11 The Secretariat took note of the recommendations made by one State concerning the avoidance of establishing new technical groups, and by another State concerning the need to encourage Headquarters to update the GANP Portal in accordance with the eighth edition. In light of these proposals, GREPECAS, in its report to the ANC, may wish to consider reflecting the latter recommendation, as appropriate.

4.12 From the discussions, the following draft Conclusion was adopted:

Conclusion GREPECAS/23/02	**ACTIONS RELATED TO THE EIGHTH EDITION OF THE GLOBAL AIR NAVIGATION PLAN (GANP)**
What: That: States, under a collaborative approach, with the assistance of the Secretariat, and in consultation with organizations and industry: a) Coordinate-the elaboration and approval of NANPs in all CAR/SAM States, aligned to the GANP and the RANP CAR/SAM; b) Include, in the national and regional planning, operational improvements to optimize efficiency and reduce emissions; c) Incorporate resilience objectives stipulated in the GANP; d) Strengthen regional and interregional integration, avoiding technological fragmentation and ensuring operational continuity; and e) Promote technical training at national and regional levels for the dissemination and understanding of the Eighth Edition of the GANP and supporting the elaboration of the NANPs;	**Expected impact:** ☒ Political / Global ☒ Inter-regional ☐ Economic ☒ Environmental ☒ Technical/Operational

Why: a) For alignment to Resolution A42.6 and LTAG 2050, to implement operational improvements as part of their national strategy to reduce the environmental impact and CO2 emissions b) promote the preparation of the CAR/SAM RANP and NANPs to ensure harmonization and interoperability. c) To guide and assist States in the development of NANPs, in line with the Strategic Goal of "No country left behind".	
When: Report progress in GREPECAS/24	**Status:** ☒ Valid / ☐ Superseded / ☐ Completed
Who: ☒ States ☒ ICAO ☒ Others: Industry and air navigation service providers	

Agenda Item 5 Assembly 42nd Results; Matters Concerning Air Navigation Initiatives

5.1 During plenary session, the Secretariat presented (**see P/02A**) the Global Developments in Air navigation that highlighted key ICAO priorities and actions relevant to regional planning and implementation. It notes the strong recovery of global air traffic after COVID-19 and emphasizes that Air Traffic Management (ATM) and operational improvements are among the most effective short- to medium-term measures to support aviation decarbonization, in line with ICAO's Long-Term Aspirational Goal (LTAG).

5.2 A central element is the outcomes of the 14th Air Navigation Conference (AN-Conf/14), which produced 22 recommendations addressing system performance, resilience, safety, hyper-connectivity, cybersecurity, and the integration of new technologies. Several actions are specifically assigned to PIRGs and RASGs, including the implementation of Project 30/10, transition to Flight and Flow Information for a Collaborative Environment (FF-ICE) by 2034, SWIM, ATFM, and regional approaches to GNSS interference monitoring and mitigation. See specific analysis below, as provided in WP/5.1.

5.3 The presentation strongly reinforces crisis preparedness and contingency management as a global mandate under Annex 11. It promotes the development of harmonized regional ATM contingency frameworks, supported by Contingency Coordination Teams (CCTs), predefined contingency categories, and a structured contingency management cycle covering preparation, response, recovery, and continuous improvement.

5.4 Finally, the briefing provides an extensive overview of upcoming ICAO SARPs and PANS from 2024 through 2030, covering FF-ICE, SWIM, SAR (GADSS), MET modernization, RPAS, data link, surveillance, aerodromes, and ATFM. The meeting is invited to align GREPECAS priorities with these developments, accelerate implementation, and support the NACC/SAM Regional ATM Contingency Management Framework and related ICAO capacity-building activities.

5.5 Under presentation **P/02B** the Secretariat summarized the outcomes of the Assembly 42 held in Montreal, from September to 3 October 2025. The 42nd ICAO Assembly (A42) reaffirmed the need to better align regional activities with global priorities. New editions of the GASP (2026–2028) and GANP were endorsed, emphasizing emerging risks, coordinated regional planning through PIRGs, ATM modernization, FF-ICE implementation and system resilience.

5.6 The Assembly highlighted cross-regional airspace optimization, SAR coordination challenges, growing GNSS interference, increased hazardous weather and the need for stronger crisis management and USOAP CMA evolution.

AN-CONF/14 Recommendations

5.7 Under **WP/5.1** the meeting reviewed the follow up actions taken by ICAO on the recommendations issued during the Fourteenth Air Navigation Conference (AN-CONF/14) as endorsed by Assembly 42. The paper highlights that many of these recommendations are directly relevant to the GREPECAS work programme, including air navigation system resilience, GNSS interference mitigation, improved separation minima, Free Route Airspace, TBO deployment, phasing out traditional systems, and the global transition to FF ICE by 2034.

5.8 Because the AN-CONF/14 Final Report (Doc 10209) and its Supplement were released after the GREPECAS/22, the Plenary has not previously examined ICAO's required follow up actions. However, GREPECAS/22 has prioritized three key initiatives: optimizing longitudinal separation (Project 30/10), aligning NEOSPACE 1 with Free Route Airspace implementation, and developing a CAR/SAM FF ICE transition plan.

5.9 Delegates expressed their commitment to support the implementation of AN Conf/14 recommendations, within the framework of the working program of GREPECAS and the Regional implementation groups.

5.10 IATA emphasized that the recommendations help partially to define priority targets referring to adoption of GANP modules/elements. IATA suggested that these recommendations should be incorporated into Volume III of the RANP and, until that document is formally approved, should serve as guidance for shaping the work programmes of the NACC/WG and SAM/IG implementation groups, as well as the planning activities of CAR/SAM States.

5.11 Secretariat remarked that the guidance for the implementation of regional and national navigation plans is analysed under Agenda Item 4, that addressed the GANP eight edition and the required "Minimum Implementation Path" with clear milestones.

A42 outcomes related to MET and SWIM implementation

5.12 Under **WP/5.3,** the Secretariat presented the outcomes of the A42 in relation to SWIM and MET, emphasizing the critical role of System Wide Information Management (SWIM) as the foundational enabler for implementing Flight and Flow Information for a Collaborative Environment (FFICE). During Assembly 42, ICAO highlighted the need for globally harmonized SWIM implementation to ensure secure, timely, and model based data exchange across aeronautical, meteorological, and operational domains. The Assembly underscored the importance of technical enablers—such as routing mechanisms, information service models, registries, and cybersecurity—and encouraged States to accelerate SWIM capabilities to support FFICE.

5.13 Persistent regional challenges—including varying levels of SWIM readiness and the pending transition from the 2012 Flight Plan to the 2034 version—were acknowledged, reinforcing the urgency of developing unified global guidance and strengthening international cooperation. The discussions also reaffirmed the relevance of the Globally Unique Flight Identifier (GUFI) as a key interoperability component in future ATM environments. See also Agenda Item 8 of this report, addressing SWIM implementation.

5.14 Concerning Meteorological services, the paper highlighted increasing risks posed by hazardous meteorological events and the need for States to enhance airport and airspace resilience. The Assembly recognized ongoing efforts to develop the Hazardous Weather Information Service (HWIS), aimed at globally harmonizing the provision of severe weather information, and took note of the proposal to establish a Tropical Cyclone Advisory Centre (TCAC) for the South Atlantic.

5.15 Based on these priorities, the paper recommended that GREPECAS integrate SWIM related strategy development, capacity building, and monitoring activities into its work Programme, while also strengthening regional mechanisms for hazardous weather risk management and following global

developments in HWIS to ensure operational safety and efficiency across CAR/SAM region.

5.16 States and international organizations expressed broad support for strengthening risk management for hazardous weather and for advancing the Global Hazardous Weather Information Service. There was also interest in continued evaluation of establishing a Tropical Cyclone Advisory Centre for the South Atlantic, with Brazil indicating its readiness to provide this service without duplicating existing functions.

5.17 Bahamas emphasized the need for deeper cooperation on SWIM, digital meteorology, improved IWXXM use, and stronger collaboration between ICAO and WMO. Brazil expressed strong support for the SWIM development, considering its key role in modernizing air traffic management. IATA shared this view but noted that some operational improvements, including those linked to trajectory-based operations and the implementation of FFICE, should progress in stages and not rely solely on full SWIM deployment. The Bahamas echoed this gradual approach.

5.18 IFAIMA stressed the importance of updating the AIS/AIM transition roadmap, harmonizing technical requirements, and modernizing flight plan submission processes to maintain safe and efficient operations.

5.19 The United States supported the strategic direction of SWIM and efforts to enhance hazardous weather risk mitigation. It also highlighted the importance of avoiding unnecessary regional divergence and promoting equitable progress. In this context, it encouraged capacity building efforts tailored to States with limited resources, following a need based and measurable approach coordinated through ICAO.

5.20 CANSO took note of the paper and made available its practical SWIM implementation kit, in the following link:

https://canso.fra1.digitaloceanspaces.com/app/uploads/2025/08/19110341/SWIM_Implementation_Kit_Guide.pdf

5.21 Secretariat expressed appreciation to States and organizations for their contributions and for underscoring the regional challenges in implementing IWXXM and SWIM. It also acknowledged the broad support for the expected implementation of Tropical Cyclone Advisory Center for the South Atlantic and for strengthening cooperation between ICAO and WMO, noting the relevance of these efforts for safety and regional harmonization. It also took note of IFAIMA's proposal and considered that updating the AIS/AIM Transition Roadmap, as referenced in the related working paper, would better support States and Regions by ensuring alignment with global frameworks and enabling a structured and sustainable evolution toward AIM.

5.22 On SWIM, the Secretariat reiterated its previous position that SWIM is a key enabler for information management components supporting FFICE and other modernization initiatives. For this reason, work has continued on promoting implementation mechanisms across the various information exchange domains, including meteorological, aeronautical, and flight information services. Regarding the need to mitigate the risks associated with severe weather, the Secretariat emphasized that workshops and seminars have been organized to enhance preparedness and that such capacity building activities will continue at the national level.

5.23 In relation to IATA's proposal to accelerate certain FF-ICE related procedures without requiring full SWIM implementation, the Secretariat took note and suggested that the meeting may endorse a recommendation for the regional working groups to assess the feasibility of this approach, considering lessons and practices already in place in other ICAO regions.

Aerodrome certification and infrastructure

5.24 Referring to **WP/5.4** presented by Secretariat, the discussion demonstrated broad support for the information presented and the proposed actions related to aerodrome certification, runway safety, infrastructure resilience, and preparedness for the future implementation of the new SARPs on Obstacle Limitation Surfaces (OLS). Comments were provided by Argentina, Aruba, Belize, Brazil, Chile, Costa Rica, Ecuador, Guatemala, Guyana, Panama, Uruguay, Venezuela, the United States of America, France, and ALTA, all of which acknowledged the WP and expressed alignment with its objectives, while highlighting ongoing national or regional regulatory activities and the relevance of a coordinated regional approach.

5.25 The Meeting emphasized the importance of capacity building, inspector training, and harmonized, risk-based implementation of the new OLS SARPs, and encouraged continued ICAO support through regional workshops, training courses, and guidance material. In addition, IATA expressed support for the initiatives outlined in the WP and underscored the need to avoid unnecessary operational impacts through coordinated and proportionate mitigation measures, while France offered to contribute through training activities, particularly in the area of aerodrome Safety Management Systems (SMS). The Secretariat took note of these interventions to confirm that regional activities and follow-up actions will be pursued in coordination with the relevant GREPECAS bodies.

Space Transport operations

5.26 The discussion on **WP 5.5** showed broad support for advancing a structured GREPECAS regional framework for Space-ATM integration. Guatemala, Chile, Panama and Aruba supported the proposed Decision and the way forward; Chile explicitly referenced Assembly Resolutions A40-26 (Commercial space transport) and A41-9 (New entrants) and highlighted the importance of broadening dialogue with States, governmental and non-governmental bodies, industry and academia, including noting ongoing global discussions and the value of strengthening ICAO-UNOOSA cooperation.

5.27 Panama emphasized the need for improved operational predictability, timely information exchange and planning to protect airspace capacity, and noted its strategic position for CAR-SAM coordination when operations affect multiple FIRs. Costa Rica, Ecuador and ALTA took note of the information presented. France provided additional operational information, including the designation of a national point of contact within CNES, existing coordination procedures for FIR Cayenne with the Guiana Space Centre, and the application of restrictions coordinated through adjacent FIRs in the Caribbean.

5.28 The United States assured its availability to exchange operational lessons learned and identify next practical steps for regional coordination. The Secretariat noted the current resource constraints faced by national space operations authorities and emphasized the importance of leveraging virtual coordination mechanisms and ensuring complementarity with the ICAO Headquarters Space Task Force.

5.29 Consequently, a drafted Decision was agreed, by the meeting:

<table>
<tr><td>DECISION
GREPECAS/23/03</td><td colspan="2">ACTIVITIES FOR THE DEVELOPMENT OF A REGIONAL FRAMEWORK ON SPACE TRANSPORT OPERATIONS (STO)</td></tr>
<tr><td colspan="2">What:
That the CAR SAM States, working with NAM Region and collaborating with other ICAO Regions, coordinated by the Secretariat, to develop a regional framework on space transport operations (STO) based on phased studies and practical activities, and in coordination with RASG-PA and the ICAO HQ STO Task Force, including at least the following subjects:

a) Space-ATM Coordination, giving priority to the preparation of a Focal Points list (States-ANSPs-Industry);
b) Operational Integration;
c) Protection of ATM Capacity; and
d) Regional Exercises</td><td>Expected impact:
☒ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="3">Why: a) establish mechanisms for the timely and standardized exchange of information between space operators, States, ANSPs and ATFM units; (b) integrate space operations into ATFM, contingency planning and flow management processes; (c) minimizing unnecessary airspace closures through dynamic management of hazardous areas; and (d) validate coordination concepts through workshops and operational demonstrations, including the ICAO Space Operations Logistics Dialogue Workshop scheduled for 2026.</td></tr>
<tr><td>When: GREPECAS /24</td><td colspan="2">Status: ☒Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who: ☒ States ☒ ICAO ☒ Other:</td><td colspan="2">Industry, ANSP, Organizations, ICAO HQ, ROs NACC SAM, RASG-PA</td></tr>
</table>

Gender inclusion in Air Traffic Management

5.30 Under **WP/5.6,** Brazil proposed actions to strengthen gender inclusion in Air Traffic Management (ATM), particularly within ICAO technical bodies and national air navigation service providers. The proposal aligns with ICAO Resolution A41-26 and subsequent Council initiatives promoting gender equality in aviation, positioning inclusion as both a policy priority and an operational enabler.

5.31 Brazil presented its institutional experience as evidence that a merit-based, equal-opportunity framework can effectively expand female participation in technical aviation roles. The Aeronautics Specialists School (EEAR), responsible for training Brazilian air traffic controllers since 1950, graduated the first female controllers in 2002. Over a 24-year period, 5,022 controllers were trained, of whom 2,603 were women, representing approximately 52 per cent of the total. Since 2009, female graduates have consistently outnumbered male graduates, reflecting structural progress rather than isolated gains. This working paper emphasizes that no gender-specific entrance examinations or reserved positions exist; advancement is based strictly on competence and demonstrated performance. This approach has expanded the professional talent pool, improved institutional adaptability, and supported workforce sustainability within the Brazilian Airspace Control System (SISCEAB).

5.32 Brazil invited the Meeting to establish a process for annual national reports on gender representation in aeronautical institutions and to encourage States to adopt merit-based recruitment, training, and advancement frameworks grounded in objective qualifications.

5.33 States and Organizations expressed support to the paper. Uruguay mentioned that it positively values the WP presented by Brazil, highlighting the merit- and competency-based approach as a key driver for promoting the inclusion of women in the aviation field. The experience presented demonstrates that equal opportunity policies expand the available talent pool and contribute to institutional strengthening, in line with the current ICAO directives and resolutions.

5.34 IATA welcomed Brazil's working paper and emphasized that creating structured opportunities for women to enter and advance in technical aviation fields has strengthened the industry's professional workforce, benefiting both individuals and overall system performance.

5.35 IATA also shared early progress from its global gender-balance initiative, noting clear improvements in the participation of women in senior leadership and in operational roles such as the flight deck. The full results of the initiative will be presented at a future IATA Annual General Meeting, along with the next phase of the program.

5.36 Looking ahead, IATA explained that the evolution of the initiative will focus on fostering a fully inclusive and representative aviation sector, addressing ongoing workforce shortages, adapting to the changing skill requirements driven by technological and regulatory developments, and promoting coordinated industry-wide approaches to shared human-capital challenges.

5.37 COCESNA informed that is committed to developing and implementing corporate-level policies that promote the inclusion of women. The Organization actively encourages female participation in these processes. In recent years, COCESNA has made efforts to increase the hiring of women in administrative, technical, and operational positions. Furthermore, COCESNA promotes the participation of women in training programs related to the aviation field.

5.38 From the perspective of COCESNA/ICCAE as a regional training center, a continuous participation of women has been observed in Initial ATC courses across all the Region. According to COCESNA/ICCAE, this sustained participation indicates that inclusive recruitment practices are effectively being promoted within this specialty. Therefore, by ensuring female representation from entry-level training through professional development and throughout the career cycle, the Region strengthens workforce sustainability and institutional resilience in Air Traffic Management.

5.39 Panama also reported that has promoted the participation of women in technical and leadership roles within the field of Air Navigation, based on objective criteria of performance, merit, and professional competence.

Cyber resilience enhancements

5.40 **WP/5.7** presented by Brazil concerns the strengthening of cyber resilience within the civil aviation system, in alignment with Pillar 6 (Incident Management and Emergency Planning) and Pillar 7 (Capacity Building, Training and Cybersecurity Culture) of the ICAO Aviation Cybersecurity Strategy.

5.41 The paper highlighted that the increasing reliance on interconnected digital infrastructures within the ATM environment expands the attack surface and exposure to cyber threats, thereby requiring a proactive approach through robust contingency planning and recurring cyber exercises. Brazil presented DECEA's experience in the development and continuous updating of contingency plans aligned with international standards, including ISO/IEC 27031, as well as the conduct of realistic, scenario-based cyber exercises aimed at identifying vulnerabilities, strengthening response capabilities, enhancing inter-institutional coordination, and ensuring minimum operational continuity of critical systems.

5.42 During the asynchronous discussion, the Meeting expressed general support for the initiatives presented in the working paper, and acknowledged the relevance of strengthening cyber incident management planning and the conduct of recurring cyber simulations.

5.43 The United States supported the proposed actions and emphasized the importance of implementing cyber resilience measures on a risk-based and scalable basis, while protecting sensitive security information when sharing lessons learned. It further encouraged the use of realistic, scenario-based exercises consistent with the ICAO Aviation Cybersecurity Strategy.

5.44 IATA expressed its support for the proposed actions and suggested considering the incorporation of cybersecurity-related aspects within the evolving regional ATS contingency framework, recognizing their strategic importance for resilience and operational continuity. CANSO welcomed the initiative, highlighted the importance of collaboration with ICAO Regional Offices, and shared reference to its cybersecurity risk assessment guidance, encouraging continued regional efforts to enhance cyber maturity levels. ALTA acknowledged the relevance of the topic and expressed appreciation for the information presented.

5.45 Considering the development of Project "Cybersecurity Guidance", under the GREPECAS Programme C - Air Navigation Safety Improvement, the Secretariat will coordinate to consider all these different inputs on cyber resilience into the programme.

Minimum Operating Network

5.46 **WP/5.8** presented by Brazil addresses the development and implementation of a Minimum Operating Network (MON) as a strategy to ensure the continuity and safety of air operations in the event of GNSS disruptions. The paper highlights the increasing vulnerability of the CNS/ATM system to radio frequency interference (RFI), including jamming and spoofing, in a context of growing reliance on Performance-Based Navigation (PBN), and underscores the need for complementary terrestrial infrastructure and robust contingency planning.

5.47 Brazil presented its MON Plan (PCA 100-5), developed by DECEA, which integrates conventional ground-based infrastructure (DME/DME, VOR/DME, ILS and radar), operational procedures applicable to all phases of flight, controller and pilot training programs, as well as monitoring and continuous review mechanisms. The DME/DME/Inertial Project is also highlighted, expanding DME coverage through strategic installations combined with onboard inertial systems, enabling the sustainment of RNAV 1 operations in high-traffic TMAs and RNAV 5 operations in upper continental airways, thereby strengthening resilience in GNSS degradation scenarios.

5.48 States and participating organizations, including Argentina, Chile, Uruguay, Panama, Guatemala, the United States, Aruba and IATA, expressed support for the initiative and acknowledged the importance of strengthening resilient navigation networks complementary to GNSS. Several States referred to recent GNSS interference events and emphasized the need to preserve and optimize conventional navigation aids. IATA highlighted the desirability of developing harmonized regional guidance material for MON implementation in the CAR/SAM Regions, drawing on international best practices.

5.49 The proposal is aligned with ICAO Assembly Resolution A42-8C and with valid GREPECAS Conclusions and Decisions, including: Conclusion GREPECAS/21/06 (Update of CNS information in the CAR/SAM ANP); Conclusion GREPECAS/21/09 (Strengthening contingency planning in CAR/SAM Regions); Conclusion GREPECAS/22/5 (Harmonization of the CAR/SAM Regional ATM Contingency Framework); Decision GREPECAS/21/24 (GNSS resilience-related aspects).

World Radio Communication Conference WRC-27

5.50 **WP/5.9** presented by Brazil addressed the strengthening of monitoring and participation of the aviation sector in the studies associated with the agenda items of the 2027 World Radio Communication Conference (WRC-27), with the objective of protecting the radio-frequency spectrum used by communication, navigation and surveillance (CNS) systems.

5.51 Brazil highlighted that decisions adopted within the ITU framework may directly impact the availability, integrity, and continuity of aeronautical services, and that several agenda items under study could affect frequency bands used by aeronautical systems.

5.52 Brazil proposed the establishment of a coordinated mechanism within the ICAO Frequency Spectrum Management Panel (FSMP), through the voluntary allocation of agenda items among its members, to monitor ITU-R activities, assess potential risks to aviation, and consolidate technical information into an updated document that supports the preparation of coordinated aviation positions.

5.53 The Meeting expressed general support for the initiative. Argentina, supported by Guatemala, suggested complementing the mechanism through the designation of national aeronautical spectrum focal points. Panama and Aruba expressed their support for the proposed approach. The United States supported the initiative, emphasizing the importance of ICAO–ITU coordination and noting that the mechanism should remain on a voluntary basis, preserving the technical independence of the Panels.

5.54 The Secretariat recalled that the results of the NAM/CAR/SAM Radio Navigation Workshop (RDNVW2025) confirmed the sustained increase of GNSS interference events (jamming and spoofing), as well as the need to reinforce aeronautical spectrum protection in international regulatory forums, including WRC-27. As well, related to proposals of Brazil on improvements for the activities of FSMP, Secretariat took note and will include the matter to be considered during the next FSMP WG/23 meeting, in September 2026, in Lima, Peru.

Agenda Item 6 Progress on Regional and National Air Navigation Planning

GREPECAS Ad-hoc Group (**GADHOC) Results**

6.1 Under **WP/6.1**, the Secretariat presented the results of the GREPECAS Ad-hoc Group (GADHOC) established under Decision GREPECAS/22/19 to strengthen performance-based planning and KPI management in alignment with the GANP 8th Edition and Volume III of the CAR/SAM RANP.

6.2 In collaboration with EASA and coordinated by the ICAO NACC and SAM Regional Offices, the GADHOC developed regional guidance material on KPI methodology, a progressive implementation Action Plan, a Communications Plan for KPI dissemination (including dashboards), and Terms of Reference.

6.3 The Working Paper proposed the approval of this material to support the CAR and SAM States to use them as guidance for a harmonized implementation of KPIs, the development of benchmarking activities, and preparation for the application of the GANP 8th Edition starting in 2026.

6.4 United States requested several modifications to the texts of Appendices B and C attached to WP/6.1, and also suggested that the simplified indicators presented by the United States and IATA (see paragraph 6.6) be considered for possible inclusion in a revised Action Plan at GREPECAS/24.

6.5 IATA acknowledged and appreciated the extensive work carried out by the GADHOC in developing Key Performance Indicators, as well as the quality and level of detail of the material presented to GREPECAS/23. However, it proposed that consideration be given to the inclusion of more pragmatic indicators capable of effectively supporting ongoing operational initiatives in the CAR/SAM Regions, even if such indicators are not included in the GANP list.

6.6 **Under WP/6.6,** presented by the United States and IATA reviewed the implementation of the Performance-Based Approach (PBA) in the CAR/SAM Region and assessed progress in the application of Volume III of the Regional Air Navigation Plan. The paper noted that, despite the meetings and workshops held, Volume III had not been updated or used effectively, thereby limiting the practical application of KPIs. It further observed that the current framework remained complex and resource-intensive, which had hindered meaningful performance monitoring and the achievement of operational improvements.

6.7 Accordingly, the paper recommended simplifying Volume III so that greater emphasis could be placed on Operational Improvements (OIs) already under implementation within GREPECAS and on linking these to practical, data-driven indicators. Rather than seeking to implement the full set of GANP KPIs, it proposed prioritizing those most directly supportive of ongoing initiatives and making use of accessible data sources. In support of this approach, reference was made to examples of data-driven practices, including traffic volume analysis, taxi-out time monitoring, flight time variability comparisons, and ETA difference analysis, as tools to identify inefficiencies and support decision-making.

6.8 The Meeting agreed that a simplified, regularly updated Volume III—maintained jointly by GADHOC and regional implementation task forces—would better support data-informed decisions,

optimize limited resources, and ensure that KPIs effectively drove tangible operational improvements in the CAR/SAM Regions.

6.9 Based on the comments and suggestions provided , the Meeting subsequently approved the following Decision:

<table>
<tr><td colspan="3">DECISION
GREPECAS/23/04 REGIONAL GUIDANCE MATERIAL FOR THE DEVELOPMENT OF KPIs</td></tr>
<tr><td colspan="2">What:
The meeting approves the following documents:
a) GADHOC Terms of Reference (Appendix 6A to this report).
b) CAR/SAM Regional guidance material on the methodology for implementation of GANP KPIs (Appendix 6B of this report).
c) CAR/SAM Action Plan for the progressive implementation of GANP KPIs (Appendix 6C to this report).
d) Communications Plan detailing the adequate means of dissemination of the KPIs (Appendix 6D to this report).</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☒Economic
☒ Environmental
☒Operational/Technical</td></tr>
<tr><td colspan="3">Why:
a) To provide guidance material to states committed to developing its NANP under performance-based approach and to comply with the GREPECAS Decision 22/19 to further strengthen the implementation of Volume III of the CAR/SAM Regional Air Navigation Plan (RANP).
b) To facilitate the definition of a “minimum implementation path” for the CAR/SAM Regions.</td></tr>
<tr><td>When: Immediate</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who: ☒ States ☒ ICAO ☐ Other:</td><td colspan="2"></td></tr>
</table>

Vol III RANP CAR/SAM

6.10 Under **WP/6.2**, the Secretariat exposed that many States in the CAR/SAM Regions continue to have trouble developing and reporting performance indicators required for Volume III of the Regional Air Navigation Plan. This lack of consistent reporting reflects broader challenges in achieving harmonized monitoring of ASBU implementation across the region. Although guidance has been issued in previous GREPECAS meetings, only a limited group of States has submitted complete baseline information, and monitoring tables in Volume III remain unevenly populated.

6.11 To address these shortcomings, the Secretariat reviewed planning practices from other ICAO regions and identified the Middle East (MID) Region as a strong example of structured and efficient performance-based planning. The MID Region complements its own Volume III with a standalone Air Navigation Strategy document that organizes priorities clearly, establishes detailed monitoring methods, and assigns responsibilities for governance at all levels. This strategy provides a transparent way for States to align their national planning with regional objectives, enabling more coherent implementation of ASBUs and more consistent tracking of progress.

6.12 The paper highlights several features of the MID Region's approach: it sets out regional priorities aligned with the GANP, clearly defines which ASBU elements are essential, links each element with indicators, metrics, baselines and targets, and establishes a governance structure to ensure continuous updating and effective reporting. This framework supports harmonization, improves interoperability, guides investment decisions, and ensures that progress is measurable and comparable across States. Recognizing the benefits of this model, the working paper proposes that the Secretariat develop a similar Air Navigation Strategy for the CAR/SAM Regions, in coordination with States and industry. The goal is to produce a regional strategy that strengthens prioritization, enhances KPI monitoring, and improves the governance required to support ASBU implementation.

6.13 The proposal envisaged that work should commence without delay and that the results be presented at the next GREPECAS meeting.

6.14 States of the CAR/SAM Regions and an industry member expressed support for the initiative to develop the strategic document, noting that it would facilitate the identification of priorities, reflect the differing characteristics of States and Regions, and broaden the scope of ASBU planning to include non-ASBU initiatives and solutions. One State also recommended that possible bottlenecks arising from limitations in airport infrastructure, which could affect air navigation improvements, be duly taken into account.

6.15 Another State observed that the CAR/SAM working groups and task forces, given their close involvement in the technical work, would be well placed to guide updates to Volume III or to contribute to the development of a more practical regional strategy. It therefore recommended that the Secretariat empower these groups to lead the development work, while maintaining appropriate oversight to ensure that progress continues to be monitored through realistic and useful indicators.

6.16 Based on the discussion, the Secretariat noted that the proposed strategic document could represent a possible response to the concerns raised during the consideration of WP/6.6 (see next paragraph), as presented by an industry member and one State, regarding the slow progress in the development of Volume III of the CAR/SAM RANP.

6.17 Under **IP/6.1** the Secretariat introduces an initiative for a harmonized template for Volume III of the Regional Air Navigation Plans (RANPs), developed through benchmarking of existing regional documents and consultations with ICAO Regional Offices.

6.18 The proposal aims to address the variability currently observed in the structure, scope and application of the Global Air Navigation Plan (GANP) across ICAO regions, particularly regarding the implementation and monitoring of Aviation System Block Upgrades (ASBUs), the application of the Performance-Based Approach (PBA), and the development of National Air Navigation Plans (NANPs). The

proposed template establishes a standardized, modular and performance-driven framework intended to guide regional and national air navigation planning and to facilitate monitoring of implementation through ICAO Key Performance Indicators (KPIs).

6.19 The harmonized template would support a more consistent approach to regional air navigation planning, improve transparency and comparability in monitoring ASBU implementation across ICAO regions, and facilitate coordination among States in the development and alignment of their National Air Navigation Plans. States took note of the information provided.

6.20 Consequently, the meeting adopted the following Conclusion:

<table>
<tr><td colspan="2">Conclusion GREPECAS/23/05 DEVELOPMENT OF THE "STRATEGY FOR AIR NAVIGATION IN THE CAR/SAM REGIONS"</td></tr>
<tr><td>What:

That:
States, Industry and International Organizations- members of the SAM /IG and NACC/WG, assisted by the Secretariat, to develop the document "Strategy for Air Navigation in the CAR/SAM Regions", based on the content and objectives of MID Doc 002, as well as other similar references in ICAO Regions, and aligned with the principles of Resolution A42-6 and other related ICAO provisions</td><td>Expected impact:

☒ Political / Global
☒ Interregional
☐ Economics
☐ Environment
☒ Operational / Technical</td></tr>
<tr><td colspan="2">Why:
To establish regional air navigation priorities. Define and prioritize ASBU Elements and NO-ASBU solutions. Strengthen the performance monitoring framework (KPIs) and establish a harmonized framework for monitoring the status of ASBU implementation. Provide the regional governance structure.</td></tr>
<tr><td>When: GREPECAS/24</td><td>Status: ☒ Valid/ ☐ Superseded / ☐ Completed</td></tr>
<tr><td colspan="2">Who: ☒ States ☒ ICAO ☒ Others: Organisations and Industry</td></tr>
</table>

ATC Sector Capacity Calculation

6.21 **WP/6.3** presents a mathematical methodology developed by the Mexican Air Navigation Services (SENEAM) to calculate the instantaneous aircraft capacity (PIAC) in sectors within Terminal Control Areas (TMAs). The model addresses the need to sequence traffic flows converging to the same aerodrome, it prioritizes the formation of arrival sequences, enabling the determination of maximum PIAC and the minimum longitudinal separations required at entry points to prevent overload. The methodology was applied to the Cancún TMA (MMUN), obtaining instantaneous capacity values for each sector. The paper proposes that this methodology be considered to enrich regional practices in the CAR/SAM Region.

6.22 The paper requested to evaluate both the regional adoption of the proposed methodology, as well as the possibility of integrating it into updates to Doc. 9971 and carrying out comparative studies in other terminal control areas of the CAR/SAM region.

6.23 The Meeting commended the developments from Mexico. Chile proposed implementing the methodology within its ATFM unit in order to collect data that could be compared with the results of its existing approach. Guatemala considered the proposed methodology viable for regional application in TMAs. Panama supported the recommendation to assess comparative implementation in other CAR/SAM TMAs in order to validate its adaptability and operational consistency, with a view to possible regional integration or future consideration in updates to Doc 9971.

6.24 The United States requested additional information on how ATCOs perceived their workload before and after the introduction of the new methodology. It also suggested that it might be more practical for ICAO to establish a general Airspace Constraint KPI or Airspace Sector Capacity KPI that States or ANSPs could adapt to their particular needs. An industry member observed that the capacity values reflected in the analysis appeared lower than those applied in other States, which could have implications for ATC capacity at the airports concerned. IATA also recommended that the Working Paper be submitted to the relevant regional working groups for comprehensive evaluation and possible application in the CAR and SAM Regions.

6.25 Consequently, suggested action to adopt the methodology and to include it in the Doc. 9971 received little support from the meeting, though some stakeholders urged caution and recommended additional analysis by the relevant expert groups. The Meeting agreed to submit this matter to the NACC/WG and SAM/IG expert groups for further review and reporting. The Secretariat was tasked to coordinate with the named groups.

ATS Performance and Early detection of Risks.

6.26 **WP/6.4** submitted by Mexico, examined the significance of ATS performance measurement and highlights the role of KPIs in evaluating not only safety, but also efficiency, capacity, punctuality, workload, and sustainability. The working paper discussed the challenges encountered by ANSPs and recommended enhancing technical capabilities by leveraging advanced analytics and artificial intelligence (AI) to facilitate the development, processing, and application of ATS KPIs.

6.27 The progressive development of advanced analytics and artificial intelligence capabilities represents a strategic opportunity to strengthen the KPI life cycle without substituting professional judgement or established processes. These technologies can facilitate data integration, contextual analysis, identification of emerging patterns, and generation of predictive alerts, improving anticipation of and response to operational risks. The paper considered that it is necessary for the regional bodies to consider the formulation of specific guidance and the establishment of common goals that facilitate the harmonized adoption of these technologies, as part of the continuous improvement and evolution of the regional air navigation system.

6.28 Chile acknowledged that the use of advanced analytics and artificial intelligence could strengthen performance-based management and improve the quality, timeliness, and strategic value of KPIs. It was noted that these tools could support early risk detection and better-informed decision-

making, while continuing to rely on professional judgement. Another State recognized the importance of strengthening the performance framework in order to address increasing operational complexity and data fragmentation.

6.29 This initiative aimed to preserve quality, traceability, and human oversight throughout the indicator lifecycle. Panama supported a structured and progressive approach to the integration of artificial intelligence capabilities, while emphasizing that the technological context and available resources of CAR/SAM Region States should be consistently taken into account.

6.30 The United States supported the alignment of the KPI-based performance framework with safety management principles, as proposed in the Working Paper. As well, emphasized that artificial intelligence should complement, rather than replace, established safety management principles and professional expertise, while also supporting the development of regional guidance for gradual implementation. It also provided a number of recommendations considered relevant for incorporation into the analysis of this Working Paper.

6.31 On this regard, the Meeting agreed that this matter be further analyse by the regional implementation groups (SAM/IG and NACC/WG) for their considerations and application and report to the next GREPECAS Plenary Meeting. The Secretariat was tasked to coordinate with the named groups.

Aviation infrastructure GAP analysis

6.32 Under **WP/6.5** the Secretariat proposed a comprehensive aviation infrastructure gap analysis for the Caribbean and South American regions. This initiative builds on a successful approach previously implemented elsewhere and aims to identify the difference between current aviation infrastructure and the capabilities needed to meet regional performance objectives. The goal is not to evaluate States' compliance with ICAO standards, but to determine what should exist to support future capacity, efficiency, and seamless regional operations.

6.33 The analysis would complement the existing Regional Air Navigation Plan by transforming its high-level requirements into an actionable and continuously monitored roadmap. It shifts the focus from static planning to a dynamic, data driven process. The work would be organized around four major domains: forecasted traffic growth, aerodrome and ground infrastructure, air navigation services, and aircraft fleet equipment. Together, these areas create a holistic view of the system's readiness to support regional development.

6.34 To ensure accuracy and regional ownership, a multidisciplinary Technical Working Group (TWG) is to be established with experts from States, the ICAO Secretariat, and relevant industry partners. This group would define regional benchmarks, validate the findings, support the development of business cases, and guide the transition to a new digital monitoring environment.

6.35 A key component of the proposal is the creation of a Regional Aviation Infrastructure Management Platform (RAIMP). This platform would replace periodic surveys with continuous updates, allowing States to log progress on infrastructure development in real time. It would also provide an automatically prioritized view of projects based on their safety relevance, operational impact, and

strategic complexity. This approach is designed to make the region's infrastructure projects more transparent and more attractive for financing from development partners.

6.36 The initiative would be implemented under ICAO's support mechanisms and funded through voluntary contributions and grants. It is intended to modernize regional planning by offering a clear, validated, and continuously updated pathway for infrastructure development.

6.37 The paper concludes by emphasizing that redefining a "gap" as a strategic shortfall—rather than a compliance problem—makes the region's planning more aligned with actual performance needs. It calls for support to initiate the project, establish the Technical Working Group, develop the monitoring platform, and ensure that States provide the data required to build a reliable regional baseline.

6.38 The Meeting concurred that the CAR/SAM region faces a major shortfall in AIS/AIM infrastructure, systems, and qualified personnel. IFAIMA emphasizes that insufficient investment has slowed modernization and that growing demands from drones, UAS, UAM, and artificial intelligence make it essential to strengthen AIS/AIM capabilities through long term planning.

6.39 During deliberations, Cuba requested a more precise explanation of what should be understood as a "gap," while other States supported the initiative and the proposed establishment of a technical working group. IATA expressed full support for the Secretariat's approach and concurred with the proposed definition of a gap, understanding it as a reflection of the principal obstacles affecting efficiency, capacity, and safety. IATA also expressed interest in participating in the technical group. France referred to similar work undertaken in another region, noting that the methodology had proven effective in identifying both technical and organizational challenges. The United States also expressed support, on the understanding that the CAR/SAM Region may be facing issues comparable to those identified in other contexts.

6.40 Brazil supported the initiative, while expressing concern about the potential increase in workload for existing implementation groups and emphasizing the importance of prioritizing activities with the greatest impact. It also requested greater clarity regarding possible funding arrangements for any in-person phases. Panama endorsed the strategic approach, supported the linkage between identified gaps and regional performance objectives, and expressed support for the establishment of a multidisciplinary technical group to promote coherent and data-driven planning. Chile supported the proposal while urging caution regarding possible duplication of effort and existing resource constraints.

APPENDIX 6A

AD-HOC GROUP FOR THE DEVELOPMENT OF KPIS OF GANP (GADHOC)

TERMS OF REFERENCE

1. BACKGROUND

At the Twenty-second Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/22), held at the ICAO SAM Regional Office in Lima, Peru, in March 2025, the AD-HOC Group for the Development of KPIS of the GANP (GADHOC) was established pursuant to Decision GREPECAS/22/19, in order to strengthen the implementation of Volume III of the CAR/SAM Regional Air Navigation Plan (RANP).

2. OBJECTIVE

GADHOC, as part of GREPECAS, is tasked with the development of Key Performance Indicators (KPIs) of the GANP to support and strengthen the implementation of Volume III of the CAR SAM RANP.

3. GENERAL FUNTIONS

3.1. The functions of the GADHOC are as follows:

3.2. Develop regional CAR/SAM guidelines and standardized training material on the methodology for performance indicators, data collection and management and calculations;

3.3. Formulate an Action Plan for the progressive implementation of KPIs, identifying priorities and resources required, harmonized with the progress of the implementation groups.

3.4. Develop a Communications Plan and propose adequate means of dissemination (dashboards, etc.) of the KPIs.

3.5. Formulate interregional initiative for KPIs benchmarking activities;

3.6. Promote close cooperation among States, Territories, users, and International Organizations to optimize the use of experience and available resources, avoiding duplication of work;

3.7. Coordinate activities with GREPECAS and consolidate regional information to support the work of the NACC/WG and SAM/IG; and

3.8. Efficiently lead activities with minimum formality and documentation, using electronic tools (TEAMS channels, teleconferences, email, etc.) and telephone calls to ensure exchange of information when required.

4. MEMBERSHIP

4.1. The member States of the AD-HOC Group for the Development of KPIS of GANP (GADHOC) are Bahamas, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Mexico, United States of America, Panama, Peru, Dominican Republic, Trinidad and Tobago, IATA and IFATCA.

5. STAKEHOLDERS

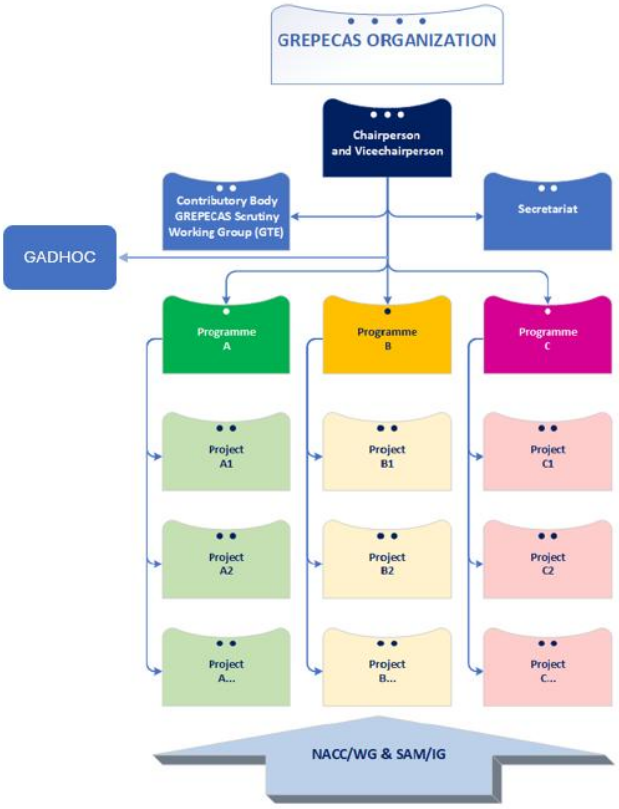
5.1. All ICAO States, Territories and International Organizations accredited to the CAR and SAM Regional Office.

5.2. Other stakeholders in the CAR and SAM regions are encouraged to actively participate.

5.3. In the cases in which the State and/or Territory agree, the airport services and air navigation services providers in the CAR and SAM region may participate as guests.

5.4. States nominating members to the GADHOC are required to provide adequate support and to possess the necessary authority to make decisions on behalf of the State they represent.

5.5. The GADHOC will coordinate and work together with other groups and projects as shown below:



6. WORKING METHODS

6.1. The GADHOC members will coordinate work as follows:

6.1.1. The ICAO Regional Officers NACC and SAM will act as the Secretariat of the GADHOC and will convene Members with a minimum anticipation of three months before holding the face-to-face meeting, or with at least one month before carrying out the virtual meeting

6.1.2. Any Member State, Territory, or International Organization may, at any time, offer to host a GADHOC Meeting, provided that the meeting is held face-to-face.

6.1.3. Follow-up will be conducted through calls and e-mails between Members and the Secretariat to monitor the Action Plan and monitor the implementation of KPIs

— END —

APPENDIX B

KPIS CAR/SAM REGIONAL GUIDANCE MATERIAL

Executive summary

The present document compiles the CAR/SAM regional guidance material on the methodology to support and guide the CAR/SAM region states in the calculation of the GANP Key Performance Indicators (KPIs) for the CAR/SAM Regional Air Navigation Plan, Volume III.

These guidelines have been developed as part of the assistance provided by the European Union Aviation Safety Agency (EASA), in collaboration with the ICAO NACC and SAM Regional Offices, and in the context of the GREPECAS Ad-hoc Group for the Development of Key Performance Indicators (GADHOC).

The GANP KPIs are core elements of any Air Navigation Plan, as part of the required Performance-Based Approach, which convert the planning objectives in quantifiable indicators, in order to allow the measurement of the existing needs and opportunities of the Air Navigation system in the different performance areas, the establishment of clear performance targets and the monitoring of the operational improvements and progress obtained by the effective implementation of the Air Navigation Plan proposed enablers and solutions.

A common regional approach for defining and implementing regional KPIs is even more necessary in the CAR/SAM region considering the transversal challenges that the region will face in the short and mid-term regarding airport and airspace capacity, flight efficiency, operations predictability and environmental sustainability, among others. In particular, these challenges would be more evident considering the high increase of traffic expected for the region in the future.

The establishment of CAR/SAM regional guidelines for the implementation of GANP KPIs represents a valuable opportunity to provide comprehensive and harmonized guidance, incorporating methodologies, and best practices consistent with ICAO recommendations. These guidelines will facilitate alignment among CAR and SAM States by supporting the development of KPI baselines and ensuring synchronism in their calculation across the region. Furthermore, they will promote more effective communication and reinforce GREPECAS's involvement in the monitoring and management of KPIs, while still allowing the use of supplemental regional and national performance indicators aimed at driving operational improvements.

The proposed approach for the CAR/SAM region builds on the work already undertaken by GREPECAS and States in defining and implementing GANP KPIs in the region, as well as existing efforts on operational and ATFM indicators, both at SAM and CAR regions, ensuring coherence between planning and operational KPIs. Recognizing the different levels of progress and resources across States, these guidelines recommend a phased implementation, beginning with a limited set of KPIs and gradually expanding coverage. The methodology emphasizes the reuse of existing practices, simple and transparent tools such as Excel for initial data collection and calculation, and a future transition to platforms like Power BI for regional integration. Moreover, it incorporates flexibility in data sources, formulas, and calculation frequency to accommodate varying national capacities, particularly in the early stages of implementation.

The proposed list of KPIs to be developed in the region is defined considering the KPIs already included in the current version of the CAR/SAM RANP Volume III (version 0.1) and adding those that have been identified as priorities by the CAR/SAM states in previous GREPECAS meetings and related workshops and activities. The selected KPIs are grouped in three groups considering their related proposed implementation phases:

- Group 1 (short- term implementation): KPI01 Departure punctuality (Variant 2A), KPI06 En-route airspace capacity (Variant 1), KPI09 Airport peak capacity, KPI10 Airport peak throughput, KPI14 Arrival punctuality
- Group 2 (mid-term implementation): KPI02 Taxi-out additional time, KPI05 Actual en-route extension, KPI08 Additional time in terminal airspace, KPI13 Taxi-in additional time, KPI15 Flight time variability, KPI23 Loss of separation (Variant 3)
- Group 3 (long-term implementation): KPI04 Filed flight plan en-route extension, KPI07 En-route ATFM delay, KPI17 Level-off during climb, KPI19 Level-off during descent

The process of calculating the CAR/SAM Regional KPIs is structured in 9 steps, involving both the States at national level and the ICAO Regional Offices at regional level:

1. Selection of the KPI
2. Understanding the KPI
3. Identifying the data sources:
4. Input data collection and consolidation
5. Calculation of indicators
6. Integration of KPIs at regional level
7. Data visualization and monitoring
8. Data analysis
9. Interpretation of results and recommendations

The current version of these guidelines provides a detailed methodology and practical examples for the calculation of each of the indicators to be deployed in the initial implementation phase (KPI01, KPI06, KPI09, KPI10, KPI14).

Future updates to these guidelines will incorporate detailed information for the rest of the proposed KPIs to be implemented in the mid and long-term phases.

In conclusion, these Guidelines provide a harmonized but flexible methodology for implementing GANP KPIs in the CAR/SAM Region while still allowing the use of supplemental regional and national performance indicators aimed at driving operational improvements. They allow States to adapt the calculation methods to their own data availability and resources, making it possible for all to participate in regional monitoring while also creating in-house expertise and producing GANP KPIs and potentially other performance indicators that support National Air Navigation Plans and regional operational improvements. The Guidelines are designed as a living document, beginning with simple tools such as Excel templates and progressively evolving toward advanced platforms like Power BI.

The main recommendations are that States begin with indicators where data is already available, integrate the methodology into their national planning frameworks, and focus on building sustainable technical capacity. They should apply minimum standards for data quality and validation, use a progressive approach to the adoption of tools, and engage actively in the periodic review process. By doing so, these Guidelines will not only ensure regional harmonization but also strengthen each State’s ability to monitor and improve its own air navigation performance.

Table of contents

List of acronyms

ACI	Airports Council International
A-CDM	Airport Collaborative Decision Making
ACC	Area Control Center
ADEP	Airport of Departure
ADES	Airport of Destination
AOBT	Actual Off-Block Time
AODB	Airport Operational Database
AO	Airspace Optimization
ANP	Air Navigation Plan
ANSP	Air Navigation Service Provider
ASBU	Aviation System Block Upgrade
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
CAR	Caribbean Region
CARSAM	Caribbean and South American Regions
CDM	Collaborative Decision Making
COCESNA	Corporación Centroamericana de Servicios de Navegación Aérea
CT	Controller Workload Time
EASA	European Union Aviation Safety Agency
EOBT	Estimated Off-Block Time
EU–LAC APP	European Union–Latin America and Caribbean Air Transport Project
FAA	Federal Aviation Administration
FIR	Flight Information Region
FPL	Flight Plan
FPV	Flight Progress View/Record
GADHOC	GREPECAS Ad-hoc Group for the Development of Key Performance Indicators
GANP	Global Air Navigation Plan
GESEA	Grupo de Estudio e Implantación del Espacio Aéreo SAM
GREPECAS	CAR/SAM Regional Planning and Implementation Group
ICAO	International Civil Aviation Organization
KPA	Key Performance Area
KPI	Key Performance Indicator

LAC	Latin America and Caribbean
MAC	Mid-Air Collision
NACC	North American, Central American and Caribbean Region
NC	Non-Commercial (flight type)
NOPS	Network Operations
OCC	Operations Control Center
PBN	Performance-Based Navigation
RASG-PA	Regional Aviation Safety Group – Pan America
RANP	Regional Air Navigation Plan
SAM	South American Region
SES	Single European Sky
SOBT	Scheduled Off-Block Time
TCAS	Traffic Collision Avoidance System
TCOM	Time of Communication (ATCO–aircraft)
TTS	Time for Secondary Tasks

1. Introduction

The present document, Deliverable 1 – CAR/SAM Regional guidance material on the methodology for implementation of GANP KPIs, is the first deliverable of the assistance provided by EASA, through the EU-LAC APP II programme, to support the ICAO NACC Regional Office in the development and implementation of the GANP KPIs for the CAR/SAM Regional Air Navigation Plan, Volume III.

This deliverable compiles the CAR/SAM regional guidance material on the methodology for the calculation of the GANP Key Performance Indicators, including the related data collection and management processes. It also provides practical examples of the application of the proposed methodology for a set of selected KPIs.

These guidelines have been promoted by the ICAO NACC Regional Office, and have been developed in close coordination and collaboration with the ICAO SAM Regional Office, as response to the conclusions and actions agreed at the GREPECAS/22 meeting.

The target audience of this guidance material are the Civil Aviation Authorities of the CAR/SAM States, and in particular the departments in charge of the Air Transport Planning activities. Additionally, the guidance material is recommended for the key stakeholders that should be involved in the process of data gathering or/and KPIs calculation, such as Air Navigation Services Providers, Airport Operators, Airlines and other required stakeholders, depending on each specific case.

This guidance material establishes minimum recommendations to support States in the implementation of the CAR/SAM KPIs. States are encouraged to incorporate these provisions into their internal processes, while retaining the flexibility to introduce additional performance indicators that may result in direct operational improvements.

These guidelines have been developed taking into account as baseline the work done so far on GANP KPIs in the CAR/SAM regions and with the objective to provide a consolidated and harmonized approach. Additionally, the proposed methodology for the GANP KPIs implementation in the CAR/SAM region is aligned, when applicable, with the existing initiatives for the calculation of ATFM and other operational indicators in the SAM and CAR regions. See additional details in the context and background section below.

This document is complemented by the other two deliverables, as part of the assistance provided by EASA:

- Deliverable 2 – Action Plan for the progressive implementation of GANP KPIs, identifying priorities and resources required, harmonized with the progress of the implementation groups and States from CAR/SAM Regions.
- Deliverable 3 – Communications Plan detailing the adequate means of dissemination (dashboards, etc.) of the KPIs.

2. Objectives and Scope

The main objective of these guidelines is to provide a comprehensive and detailed methodology to support and guide the CAR/SAM region states in the calculation and implementation of the GANP KPIs as part of the CAR/SAM Regional Air Navigation Plan Volume III.

To achieve the previous general objective, the following specific objectives are addressed:

- To understand the work performed up to date in the region on GANP KPIs in the context of the ICAO GREPECAS working groups and individually at state level.

- To define a specific approach for the CAR/SAM region considering the particularities of the region and the different starting points of the CAR/SAM region states to ensure a fast and efficient implementation by all states.
- To depict and justify the proposed list of GANP KPIs for the CAR/SAM region and explain the selection process.
- To present a scheme of the general process and a summarized overview of the action plan to develop and implement the GANP KPIs for the CAR/SAM Region.
- To detail the proposed methodology for calculating and monitoring each of the GANP KPIs, providing a step-by-step overview of the process, including data sources, calculation formula, stakeholders involved and including a description of the templates, models, tools and/or platforms to be used in the different steps of the process.
- To provide practical examples of the application of the methodology to selected KPIs.
- To finish with a list of conclusions and recommended next steps.

These are regional guidelines and orientations for the States in the CAR and SAM regions that are interested in implementing them.

Considering the previous objectives and scope, the contents of the guidelines are structured as follows:

- First, a justification is presented on the need of defining and implementing regional GANP KPIs aligned with the needs of the CAR/SAM region. Also it is explained why there is a need of having a regional guidance material proposing a common approach for selecting, calculating and monitoring the regional KPIs.
- In addition, a summary of the context and the background of the work done so far regarding the development and implementation of GANP KPIs in the CAR/SAM region is outlined.
- Second, it is provided an overview of the particular approach for the CAR/SAM region and the proposed list of GANP KPIs and explain the applied selection process.
- Third, an scheme of the general process and a summary of the proposed action plan is presented.
- Following, the main part of the guidelines is dedicated to explain in detail the methodology for calculating and monitoring each of the GANP KPIs, and including a practical example of the application of the methodology to a selected KPI.
- Finally, a set of conclusions and next steps is presented to efficiently implement the recommended methods of the present guidelines.

3. Justification for CAR/SAM Regional Guidelines on GANP KPIs

The GANP KPIs are core elements of any Air Navigation Plan, as part of the required Performance-based Approach, in order to assess Performance Objectives and Operational Improvements. GANP KPIs convert the planning objectives in quantifiable indicators, in order to allow the measurement of the existing needs and opportunities of the Air Navigation system in the different performance areas, the establishment of clear performance targets and the monitoring of the operational improvements and progress obtained by the effective implementation of the proposed enablers and solutions.

As described by the ICAO GANP, the Performance Framework and the KPIs are transversal elements of the planning and implementation functions that connect them into an iterative cycle. This

Performance-based Approach was defined by the ICAO Doc. 9883 Manual on Global performance of the Air Navigation System and adopted by the GANP 6th Edition, representing a profound change in the Air Navigation planning and implementation approaches. The figure below presents the six steps proposed by the GANP and how the KPIs are driving the iterative planning and monitoring processes.

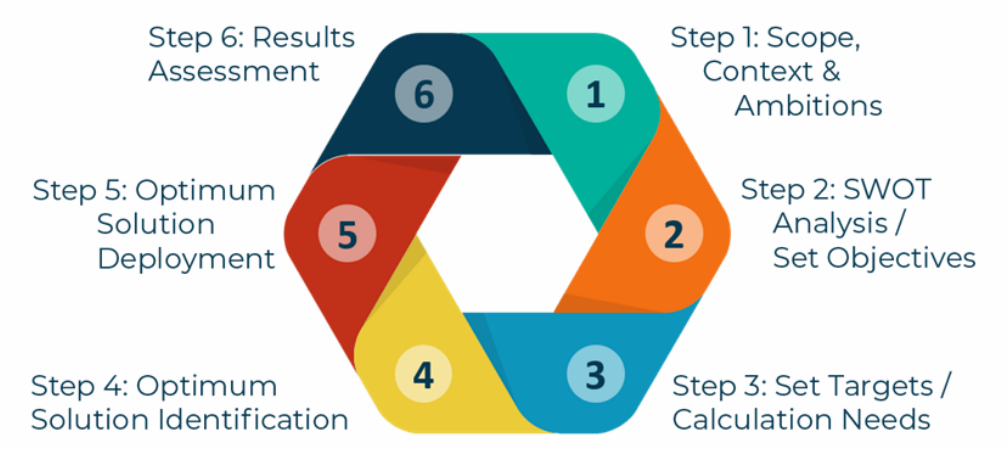


Figure 1 – Iterative six steps of the ICAO GANP Performance-based Approach

The objective of this six-step cyclical approach is to identify optimal solutions based on operational requirements and performance needs so that the expectations of the aviation community can be met by improving air navigation system performance and optimizing allocation and use of available resources.

The KPIs are defined in Step 3 of the iterative cycle, considering the performance ambitions established in Step 1 and the objectives based on operational needs and opportunities identified in Step 2. Then, considering the performance targets in each KPI settled in Step 3, the enablers and solutions are selected in Step 4. At this stage KPIs are crucial since they can quantify the potential performance gains that the future implementation of the selected solutions, including ASBU elements, would bring to the air navigation system. In particular, ICAO GANP has establish a traceability link between the KPIs and the ASBU elements. Finally, once the solutions are deployed in Step 5, it is necessary to evaluate the impact generated by the implementation of each solution (and ASBU element) in the system by measuring the KPIs to continuously track performance and monitor if the performance gaps are being closed as expected. This Performance monitoring activity is conducted in Step 6. Once the cycle is completed, it is necessary to start again a new planning cycle, identifying new needs, potential new KPIs and a new set of solutions to be implemented.

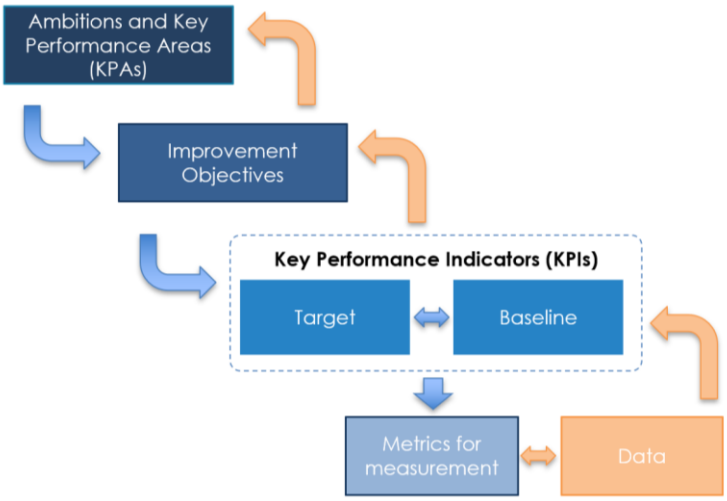


Figure 2 – Overview of the performance management process

In this sense, KPIs are the key elements of the Performance-based Approach supporting with quantifiable data the decision-making approach of selecting and planning the required enablers and solutions. This decision making approach is based on three principles: strong focus on desired or required results; informed decision making motivated by said desired or required results; and decision making based on facts and data.

The following table presents a practical example for two KPIs and how they are mapped to ASBU elements and other enablers.

				...up to Step 3		...steps 4 and 5	
Scope/ Applicability	**KPA & Focus Area**	**Performance Objective**	**KPI/ Variant**	**KPI Baseline**	**KPI Target**	**Operational Improvements (ASBU Elements/Enablers & Non ASBU)**	**Target Date**
1	2	3	4	5	6	7	8
FIR	Capacity (Capacity, throughput & utilisation)	En-route airspace capacity	**KPI 06** Variant 2: airspace occupancy count	35 movements /hr.	56 movements /hr.	Enhanced Airspace and FIR implementation ; FRTO B0/4; FRTO B1/1	Implemented
[location]	Predictability (Punctuality)	Increase the number (%) of scheduled flights adhering to the scheduled on-block time.	**KPI 14** Variant 2A: % of arrivals within ± 15 minutes of scheduled time of arrival	44% of flights 52% of flights	50% of flights 90% of flights	ACDM B0/1; ACDM B0/2	Implemented

Figure 3 – Example of KPIs to ASBU elements mapping

The future GANP 8th Edition, which was approved at the ICAO 42nd Assembly but has not yet been published, will increase the focus on the Performance-based Approach and the relevance of establishing and using KPIs in the planning and implementation processes. In particular the GANP portal will be updated covering all the essential elements of Doc. 9883 with many sections updated to reflect improvements in Data Management and more specific guidance for Key Performance Indicators (KPIs). In this sense, current guidelines are subject to be updated once the update of the ICAO GANP portal is effective.

The ICAO GANP propose to apply the Performance-based Approach following a multilayer structure of four levels, made up of global (strategic and technical), regional and national levels, providing a framework for alignment of regional, sub-regional and national plans. The four-layer structure facilitates decision making by providing a stable strategic direction for the evolution of the air navigation system and, at the same time, timely relevance in the technical content.

Figure 4 – ICAO GANP Performance-based Approach multilayer structure

The Regional level ensures regional consistency and provides common planning, R&D and implementation, where applicable. The regional ANPs apply the GANP methodology to develop the strategic direction, as well as performance and planning guidance for each of the ICAO regions. Regional ANPs are composed of 3 volumes: Static elements (Vol. I) and dynamic elements (Vol. II) and guidance for planning and implementation of ASBU elements (Vol. III). Regional Air Navigation Plans are coordinated by the Planning and Implementation Regional Groups (PIRGs).

In the case of CAR/SAM region, GREPECAS is the CAR/SAM Planning and Implementation Regional Group (PIRG), which is responsible for the development and maintenance of air navigation plans and provides guidance for the planning and implementation of air navigation systems within specific areas, in accordance with the planning frameworks agreed at the global and regional levels. In September 2015, GREPECAS endorsed the Vol. I and Vol. II of the CAR/SAM Regional Air Navigation Plan. Since 2020, GREPECAS through its ePPRC Meetings has been preparing the work and activities to comply with the development of the Regional CAR/SAM Air Navigation Plan Vol. III. See additional information on the activities performed in the next section.

The existing version of the Regional CAR/SAM Air Navigation Plan Vol. III defines a first list of regional KPIs based on the ICAO GANP KPIs:

- KPI01 Departure Punctuality (Var 2A): % of departures within ± 15 minutes of scheduled time of departure. KPA Predictability.
- KPI02 Taxi out additional time: Actual taxi-out time compared to an unimpeded/reference taxi-out time. KPA Efficiency.
- KPI04 Filed flight plan en-route extension: Flight planned en-route distance compared to a reference ideal trajectory distance. KPA Efficiency.
- KPI05 Actual en-route extension: Actual en-route distance flown compared to a reference ideal distance. KPA Efficiency.
- KPI06 En-route airspace capacity: The maximum volume of traffic an airspace volume will safely accept under normal conditions in a given time period. KPA Capacity.
- KPI08 Additional time in terminal airspace: Actual terminal airspace transit time compared to an unimpeded time. Actual trajectories are generally longer in time and distance due to path

stretching and/or holding patterns. In the example below the unimpeded trajectories are shown in red, and the actual trajectories in green and blue. KPA Efficiency.

- KPI09 Airport peak capacity: The highest number of operations an airport can accept in a one-hour time frame (also called declared capacity). Can be computed for arrivals, departures or arrivals + departures. KPA Capacity.
- KPI10 Airport peak throughput: The 95th percentile of the hourly number of operations recorded at an airport, in the "rolling" hours sorted from the least busy to the busiest hour. Can be computed for arrivals, departures or arrivals + departures. KPA Capacity.
- KPI13 Taxi-in additional time: Actual taxi-in time compared to an unimpeded/reference taxi-in time. KPA Efficiency.
- KPI14 Arrival punctuality: Percentage of flights arriving at the gate on-time (compared to schedule). KPA Predictability.
- KPI15 Flight time variability: Distribution of the flight (phase) duration around the average value. KPA Predictability.

The list of regional KPIs establishes a reference performance framework for the National KPIs, which should contain at least these regional KPIs and adding also those national ones that are specific to the national specific operational needs and opportunities. In this sense, contributing to the Regional Air Navigation Plan KPIs is a way to develop at the same time the National Air Navigation Plan KPIs. This could be an optimum approach for those states that are still a bit behind in the development of their National Air Navigation Plans, and thanks to the contribution to regional KPIs they can start also developing some of the national KPIs.

A common regional approach for defining and implementing regional KPIs is even more necessary in the CAR/SAM region considering the transversal challenges that the region will face in the short and mid-term regarding airport and airspace capacity, flight efficiency, operations predictability and environmental sustainability, among others. In particular these challenges would be more evident considering the high increase of traffic expected for the region in the coming years and decades, in particular in specific states such as projected by the traffic forecasts, as for example the ones from ACI LAC. Special attention should be made to expected growth of the international traffic in the CAR/SAM region, which would require a coordinated regional planning approach in terms of airspace capacity, flight efficiency and operations predictability.

An example of a regional performance framework is the Single European Space (SES) Performance Scheme which was established in 2012, as a coordinated action to address the challenges of the fragmented and complex European air navigation system in terms of capacity, efficiency and environmental sustainability. The SES Performance Scheme is currently implemented based on regulation (EU) 2019/317 and establishes KPIs and their compliance targets in different reference periods (RPs), RP1 (2012-2014), RP2 (2015-2019), RP3 (2020-2024) the current one being RP4 (2025-2029). It is a regional performance management framework that uses advanced methodology and tools and establishes a common KPI management process for all European States. In addition to the operational performance areas proposed by ICAO, the European Performance Scheme sets KPIs and targets for cost efficiency and ANS fees and rates.

On the other hand, there are several additional reasons that made necessary to have a CAR/SAM regional guidelines to foster the implementation of GANP KPIs in the region:

- First, there is no a clear CAR/SAM regional guidance with detailed instructions on the implementation of GANP KPIs and the application of the methodologies suggested by ICAO in

the GANP, including case studies. Additionally, there are no formal regional agreements on the variants that will be used for some KPIs, according to the description of the GANP.

- Second, the pace of implementation of the GANP KPIs is different for the SAM and the CAR regions, being more advanced the situation in the SAM States, while most States of the CAR region are in the initial or preparatory process for the formulation of KPI baselines. There is a need to achieve a synchronism between all CAR/SAM States for the calculation of the KPIs in same baseline years.
- Finally, there is insufficient communication that affects the participation of GREPECAS in the tasks of calculation and management of KPIs. These deficiencies were identified at the KPI Workshop from 28 to 31 October 2024.

4. Context and Background

In 2014, ICAO's Council approved a new model for Regional Air Navigation Plans (ANP) with three volumes.

Volume III was designed to contain dynamic and flexible elements, guidance for planning and implementing air navigation systems, and modernization aligned with initiatives such as ASBUs and related technology roadmaps in the GANP. Unlike Volumes I and II, amendments to Volume III do not require Council approval.

Initial plans aimed for GREPECAS to approve the CAR/SAM RANP Vol. III by mid-2015, but the process was delayed, partly awaiting the ICAO GANP 5th edition (2016) and later adjustments for the 6th edition.

In July 2019, the GREPECAS Program and Project Review Committee tasked ICAO's Secretariat to align the Vol. III with GANP 6th Edition and finalize it for the CAR/SAM ANP by Q3 2020. A coordinated work plan between regional offices supported planning for upcoming years, including guidance development for Vol. III completion.

A virtual and first CAR/SAM Volume III Preparation Workshop was held in February 2022 to guide the States in preparing Vol. III and engage the required stakeholders in the related work. Best practices were shared from EANA (Argentina) and COCESNA (Central America) in ANS planning. Performance ambitions for the CAR/SAM region and related KPIs were prioritized, including new KPIs initially not included in Volume III or in the ICAO GANP. In the first level of priority the following KPA and KPIs were agreed:

- Capacity:
  - KPI06 En-route airspace capacity
  - KPI07 En-route ATFM delay (not included in Vol. III)
  - KPI09 Airport peak capacity
- ATM community participation:
  - KPI# Improve stakeholder participation, collaboration, and coordination (not included in the GANP)
- Safety:
  - KPI# Number of operational deviations per / number of operations (not included in the GANP)
- Aviation Security:

- KPI# Number of events that interrupt or affect service delivery/number of total events (not included in the GANP)
- KPI# Number of vulnerabilities identified and resolved (not included in the GANP)
- KPI# Time of service interruption caused by cyberattacks/evaluated by impact (not included in the GANP)

As second level of priority were identified the following KPAs: Efficiency, Flexibility and Interoperability. In this case the related KPIs were not assigned yet.

In November 2022 the 20th meeting of GREPECAS (GREPECAS/20) was celebrated in which the initial version (version 0) of Volume III of the CAR/SAM ANP was approved, together with the Program for its management, which allows the sustainable implementation of performance-based planning. Additionally, it was approved that the States should implement work teams to develop data collection activities and management of GANP KPIs as a basis for populating the data of the Planning Tables of Vol. III, with the assistance of the Secretariat to report in GREPECAS/21.

The second CAR/SAM Volume III Preparation Workshop was held in February 2024 at Mexico City, where it was recommended to incorporate the following indicators for the Efficiency KPA:

- KPI17 Level-off during climb
- KPI19 Level-off during descent

Additionally, during this workshop, it was recommended to consider Safety as the number one priority KPA and in this sense to incorporate in the CAR/SAM ANP Vol. III the following KPIs:

- KPI20 Number of aircraft accidents
- KPI21 Number of runway incursions
- KPI22 Number of runway excursions
- KPI23 Number of airprox/TCAS alert/loss of separation/near midair collisions/midair collisions (MAC)

In September and October 2024 two workshops in Mexico City were held to discuss strategic planning for air navigation and airports, and on GANP KPIs, respectively. Main conclusions from the second workshop were:

- Workshop participants highlighted that it is necessary to identify which of the GANP indicators should first be developed, within a progressive approach, from simple KPI to complex indicators and the selection of priorities based on some criteria defined in consensus.
- Workshop participants commented on the insufficient communication that promotes the participation of air navigation implementation groups in the tasks of calculation and management of KPIs, which does not allow strengthening the performance-based planning process. This also affects integrated work with industry, airlines and users.
- There is no Regional CAR/SAM Guidance with more specific directions for the application of these methodologies, including case studies. Therefore, there are no formal agreements on the variants that will be used for some KPIs, according to the description of the GANP. A harmonized reference year for the baseline needs to be defined, the KPIs promulgated in Vol. III refer to different years (2019, 2021, 2022, etc.).

The ninth meeting of the NACC Working Group (NACC/WG/9) was celebrated in September and October of 2024 at Mexico City. During this meeting the following recommendations were agreed:

- The NACC/WG should give priority to the measurement of the following KPIs:
    - Capacity:
        - KPI06 En-route airspace capacity
        - KPI09 Airport peak capacity
    - Efficiency:
        - KPI01 Departure punctuality
        - KPI05 Actual en-route extension
        - KPI08 Additional time in terminal airspace
    - Safety:
        - KPI23 Number of loss of separation (variant 3)
- The Meeting recognized the GANP KPIs can be difficult to measure for many of the States/ANSPs, this is mostly due to the data elements needed to calculate the indicators. The Meeting requested the NACC/WG ATFM and Airspace Optimization (AO) Task Force Rapporteurs (now combined into the Airspace Management and Capacity Balancing Task Force or AMCB TF), along with the Secretariat, establish an ad hoc group to address the following:
    - provide recommendations and guidance to ensure each State/Territory can effectively store and analyze the required data.
    - promote the development of capabilities to use traffic counts as the most commonly available data.
    - provide guidance to analyze the GANP KPIs to ensure they can be tailored to States'/Territories' capabilities, yet flexible enough to adapt to changing needs, and provide possible alternatives for measurement.

The Joint GREPECAS–RASG-PA meeting and the 22nd GREPECAS meeting (GREPECAS/22) were held in November 2024 at Lima (Peru). The main conclusion related to the CAR/SAM ANP Vol. III was

- That the CAR/SAM States, in conjunction with ANSP and airports, with the participation of airlines and International Organizations, assisted by the Secretariat, populate the Tables of Volume III of the RANP CAR/SAM with the data of performance indicators - KPIs, prioritizing and harmonizing the management of these indicators according to the progress of the Working Groups for the regional implementation of air navigation by GREPECAS/23.
- That under the framework of GREPECAS Program for the Strengthening of the Regional Plan (RANP) and National Plans (NANP) of the CAR/SAM, Project A1, and to work jointly with the regional implementation groups, the industry and stakeholders, the AD-HOC Group is activated, which members are Bahamas, Brazil, Chile, Colombia, Cuba, Dominican Republic, Ecuador, Panama, Peru, Trinidad and Tobago, United States, IATA and IFATCA, for the development of Key Performance Indicators of the GANP (GADHOC) in order to strengthen the implementation of Volume III of the RANP CAR/SAM, which results are to be presented at GREPECAS/23 with the following tasks:
    - prepare a regional CAR/SAM guidelines and standardized training material on the methodology of performance indicators, data collection and management and calculations;

- formulate an Action Plan for the progressive implementation of KPIs, identifying priorities and resources required, harmonized with the progress of the implementation groups;
- implement a Communications Plan and adequate means of dissemination (dashboards, etc.) of the KPIs;
- and formulate a regional and/or interregional initiative for KPIs benchmarking activities.

First meeting of the GADHOC group was held online on the 12th September 2025, where the terms of reference and action plan of the group were discussed. First outline of these regional guidelines were presented during the meeting.

Additionally, in July 2025 the Fourth Air Traffic Flow Management (ATFM) Workshop/Meeting on Data Management and Indicator Calculation was celebrated at Lima (Peru). The workshop focused on the work done by DECEA (Brazil), in coordination with the ICAO SAM Office, on the calculation of ATFM operational indicators at SAM region level. During the workshop, different states in the SAM region presented the processes they used to calculate their ATFM indicators, including which data inputs were used, and how they were processed and integrated by DECEA at regional level. As one of the main outcomes of the workshop, it was identified that for several of the ATFM operational indicators already being calculated in the SAM region, most of the aspects of the process, such as the data input, the formula and methods of calculation and integration at regional level are the same or very similar to the ones required for the calculation of equivalent GANP KPIs. In this sense, it is recommended to take advantage of this work done so far by the states in the SAM region and consider it as starting point for the calculation the GANP KPIs for the CAR/SAM Regional Air Navigation Plan, Vol. III. Additionally, having common data inputs from the states for the calculation of both ATFM indicators and GANP KPIs ensures the coherency of the data used and the indicators results both for operational analysis and planning purposes.

Similar work on ATFM indicators is being also conducted in the NACC region with several initiatives, such as the CARPIs initiative led by the FAA (USA) and CADENA by CANSO. In both cases, and similarly to the ATFM indicators calculated in the SAM region, the work done by the states for compiling the required data inputs and for contributing to the calculation of the indicators could be also considered as a starting point for the calculation of the GANP KPIs for the CAR/SAM region.

5. CAR/SAM Regional ANP KPIs General Approach

Before entering in the description of the detailed methodology for the calculation of the selected KPIs, this section outlines the proposed general approach for the CAR/SAM Regional ANP KPIs, looking for an efficient implementation and taking into account the current situation and the particularities of the region.

a. Key aspects and assumptions of the proposed approach

The proposed approach for the CAR/SAM region is defined considering the following assumptions:

- As described in the previous section, the CAR/SAM region and in particular GREPECAS has been working for several years in the definition and selection of the GANP KPIs to be incorporated in the Regional ANP Vol III. Additionally, the calculation and implementation of the KPIs in the CAR/SAM region is already in progress, even though there are different levels of deployment depending on the States, with the States in the SAM region being more advanced (in general) than the CAR States. In this sense, the approach proposed by these

guidelines is not to start from scratch but to review and to build up from the work already done in the region with regards to GANP KPIs and other performance indicators aimed at driving national and regional operational improvements.

- Considering the potential long list of available performance indicators (GANP and others), and the different starting points and available dedicated resources of the States, the approach should follow the principle of "starting small". In this sense, it is recommended to follow a phased implementation approach, with a first phase addressing a reduced number of performance indicators and then adding the rest of them in following phase(s).

- As described in the first assumption, one of the principles of these guidelines is to utilize the work done so far. As mentioned in the previous section, the region has been working considerably in the development of ATFM indicators, both in the SAM region with the coordination of the ICAO SAM office and the leadership of Brazil, and in the CAR region with several initiatives as CADENA from CANSO and the CARPIs from the FAA. The inputs and the process of calculation of some of the GANP KPIs are the same or very similar to the ones followed in the calculation of some ATFM indicators, which are already being calculated in the CAR/SAM region. This ensures the coherence between planning and operation indicators and allows the region to follow a unique process for the data collection and calculation of both types of indicators, and then apply separate processes for the application and use of the indicator outcome, GANP indicator for medium-long term planning and ATFM indicator for tactical and operational analysis.

- The proposed methodology of calculation and management of GANP indicators is based in simple tools and open processes. For the collection and registration of the data inputs required to calculate the indicators, structured data storage in simple relational databases, such as Excel tables are recommended. In an initial phase, the calculation of the indicators and they integration at regional level will be also performed using Excel. In a second phase it is envisaged to incorporate Power BI or similar platforms to perform the calculation and integration of the KPIs, and keeping the Excel tables as the way of collecting data inputs from the States. All processes and tools will be used following an "open access" approach to facilitate the traceability of the data and to ensure a transparency during the entire process.

- As suggested at GREPECAS meetings, the proposed methodology should allow a level of flexibility in the different KPI calculation and management processes, in particular in the required data sources, the calculation formulas, the periodicity of calculation of the KPIs, etc. The methodology should also allow for the use of other (non-GANP) performance indicators aimed at driving operational improvements in the region. In this sense, variations in some of these elements could be initially accepted. This flexibility would facilitate to address some potential difficulties that some States may have to comply completely with the methodology and process described by the ICAO GANP. This flexibility could be necessary mainly in the starting phase of the proposed methodology.

b. List of selected CAR/SAM KPIs

The proposed list of KPIs to be developed in the region is defined considering the KPIs already included in the current version of the CAR/SAM RANP Volume III (version 0.1) and adding those that have been identified as priorities by the CAR/SAM states in previous GREPECAS meetings and related workshops and activities. This list only include KPIs that are part of the current list of 23 KPIs proposed by the ICAO GANP 7th edition. In future editions of these guidelines the list of KPIs can be updated and extended to incorporate new KPIs, as applicable.

The following table presents the current 23 GANP KPIs grouped by basic and advanced KPIs, per KPA and per focus area within the KPA.

ICAO KPI Overview

KPA	Efficiency			Capacity	Predictability			Safety
Focus Area(s)	Additional flight time & distance	Vertical flight efficiency	Additional fuel burn	Capacity, throughput & utilization	Capacity shortfall & associated delay	Punctuality	Variability	Operational safety outcomes
Basic KPIs	KPI02 Taxi-out additional time KPI13 Taxi-in additional time			KPI09 Airport peak capacity KPI10 Airport peak throughput		KPI01 Departure punctuality KPI14 Arrival punctuality	KPI15 Flight time variability	KPI20 Number of aircraft accidents KPI21 Number of runway incursions KPI22 Number of runway excursions KPI23 Number of airprox/ TCAS alert/ loss of separation/ near midair collisions/ midair collisions (MAC)
Advanced KPIs	KPI04 Filed flight plan en-route extension KPI05 Actual en-route extension KPI08 Additional time in terminal airspace	KPI17 Level-off during climb KPI18 Level capping during cruise KPI19 Level-off during descent	KPI16 Additional fuel burn	KPI06 En-route airspace capacity KPI11 Airport throughput efficiency	KPI07 En-route ATFM delay KPI12 Airport/Terminal ATFM delay	KPI03 ATFM slot adherence		

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Figure 5 – ICAO GANP KPIs

The list of CAR/SAM KPIs is structured in three groups, the first one composed by those KPIs to be built in the first short-term phase of implementation, as priority KPIs for the region and including those that are already being calculated by several States in the region; and then a second group of KPIs to be implemented in a mid-term phase, and finally a third group targeting a long-term phase of implementation.

Group 1 (short- term implementation):

- KPI01 Departure Punctuality (Variant 2A)
- KPI06 En-route airspace capacity
- KPI09 Airport peak capacity
- KPI10 Airport peak throughput
- KPI14 Arrival punctuality

Group 2 (mid-term implementation)

- KPI02 Taxi out additional time
- KPI05 Actual en-route extension
- KPI08 Additional time in terminal airspace
- KPI13 Taxi-in additional time
- KPI15 Flight time variability
- KPI23 Loss of separation (Variant 3)

Group 3 (long-term implementation):

- KPI04 Filed flight plan en-route extension
- KPI07 En-route ATFM delay
- KPI17 Level-off during climb
- KPI19 Level-off during descent

Please note that KPI20 Number of aircraft accidents, KPI21 Number of runway incursions and KPI22 Number of runway excursions are not part of the scope of the CAR/SAM RANP Volume III.

c. Scheme of the general process

The process of calculating the CAR/SAM Regional KPIs is structured in 9 steps, involving both the States at national level and the ICAO Regional Offices at regional level.

The following list identifies and describes briefly each of the steps of this general process.

1. Selection of the KPI:
    a. Justification: Explain the relevance of the KPI to the strategic objectives.
    b. Priority: Determine the urgency and impact of the KPI in the region.
    c. Link with ASBU elements: Establish the traceability between the KPI and the related ASBU elements.
    d. Selection criteria: Ensure that the KPI is measurable, achievable, and aligned with global policies.
2. Understanding the KPI:
    a. Definition: Write the exact and clear concept of the KPI.
    b. Contribution to Objectives and KPAs: Indicate how it contributes to the achievement of the objectives defined in the GANP.
    c. Formula: Present the precise mathematical equation or algorithm to calculate the KPI, including the KPI unit and the considered period of time, if applicable.
    d. Instances: Define the instances of calculation (Per airport, per airspace sector, per state, etc.).
    e. Metadata: Input data elements required for the calculation of the KPI.
    f. Frequencies: Determine the frequency of calculation at State level and consolidation at Regional level.
    g. Owner and Responsibilities: KPI owner is the responsible of its entire calculation and management process at State level. Additionally, it is needed to assign responsible staff for the different activities, collection of inputs, quality check, KPI calculation, etc.
    h. References and Best Practices: Identify the main references and practices applied internationally for calculating the KPI (others to ICAO GANP reference).
3. Identifying the data sources:
    a. Primary sources: List the databases, tools, processes and stakeholders involved.
    b. Alternative sources: In the case primary sources are not available, identify and characterize the available alternative ones and assess the potential impact in the KPI formula and/or metadata.
    c. Data source accessibility evaluation: Evaluate the consistency, validity, and accessibility of each source.
4. Input data collection and consolidation
    a. Collection and consolidation format: Use of tables in Excel or other standardized formats.
    b. Frequency of collection and consolidation: Define the update frequency (monthly, quarterly, yearly).
    c. Metadata quality check: Ensuring the quality of the input data received form the different data sources.
5. KPI calculation and provision of results

a. Formula application: Use the data collected and the defined formula to generate results by country.
b. KPI baselines calculation: Calculate the KPI value for the most recent available data, for a defined period of time, normally per year.
c. Internal validation: Check the consistency and accuracy of the calculations.
d. Documentation preparation: Record assumptions, variations, unavailable input data and observations.
e. Provision of results to regional level: Sending KPI's State results and associated documentation for its integration at regional level.

6. Integration of KPIs at regional level
    a. Integration format: Use of Excel tables, Power Bi models or other standardized data bases.
    b. Consolidation and standardization: To group national results into a regional set. And adjust potential methodological or unit differences between States.
    c. Quality Control and Verification: Review of errors, outliers and temporal consistency and confirm consistency of integrated data before regional analysis.
    d. Comparison: Calculation of regional averages and establish KPI rankings among States.
7. Data visualization and monitoring:
    a. Presentation tools: Excel dynamic tables and graphs or more advanced formats as for example Power Bi models or other visualization dashboards.
    b. KPIs views: Baseline vs target, historical trends, regional maps, state monographic, multi-state comparison, etc.
    c. Access and transparency: Ensure that States Civil Aviation Authorities and other relevant stakeholders (ANSPs, Airport operators, Airlines) can consult the information.
8. Data analysis:
    a. Comparative analysis: Evaluate performance across countries and against regional averages and international benchmarks.
    b. Trend analysis: Identify short-, medium-, and long-term patterns.
    c. Gap analysis: Baseline results vs targets, identification of new targets.
9. Interpretation of results and recommendations
    a. Synthesis of findings: Explain the main conclusions of the analysis.
    b. Impact on regional objectives: Determine to what extent KPIs reflect progress or gaps.
    c. Traceability KPIs vs RANP Solutions: Identification of the effectiveness in terms of performance improvement of the implemented solutions and ASBU elements of the RANP and recommendations of new solutions.
    d. Recommendations: Propose concrete actions for improvement and priority areas of attention, in the form of new performance objectives, KPIs and associated targets.

The figure below illustrates how these steps are sequenced and structured at national and regional levels. The processes at national level are responsibility of each CAR/SAM State, while the process to be performed at regional level could be done either by the ICAO SAM and NACC regional offices or a designated State or organization. The process to be done at both levels should be appropriately coordinated.

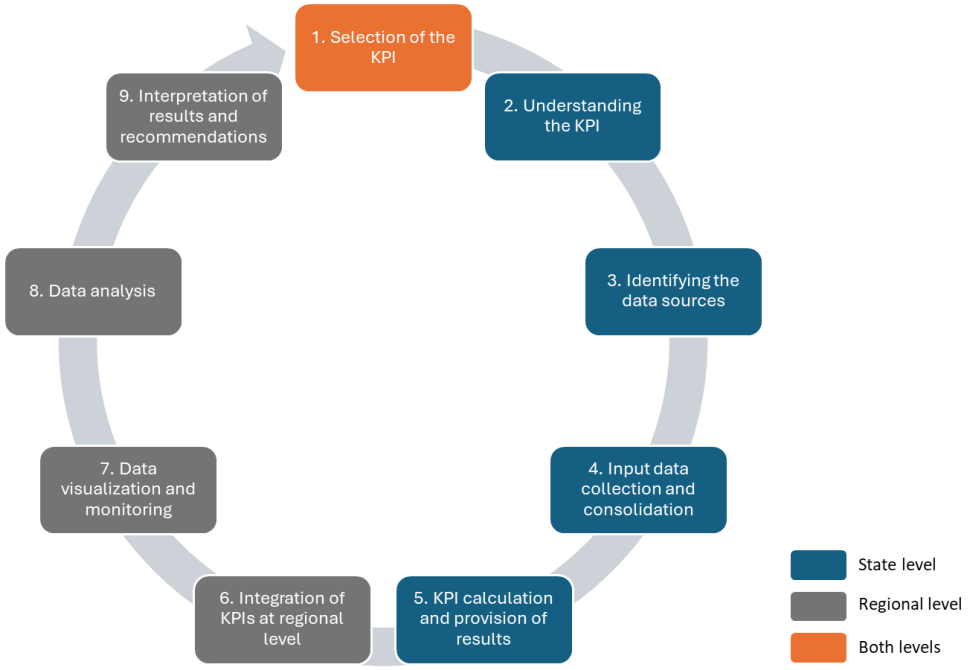

Figure 6 – Scheme of the general process for calculating the CAR/SAM RANP KPIs

Please note that the previous approach does not prevent that a State implements the entire process at national level, as part of their National Air Navigation Plan development and monitoring activities.

The following table summarizes the general process of calculation and its application to KPI01 as an example.

Step	**Sub-levels**	**Example for KPI 01 – Departure Punctuality**
1. Selection of the KPI	a. Justification b. Priority c. Link with ASBU elements d. Selection criteria	a. Departure punctuality is a key performance measure for passenger experience and operational efficiency. b. High priority in CAR/SAM due to recurrent congestion at main hubs (i.e. Mexico City, São Paulo, Bogotá, Lima). c. KPI01 is not linked to any ASBU element (as per ICAO GANP traceability tool (https://www4.icao.int/ganpportal/ASBU/PerformanceDashboard) d. Measurable using airline operational data, airport departure boards, and ANSP coordination.

Step	Sub-levels	Example for KPI 01 – Departure Punctuality
2. Understanding the KPI	a. Definition b. Contribution to Objectives and KPAs c. Formula d. Instances e. Metadata f. Frequencies g. Owner and Responsibilities h. References and Best Practices	a. Percentage of flights departing within ±15 minutes of their Scheduled Off-Block Time (SOBT) compared with their Actual Off-Block Time (AOBT). b. Contributes to GANP KPA: Predictability c. Formula: (Departures where |AOBT − SOBT| ≤ 15 min ÷ Total scheduled departures) × 100. d. Instances: by airport, runway, and consolidated at State and CAR/SAM regional level. e. Metadata: ▪ Flight Call sign (i.e. GLO1182) ▪ Aircraft Type (i.e. B738) ▪ Airport of departure (ADEP) (i.e. SBBR) ▪ Airport of destination (ADES) ▪ Flight Type, commercial, using for example a C, or non-commercial, indicating NC ▪ Scheduled Off-Block Time (SOBT) (i.e. 28/01/25 06:15:00) ▪ Actual Off-Block Time (AOBT) ▪ Runway in use (i.e. 17R) f. Frequencies: monthly calculation and quarterly consolidation at regional level. g. KPI owner and responsible staff from the National Civil Aviation Authority h. References: DECEA (Brazil), EUROCONTROL, ACI Europe
3. Identifying the data sources	a. Primary sources b. Alternative sources c. Data sources accessibility evaluation	a. Primary: Airport Operational Databases (AODB) b. Alternative: Airline OCCs and ATC systems. c. Accessibility: Higher in larger airports with A-CDM implemented, but weaker in smaller airports where access to SOBT/AOBT may require airline cooperation.

Step	Sub-levels	Example for KPI 01 – Departure Punctuality
4. Input data collection and consolidation	a. Collection and consolidation format b. Frequency of collection and consolidation c. Metadata quality check	a. KPI01 metadata stored in Excel/CSV or centralized database. b. Weekly updates of data input and monthly consolidation of metadata. c. Quality check established for mapping, completeness, matching and accuracy evaluation.
5. KPI calculation and provision of results	a. Formula application b. KPI baseline c. Internal validation d. Documentation preparation e. Provision of results to regional level	a. Example: Bogotá (BOG), July 2024 → SOBT flights = 12.000; flights within ±15 min SOBT-AOBT = 9.240 → KPI = 77% Departure Punctuality in july 2024 b. Example: KPI baseline for Brazil airports in 2024 = 80% c. Cross-check with airline punctuality reports and stakeholders peer reviews. d. Document cases with missing SOBT or AOBT, note assumptions. e. KPI01 State results are provided to ICAO Regional Office.
6. Integration of KPIs at regional level	a. Integration format b. Consolidation and standardization c. Quality Control and Verification	a. Regional consolidation via Excel/Power BI. b. Ensure KPI results are consolidated and standardized across States. c. Check KPI results consistency, remove duplicate records and verify with ICAO SAM Performance Dashboard.
7. Data visualization and monitoring	a. Presentation tools b. KPI views c. Access and transparency	a. Dashboards in Power BI with punctuality charts. b. Views: baseline vs. targets, monthly trends, punctuality maps, State rankings. c. Access for CAAs, ANSPs, airports, airlines, ICAO regional offices.
8. Data analysis	a. Comparative analysis b. Trend analysis c. Gap analysis	a. Benchmark airports and States (e.g., PTY vs. MEX). b. Seasonal trend: Example: delays increase in Caribbean during tourist peaks. c. Gap: Regional target 85%, actual average 77% → shortfall of 8%.

Step	Sub-levels	Example for KPI 01 – Departure Punctuality
9. Interpretation of results and recommendations	a. Synthesis of findings b. Impact on regional objectives c. Traceability KPIs vs RANP Solutions d. Recommendations	a. CAR/SAM average = 77% punctuality; large hubs show greatest unpunctuality concentrations. b. Efficiency and predictability targets and objectives not fully achieved. c. Airports with A-CDM and ATFM show better punctuality. d. Recommendations: expand A-CDM, reinforce ATFM, improve SOBT-AOBT reporting, set 2030 target at 85% punctuality.

In section 6, the methodology to be applied in each of the previous steps will be detailed for the selected list of KPIs to be implemented in the short-term phase.

d. Summarized action plan

The Action Plan for the implementation of the GANP KPIs to be included in the CAR/SAM Regional Air Navigation Plan, Vol. III is structured in three main phases:

- First phase (Short-term deployment): Implementation of the first 5 KPIs (KPI01, KPI06, KPI09, KPI10, KPI14) by all states in the CAR/SAM region. From January 2026 until December 2026.
- Second phase (Mid-term deployment): Implementation of the next group of 6 KPIs (KPI02, KPI05, KPI08, KPI13, KPI15, KPI23) by all states in the CAR/SAM region. From June 2026 until June 2027. Considering that some states have already advanced in the implementation of the first phase, this second phase can be started earlier and in parallel with the first phase.
- Third Phase: (Long-term deployment): Implementation of the last group of 4 KPIs (KPI04, KPI07, KPI17, KPI19) by all states in the CAR/SAM region. From July 2027 until July 2028.

On-site support would be provided by ICAO regional offices to the CAR/SAM States during the three implementation phases. These on-site support will be designed in each case depending on the specific needs of each State.

See detailed description of the Action Plan in Deliverable 2.

6. Detailed methodology for calculating the CAR/SAM KPIs

The current version of these guidelines provides a detailed methodology and a practical example for the calculation of each of the indicators to be deployed in the initial deployment phase (KPI01, KPI06, KPI09, KPI10, KPI14).

Following editions of these guidelines will incorporate detailed information for the rest of the KPIs proposed to be implemented in the mid and long-term phases.

The proposed methodology addresses the steps to be performed at State level, which are the first 5 steps of the general process defined in the previous section.

a. KPI01 Departure Punctuality (Variant 2A)

i. Selection of the KPI

First, it is necessary to understand why the KPI has been selected as part of the CAR/SAM RANP, evaluate its level of priority, its link with ICAO ASBU elements and the selection criteria applied.

- **Justification:**

It is clear that punctuality is a key business driver of the air transport sector, which ensures its competitiveness versus other transportation modes. And in particular departure punctuality is a key performance measure for passenger experience and operational efficiency. Increasing predictability of operations ensures a higher reliability to the flight schedules, which is crucial to provide the right flight status information to the passengers and to facilitate the capacity and resource allocation procedures to airport operators and ANSPs.

- **Priority:**

Considering the current situation of frequent delays and unpredictable situations in several main airport hubs in the CAR/SAM region, KPI01 is of high priority for the CAR/SAM Regional Air Navigation Plan. The urgency of establishing and monitoring the indicator may vary across the different States considering the current baseline regarding departure punctuality at their airports.

- **Link with ASBU elements:**

Links between KPI01 and ASBU elements are not yet provided by the ICAO GANP traceability tool https://www4.icao.int/ganpportal/ASBU/PerformanceDashboard. It is expected that in the short/mid-term KPI01 traceability will be established, mainly with ACDM ASBU elements.

Note. - The GANP 8th Edition was approved by the ICAO Assembly 42 (Montreal, 23 September – 3 October 2025). Among other insertions, the traceability for KPI01, KPI09 and KPI14 was defined. The publication of 8th edition in GANP Portal is expected by the first quarter of 2026.

- **Selection criteria:**

Finally, regarding the KPI selection criteria, it is necessary to ensure that the KPI is feasible to be measured by all States in the region. In this sense, considering the relative simple formula of the KPI and the potential easy access to the input data required, KPI01 is considered as a feasible KPI for most of the States in the region. Additionally, it has been identified by both regions, CAR and SAM, as a priority GANP KPI, and for operational ATFM purposes it is being already calculated, mainly by SAM region States.

ii. Understanding the KPI

The KPI01 Departure Punctuality, as described by the ICAO GANP portal, is an airspace user and passenger focused KPI: departure punctuality gives an overall indication of the service quality experienced by passengers, and the ability of the airlines to execute their schedule at a given departure location.

- **Definition:**

KPI01 Departure Punctuality is defined by the ICAO GANP as the percentage (%) of flights departing from the gate on-time (compared to schedule).

ICAO GANP offers four variants for calculating KPI01:

- Variant 1A – % of departures within ± 5 minutes of scheduled time of departure
- Variant 1B – % of departures delayed ≤ 5 minutes versus schedule
- Variant 2A – % of departures within ± 15 minutes of scheduled time of departure
- Variant 2B – % of departures delayed ≤ 15 minutes versus schedule

The proposed variant for the KPI01 as part of the CAR/SAM RANP is the variant 2A, which on one hand, compared with variants 1, allows a wider tolerance window, giving a realistic picture of operations since minor delays are inevitable, and is widely used in the aviation industry, being therefore more suitable for global benchmarking; and on the other hand, compared with variant 2B, it detects not only delayed flights but also early departures, which could also lead to operational and passenger connections issues. The objective is to measure the schedule adherence.

Therefore, the definition to be used for the KPI01 in the CAR/SAM RANP is: Percentage of flights departing from the gate within ±15 minutes of their Scheduled Off-Block Time (SOBT) compared with their Actual Off-Block Time (AOBT).

Depending on the availability of the required input data, if the SOBT data is not available it can be calculated using EOBT data form the flight plan, instead.

Additionally, in the case AOBT data is not available, it can be considered to use ATOT and taxi out times and estimate AOBT values.

- **Contribution to Objectives and KPAs:**

KPI01 Departure Punctuality is aligned with the following CAR/SAM performance objective, included in the Voume III: Increase the number (%) of flights adhering to the planned take-off time. This performance objective is part of the Predictability KPA.

- **Formula:**

$$KPI01 = \frac{Departures\ where\ |AOBT - SOBT| \leq 15\ min}{Total\ scheduled\ departures} \times 100$$

In the case SOBT data is not available, it can be calculated using EOBT data instead.

Additional variation in the formula, depending on data availability, could be to use ADT and SDT data instead of AOBT and SOBT data, respectively.

Initially, only scheduled commercial departures are considered. General aviation, military and other type of flights could be included only for specific analysis of KPI01, as required by each State. KPI01 does not take into account the cancelled departing flights, which could be measured and monitored as a separated metric.

The considered time period for calculating KPI01 could be from hourly to yearly results, including also daily and monthly periods.

- **Instances:**

The instances of calculation of KPI01 may depend on the available input data. The recommended instance is by airport infrastructure in each State. The list of airports to be include in the analysis should include those airports above 40.000 commercial operations/year.

Additionally, for airports with more than one departing runway, it is suggested to calculate KPI01 per each departing runway.

Finally, at State level it will be calculated the aggregated KPI for all airports included in each State scope. Consolidation of KPI01 results will be also done at Regional level in step 6 of the process.

- **Metadata:**

Metadata is normally defined as the data of the data, that is the contextual information that makes raw data meaningful, searchable, and usable. In this sense, for each KPI we need to identify and characterize the different data input that it is required for its calculation. In the context of these guidelines, the group of data inputs of the KPI is considered as the KPI metadata.

In the case of KPI01, for each registered flight in the considered time period, the following metadata is required:

- Flight Call sign, as per the Flight Plan (i.e. GLO1182)
- Aircraft Type (i.e. B738)
- Flight Type, commercial, using for example a C, or non-commercial, indicating NC
- Airport of departure (ADEP), in ICAO code (i.e. SBBR)
- Airport of destination (ADES), in ICAO code
- Scheduled Off-Block Time (SOBT), in date (day/month/year) and time (hour : minute : seconds) (i.e. 28/01/25 06:15:00)
- Actual Off-Block Time (AOBT), in in date (day/month/year) and time (hour : minute : seconds)
- Runway in use (RWY) (i.e. 17R)
- Departing gate (GATE)

See example for table for compiling the metadata required for KPI01 at the input data collection and consolidation section. Also see Excel template in Annex 1.

- **Frequencies:**

KPI01 is recommended to be calculated by each State at national level with a monthly frequency. The integration at regional level is recommended to be done with a quarterly frequency (every three months).

- **Owner and Responsibilities:**

Each KPI should have an owner nominated at State level, who will be responsible for the calculation and management of the KPI. Normally, it will be staff of the Planning Department at the Civil Aviation Authority or the State ANSP.

The owner of KPI01 at State level should nominate the staff responsible for receiving the data, consolidating it and performing the metadata quality checks.

The same responsible staff can be nominated for the three roles, or, depending on existing capabilities at the owner entity, the responsibilities could be assigned to different teams. The selected approach would be the same across all KPIs.

- **References and Best Practices:**

Departure punctuality is a key metric for the aviation sector, and not only for planning purposes. Some key references and best practices on departure punctuality indicators are:

- DECEA (Brazil) presents the SISCEAB Performance website, providing access to ATM performance indicators, including departure punctuality.

  https://performance.decea.mil.br/areas/previsibilidade/#graf_opc_ano

- EUROCONTROL, at its Aviation Intelligence Portal, provides a dashboard with insights into various performance areas and indicators, including departure punctuality.

  https://www.eurocontrol.int/Economics/DailyPunctuality-Airports.html

- The Airport Performance Network – Europe (APN – Europe) brings together ACI Europe members to discuss issues related to punctuality and airport performance management.

  https://www.aci-europe.org/industry-topics/industry-topics/29-airport-performance.html

As a summarized outcome of this step, the following KPI01 **Descriptive Table** is recommended to be completed by each State (see Excel template in Annex 1):

KPI01 – Descriptive Table	
Name	Departure Predictability (Variant 2A)
Definition	Percentage of flights departing from the gate within ±15 minutes of their Scheduled Off-Block Time (SOBT) compared with their Actual Off-Block Time (AOBT). Depending on the availability of the required input data, if the SOBT data is not available it can be calculated using EOBT data form the flight plan, instead.
Utility of the KPI	This is an airspace user and passenger focused KPI: departure punctuality gives an overall indication of the service quality experienced by passengers, and the ability of the airlines to execute their schedule at a given departure location.
Key Performance Area	Predictability
RANP Performance Objectives	Increase the number (%) of flights adhering to the planned take-off time
Link to ASBU elements	None It is expected that links will be established in the future with ACDM elements
Formula	(Departures where |AOBT − SOBT| ≤ 15 min ÷ Total scheduled departures) × 100 Only commercial departures considered Considered time periods: hour, day, month and year
Unit	% of scheduled departures
Metadata	CALLSIGN, ACFT TYPE, FLT TYPE, ADEP, ADES, SOBT, AOBT, RUNWAY, GATE
Instances	Identify the instances of calculation for the KPI, for example: • Airports above a defined threshold of commercial ops/year • Departure runway • Gate
Frequencies	Monthly calculation at State level Quarterly consolidation at Regional level

KPI01 – Descriptive Table	
Data Sources	Indicate the data source used per each required metadata element at each instance (for example): • AOBT: AODB • SOBT: AODB, Airline OCC • Allocated airport resources (runway, gate): AODB Additionally, if applicable, identify the responsible staff, at the data source, to provide the information and the responsible staff, at State level, to collect it.
Owner and responsibilities	Identify the owner of the KPI and the responsible staff, at Stale level, for the calculation and management of the KPI
Users	Identify the users of the KPI, such as airports operators, ANSPs, Airlines and others, at State level
Applied Variations	List the variations applied in the formula, metadata, data sources, frequency, or other elements of the calculation process
References	Links to reference material and to examples of calculation For example: DECEA, EUROCONTROL, ACI Europe
File	Link to the local Excel file with the input data and calculation formulas

Some of the fields of the KPI Descriptive Table should be filled once the next steps are completed, for example, metadata, data sources, owner, applied variations, etc.

As a main reference, to complement the understanding of KPI01, see the descriptive table provided by the ICAO GANP: https://www4.icao.int/ganpportal/ASBU/KPI

iii. Identifying the data sources

In order to identify the required data sources for KPI01, it is necessary to clearly understand the different metadata necessary as inputs. In the case of KPI01 main metadata elements are the off-block time stamps, both the actual (AOBT) and the schedule (SOBT). The definition of off-block time stamp is the time the aircraft starts to move from its stand, with all doors closed, under its own power or pushback. Additionally, it would be required to obtain the assigned airport resources, runway and gate, to each departing flight.

- **Primary sources**

Primary sources of information for obtaining the required KPI01 metadata usually are:

- Airport Operational Databases (AODB), which normally registers flight schedule information from airlines, including SOBT, resource allocation as assigned gates and departure runways, and key turnaround milestones, as AOBT. For CDM airports, SOBT and AOBT are key milestones to be registered.
- Airline Operations Control Centers (OCC) provide flight schedules including the SOBT information. Additionally, Airline OCCs record the AOBT which is reported in airline movement (MVT) messages, as OUT field of the message. SOBT is also included in MVT messages.

It is also important to identify in each potential data source the responsible staff, which will be providing the information with the required frequency and formats.

When possible, it is recommended to use a unique data source for all airport instances, for example an existing database at the Civil Aviation Authority. If this not the case, it will be necessary to work with each airport operator and/or airline to establish separated data collection processes per each airport instance, and then build an integrated data base at State level (see next step).

- **Alternative sources**

In the case of AOBT, alternative sources of information could be:

- Some ANSPs record at their ATC departure clearance systems the start of pushback or movement from stand clearance, more likely to be available at CDM airports
- Surveillance systems, such as Surface Movement Radar, A-SMGCS or ADS-B, can identify the exact time an aircraft begins to move from the stand.
- Ground Handling systems: Pushback time stamps are recorded directly by ramp agents or automated systems (electronic dispatch, handheld devices) and then fed into AODB and/or airline OCC systems. Please, note that this source would not be providing the AOBT in the case pushback is not required.

Alternatively, if AOBT data is not available from any source, it could be considered to estimate it using ATOT data and taxi out times, in the case they are available. ATOT could be obtained from ADS-B data sources, and taxi times could be estimated using a reference or average taxi time, usually provided by the airport operators.

On the other hand, if SOBT is not available from the primary sources, then it can be introduced a variation in the KPI01 calculation formula and use EOBT instead of SOBT. In that case, EOBT can be obtained from Flight Plans (FPL) databases.

- **Data sources accessibility evaluation**

Once the primary, or alternative if necessary, sources are identified per each element of the KPI metadata, it is necessary to conduct and evaluation of its accessibility in different aspects:

- Collection frequency: Daily frequency is recommended, if not weekly, but not lower than monthly.
- Data format: It is recommended to have access to digital data sources, such as databases or Excel files. As last option paper based reports could be accepted.
- Collection method: Automated methods, as online interfaces, would be ideally preferred, but email communication could be acceptable at early stages.
- Data completeness should be total, in order to ensure the quality of the calculated KPI. Depending on the data source continuity completeness could be impacted.
- Data reliability is evaluated qualitatively, mainly depending if the source relies on manual processes or is generated by automated systems.
- Access benefit vs cost: Also a qualitative factor, that evaluates how difficult or costly could be to get access to the data source. For example, accessing some data from third parties might require complex approvals or agreement letters.

Additionally, commitment from the involved staff at each data source, which will be responsible for providing the data, needs to be assessed and confirmed.

To perform this assessment of the accessibility of the different data sources, the following table needs to be prepared, including the aspects to be evaluated for each source identified per each metadata element and at each calculation instance. See example below for KPI01:

Meta-data	Instance	Data source	Collection frequency	Data format	Collection method	Data completeness	Data reliability	Access Benefit vs Cost	Responsible focal point
AOBT	Airport i	AODB	Daily	Database	Online interface	Total	High	Low	Airport ops manager
		Airline OCC	Weekly	Excel	Email	Very high	High	Medium	Airline ops manager
	Airport ii	ATC system	Weekly	Excel	Email	High	Medium	High	TWR Supervisor
SOBT	Airport i	AODB	Daily	Database	Online interface	Total	High	Low	Airport ops manager
	Airport ii	Not available	N/A	N/A	N/A	N/A	N/A	N/A	N/A
EOBT	Airport ii	ICAO FPL	Daily	Database	Online interface	Total	High	High	ICAO officer

This example shows that, depending on the airport, there could be more than one available data sources, but with different levels of accessibility. This exercise is crucial to ensure the continuity and success of the data collection process and further calculation of the KPI, and to identify the potential variations required due to data availability. As a result, the optimum data source per each metadata element is identified and the required coordination and collection agreements are established with the data source responsible.

See Excel template in Annex 1 for the previous table to evaluate the KPI data sources accessibility.

iv. Input data collection and consolidation

Once the data sources are identified and the required connection and coordination is established with all of them, the process of collecting and integration of the KPI01 input data should be activated.

- **Metadata collection and integration format:**

At this step, the designated KPI01 owner at State level starts receiving from the different sources the required metadata for calculating the KPI. As described in the previous step, each metadata may be received from different data sources using different formats, methods and frequencies. In this regards, the consolidation of the input data per departing flight should be done using a common database or Excel table to ensure the appropriate management of the data for the KPI calculation.

For KPI01, it is recommended to consolidate the metadata in the following table, and initially using Excel as recommended format (See Annex 1 for Excel template). See example below:

CALLSIGN	ACFT TYPE	FLT TYPE	ADEP	ADES	SOBT	AOBT	RUNWAY	GATE
AEB9003	A320	NC	SBBR	SBFL	29/01/25 15:45:00	01/01/25 15:37:14	11L	N/A
ARG1219	B738	C	SBBR	SABE	13/01/25 01:21:00	13/01/25 01:05:00	11L	N/A
AZU2604	E295	C	SBBR	SBCF	04/01/25 09:00:00	04/01/25 08:56:50	11L	N/A
AZU2604	E295	C	SBBR	SBCF	06/01/25 09:00:00	06/01/25 08:57:16	11L	N/A

In the case any variation is introduced in the formula and/or input data, as for example using EOBT instead of SOBT, or using ATOT and taxi times instead of AOBT, the table will be adapted as necessary.

Additionally for each metadata element it will be registered information on the data source, focal point at data source, date of reception, and comments field indicating any missing information or issue on the received data. This information will be an input for the metadata quality check described below.

- **Frequency of collection and consolidation:**

As described in previous section, the frequency of collection of the KPI01 metadata elements could be different depending on the used data sources. Therefore, the consolidation frequency of the metadata for a same flight will be defined by the metadata element with lower frequency of collection. Considering the previous, in the worst case a monthly frequency should be established as the minimum one for the metadata consolidation process, and targeting to improve it to a daily or, at least, weekly frequency.

- **Metadata quality check:**

Considering that various sources could be used to build the complete set of metadata elements per each departing flight, it is crucial to conduct a quality check of the consolidated data per flight and per the full set of flights per consolidation period.

The following quality checks are proposed to be conducted for KPI01 metadata:

- Mapping: This quality process checks the format of the submitted data ensuring that follows the correct coding convention.
- Completeness: This area focuses on checking the number of operated flights and the amount of flights with null values in the metadata elements.
- Matching: To ensure that the consolidated metadata elements are correctly assigned to the corresponding departing flights. For example avoiding duplicate flights.
- Accuracy Validation: This quality area aims to evaluate the degree of conformance between the collected values and their true values. In the case of KPI01, it could be introduced a check process using various data sources to confirm that SOBT and AOBT data are coherent.

As a result of this process a metadata quality check report will be produced, identifying the required corrective actions to be implemented at collection and/or consolidation activities.

v. KPI calculation and provision of results

- **Formula application:**

For calculating KPI01, first it is necessary to have all the data inputs for all scheduled departing flights in the defined calculation period (daily weekly, monthly, quarterly, season, yearly punctuality). Once all metadata is registered in the consolidation table (see previous section) for the complete set of flights, then the KPI formula can be applied.

Several options can be used to apply the formula using the same consolidation table in excel format. A common approach is to add a column, after the metadata columns, to evaluate if a departure flight is punctual or not, by checking if the absolute value of the difference between its AOBT and its SOBT is equal or less than 15 min. In the case the flight is punctual, the value “1” is registered in the new column. Finally, by calculating the sum of “1” in that column for all flights in a defined period of time and dividing it by the total number of scheduled flights in that same period, it is obtained the % of punctual departure flights, that is the value of KPI01, in the mentioned period of time.

Applying to excel table different filters or using dynamic tables, KPI01 can be calculated for specific an airport, or group of airports, or at State level and for different calculation periods, day, week, month, quarter, season or year. Additionally, if the data is available, within an specific airport the calculation can be also done for a specific departure runway or for a specific gate.

See Excel template in Annex 1 incorporating formula to calculate KPI01

- **KPI baselines calculation:**

KPI values are essential to evaluate system performance. For KPI01, this specifically means assessing the predictability of scheduled departures. To identify potential improvements in this area, the KPI must be quantified and its evolution monitored over time. This requires establishing a reference baseline, which serves as the foundation for future performance comparisons. Furthermore, baseline values at both State and Regional levels offer a clear picture of any existing performance gaps and provide the necessary insights for setting future KPI target values.

When complete annual datasets for KPI01 become available, a reference baseline can be calculated. The goal for all CAR/SAM States is to deliver KPI01 results for 2026, establishing a common regional baseline reference.

- **Internal validation:**

It is necessary to ensure that the KPI results obtained by the application of the formula are accurate and reliable before its submission to regional level. Different approaches can be followed:

- Select representatives samples of data and recalculate the KPI manually and compare it with the excel formula outputs.
- Check consistency over the time and validate that KPI results follow expected patterns (no sudden variations due to calculation errors).
- Peer review: share methodology and sample results with internal and external stakeholders (airport operators, airlines, etc.).
- Cross-check with other punctuality reports from airlines or commercial aviation data sources.

The validation results will determine any corrective actions needed in the KPI calculation process. If no issues are found, the KPI results are considered approved.

Additionally, the internal validation process may reveal anomalies, such as implausible delays, often caused by incorrect AOBT or SOBT timestamps. In such cases, corrective action should be taken directly at the data source level.

- **Documentation:**

Once the KPI is calculated it is necessary to document the key aspects of the process: what the KPI is, how it is defined, which data sources are used, how data is processed, the exact calculation steps, who is responsible, how it is reported, and how changes are tracked. Documenting the process of KPI calculation is essential to ensure transparency, repeatability, and auditability.

Key elements of the KPI documentation package are:

- KPI Descriptive Table
- Data sources evaluation table
- Metadata collection, consolidation and KPI calculation processes descriptions and Excel files
- Metadata consolidation quality check reports
- KPI calculation internal validation report

It is relevant to include in the different documents the required references to the potential variations applied to KPI01 calculation, that is assumptions, KPI formula and/or metadata adjustments, unavailable input data and other observations.

- **Provision of results to regional level**

After the KPI results are calculated and internally approved, the State compiles the standardized submission package formed by the KPI documentation described in the previous step. This package is then sent to the regional coordinating body (ICAO NACC and SAM Regional Offices) through the designated reporting channel, whether that is a secure email, an online portal, or another official submission system to be defined. States should confirm that the submission is received and track any feedback or requests for clarification. This step ensures official receipt, traceability, and accountability, forming the basis for subsequent regional consolidation and analysis of KPI results.

b. KPI06 En-route airspace capacity (Variant 1)

i. Selection of the KPI

First, it is necessary to understand why the KPI has been selected as part of the CAR/SAM RANP, evaluate its level of priority, its link with ICAO ASBU elements and the selection criteria applied.

- **Justification:**

En-route airspace capacity is a key performance indicator as it assesses the extent to which traffic demand can be accommodated within the available sector capacity in a safe and efficient manner. The indicator supports the implementation of Air Traffic Flow Management (ATFM) by facilitating the identification of capacity bottlenecks and enabling the planning of appropriate measures, such as sector reconfiguration or flow management regulations. Furthermore, it contributes to the preservation of safety margins by preventing excessive controller workload, while at the same time enhancing operational efficiency through the reduction of delays, rerouting, and holding, which also could lead to a reduction of fuel consumption and emissions.

- **Priority:**

In the CAR/SAM region, monitoring KPI06 will provide relevant insights to ensure that growing traffic demand can be safely and efficiently accommodated within available sectors, helping States and ANSPs plan and manage airspace proactively. In particular, with traffic expected to increase significantly across the region, SAM States face opportunities to enhance capacity along major corridors linking São Paulo, Buenos Aires, Lima, Bogotá, and Santiago through sector redesign, ADS-B deployment, and improved cross-border coordination. On the other hand, in the CAR region, dense international flows crossing multiple FIRs within short distances—such as routes between Miami, Havana, Kingston, Santo Domingo, and San Juan—highlight the benefits of introducing coordinated ATFM measures. In this sense, monitoring KPI06 will enable CAR States to optimize sector use, strengthen predictability, and minimize delays, contributing to a more resilient and harmonized regional air traffic system.

- **Link with ASBU elements:**

The ICAO GANP traceability tool https://www4.icao.int/ganpportal/ASBU/PerformanceDashboard identifies the following ASBU elements which implementation will generate a positive impact on KPI06:

Elements implementation planning in progress in CAR/SAM regions.

- FRTO (Improved operations through enhanced en-route trajectories) elements: FRTO-B0/4 Basic conflict detection & conformance monitoring (MTCD/MONA) equips ATC with planning tools that detect conflicts earlier and ensure adherence to clearances, reducing tactical

vectoring and enabling denser, more orderly streams. FRTO-B1/2 Required Navigation Performance (RNP) routes create more predictable, performance-based routing structures (including in constrained airspace), which reduces controller workload and deconflicts flows, allowing more aircraft to use the same airspace safely. Both elements translate to higher sustainable sector demand handling for KPI06.

- NOPS (Network Operations) element: NOPS-B1/4 Dynamic Traffic Complexity Management gives the network and ANSPs the means to measure and actively manage complexity (not just volume), coordinating flow measures, configurations, and reroutes before sectors overload. By keeping controller task load within acceptable bounds and distributing demand across time/space, this element raises the effective capacity the network can safely absorb, improving KPI06 outcomes.

Elements implementation not yet planned

- CSEP (Cooperative Separation) elements: CSEP-B1/3 Performance-Based Longitudinal Separation Minima and CSEP-B1/4 Performance-Based Lateral Separation Minima reduce required in-trail and lateral spacing where performance allows, letting controllers safely accommodate more traffic per sector. CSEP-B2/1 Interval Management (IM) Procedure and CSEP-B3/1 IM with complex geometries shift part of spacing management to airborne tools, smoothing flows through merges/crossings and further increasing sector throughput. CSEP-B3/2 Remain-Well-Clear (RWC) for UAS/RPAS enables predictable integration of new entrants without eroding crewed traffic capacity, and CSEP-B4/1 Airborne separation (longer-term) envisages aircraft-managed separation to unlock additional capacity where supported by standards and equipage. Together these elements lift the practical ceiling of aircraft a controller/sector can handle while preserving safety margins, directly improving KPI06.
- OPFL (Improved access to optimum flight levels in oceanic and remote airspace) elements: OPFL-B3/1 Helicopter RNP 0.3 Terminal and En-route Operations standardizes precise rotorcraft operations so they can share or transition through en-route structures with less segregation, protecting fixed-wing capacity. OPFL-B3/2 Expansion of the upper limit of the RVSM band increases the number of usable flight levels, directly adding vertical capacity for long-haul flows. Both reduce level capping/constraints and open more vertical “lanes,” positively impacting KPI06 where applicable.

In summary, these specific ASBU elements, once they are available for implementation, will raise safe sector throughput by tightening separation where performance justifies it, improving controller tools and route predictability, managing network complexity, and adding usable flight levels, each a direct lever on KPI06.

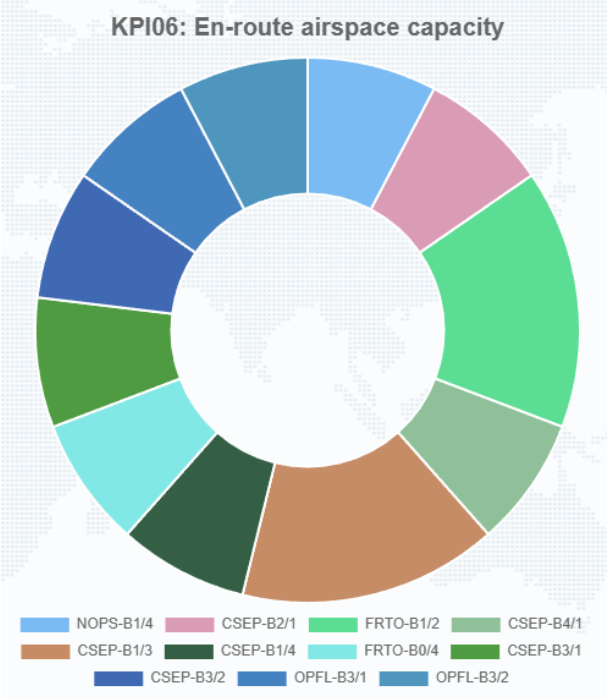

Figure 6 – KPI06 traceability with ASBU elements – ICAO GANP Portal

- **Selection criteria:**

Regarding the KPI selection criteria, it is essential to ensure that the chosen indicator can be measured by all States in the region. KPI06 is derived from the GESEA Capacity Manual formulas, which are based on measurement processes that, while requiring time and resources, remain feasible and affordable for most States. Furthermore, CAR region has identified KPI06 as a priority GANP indicator.

ii. Understanding the KPI

The KPI06 En-route airspace capacity, as described by the ICAO GANP portal, measures an upper bound on the allowable throughput or occupancy count of an en-route facility or sector.

KPI06 measures the nominal capability of an ANSP to deliver ATM services to IFR traffic in a given volume of en-route airspace, as seen at a given planning horizon. For each horizon a different type of capacity is defined by the ICAO GANP:

- Planned capacity: expected values one or more years ahead for planning and investment purposes
- Declared capacity: values used during the strategic and pre-tactical ATFM processes
- Expected capacity: values as finalized at the end of the pre-tactical process
- Actual capacity: values as actually used on the day of operation during tactical ATFM and ATC.

Planned capacities are primarily used for multi-year and investment planning. Declared, expected and actual capacities are used in traffic flow management as well as for measuring and monitoring service delivery and efficiency. Some ANSPs may prefer not to declare capacities, and only have these capacities established on a daily basis based on known/current operational factors. Establishing capacities at different planning horizons provides an important reference for understanding the total system performance under normal operating conditions and provides a basis to work from when

determining the impact of operational factors limiting capacity. These factors include, but are not limited to, ATCO availability and workload.

These guidelines recommend using the declared capacity approach, consistent with the definitions and methodology contained in the *Manual de Cálculo de Capacidad de Pista y Sector ATC*, Version 2.0, developed by GESEA. This GESEA Capacity Manual constitutes the primary reference underpinning the KPI06 calculation methodology presented in the present guidelines.

- **Definition:**

KPI06 En-route airspace capacity is defined by the ICAO GANP as the maximum volume of traffic an airspace volume will safely accept under normal conditions in a given time period.

ICAO GANP offers two variants for calculating KPI06:

- Variant 1: airspace throughput (entry flow rate), at a specific time interval at which the throughput declaration is made.
- Variant 2: airspace occupancy count, at a specific time interval at which the average occupancy count declaration is made.

The proposed variant for the KPI06 as part of the CAR/SAM RANP is the variant 1, and for a time interval of 1 hour, which is in line with the definitions and approach of the GESEA Capacity Manual.

Therefore, the definition to be used for the KPI06 in the CAR/SAM RANP is the maximum flow of traffic an airspace volume will safely accept under normal conditions in one hour, measured in movements/hour.

This definition will be applied using the approach of the GESEA Capacity Manual for the Sector Hourly Capacity (CSH).

- **Contribution to Objectives and KPAs:**

KPI06 En-route airspace capacity is aligned with the following CAR/SAM performance objectives included in the Voume III:

- Improve what's needed to reduce longitudinal separation minima.
- Overcome capacity limitations attributable to route network design.
- Take advantage of increased navigation precision (airspace with PBN operations) to implement route networks and airspace structures with smaller lateral and vertical safety buffers.

These three performance objectives are part of the Capacity KPA.

- **Formula:**

The proposed KPI06 formula is the following one, described in the GESEA Capacity Manual:

$$KPI06 = Sector\ Hourly\ Capacity\ (CHS) = 3.600 \times \frac{0{,}683 \times Nref + 0{,}317 \times Npeak}{T}$$

Nref, calculated ATC sector capacity, is the optimal number of aircraft under simultaneous control in an ATC sector over a period of time, without the number of flights ever causing an overload of work for the ATCO, and is calculated as:

$$Nref = \frac{T \times \propto}{CT}$$

- T is the average time the aircraft remains in the sector (in seconds)

- α is the convergence factor, which is a factor for reducing the average time spent in the sector (T). The convergence factor is intended to minimize discrepant effects in very large ATC sectors so that the Nref does not exceed 18 aircraft[1]. For each class of average time spent in the sector (T), a coefficient (α) was established as follows:

T (seconds)	α
0-899	1,00
900-999	0,98
1.000-1.099	0,92
1.100-1.199	0,87
1.200-1.299	0,82
1.300-1.399	0,78
1.400-1.499	0,74
1.500-1.599	0,70
1.600-1.699	0,66
1.700-1799	0,63
1.800-1.899	0,60
1.900-1.999	0,57
2.000-2.099	0,54
2.100-2.199	0,51
2.200-2.299	0,48
2.300-2.399	0,46
2.400-2.499	0,44
2.500-2.599	0,41

- CT is the ATCO workload defined as the average time (in seconds) used by the ATCO to process all the tasks required by a control position, within a given time interval, to maintain safe and orderly air traffic.

$$CT = (TCom + TTS) \times 1{,}30$$

  - TCom is the sum of the communication time between aircraft and the ATCO in a given period, divided by the number of aircraft that maintained contact during that same period.
  - TTS is the average time spent by the ATCO performing coordination tasks, filling in flight progress records (FPV), updating the radar screen, and any other visible activity inherent to air traffic service, except for the use of the communication channel with the aircraft. In certain cases, a percentage of the tasks performed by the assistant is added when it influences the ATCO's TTS.
  - The constant 1,30 is the cognitive factor (COGNF) and consists of adding 30% of the sum of TCom and TTS to the workload (CT). It refers to the ATCO's thinking operations during the time dedicated to planning, traffic organization, and radar surveillance functions.

Npeak is the simultaneous aircraft control capacity that a given ATC sector is able to maintain for a maximum of 19 (nineteen) minutes, continuous or not, within one hour, in order to meet a short-term increase in demand. During this period, the ATCO could experience a controlled workload. If the

[1] Optimum number of aircraft according to ICAO Doc 9971 Appendix II-C

situation is seen to be prone to prolonging, ATFM measures should be taken. In the mathematical model, the Nref should be treated as an optimal capacity value to which a margin can be added to reach Npeak for a period of up to 19 minutes.

$$Npeak = \frac{T_{max} \times \alpha}{(TCom_{min} + TTS_{min}) \times 1{,}30}$$

$$T_{max} = T + \sigma_T$$

$$TCom_{min} = TCom - \sigma_{TCom}$$

$$TTS_{min} = TTS - \sigma_{TTS}$$

- One sigma (σ: standard deviation) is equivalent to 68,3% of the sample's representativeness. Considering that the probability of variation caused by using the σ for T_{max}, $TCom_{min}$, and TTS_{min} is the same, it will occur 31,7% of the time (one hour) – equivalent to approximately 19 (nineteen) minutes.

The proposed formulas are established on the basis that each ATC sector is operated by one executive ATCO. It is further recognized that, in some operational environments, the executive ATCO may be assisted by a planner ATCO or an assistant ATCO responsible for the execution of part of the secondary tasks.

Coming back to the KPI06 formula, CHS represents the ATC sector's capacity to flow air traffic. Thus, the greater the CHS of an ATC sector, the greater the air traffic flow in that sector. The CHS varies according to the number of aircraft that can be controlled simultaneously (sector complexity) and the time spent in the sector (T).

Therefore, to increase the sector's hourly capacity, its complexity must be reduced and the time spent by the aircraft in the sector.

- **Instances:**

The recommended instances of calculation of KPI06 are the individual ATC sectors of the State airspace.

Finally, at State level it will be calculated the aggregated KPI for all ATC sectors, and grouped by FIR and/or ACC, as applicable. Consolidation of KPI06 results will be also done at Regional level in step 6 of the process.

- **Metadata:**

Metadata is normally defined as the data of the data, that is the contextual information that makes raw data meaningful, searchable, and usable. In this sense, for each KPI we need to identify and characterize the different data input that it is required for its calculation. In the context of these guidelines, the group of data inputs of the KPI is considered as the KPI metadata.

In the case of KPI06, the metadata required per ATC sector are the different elements of the KPI calculation formula, together with the information from the flight samples needed to be measured and used in the calculation process:

- Sector identification (ATC SECTOR)
- Date of sample (DATE) (day/month/year) (i.e. 20/08/25)
- Aircraft identification (ACT ID) (i.e. XX-ZPC)
- Aircraft entry time in the sector (ENTRY TIME) (hour : minute : seconds) (i.e. 10:10:10)
- Aircraft exit time in the sector (EXIT TIME) (hour : minute : seconds) (i.e. 10:25:00)

- Planner ATCO or assistant support (PL ATCO SUPP), indicating if there is or not a planning ATCO or assistant supporting the activities of the executive ATCO (Y or N)
- Time of communication between ATCO and aircraft (TCOM) (in seconds)
- Time used by the ATCO for secondary tasks (TTS) (in seconds)
- Type of secondary task (TS TYPE) (1 = Coordination (other controls, assistant, supervisor), 2 = Interaction with communications system, 3 = Filling flight progress records (FPV) and arranging the dashboard, 4 = Processing flight plans (FPL), 5 = Interaction with radar screen)
- Traffic density at the start (TRAFFIC DENSITY START) and at the end (TRAFFIC DENSITY END) of the measurement of TTS, in number of aircraft in the sector
- Names of the executive ATCO (EX ATCO) and of the planner ATCO or assistant (PL ATCO), if any
- Cognitive factor (COGNF)(by default 1,30)

See example for table for compiling the metadata required for KPI06 at the input data collection and consolidation section. Also see Excel template in Annex 1.

- **Frequencies:**

Compared with other KPIs, KPI06 can be considered as a more “static” indicator, since it looks at the structural capacity of en-route sectors, which is mostly determined by airspace design, separation standards, sectorization, ATCO staffing models, and supporting technology, elements which are not subject to frequent changes. In this sense, KPI06, as sector declared capacity, remains valid until there is a significant change in any of the previous factors.

Therefore, KPI06 should be recalculated only when structural or technological changes occur, or when traffic demand shows a sustained deviation from earlier patterns. Although relevant changes do not occur, it would be recommended to update the calculations with an annual frequency. For regional reporting purposes, States should confirm KPI06 values quarterly, as for the rest of the CAR/SAM KPIs.

- **Owner and Responsibilities:**

Each KPI should have an owner nominated at State level, who will be responsible for the calculation and management of the KPI. Normally, it will be staff of the Planning Department at the Civil Aviation Authority or the State ANSP.

The owner of KPI06 at State level should nominate the staff responsible for measuring and obtaining the required data samples, collecting the data, consolidating it and performing the metadata quality checks.

The same responsible staff can be nominated for the different roles, or, depending on existing capabilities at the owner entity, the responsibilities could be assigned to different teams. The selected approach would be the same across all KPIs.

- **References and Best Practices:**

En route airspace is a key metric for the aviation sector, and not only for planning purposes. Some key references and best practices on en-route airspace capacity indicators are:

- As described in previous section, the formula and calculation methodology of KPI06 follows the approach and methods of the GESEA Capacity Manual (*Manual de Cálculo de Capacidad de Pista y Sector ATC*, Version 2.0, developed by GESEA).
- DECEA (Brazil) presents the SISCEAB Performance website, providing access to ATM performance indicators, including en-route airspace capacity.

https://performance.decea.mil.br/areas/capacidade/#graf_opc_ano

- The EUROCONTROL CAPAN methodology calculates sector capacity by applying a controller workload model to traffic samples from peak periods, where each flight is assigned task times for activities such as conflict detection, coordination, and radio communication; the total workload is compared against the usable controller time available per hour (typically 70% of 60 minutes per controller), and declared capacity is obtained by dividing this usable time by the average workload per flight, with results validated through fast-time simulation and operational feedback to set a safe entry flow rate in flights per hour.

  https://www.eurocontrol.int/methodology/capacity-analysis-methodology

- The FAA uses the Monitor Alert Parameter (MAP). The MAP establishes a numerical trigger value to provide notification to facility personnel, through the MA function of the TFMS, that sector/airport efficiency may be degraded during specific periods of time. The efficiency of a functional position or airport in providing air traffic services is a shared responsibility of the TM team. That team consists of the ATCS(s), OS(s), and the TMU. These entities must monitor, assess and act on sector/airport loading issues to ensure that these NAS elements operate efficiently. The ability of a functional position or airport to provide air traffic services may be affected by a variety of factors (i.e., NAVAIDs, meteorological conditions, communications capabilities, etc.); therefore MAP is a dynamic value which will be adjusted to reflect the capabilities of the functional position or airport (FAA JO 7210.3EE).

  https://archive.ll.mit.edu/mission/aviation/publications/publication-files/atc-reports/Welch_2015_ATC-426.pdf

As a summarized outcome of this step, the following KPI06 **Descriptive Table** is recommended to be completed by each State (see Excel template in Annex 1):

KPI06 – Descriptive Table	
Name	En-route airspace capacity (Variant 1)
Definition	Maximum flow of traffic an airspace volume will safely accept under normal conditions in one hour. This definition follows declared capacity approach of the GESEA Capacity Manual for the Sector Hourly Capacity (CSH).
Utility of the KPI	Declared, expected and actual capacities are used in traffic flow management as well as for measuring and monitoring service delivery and efficiency. Establishing capacities at different planning horizons provides an important reference for understanding the total system performance under normal operating conditions and provides a basis to work from when determining the impact of operational factors limiting capacity, such as ATCO availability and workload.
Key Performance Area	Capacity
RANP Performance Objectives	• Improve what's needed to reduce longitudinal separation minima. • Overcome capacity limitations attributable to route network design. • Take advantage of increased navigation precision (airspace with PBN operations) to implement route networks and airspace structures with smaller lateral and vertical safety buffers.

KPI06 – Descriptive Table	
Link to ASBU elements	• CSEP (Cooperative Separation) elements: CSEP-B1/3, CSEP-B1/4, CSEP-B2/1, CSEP-B3/1, CSEP-B3/2, CSEP-B4/1 • FRTO (Improved operations through enhanced en-route trajectories) elements: FRTO-B0/4, FRTO-B1/2 • NOPS (Network Operations) element: NOPS-B1/4 • OPFL (Improved access to optimum flight levels in oceanic and remote airspace) elements: OPFL-B3/1, OPFL-B3/2
Formula	$$KPI06 = 3.600 \times \frac{0{,}683 \times Nref + 0{,}317 \times Npeak}{T}$$ Nref is the optimal number of aircraft under simultaneous control in an ATC sector over a period of time, without the number of flights ever causing an overload of work for the ATCO (in number of aircraft). Npeak is the simultaneous aircraft control capacity that a given ATC sector is able to maintain for a maximum of 19 (nineteen) minutes, continuous or not, within one hour, in order to meet a short-term increase in demand (in number of aircraft). T is the average time the aircraft remains in the sector (in seconds).
Unit	Aircraft/hour
Metadata	ATC SECTOR, DATE, ACT ID, ENTRY TIME, EXIT TIME, PL ATCO SUPP, TCOM, TTS EX ATCO, TTS PL ATCO, TS TYPE, TRAFFIC DENSITY START, TRAFFIC DENSITY END, EX ATCO, PL ATCO, COGNF
Instances	Identify the instances of calculation for the KPI, for example: • Individual ATC Sectors • Grouped by ACC and/or FIR
Frequencies	KPI06 is considered a “static” indicator. In this sense, recalculation at State level is recommended in an annual basis and when an structural and operational change occurs at sector level. Reporting at Regional level will be done quarterly, providing new values or reconfirming previous ones as applicable.
Data Sources	Indicate the data source used per collect the information to characterize each ATC sector and select the related measurement time intervals. Confirm per ATC sector that the data measurement process in live operations will be the primary source to obtain the required KPI06 metadata, or indicate the alternative method, if any.
Owner and responsibilities	Identify the owner of the KPI and the responsible staff, at Stale level, for the calculation and management of the KPI
Users	Identify the users of the KPI, such as ANSPs, at State level
Applied Variations	List the variations applied in the formula, metadata, data sources, frequency, or other elements of the calculation process
References	Links to reference material and to examples of calculation For example: GESEA Capacity Manual, DECEA, EUROCONTROL, FAA
File	Link to the local Excel file with the input data and calculation formulas

Some of the fields of the KPI Descriptive Table should be filled once the next steps are completed, for example, metadata, data sources, owner, applied variations, etc.

As a main reference, to complement the understanding of KPI06, see the descriptive table provided by the ICAO GANP: https://www4.icao.int/ganpportal/ASBU/KPI

iii. Identifying the data sources

As explained in the previous sections, KPI06 is calculated for each ATC sector using a formula that relies on data collected from multiple samples of controlled flights within that sector. The specific approach to data collection or measurement will vary depending on the type of metadata required, with some elements obtained directly from existing records and others needing to be measured through dedicated measurement or observation.

On one hand, the metadata used in the KPI06 formula will be mainly obtained from direct observation and measurement during live operation conditions at each ATC sector.

On the other hand, for characterizing the ATC sectors to be analyzed is necessary to have access to the following information:

Additionally, for selecting the optimum periods of measurement at an ATC sector is necessary to ensure that the following conditions apply to the ATC sector in the selected measurement periods:

- Ideal conditions for air traffic sequencing and coordination
- All personnel are considered to have the same training and operational performance
- All radio navigation equipment, visual aids, and communications equipment (VHF/telephony) are considered to be technically and operationally unrestricted.

Finally, for successful data measurement, it will be required to be analyzed all available information regarding the operation of the ATC sector (for example: the operational shift list, the internal operating manual, and shift books or records of the ATC unit, etc.). Factors that may disrupt routine operations must be taken into consideration to avoid collecting data when they cause a significant operational impact. These factors may include:

- Periods of high meteorological instability
- Military operations
- Events and holidays
- Radar maintenance
- Maintenance of air navigation aids (VOR, ILS, etc.) and communication equipment (VHF)
- Database updates
- Replacement of automated ATM systems
- Traffic volume statistics during the collection period (medium or high demand)
- Analysis of clusters of the most frequently used sectors in the ATC unit

- **Primary sources**

In the case of the information to characterize the ATC sector and selecting the optimum periods of measurement, it should be provided by the ANSP and in particular by the responsible or supervisor of the ATC sector or related ACC.

Regarding the metadata to be measured, mainly the time values for T, TCom and TTS, its measurement process should be conducted by designated staff from the Civil Aviation Authority or the ANSP. It is recommended 2-3 specialists per ATC sector.

This measurement process, which is described in detail in the next step, is mainly based in direct observation, registration of time stamps and measurement of time intervals. The tools normally used for the measurement process are templates, time chronometer, and access to audio register of the ATS communication frequencies (in particular for the TTS).

- **Alternative sources**

For ATC sector characterization, an alternative data source to the ANSP may be the Civil Aviation Authority department responsible for airspace design and planning.

If direct measurement in live operations cannot be carried out in a given sector, the required KPI06 metadata may instead be obtained from available statistical information on sector operations.

Ideally, when dedicated simulation platforms are available, such as EUROCONTROL's CAPAN model, they may be used as an alternative to the measurement-based methodology proposed in these guidelines.

- **Data sources accessibility evaluation**

Regarding the information to characterize the ATC sector and select the measurement time intervals, it is important to ensure its completeness and reliability.

Regarding the measurement process of the required metadata at each ATC sector, the relevant aspect is to ensure the representativeness of the data measured and the correctness of the measurement processes.

Additionally, commitment from the involved staff at each data source, which will be responsible for providing the data, and at the measurement processes needs to be assessed and confirmed.

iv. Input data collection and consolidation

Once the data sources and measurement methods are evaluated and confirmed, the process of collection of information and measurement of data should start.

- **Metadata collection and integration format:**

First, it is necessary to identify the different instances of calculation of KPI06 at State level, that is individual ATC Sectors or groups of them. The measurement process is the same for grouped and individual sectors.

A list of sector groupings should be requested in advance from ATC units for measurement analysis and planning, where deemed necessary by the sector configuration. This will allow for analyzing the operational console configuration, preparing for data collection, and identifying the time intervals of medium and high traffic demand in each sector, which are the preferred time intervals to conduct the measurements. This step is not considered necessary for less complex sectors or where information is available from another source, as for example, from statistics.

Per each instance it will be identified the collection and measurements periods and time intervals, with medium and high traffic demands. Example:

- ATC instance: ACC ANYPORT (Sector 1)
- Measurement period: 03/11/2025 – 12/11/2025

- Measurement hourly intervals: 11:30 – 13:30 UTC and 21:30 – 23:30 UTC

The selected periods and time intervals, should be enough to allow conducting the measurement of a minimum of 35 samples of 1 hour of live operations each. This number of samples is required to be measured per each instance (individual ATC sector or group of sectors) to ensure the representativeness of the calculated KPI06. For each of the 35 samples the values of T, TTS and TCom will be measured.

For the measurement of T(average time the aircraft remains in the sector), it is necessary to record the time of the first and last communication (time of entry and exit from the sector in minutes) of the aircraft during periods of greatest traffic volume, separating by sector and/or group of sectors, in a continuous one-hour interval. Each continuous hour represents a sample.

To obtain the TCom (Time of communication between ATCO and aircraft), the same criteria for collecting T are followed, and the samples are added until they reach 35. A chronometer or other available automated system is used to record the communication times in seconds between the pilot and the ATCO per each aircraft in the sample (one-hour period).

The collected data for entry and exit times and TCom will be registered in the table below (See Annex 1 for Excel template).

ATC SECTOR	DATE	SAMPLE	ACFT ID	ENTRY TIME	EXIT TIME	TCOM	EX ATCO
SECTOR 1	03/11/2025	1	XX-ZPC	10:00:30	10:10:15	10 secs	J. Perez
SECTOR 1	03/11/2025	1	XZ-JPC	10:01:40	10:12:00	15 secs	J. Perez
SECTOR 1	03/11/2025	1	ZY-BRK	10:01:55	10:09:50	8 secs	J. Perez
SECTOR 1	03/11/2025	1	VB-SBB	10:02:10	10:11:15	12 secs	J. Perez

T values per aircraft are calculated in seconds as EXIT TIME - ENTRY TIME. Additionally, per each sample (n) is counted the number of aircraft (N_n), which will be used in the later calculation of TTS.

In the case of the TTS (Time used by the ATCO for secondary tasks), at least 35 measurements during 180 seconds (3 minutes) each will be performed per each sector. These measurements will comply with the following criteria:

- A minimum of five and a maximum of ten measurements of each type of TTS from the same controller
- Collection must be performed when demand is equal to or greater than 50% (fifty percent) of the reference number or at identified times of medium/high demand
- To collect up to 10% (ten percent) of a sector's measurements, an ATCO in training (final phase) may be observed. Other trainees should not be observed
- Depending on the sector being analyzed, a collection time of 7 to 10 days is recommended
- In non-radar sectors, other types of TTS may be omitted or indicated
- All activities related to the provision of ATS services performed by the ATCO must be measured (in seconds), except for the time spent communicating with aircraft, separating the TTS by type

The types of secondary tasks are coded as following, as described in the metadata section above:

- 1 = Coordination (other controls, assistant, supervisor)
- 2 = Interaction with communications system
- 3 = Filling flight progress records (FPV) and arranging the dashboard

- 4 = Processing flight plans (FPL)
- 5 = Interaction with radar screen

In cases where, due to the sector design and work methodology used, the influence of the tasks of the planner ATCO (or assistant ATCO) significantly influences the workload of the executive ATCO on the main frequency, the planner ATCO's TTS measurements will be taken following the parameters mentioned in the previous point. In the calculation process, the planner ATCO's TTS values will be considered as a weighted 20% of the sector's total TTS.

The TTS measurements are recorded in the following table:

ATC SECTOR	DATE	PL ATCO SUPP	START	END	TS TYPE	TTS EX ATCO	TTS PL ATCO	TRAFFIC DENSITY START	TRAFFIC DENSITY END	EX ATCO	PL ATCO
S1	03/11/2025	Y	13:00:00	13:03:00	1	31 s	12 s	8	8	J. Perez	M. Ace
S1	03/11/2025	Y	13:05:00	13:08:00	1	29 s	15 s	8	7	J. Perez	M. Ace
S1	03/11/2025	Y	13:07:00	13:10:00	3	37 s	25 s	7	5	J. Perez	M. Ace
S1	03/11/2025	N	13:08:00	13:11:00	5	30 s		4	4	J. Perez	N/A

Once all measurements of T, TCom and TTS are registered per a specific ATC sector, they need to be processed and consolidated.

For the measurements of T, it is necessary to calculate the average T per aircraft in each sample (T_n), that is to sum together all measurements per aircraft in one sample and divide the total by the number of aircraft in the sample (N_n). Then it is calculated the general average of T per aircraft in the ATC sector, considering the 35 samples:

$$T = \frac{T_1 + T_2 + \cdots + T_{35}}{35}$$

Additionally, the standard deviation of the measurements of T in each sector is also calculated:

$$\sigma_T = \sqrt{\frac{\sum_{n=1}^{35}(T_n - T)^2}{n-1}}$$

In the case of TCom, a similar process is followed. It is necessary to calculate the average TCom per aircraft in each sample, that is to sum together all measurements per aircraft in one sample and divide the total by the number of aircraft in the sample. Then it is calculated the general average of TCom per aircraft in the ATC sector, considering the 35 samples:

$$TCom = \frac{TCom_1 + TCom_2 + \cdots + TCom_{35}}{35}$$

And the standard deviation of the measurements of TCom in each sector is also calculated:

$$\sigma_{TCom} = \sqrt{\frac{\sum_{n=1}^{35}(TCom_n - TCom)^2}{n-1}}$$

Finally, the TTS measurements are also processed and integrated. First, it is calculated the average of the measurements in each sector per type of ATCO, executive ATCO or planner/assistant ATCO, and then pondered (80% for executive ATCO and 20% for planner/assistant ATCO) to calculate the average of the measurements of TTS in the sector (TTS_M).

$$TTS_{Ex\ ATCO} = \frac{\sum_{M_{Ex\ ATCO}=1}^{M_{Ex\ ATCO}} TTS_{M_{Ex\ ATCO}}}{M_{Ex\ ATCO}}$$

$$TTS_{Pl\ ATCO} = \frac{\sum_{M_{Pl\ ATCO}=1}^{M_{Pl\ ATCO}} TTS_{M_{Pl\ ATCO}}}{M_{Pl\ ATCO}}$$

$$TTS_M = \frac{TTS_{Ex\ ATCO} \times 80 + TTS_{Pl\ ATCO} \times 20}{100}$$

Then, the TTS_M per hour is calculated, considering the TTS_M has been obtained for measurement periods of 180 seconds:

$$TTS_{M/h} = \frac{3.600 \times TTS_M}{180}$$

With this value, the TTS per aircraft in each sample (samples used for the T and TCom measurements) is calculated diving the $TTS_{M/h}$ by the number of aircraft in the sample (N_n):

$$TTS_n = \frac{TTS_{M/h}}{N_n}$$

Finally, the average TTS per aircraft in the sector and the associated standard deviation are calculated:

$$TTS = \frac{TTS_1 + TTS_2 + \cdots + TTS_{35}}{35}$$

$$\sigma_{TTS} = \sqrt{\frac{\sum_{n=1}^{35}(TTS_n - TTS)^2}{n-1}}$$

To finalize the measurement process, the measurement results of T, TCom and TTS and its related standard deviations are consolidated in the following table per ATC sector (see Excel template in Annex 1):

SAMPLES	T		TCOM		TTS	
1	T_1		$TCOM_1$		TTS_1	
2	T_2		$TCOM_2$		TTS_2	
3	T_3		$TCOM_3$		TTS_3	
…	…		…		…	
…	…		…		…	
34	T_{34}		$TCOM_{34}$		TTS_{34}	
35	T_{35}		$TCOM_{35}$		TTS_{35}	
SECTOR AVERAGE TIMES	**T**		**TCOM**		**TTS**	
SECTOR STANDARD DEVIATIONS	**σ_T**		**σ_{TCOM}**		**σ_{TTS}**	

Additionally, for each ATC sector it will be registered information on the specialists conducting each if the measurements, the ATCOs on duty, and an observations or comments field indicating any missing information or issue during the measurement process. This information will be an input for the metadata quality check described below.

- **Frequency of collection and consolidation:**

As described in previous sections, KPI06 is considered a "static" KPI which should be recalculated in an annual basis and when an structural and operational change occurs at sector level. Therefore, the measurement frequency of the KPI06 metadata elements will be also aligned with the KPI06 calculation frequency, that is annually and when a change occurs.

- **Metadata quality check:**

Considering that different measurements processes are used to build the complete set of metadata elements, it is crucial to conduct a quality check of the consolidated measurements per sector.

The following quality checks are proposed to be conducted for KPI06 metadata:

- Mapping: This quality process checks the format of the measured and recorded data ensuring that follows the correct coding convention.
- Completeness: This area focuses on checking the number of samples, the number of measurements in each sample and the amount of aircraft with null values in the metadata measurements.
- Matching: To ensure that the consolidated metadata measurements are correctly assigned to the corresponding aircraft in the Sector. For example avoiding duplicate aircraft.
- Accuracy Validation: This quality area aims to evaluate the degree of conformance between the measured values and their true values. In the case of KPI06, it could be introduced a check process using alternative data sources and cross-checks to confirm that measurements are coherent.

As a result of this process a metadata quality check report will be produced, identifying the required corrective actions to be implemented at measurement and/or consolidation activities.

v. KPI calculation and provision of results

- **Formula application:**

For calculating KPI06, once all the measurements of T, TCom and TTS per each ATC sector are registered in the consolidated table, as described in the previous section, then the KPI06 formulas can be applied.

First, the Nref is calculated:

$$Nref = \frac{T \times \propto}{(TCom + TTS) \times 1{,}30}$$

Where the value of α (convergence factor) is obtained from the table included in previous section describing KIP06 formula. The cognitive factor of 1,30 could be adapted to other values if it is justified considering that different conditions apply.

Secondly, the Npeak is calculated:

$$Npeak = \frac{(T + \sigma_T) \times \alpha}{((TCom - \sigma_{TCom}) + (TTS - \sigma_{TTS})) \times 1{,}30}$$

And finally, the KPI06 formula is applied:

$$KPI06 = 3.600 \times \frac{0{,}683 \times Nref + 0{,}317 \times Npeak}{T}$$

Several options can be used to apply the formula using the same consolidation table in excel format, adding the Nref and NPeak values and the KPI06 calculation formula in the same table.

See Excel template in Annex 1 incorporating formula to calculate KPI06.

- **KPI baselines calculation:**

KPI values are essential to evaluate system performance. For KPI06, this specifically means assessing the capacity of the en-route sectors at State airspace. To identify potential improvements in this area, the KPI must be quantified and its evolution monitored over time. This requires establishing a reference baseline, which serves as the foundation for future performance comparisons. Furthermore, baseline values at both State and Regional levels offer a clear picture of any existing performance gaps and provide the necessary insights for setting future KPI target values.

When complete measurements of KPI06 become available at all ATC sectors at State level, a reference baseline can be calculated. The goal for all CAR/SAM States is to deliver KPI06 results for 2026, establishing a common regional baseline reference.

- **Internal validation:**

It is necessary to ensure that the KPI results obtained by the application of the formula are accurate and reliable before its submission to regional level. Different approaches can be followed:

- Select representatives samples of data and recalculate the KPI manually and compare it with the excel formula outputs.
- Check consistency of ATC sectors results compare with adjacent sectors and validate that KPI results follow expected patterns (no sudden variations due to calculation errors).
- Peer review: share methodology and sample results with internal and external stakeholders (Other states ANSPs, airlines, etc.).
- Cross-check results with other available capacity assessment methodologies or tools, as for example, simulation platforms.

The validation results will determine any corrective actions needed in the KPI measurement and calculation process. If no issues are found, the KPI results are considered approved.

- **Documentation:**

Once the KPI is calculated is necessary to document the key aspects of the process: what the KPI is, how it is defined, which data sources are used, how data is measured and processed, the exact calculation steps, who is responsible, how it is reported, and how changes are tracked. Documenting the process of KPI calculation is essential to ensure transparency, repeatability, and auditability.

Key elements of the KPI documentation package are:

- KPI Descriptive Table
- Metadata measurement and consolidation and KPI calculation processes descriptions and Excel files
- Metadata measurement and consolidation quality check reports
- KPI calculation internal validation report

It is relevant to include in the different documents the required references to the potential variations applied to KPI06 calculation, that is assumptions, KPI formula and/or metadata measurement adjustments, unavailable input data and other observations.

- **Provision of results to regional level**

After the KPI results are calculated and internally approved, the State compiles the standardized submission package formed by the KPI documentation described in the previous step. This package is then sent to the regional coordinating body (ICAO NACC and SAM Regional Offices) through the designated reporting channel, whether that is a secure email, an online portal, or another official submission system to be defined. States should confirm that the submission is received and track any feedback or requests for clarification. This step ensures official receipt, traceability, and accountability, forming the basis for subsequent regional consolidation and analysis of KPI results.

c. KPI09 Airport peak capacity

T B D

i. Selection of the KPI

ii. Understanding the KPI

iii. Identifying the data sources

iv. KPI calculation and provision of results

d. KPI10 Airport peak throughput

T B D

i. Selection of the KPI

ii. Understanding the KPI

iii. Identifying the data sources

iv. Input data collection and consolidation

v. KPI calculation and provision of results

e. KPI14 Arrival Punctuality

T B D

i. Selection of the KPI

ii. Understanding the KPI

iii. Identifying the data sources

iv. Input data collection and consolidation

v. KPI calculation and provision of results

7. Conclusions and next steps

The conclusions of these Guidelines highlight their role as a foundation for the consistent implementation of GANP KPIs across the CAR/SAM Region. They provide a harmonized methodology while allowing for flexibility so that each State can adapt the calculation process to its own availability of data, institutional resources, and technical readiness. This adaptability ensures that all States can begin monitoring performance in a meaningful way while progressively strengthening their systems. The Guidelines also represent an opportunity to create in-house capabilities, enabling Civil Aviation Authorities, ANSPs, airport operators and other aviation stakeholders to build sustainable expertise and at the same time generate KPIs to support their own National Air Navigation Plans.

Another important conclusion is that the Guidelines emphasize a practical and progressive use of tools. Initial implementation relies on simple formats such as Excel templates, which are widely available and easy to use. As experience grows and more sophisticated needs arise, the framework foresees the evolution toward advanced platforms such as Power BI or similar analytical tools. This gradual approach lowers the barrier to entry while also preparing the region for more complex, real-time monitoring and benchmarking in the future.

The Guidelines are conceived as a living document, subject to periodic updates. These updates will incorporate lessons learned during implementation, refine methodologies, and provide detailed calculation approaches for subsequent groups of KPIs. This ensures that the Guidelines remain relevant, practical, and aligned with regional and global developments over time.

A further conclusion is the importance of building on synergies with work already undertaken in the region. In the SAM Region, extensive experience has been gained with ATFM indicators, which use similar data inputs and calculation approaches to several GANP KPIs. Aligning with this work will accelerate implementation and enhance methodological consistency. In the CAR Region, initiatives such as the FAA's CARPIs and the CANSO CADENA initiative already provide valuable operational data and collaborative platforms that can support KPI calculation. Leveraging these initiatives will help avoid duplication, maximize the use of existing data, and promote greater regional integration in performance monitoring.

a. Recommendations

1. **Start with achievable priorities:** States should begin with KPIs for which data is already collected or easily accessible, ensuring early engagement and quick wins.
2. **Integrate with national frameworks**: KPI methodologies should be embedded into National Air Navigation Plans so that results serve both regional and national objectives.
3. **Build in-house capacity:** Authorities and service providers should invest in training staff to calculate, validate, and analyze KPIs, ensuring knowledge remains sustainable at the local level.
4. **Ensure data quality and validation:** Even with limited resources, States should adopt minimum validation processes to guarantee that KPI results are credible and comparable.
5. **Adopt a progressive approach to tools:** Begin with Excel templates for calculation and reporting, but plan to evolve toward advanced solutions such as Power BI for deeper analysis and dashboards.
6. **Engage with regional synergies:** Take advantage of ongoing work such as SAM's ATFM indicators, FAA's CARPIs, and CANSO's CADENA indicators to align methodologies, reuse data inputs, and foster collaboration.
7. **Participate actively in updates:** States should provide feedback and lessons learned so that periodic revisions of the Guidelines reflect operational realities and collective experience.

In conclusion, the Guidelines provide not only a technical reference but also a strategic opportunity for the CAR/SAM Region. Their flexible design ensures that every State can participate according to its capabilities, while their progressive structure encourages the use of increasingly sophisticated tools over time. By implementing the recommendations and capitalizing on existing synergies, the CAR/SAM Region can accelerate the adoption of a harmonized, reliable, and future-oriented performance monitoring framework that supports both regional cooperation and national air navigation priorities.

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Annex 1 – Excel templates

APPENDIX C

KPIs ACTION PLAN

Executive summary

The present document compiles the Action Plan to implement the CAR/SAM regional guidelines supporting the CAR/SAM region states in the calculation of the GANP Key Performance Indicators (KPIs) for the CAR/SAM Regional Air Navigation Plan, Volume III.

This Action Plan has been developed as part of the assistance provided by the European Union Aviation Safety Agency (EASA), in collaboration with the ICAO NACC and SAM Regional Offices, and in the context of the GREPECAS Ad-hoc Group for the Development of Key Performance Indicators (GADHOC).

The plan aims to ensure that KPIs become an integral part of national and regional monitoring processes by providing a structured framework that builds institutional capacity, establishes clear reporting mechanisms, and aligns regional activities with global ICAO objectives. Its scope covers the entire cycle of implementation, from the introduction of initial baseline indicators to the full deployment of the complete KPI set by 2029. Recognizing that States within the region begin from different levels of readiness, the plan emphasizes dedicated support measures such as on-site missions, training workshops, and peer-to-peer exchanges. These actions are designed to foster coordination, strengthen technical skills, and ensure that no State is left behind in meeting regional and global performance targets.

Implementation is designed in three phases over the period 2026 to 2029. The first phase, scheduled for 2026, introduces five priority KPIs (KPI01 Departure punctuality (Variant 2A), KPI06 En-route airspace capacity (Variant 1), KPI09 Airport peak capacity, KPI10 Airport peak throughput, KPI14 Arrival punctuality). This phase establishes national KPI focal points, baseline values, and the quarterly reporting cycle that will form the backbone of monitoring in subsequent years. The second phase, spanning mid-2026 to mid-2027, adds six more indicators (KPI02 Taxi-out additional time, KPI05 Actual en-route extension, KPI08 Additional time in terminal airspace, KPI13 Taxi-in additional time, KPI15 Flight time variability, KPI23 Loss of separation (Variant 3)). During this stage, regional performance monitoring expands to 11 KPIs, and the first consolidated reports begin to provide comparative analysis across States. The third and final phase introduces four advanced indicators (KPI04 Filed flight plan en-route extension, KPI07 En-route ATFM delay, KPI17 Level-off during climb, KPI19 Level-off during descent) to complete the full set of 15 GANP KPIs. By March 2029, all States are encouraged to report consistently on the complete framework, enabling comprehensive performance-based oversight across the CAR/SAM Regions.

Governance of the Action Plan is entrusted to the GREPECAS Ad Hoc Group on KPIs (GADHOC), which provides regional oversight and alignment with ICAO objectives. The ICAO NACC and SAM Regional Offices are responsible for technical coordination, guidance, and the development of reporting tools such as templates and dashboards. EASA contributes expertise and training through the EU–LAC APP programme, while industry partners, notably IATA and CANSO, bring operational knowledge and data inputs. Ultimately, the CAR/SAM States are the primary implementers, designating national focal points, collecting data, and reporting results on a quarterly basis. This collaborative framework

ensures strong regional leadership, technical guidance, and industry participation while fostering ownership at the State leveld

On-site support plays a central role in the plan's strategy to address disparities in readiness. During the first phase, experts will help States establish KPI focal points and build reporting structures, with a focus on establishing baseline values for 2025. In the second phase, support will shift toward integrating additional indicators and harmonizing reporting practices. In the final phase, assistance will concentrate on ensuring full KPI coverage, strengthening sustainability, and sharing best practices across the region. By combining technical assistance, mentoring, and knowledge exchange, this support mechanism will raise overall capacity and ensure consistent implementation.

The Action Plan concludes with a clear set of expected outcomes. By mid-2029, every CAR/SAM State should be reporting on all 15 KPIs and operating reliable monitoring systems embedded within their institutional structures. Regular regional reports will provide transparency and accountability while supporting continuous improvement. Looking beyond 2028, the creation of a dedicated CAR/SAM KPI Portal is recommended to centralize reporting, automate feedback, and provide a knowledge-sharing platform for best practices. This digital infrastructure will institutionalize KPI monitoring and ensure its sustainability as a permanent regional function.

In summary, the Action Plan provides the CAR/SAM Region with a practical, phased, and collaborative approach to implementing GANP KPIs. Through a combination of structured reporting, technical support, and capacity-building, it will harmonize performance monitoring across States, enhance evidence-based decision-making, and embed a culture of continuous improvement. By the end of the implementation cycle, the region will not only meet ICAO's requirements but also establish a sustainable framework that strengthens air navigation performance well into the future.

Table of contents

List of acronyms

ANP	Air Navigation Plan
ANSP	Air Navigation Service Provider
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
CAA	Civil Aviation Authority
CAR	Caribbean Region
CANSO	Civil Air Navigation Services Organisation
EASA	European Union Aviation Safety Agency
EU–LAC APP	European Union–Latin America and Caribbean Air Transport Project
GANP	Global Air Navigation Plan
GADHOC	GREPECAS Ad Hoc Group on Key Performance Indicators
GREPECAS	CAR/SAM Regional Planning and Implementation Group
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
KPI	Key Performance Indicator
LAC	Latin America and Caribbean
NACC	North American, Central American and Caribbean Region
RANP	Regional Air Navigation Plan
SAM	South American Region

1. Introduction

The present document, Deliverable 2 – CAR/SAM Action Plan for the progressive implementation of GANP KPIs, is the second deliverable of the assistance provided by EASA, through the EU-LAC APP II programme, to support the ICAO NACC and SAM Regional Office in the development and implementation of the GANP KPIs for the CAR/SAM Regional Air Navigation Plan, Volume III.

This deliverable provides an action plan for the progressive implementation of the GANP KPIs, identifying the priorities and resources required, and harmonized with the progress of the implementation groups and States from CAR/SAM Regions.

This Action Plan has been promoted by the ICAO NACC Regional Office and has been developed in close coordination and collaboration with the ICAO SAM Regional Office, as response to the conclusions and actions agreed at the GREPECAS/22 meeting.

The target audience of this action plan are the Civil Aviation Authorities of the CAR/SAM States, particularly the departments in charge of the Air Transport Planning activities. Additionally, the action plan is recommended for the key stakeholders that should be involved in the process of data gathering or/and KPIs calculation, such as Air Navigation Services Providers, Airport Operators, Airlines and other required stakeholders, depending on each specific case.

This document is complemented by the other two deliverables, as part of the assistance provided by EASA:

- Deliverable 1 – CAR/SAM Regional guidance material on the methodology for implementation of GANP KPIs.
- Deliverable 3 – Communications Plan detailing the adequate means of dissemination (dashboards, etc.) of the KPIs.

2. Objectives and Scope

The main objective of this action plan is to guide the progressive implementation of the GANP KPIs for the CAR/SAM Regional Air Navigation Plan, Volume III, across all States of the CAR/SAM Region following a harmonized, structured, and efficient approach. The plan aims to build the necessary institutional, technical, and operational capacity within States so that KPIs become an integral part of national and regional air navigation monitoring processes.

The scope of the plan covers the full cycle of implementation, from the introduction of the first group of priority KPIs to the final deployment of the complete set by March 2029. It encompasses not only the technical adoption of KPIs but also the establishment of baseline values, the creation of national focal points, the design of reporting and monitoring mechanisms, and the production of consolidated regional reports. The implementation phased approach—short-term, mid-term, and long-term—allows States to gradually absorb the request while ensuring that early progress is captured and lessons learned are integrated into subsequent stages.

Equally important, the plan recognizes that not all States begin from the same level of readiness. For this reason, it incorporates dedicated support from the GREPECAS GADHOC group and the ICAO NACC and SAM regional offices, including on-site missions, training workshops, and peer-to-peer exchanges to address specific needs. The scope therefore extends beyond technical implementation, embracing capacity-building, coordination, and risk management to ensure that no State is left behind in meeting the regional and global objectives of performance-based air navigation.

Finally, the action plan establishes a systematic reporting framework to ensure accountability and transparency. States should report KPI results on a semiannual basis to the CAR/SAM Regional levels,

which will consolidate and analyze the information to produce regional integrated reports at the end of each implementation phase. These reports will serve both as a record of progress and as a tool for continuous improvement, allowing stakeholders to assess trends, identify challenges and take corrective action where needed.

Considering the previous objectives and scope, the contents of the action plan are structured as follows:

- First, an overview of the Action Plan for the CAR/SAM region is presented.
- Second, the organizational structure for the implementation of the Action Plan is outlined.
- Third, the main part of the Action Plan is dedicated to detail each implementation phase (Phase 1, Phase 2 and Phase 3), including the meetings and workshops, key milestones and desired deliverables in each phase.
- Following, the description of the proposed on-site support to the CAR/SAM States for the implementation of the Action Plan is included.
- Additionally, a Gantt chart compiling all activities of the Action Plan is presented.
- Finally, a set of milestones and next steps is presented to efficiently implement the recommended actions of the present Action Plan and the recommended way forward.

3. Overview of the Action Plan for the CAR/SAM RANP KPIs implementation

The Action Plan for the implementation of the GANP KPIs within the CAR/SAM Regional Air Navigation Plan (RANP), Volume III, provides a structured roadmap of three phases, each introducing a defined set of KPIs that will expand the region's monitoring capability in a gradual and manageable way.

The following phases are included in the CAR/SAM RANP KPIs Action Plan:

- Phase 1: Short-term phase (April 2026 – March 2027) focuses on five priority KPIs that establish a baseline and strengthen States' capacity to integrate performance-based monitoring into their systems. Group 1 KPIs to be implemented in phase1:
    - KPI01 Departure punctuality
    - KPI06 En-route airspace capacity
    - KPI09 Airport peak capacity
    - KPI10 Airport peak throughput
    - KPI14 Arrival punctuality
- Phase 2: Mid-term phase (January 2027 – March 2028) adds six additional KPIs, consolidating the first set while extending RANP performance areas and objectives coverage. Considering that some states have already advanced in the implementation of the first phase, this second phase can be started earlier and in parallel with the first phase. Group 2 KPIs to be implemented in phase 2:
    - KPI02 Taxi-out additional time
    - KPI05 Actual en-route extension
    - KPI08 Additional time in terminal airspace

  - KPI13 Taxi-in additional time
  - KPI15 Flight time variability
  - KPI23 Loss of separation (Variant 3)

- Phase 3: Long-term phase (January 2028 – March 2029) completes the implementation with four more advanced KPIs, ensuring that by February 2029, all States in the CAR/SAM Region report on a full set of 15 KPIs. Group 3 KPIs to be implemented in phase 3:
  - KPI04 Filed flight plan en-route extension
  - KPI07 En-route ATFM delay
  - KPI17 Level-off during climb
  - KPI19 Level-off during descent

The implementation of the GANP KPIs in the CAR/SAM Region will be led by the GREPECAS Ad-hoc Group for the Development of Key Performance Indicators (GADHOC), which will provide governance and oversight, with technical coordination and support from the ICAO NACC and SAM Regional Offices.

It is important to emphasize that the GADHOC group, the NACC WG and/or SAM IG subgroups may identify additional voluntary regional performance indicators deemed useful for driving operational improvements as a supplement to the aforementioned phases (1 to 3). In the event this occurs and the GADHOC, NACC WG or SAM IG wish for the non-GANP performance indicators to be specifically included in future updates of Vol. III of the CAR/SAM RANP, the group requesting the update will elaborate on the corresponding amendment and submit the relevant information for consideration of the GREPECAS Member States. That being said, nothing should prevent an individual State from using non-GANP performance indicators in their national plans when those indicators are aimed at driving operational improvements. For non-GANP indicators used in national plans but excluded from Vol. III of the CAR/SAM RANP, no GREPECAS approval is required.

The process will be further strengthened by the contribution of EASA through the EU–LAC APP programme, offering capacity-building and cooperative expertise, as well as by regional teams of industry partners such as IATA and CANSO, who will provide operational knowledge and data inputs. Ultimately, the CAR/SAM States will serve as the main implementers, responsible for designating KPI focal points, collecting data, calculating and integrating KPIs into their national monitoring frameworks, and reporting them to the regional levels. This collaborative structure ensures leadership, technical guidance, industry alignment, and active State participation to achieve the objectives of the Action Plan.

4. Organizational Structure for the Implementation of the Action Plan

The implementation of the GANP KPIs within the CAR/SAM Regional Air Navigation Plan (RANP), Volume III, will be coordinated through a collaborative structure that ensures strategic oversight, technical support, and operational delivery. The GREPECAS Ad-hoc Group on KPIs (GADHOC) will act as the leading body responsible for guiding and monitoring the execution of this Action Plan. Under GREPECAS, the GADHOC group will provide the overall governance framework, ensure alignment with regional priorities, and report progress to the GREPECAS plenary as part of its mandate to oversee performance-based implementation in the CAR/SAM Region.

The ICAO NACC and SAM Regional Offices will provide direct technical and operational support to States throughout the three phases of implementation. Their role will include developing and distributing KPI guidance materials, organizing workshops and training sessions, facilitating reporting mechanisms, maintaining the regional KPI dashboard, and coordinating the publication of integrated

regional reports. They will also manage on-site assistance missions, ensuring that specific national challenges are addressed in a timely and effective manner.

The implementation process will also benefit from the active support of international and regional partners. The European Union Aviation Safety Agency (EASA), through the EU–LAC APP programme, will contribute technical cooperation, training, and knowledge transfer to support States in strengthening their capacity for KPI reporting and monitoring. This collaboration will complement ICAO's efforts and promote best practices by drawing on experiences from other regions. In addition, regional delegations of industry partners such as the International Air Transport Association (IATA) and the Civil Air Navigation Services Organisation (CANSO) will provide operational expertise, data inputs, and alignment with global industry standards, helping to ensure that KPIs and other potentially useful performance indicators reflect both regulatory and operational perspectives.

Finally, the CAR/SAM States will serve as the primary implementers of the Action Plan. Each State will be responsible for designating national KPI focal points, establishing data collection systems, calculating and integrating KPIs into their national performance monitoring frameworks, and ensuring quarterly reporting to regional levels. States are also encouraged to participate actively in workshops, progress meetings, and reporting reviews, as well as to provide feedback on challenges and lessons learned.

5. Phase 1: Short-term Deployment (April 2026 – March 2027)

The first phase of the Action Plan marks the launch of KPI implementation across the CAR/SAM Region and establishes the foundation for subsequent phases. During this stage, States will implement the first five priority KPIs (KPI01, KPI06, KPI09, KPI10, KPI14), selected for their relevance and feasibility as entry points to performance-based monitoring. The main objective of Phase 1 is to build national capacity, establish baseline values for 2025, and develop a consistent regional reporting framework that can be expanded in later phases. By the end of this phase, all CAR/SAM States should have functional processes in place for collecting, reporting, and validating these KPIs.

Implementation will begin in April 2026, following the distribution of official regional guidelines and templates by GREPECAS ADHOC (GADHOC) Group in December 2025. CAR/SAM States will designate national KPI focal points who will be responsible for coordinating implementation at the national level and ensuring compliance with KPI reporting requests. To support this process, ICAO regional offices will organize several kick-off and training activities, ensuring that all States are familiar with the methodology, tools, and reporting expectations. In addition, ICAO will provide tailored on-site support missions to States requiring specific technical assistance. EASA, through the EU–LAC APP programme, will assist with training and capacity-building initiatives, while IATA and CANSO regional teams will contribute with industry data and operational expertise to strengthen the KPI calculation processes.

A key feature of Phase 1 is the establishment of a biannual reporting cycle, ensuring consistent monitoring and corrective action where needed. States should submit KPI data to ICAO regional offices in September 2026, and February 2027. GADHOC and ICAO Regional Offices will validate the submissions and consolidate them into a regional dashboard. A critical milestone for this phase is the provision of baseline values for 2025, to be submitted by all States as part of the June 2026 reporting cycle. These baseline values will serve as the reference point for measuring progress in later phases.

a. Key meetings and Workshops (Phase 1)

The following meetings and workshops will be conducted in Phase 1:

- **April 2026**: Regional Kick-off Meeting, organized by ICAO Regional Offices under GADHOC guidance, with participation from any CAR/SAM States, EASA, IATA, and CANSO.
- **May 2026:** Familiarization Training Workshops (virtual and in-person) on methodology, data reporting, and use of the ICAO KPI dashboard. Supported by ICAO Regional Offices and EASA, with input from industry stakeholders.
- **September 2026, February 2027:** Biannual Progress and Reporting Meetings held in conjunction with State KPI submissions, providing feedback and guidance. Coordinated by ICAO Regional Offices, with GADHOC oversight.
- **October 2026:** Mid-term Regional Review Workshop to assess data quality, identify challenges, and share lessons learned. Organized by ICAO Regional Offices under GADHOC guidance, with participation from any CAR/SAM States, EASA, IATA, and CANSO.
- **March 2027:** Final Reporting and Progress Meeting, including presentation of the first CAR/SAM Regional Integrated KPI Report (Phase 1). Organized by ICAO Regional Offices under GADHOC guidance, with participation from any CAR/SAM States, EASA, IATA, and CANSO.

b. Milestones (Phase 1)

The following Milestones are defined for Action Plan Phase 1:

- **April 2026:** Designation of national KPI focal points by all States.
- **June 2026:** First quarterly KPI submission.
- **September 2026:** Submission of 2025 baseline values by all States.
- **October 2026:** Mid-term review completed.
- **March 2027:** Publication of Regional Integrated KPI Report (Phase 1).

c. Deliverables (Phase 1)

As a result of Phase 1, the following key deliverables are encouraged to be obtained:

- Established national KPI focal points in every State.
- Biannual KPI submissions throughout 2026.
- A regional baseline dataset for Group 1 KPIs.
- CAR/SAM Regional Integrated KPI Report consolidating Phase 1 results.

6. Phase 2: Mid-term Deployment (January 2027 – March 2028)

The second phase of the Action Plan expands KPI implementation by introducing a new set of six indicators (KPI02, KPI05, KPI08, KPI13, KPI15, KPI23). This stage builds on the foundations laid in Phase 1, consolidating the reporting mechanisms already established while progressively broadening the scope of monitoring. The main objectives of Phase 2 are to ensure that States transition smoothly from the initial set of KPIs to a more comprehensive performance framework, to harmonize reporting practices across the region, and to strengthen regional benchmarking capabilities.

Phase 2 officially begins in January 2027, but some States that have advanced quickly in Phase 1 may begin working in the Group 2 KPIs and reporting them earlier. GADHOC will issue the Phase 2 guidance

package in March 2027, accompanied by technical briefing sessions to clarify methodology and data requirements. By September 2027, States will conduct readiness assessments to evaluate their ability to integrate the new KPIs into their national systems. Throughout this period, ICAO regional offices will continue to provide technical support, on-site missions, and opportunities for peer-to-peer learning between early adopters and those requiring additional assistance. EASA/EU–LAC APP will support capacity-building, particularly for States requiring additional assistance, while IATA and CANSO regional delegations will contribute with operational expertise and facilitate peer-to-peer exchanges between States and industry stakeholders.

The biannual reporting cycle continues as the backbone of monitoring during Phase 2. States will submit KPI results covering both Phase 1 and Phase 2 indicators in September 2027, and in February 2027. GADHOC and ICAO Regional Offices will validate submissions, update the regional dashboard, and provide targeted feedback to each State. A mid-point evaluation will be carried out in March 2028, allowing ICAO Regional Offices and States to assess progress, identify common difficulties, and agree on corrective measures. The KPIs baseline values for 2026 will be submitted by all States as part of the 2027 reporting cycle. At the conclusion of this phase, ICAO will issue the Regional Integrated KPI Report (Phases 1 and 2), consolidating results for 11 KPIs across the CAR/SAM Region.

By completing Phase 2, the CAR/SAM Region will have significantly broadened its performance monitoring framework, moving from five to eleven KPIs. This stage will reinforce harmonization, enable deeper regional comparisons, and provide valuable insights for refining strategies ahead of the final implementation phase.

a. Key meetings and Workshops (Phase 2)

The following meetings and workshops will be conducted in Phase 2:

- **March 2027:** Technical briefing webinar on Phase 2 guidelines and data requirements.
- **April 2027:** Phase 2 Readiness Meeting for States to share readiness assessments and identify data gaps.
- **September 2027, February 2028:** Quarterly Progress and Reporting Meetings to review submissions, provide feedback, and discuss challenges.
- **October 2027:** Regional Progress Meeting and ICAO Interim Evaluation of implementation progress.
- **February 2028:** Regional Consolidation Workshop to validate results and discuss lessons learned, followed by the publication of the Regional Integrated KPI Report (Phases 1 and 2).

b. Milestones (Phase 2)

The following Milestones are defined for Action Plan Phase 2:

- **April 2027:** GADHOC issues Phase 2 regional guidelines.
- **June 2027:** States submit Phase 2 readiness self-assessments.
- **September 2027:** First consolidated reporting cycle including Groups1 and 2 KPIs.
- **October 2027:** ICAO interim evaluation completed and submission of 2026 baseline values by all States.
- **March 2028:** Publication of Regional Integrated KPI Report (Phases 1 and 2).

c. Deliverables (Phase 2)

As a result of Phase 2, the following key deliverables are desired:

- Successful integration of six additional KPIs across all States.
- Biannual KPI submissions covering Groups 1 and 2 KPIs.
- Regional dashboard updated with consolidated KPI data.
- CAR/SAM Regional Integrated KPI Report (Phases 1 and 2) presenting harmonized results for 11 KPIs.

7. Phase 3: Long-term Deployment (January 2028 – March 2029)

The third and final phase of the Action Plan completes the regional implementation of the GANP KPI framework by introducing the last set of four indicators (KPI04, KPI07, KPI17, KPI19). This stage focuses on consolidating all previous efforts, achieving full KPI coverage across the CAR/SAM States, and embedding a culture of continuous monitoring and performance-based decision-making. The main objectives of Phase 3 are to ensure that every State reports on the complete set of 15 KPIs, to validate the reliability of data collection and analysis processes, and to publish a final regional report that captures the results of the entire implementation cycle.

Implementation will begin in January 2028, following the release of the Phase 3 guidance package and technical documentation by GADHOC in April 2028. A Technical Kick-off Workshop will be organized in June 2028 to provide States with practical training on advanced KPI methodologies and integration into existing monitoring frameworks. ICAO Regional Offices will continue to provide tailored technical support, both through on-site missions and virtual assistance, with a strong focus on ensuring that States with limited capacity are able to achieve compliance. Additionally, EASA and CANSO and IATA regional delegation will continue supporting the CAR/SAM States in the process.

The biannual reporting cycle remains in force throughout Phase 3, covering the full set of 15 KPIs. States will submit data in September 2028, and February 2029. GADHOC and ICAO Regional Offices will validate these submissions, update the regional dashboard, and provide feedback bulletins. A Regional Best Practices Workshop will be held in October 2028 to showcase experiences, share solutions to common challenges, and promote peer learning across States. A critical milestone will be reached in December 2028, when all CAR/SAM States are encouraged to achieve full KPI coverage, reporting consistently on the entire framework. The phase will conclude with a Closing Workshop in March 2029, during which ICAO Regional Offices will publish the Final Regional Integrated KPI Report, summarizing results and outlining recommendations for ongoing performance monitoring.

By completing Phase 3, the CAR/SAM Region will achieve full implementation of all 15 selected GANP KPIs. This milestone will not only fulfill the objectives of the Action Plan but also establish a sustainable performance-monitoring culture, enabling the region to continuously evaluate progress, share best practices, and make informed decisions to enhance air navigation in alignment with ICAO GANP global vision.

a. Key meetings and Workshops (Phase 3)

The following meetings and workshops will be conducted in Phase 3:

- **April 2028:** Distribution of Phase 3 guidelines and technical documentation.
- **June 2028:** Phase 3 Technical Kick-off Workshop to launch implementation.

- **September 2028, February 2029:** Quarterly Progress and Reporting Meetings tied to KPI submissions.
- **October 2028:** Regional Best Practices Workshop for peer learning and validation of preliminary results.
- **March 2029:** Final Reporting and Closing Workshop, presentation of the Final Regional Integrated KPI Report.

b. Milestones (Phase 3)

The following Milestones are defined for Action Plan Phase 3:

- **April 2028:** GADHOC issues Phase 3 guidelines.
- **June 2028:** Technical Kick-off Workshop held.
- **September 2028:** First quarterly submission including Phase 3 KPIs.
- **October 2028:** Regional Best Practices Workshop.
- **October 2028:** Submission of 2027 baseline values by all States.
- **December 2028:** All States achieve full KPI coverage (15 KPIs).
- **March 2029:** Publication of the Final Regional Integrated KPI Report.

c. Deliverables (Phase 3)

As a result of Phase 3, the following key deliverables are desired:

- Implementation of the final seven KPIs in all CAR/SAM States.
- Quarterly submissions covering the full KPI framework.
- A regional best practices repository to support ongoing learning.
- The Final Regional Integrated KPI Report (March 2029) consolidating results from all phases and providing recommendations for sustainability.

8. On-site Support for KPI Implementation

Recognizing the varying levels of readiness among CAR/SAM States, the Action Plan foresees dedicated on-site support missions to assist States with limited capacity or those requiring targeted guidance. This support is aimed at ensuring that no State is left behind and that all States are able to implement the KPI guidelines effectively, establish reliable data collection processes, and succeed in calculating and reporting the KPIs in line with the regional plan.

On-site support will be coordinated under the oversight of the GREPECAS Ad-hoc Group on KPIs (GADHOC) and managed operationally by the ICAO NACC and SAM Regional Offices, in close collaboration with partners such as EASA through the EU–LAC APP programme, IATA, and CANSO. Support will be tailored to each State’s needs and may include technical missions, hands-on workshops, mentoring, or virtual follow-up sessions.

a. On-site Support by Implementation Phase

- **Phase 1 (2026 - 2027 – Foundational Implementation):**

During Phase 1, on-site missions will concentrate on helping States establish the foundations of KPI monitoring. ICAO and EASA experts will work directly with national authorities to designate KPI focal points, review and strengthen national data collection systems, and ensure that reporting templates are properly understood. Special emphasis will be placed on assisting States in producing their 2025 baseline values, which are critical for establishing reference points for future performance assessments. These visits will also facilitate dialogue among national stakeholders, such as civil aviation authorities, air navigation service providers, and airports, to ensure that responsibilities for data provision and validation are well coordinated.

- **Phase 2 (2027–2028 – Expansion and Harmonization):**

In Phase 2, the focus of on-site support will evolve to reflect the broader scope of the KPIs being introduced. Missions will assist States in integrating the second group of indicators, identifying reliable data sources, and consolidating calculation methodologies. In this stage, capacity-building will be strengthened through collaborative activities, with ICAO and EASA supporting national teams and industry partners like IATA and CANSO contributing their expertise on traffic management, flight efficiency, and operational performance. For States that encounter difficulties in aligning Phase 1 and Phase 2 data, additional mentoring and technical coaching will be offered to ensure consistent reporting across the expanded KPI framework.

- **Phase 3 (2028 – 2029 – Full Coverage and Consolidation):**

Finally, in Phase 3, on-site support will concentrate on ensuring that States achieve full KPI coverage and can sustain the monitoring framework beyond 2028. Technical experts will help refine national methodologies, validate data quality, and integrate the complete set of 15 KPIs into national performance monitoring systems. Special missions will share best practices and lessons learned across the region, with contributions from industry and international partners enriching the practical aspects of KPI application. For States that continue to face challenges, additional visits or virtual follow-up sessions will be arranged to ensure full KPI coverage is achieved, hopefully by the end of 2028.

b. Expected Outcomes of the On-site Support

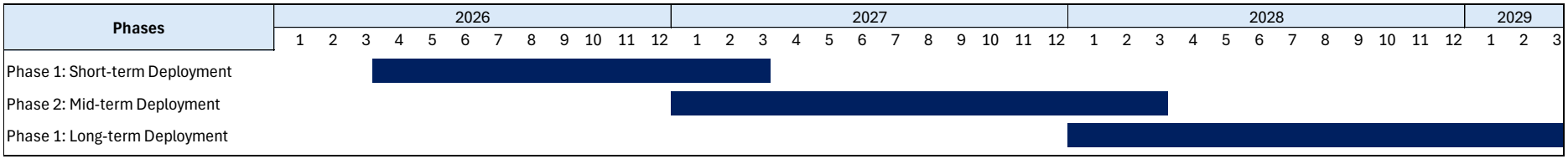
Through this phased approach, on-site support will ensure that disparities in readiness are progressively reduced, that capacity is strengthened at both technical and institutional levels, and that the whole region advances in a harmonized and coordinated manner. By the conclusion of Phase 3, every State in the CAR/SAM Region should not only be capable of reporting on all 15 GANP KPIs but also have the internal structures in place to continue monitoring performance sustainably into the future.

- States with initially low levels of readiness will reach the same level of compliance as their regional peers by the end of each phase.
- Technical capacity within Civil Aviation Authorities (CAAs) and Air Navigation Service Providers (ANSPs) will be strengthened to ensure sustainable KPI monitoring.
- Regional harmonization will be achieved, with reduced disparities between advanced and less advanced States in terms of reporting quality and timeliness.

Through this structured programme of on-site support, coordinated among ICAO regional offices, EASA, IATA, and CANSO, the Action Plan guarantees that all CAR/SAM States will receive the assistance

they need to succeed in implementing the KPI guidelines and to fully contribute to the regional performance monitoring framework.

9. Action Plan Gantt Chart



10. Conclusions and next steps

The implementation of the GANP KPIs within the CAR/SAM Regional Air Navigation Plan, Volume III, represents a decisive step towards harmonizing performance monitoring and strengthening evidence-based decision-making in the region. Through a structured three-phase approach, supported by clear milestones, biannual reporting cycles, and regional integrated reports, the Action Plan provides States with a practical and achievable roadmap to progressively adopt and apply the full set of 15 GANP KPIs by December 2028. The collaborative framework, led by the GREPECAS Ad-hoc Group on KPIs (GADHOC), ensures that implementation is guided by regional oversight, reinforced by ICAO's technical coordination, enriched by the support of EASA through the EU–LAC APP programme, complemented by the operational expertise of IATA and CANSO, and ultimately delivered by CAR/SAM States themselves.

One of the central conclusions of this plan is the recognition that States within the region begin from different levels of maturity in performance monitoring. For this reason, the plan integrates a strong programme of capacity-building, on-site support, and peer-to-peer collaboration to guarantee that no State is left behind. Quarterly reporting and the production of regional integrated reports will not only ensure transparency and accountability but also provide a valuable feedback mechanism, allowing the region to adjust its strategies and continuously improve data quality and consistency.

a. Recommendations

- Sustain regional biannual KPI reporting as the backbone of regional monitoring, ensuring reliable and timely data for decision-making.
- Strengthen national ownership by empowering KPI focal points in each State and embedding reporting responsibilities institutionally
- Maximize the role of support partners (EASA, IATA, CANSO) to leverage international best practices, industry data, and complementary resources.
- Ensure equitable progress by prioritizing on-site assistance to States with lower levels of readiness, especially during the baseline establishment in Phase 1 and the full coverage milestone in Phase 3.
- Promote knowledge-sharing and transparency through workshops, best-practice exchanges, and regional dashboards that allow States to benchmark their performance.

b. Way Forward

To ensure the long-term sustainability of KPI monitoring beyond 2028, the Action Plan recommends the creation of a CAR/SAM RANP KPI Portal to serve as the single channel for States to report their KPI data to ICAO regional offices. This portal will incorporate:

- Standardized online reporting templates to simplify biannual submissions from States.
- A regional dashboard (developed using tools such as Power BI or similar platforms) to present integrated KPI results at the regional level, enable trend analysis, and allow for transparent benchmarking among States.
- Automated feedback mechanisms, providing States with validation alerts, performance summaries, and tailored recommendations immediately after data submission.

- A knowledge-sharing section with training resources, best-practice case studies, and guidance material contributed by ICAO, EASA, IATA, CANSO, and States.
- A documentary repository, serving as a centralized library for all key references, including:
    - Regional guidelines for KPI calculation and implementation.
    - The CAR/SAM RANP Volumes I, II, and III.
    - Regional Integrated KPI Reports.
    - Other relevant ICAO and partner documentation supporting performance monitoring.
- Secure access protocols, ensuring data protection while enabling authorized stakeholders to monitor progress in real time.

This digital infrastructure will institutionalize KPI monitoring as an ongoing regional process, reduce administrative burdens, and embed performance monitoring as a permanent function within the CAR/SAM RANP framework. By adopting this portal, the region will not only meet its 2028 targets but also establish a sustainable platform to support continuous improvement, cooperation, and accountability in the years that follow.

APPENDIX D

KPIS COMMUNICATION PLAN

Executive summary

The present document compiles the Communication Plan to implement the CAR/SAM regional guidelines supporting the CAR/SAM region states in the calculation of the GANP Key Performance Indicators (KPIs) for the CAR/SAM Regional Air Navigation Plan, Volume III.

This Communication Plan has been developed as part of the assistance provided by the European Union Aviation Safety Agency (EASA), in collaboration with the ICAO NACC and SAM Regional Offices, and in the context of the GREPECAS Ad-hoc Group for the Development of Key Performance Indicators (GADHOC).

The Communication Plan is designed to ensure that States and stakeholders are equipped with the information, tools, and guidance necessary to effectively adopt and apply the GANP KPIs. It positions communication as a critical enabler of performance monitoring by ensuring that guidance is not only distributed but also understood, applied, and reinforced throughout the three implementation phases.

The plan recognizes that successful KPI implementation depends not only on technical guidance and reporting requirements but also on clear and consistent communication with the relevant audiences. Its primary objective is to guarantee that States are informed about regional guidance materials, reporting cycles, and methodological expectations, while also promoting engagement, transparency, and accountability. By combining formal ICAO communication channels with innovative digital tools, the plan creates an environment where States can both receive and contribute to the flow of information, making the process participatory and collaborative.

The target audience of the plan is twofold. On one hand, it focuses on the direct implementers—national KPI focal points, Civil Aviation Authorities, Air Navigation Service Providers, and relevant ministries—who are responsible for producing reports and applying guidance. On the other, it addresses secondary stakeholders such as ICAO regional offices, EASA, IATA, and CANSO, who play a supporting role by providing expertise, data, training, and coordination. By tailoring communication to each audience, the plan ensures that every stakeholder receives relevant and actionable information in a timely manner.

At the core of the plan is a mix of communication channels and tools designed to balance the formal with the interactive. ICAO circulars and State letters remain the official channels for transmitting requirements and deadlines, while guidance materials provide detailed methodological instructions. At the same time, modern platforms such as the CAR/SAM KPI Portal and the Interactive KPI Guidelines Website add new dimensions by offering real-time dashboards, automated validation tools, training modules, and case studies. These platforms will not only support the quarterly reporting cycles but also act as knowledge-sharing hubs, ensuring that lessons learned and best practices are widely disseminated.

The Communication Plan is aligned with the phased implementation of KPIs. During Phase 1, emphasis is placed on launching the portal and website, conducting workshops, and issuing the first integrated reports. In Phase 2, communication activities expand with technical briefings, readiness assessments,

and interim evaluations that accompany the introduction of additional KPIs. Phase 3 consolidates the process with advanced training, best practices workshops, and the publication of the final integrated report. By linking communication directly to implementation milestones, the plan ensures that States are consistently supported at each stage of the journey.

Roles and responsibilities are clearly distributed across the network of stakeholders. GREPECAS, through its Ad Hoc Group on KPIs (GADHOC), provides strategic oversight, while ICAO regional offices manage operational communication, maintain the digital platforms, and lead workshops. EASA contributes training and cooperative expertise, while IATA and CANSO enrich communication with industry data and practical perspectives. The States themselves remain responsible for cascading information internally and ensuring timely reporting. This multi-actor framework ensures that communication is both top-down, from ICAO to States, and bottom-up, with States providing feedback and lessons learned.

Continuous monitoring and feedback mechanisms form an integral part of the plan, ensuring that communication is not static but adaptive. Portal usage statistics, participation records, reporting reviews, and annual surveys of focal points will allow ICAO and partners to assess whether States are receiving and applying information effectively. This approach transforms communication into a two-way process, where guidance is continuously refined in response to user needs and regional realities.

In conclusion, the Communication Plan elevates communication from a supportive activity to a strategic pillar of KPI implementation in the CAR/SAM Region. By combining formal ICAO mechanisms with digital innovation, it guarantees that States are well-informed, engaged, and supported throughout the implementation cycle. It also provides the foundation for sustainable communication beyond 2028, as the KPI Portal and interactive website will continue to serve as permanent regional tools for reporting, monitoring, and training. Through this plan, the CAR/SAM Region establishes a transparent, participatory, and forward-looking communication framework that strengthens performance monitoring and ensures alignment with ICAO’s global vision.

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List of acronyms

ANP	Air Navigation Plan
ANSP	Air Navigation Service Provider
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
CAA	Civil Aviation Authority
CAR	Caribbean Region
CANSO	Civil Air Navigation Services Organisation
EASA	European Union Aviation Safety Agency
EU–LAC APP	European Union–Latin America and Caribbean Air Transport Project
GANP	Global Air Navigation Plan
GADHOC	GREPECAS Ad Hoc Group on Key Performance Indicators
GREPECAS	CAR/SAM Regional Planning and Implementation Group
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
KPI	Key Performance Indicator
LAC	Latin America and Caribbean
NACC	North American, Central American and Caribbean Region
RANP	Regional Air Navigation Plan
SAM	South American Region

1. Introduction

The present document, Deliverable 3 – CAR/SAM Communication Plan for the implementation of GANP KPIs, is the third deliverable of the assistance provided by EASA, through the EU-LAC APP II programme, to support the ICAO NACC Regional Office in the development and implementation of the GANP KPIs for the CAR/SAM Regional Air Navigation Plan, Volume III.

This deliverable provides a communication plan for detailing the adequate means of dissemination (dashboards, etc.) of the CAR/SMA RANP KPIs and its related implementation guidelines.

This Communication Plan has been promoted by the ICAO NACC Regional Office, and has been developed in close coordination and collaboration with the ICAO SAM Regional Office, as response to the conclusions and actions agreed at the GREPECAS/22 meeting.

The target audience of this communication plan are the Civil Aviation Authorities of the CAR/SAM States, and in particular the departments in charge of the Air Transport Planning activities. Additionally, the action plan is recommended for the key stakeholders that should be involved in the process of data gathering or/and KPIs calculation, such as Air Navigation Services Providers, Airport Operators, Airlines and other required stakeholders, depending on each specific case.

This document is complemented by the other two deliverables, as part of the assistance provided by EASA:

- Deliverable 1 – CAR/SAM Regional guidance material on the methodology for implementation of GANP KPIs.
- Deliverable 2 – CAR/SAM Action Plan for the progressive implementation of GANP KPIs.

2. Objectives and Scope

The Communication Plan is designed to ensure that all CAR/SAM States are informed about the regional guidance material for the implementation of GANP KPIs and receive clear, timely, and user-friendly information to successfully implement the GANP KPIs in line with the Action Plan.

Communication will not only deliver regional guidelines but also foster engagement, capacity-building, and transparency across the region. By using a combination of formal ICAO channels and innovative digital tools, the plan will help States to internalize KPI methodologies, meet reporting requirements, and benefit from regional benchmarking. Its primary aim is to guarantee that the guidance provided by ICAO and supporting partners translates into effective national action.

For the Communication Plan to succeed, it is not enough to define KPIs and reporting cycles, States must clearly understand what is expected of them, how to calculate the indicators, and how to report results in a consistent way. The communication plan provides this foundation by ensuring that guidance is not only transmitted but also understood, applied, and reinforced throughout the three implementation phases. It positions communication as both an enabler of compliance and a catalyst for engagement among States and partners.

Key objectives of the CAR/SAM Communication Plan include:

- Disseminating the Regional Guidance Material, including guidelines for KPI calculation, reporting templates, and methodological notes, as the foundation for implementation.
- Ensuring States understand and apply the guidance consistently through training, interactive platforms, and direct feedback.
- Providing continuous feedback mechanisms on the CAR/SAM Regional KPIs between ICAO, States, and partners.

- Promoting engagement and transparency through modern communication platforms (KPI Portal, Regional Dashboard, interactive guidelines).
- Ensuring States are consistently informed of milestones, reporting deadlines, and integrated results throughout the three phases of implementation.

By pursuing these objectives, the communication plan ensures that KPI implementation becomes a shared regional effort rather than a series of isolated national initiatives.

Considering the previous objectives and scope, the contents of the action plan are structured as follows:

- Firstly, the target audience of the Communication Plan for the CAR/SAM region is presented.
- Secondly, the communication channels and tools of the Communication Plan are outlined.
- Thirdly, the proposed digital tools to support communication and implementation, such as the CAR/SAM KPI Portal and the iterative KPI Guidelines website, are detailed.
- Fourthly, the main part of the Communication Plan is dedicated to detail the specific communication action in each implementation phase (Phase 1, Phase 2 and Phase 3).
- Following, the description of the proposed communication roles and responsibilities is included.
- Additionally, the communication monitoring and feedback activities are presented.
- Finally, a set of conclusions and next steps is presented to efficiently implement the recommended actions of the present Communication Plan.

3. Communication Plan target audience

The success of the Action Plan depends on delivering the right information to the right people. Each communication activity must be tailored so that national implementers receive practical instructions, while regional and industry partners are provided with contextual information that allows them to support States effectively.

- Primary audience (direct implementers):
    - National KPI focal points in each State.
    - Civil Aviation Authorities (CAAs), Air Navigation Service Providers (ANSPs), and Ministries of Transport.

  These actors are directly responsible for applying the guidance and producing reports.
- Secondary Audience (supporters and stakeholders):
    - ICAO NACC and SAM Regional Offices technical divisions, ensuring global alignment with GANP.
    - EASA through the EU–LAC APP programme, providing cooperative expertise and training.
    - IATA and CANSO, offering operational perspectives and data.
    - Other regional aviation organizations supporting capacity-building.

By clearly defining audiences, the plan makes it possible to tailor the tone, format, and depth of communication. This ensures that every stakeholder, whether policymaker, implementer, or technical partner, receives relevant and actionable information.

4. Communication channels and tools

A robust communication framework must balance formal ICAO mechanisms with modern, interactive platforms. This balance guarantees harmonization and consistency while also enhancing accessibility and user engagement. The CAR/SAM Region will therefore rely on a mix of circulars, digital portals, online tools, and interactive training resources:

- **ICAO Circulars and State Letters:** The formal and official means of communicating requirements, milestones, and updates.
- **Regional Guidance Material:** Detailed documentation on KPI calculation and reporting methods, distributed as PDFs and interactive modules.
- **Interactive KPI Guidelines Website:** A dynamic platform with tutorials, FAQs, and case studies to complement static guidance.
- **CAR/SAM KPI Portal:** The central hub for quarterly reporting, validation, and access to the Regional Dashboard. It will also serve as a documentary repository containing guidance, RANP Volumes I–III, regional reports, and workshop materials.
- **Email Distribution Lists:** Fast and direct communication to remind, update, and clarify.
- **Workshops and Webinars:** ICAO-led events with contributions from EASA, IATA, and CANSO to reinforce application of the guidance.
- **Quarterly Progress and Reporting Meetings:** Structured opportunities for ICAO and States to review submissions, challenges, and improvements.
- **Regional Integrated KPI Reports:** Periodic publications summarizing results and lessons learned.

Together, these channels ensure that communication is harmonized, interactive, and adaptable. This multi-layered approach reflects the diversity of stakeholders in the CAR/SAM Region and recognizes that effective communication is a key enabler of performance monitoring.

The central innovation of this plan is the introduction of dedicated digital tools — the CAR/SAM KPI Portal and the Interactive KPI Guidelines Website — which transform communication into a dynamic, transparent, and sustainable process. The following section describes them in detail .

5. Digital tools to support communication and implementation

The success of the Communication Plan relies not only on written guidance and periodic meetings but also on digital tools that make KPI reporting and knowledge-sharing accessible, transparent, and user-friendly. To achieve this, two complementary platforms will be developed and maintained by ICAO Regional Offices with the support of partners: the CAR/SAM KPI Portal and the Interactive KPI Guidelines Website. Together, these platforms will become the central pillars of communication, training, and reporting throughout the implementation phases and beyond 2028.

a. CAR/SAM KPI Portal

The CAR/SAM KPI Portal will serve as the official digital platform for all States to submit, validate, and consult KPI data. Designed as a secure, interactive environment, the portal will ensure consistency in reporting while providing States and stakeholders with real-time access to integrated regional results. Its structure an main components are:

- **User Dashboard (State interface):** Personalized workspace for national KPI focal points, including reporting deadlines, submission status, and automated reminders.
- **KPIs Reporting Module:** Online forms and templates aligned with Regional Guidance Material to allow structured quarterly submissions. Includes automatic validation checks to identify inconsistencies or missing data before submission.
- **KPIs Regional Dashboard:** A dynamic interface developed with Power BI or equivalent, offering real-time visualization of regional KPI results, comparisons among States, and trend analysis over time. This dashboard will be available to authorized stakeholders and updated quarterly.
- **Documentary Repository:** Digital library with:
    - Regional Guidance Material for KPI calculation and implementation.
    - CAR/SAM RANP Volumes I, II, and III.
    - Regional Integrated KPI Reports.
    - ICAO circulars, training materials, and case studies.
- **Feedback Module:** Enables ICAO to provide tailored comments on submissions and share performance summaries directly with each State.
- **Helpdesk Section:** Provides States with access to FAQs, user manuals, and a helpdesk service operated by ICAO Regional Offices.

By combining reporting, results visualization, and documentation, the portal will institutionalize KPI monitoring as a permanent function of the CAR/SAM RANP.

The CAR/SAM KPI Portal will function as the official platform for KPI reporting, validation, and monitoring. Given its role in managing quarterly submissions and sensitive State data, access will be strictly role-based. National KPI focal points will have rights to submit and review their own data, while ICAO Regional Offices will manage validation, oversight, and dashboard publication. GADHOC Group members will be able to consult validated regional data, while partners such as EASA, IATA, and CANSO will have limited access to aggregated results and reports. Only ICAO and the submitting State will see raw data, ensuring confidentiality while promoting transparency through aggregated dashboards and regional reports.

b. Interactive KPI Guidelines Website

Complementing the portal, the Interactive KPI Guidelines Website will act as a knowledge-sharing and training hub. Unlike the portal, which is focused on reporting and monitoring, the website will focus on learning, familiarization, and capacity-building. Its structure and main components are:

- **Guideline Modules:** Interactive presentations of the Regional Guidance Material, including step-by-step explanations of KPI definitions, formulas, and calculation examples.
- **Tutorial Videos and Webinars:** On-demand access to recorded training sessions, walkthroughs of the reporting process, and presentations from workshops.

- **Case Studies and Best Practices:** Practical examples contributed by ICAO, EASA, IATA, CANSO, and States, illustrating successful KPI application.
- **Interactive Tools:** Calculators, quizzes, and self-assessment checklists to help focal points test their understanding of methodologies.
- **FAQ and Troubleshooting Section:** Continuously updated with clarifications on recurring questions raised by States.
- **Community Forum:** Moderated discussion space where focal points can exchange experiences, challenges, and solutions under ICAO supervision.

The website will be public and widely accessible, ensuring transparency and inclusivity. It will also be regularly updated to reflect lessons learned from each implementation phase.

The Interactive KPI Guidelines Website is intended as a knowledge-sharing and training tool rather than a reporting channel. Most of its content — including guidance modules, tutorials, case studies, FAQs, and interactive tools — will be openly accessible to all States and stakeholders. Certain features, such as community forums or advanced training modules, may require user registration for moderation purposes, but overall the website will remain public-facing. This open model ensures that guidance is widely available, promoting inclusivity and capacity-building across the region.

c. Integration between platforms

The portal and the interactive website will be complementary and interconnected:

- The portal will be the formal channel for quarterly submissions, regional dashboards, and access to authoritative documents.
- The website will serve as a training and familiarization tool, making it easier for States to apply the guidance when using the portal.
- Cross-links will allow users to move seamlessly between the two, ensuring coherence and reinforcing both platforms as parts of the same digital ecosystem.

d. Sustainability beyond 2028

Once the three implementation phases of the Action Plan are completed, the CAR/SAM KPI Portal and the Interactive Guidelines Website will remain active as permanent tools for monitoring, reporting, and training. They will serve not only the KPI framework but also future regional initiatives requiring structured reporting and capacity-building. Their creation therefore represents both a short-term enabler of this Action Plan and a long-term investment in the region’s digital infrastructure for air navigation planning and performance monitoring.

6. Communication activities aligned with the Implementation Phases

Communication must evolve alongside the phased implementation of KPIs. Each phase requires targeted messages, clear materials, and specific events to guide States through the process. By linking communication activities directly to phases, the plan ensures coherence and continuity.

- **Phase 1 (April 2026 – March 2027 – Foundations):** Distribution of guidance, launch of portal and website, Kick-off Meeting, workshops, biannual meetings, and publication of the first integrated report.
- **Phase 2 (January 2027 – March 2028 – Expansion):** Updated guidance, webinars, readiness meeting, consolidated reporting cycles, interim evaluation, and publication of the Regional Integrated KPI Report (Phases 1 & 2).
- **Phase 3 (January 2028 – March 2029 – Consolidation):** Final guidance, technical Kick-off Workshop, biannual submissions, Best Practices Workshop, and Final Regional Integrated KPI Report.

These activities ensure that States always have access to the right tools and information at the right moment. Communication is not a one-time action but a continuous cycle that accompanies the entire implementation journey. By aligning communication directly with implementation milestones, States are continuously supported and reminded of their obligations.

7. Communication roles and responsibilities

Effective communication requires clarity about who is responsible for producing, transmitting, and applying information. The plan assigns responsibilities across all key actors to ensure accountability and collaboration:

- **GADHOC:** Provides strategic oversight and ensures communications remain aligned with GREPECAS objectives.
- **ICAO NACC and SAM Regional Offices:** Act as the operational backbone, managing communications, maintaining the portal, distributing guidance, and leading workshops.
- **EASA/EU–LAC APP:** Supports the development of training content and provides technical cooperation disseminated through the portal and workshops.
- **IATA and CANSO:** Contribute operational case studies and data that enrich the communication of KPIs.
- **CAR/SAM States:** Responsible for cascading guidance within their administrations, coordinating national data collection, and ensuring timely submissions.

By sharing responsibilities across this network, communication is ensured to be both top-down (from ICAO to States) and bottom-up (from States back to ICAO through feedback and reporting).

8. Communication monitoring and feedback

To be effective, communication must be continuously assessed and improved. Monitoring ensures that States are not only receiving information but also applying it effectively in their KPI reporting. Feedback mechanisms close the loop and allow communication tools to evolve based on user needs.

Monitoring will be achieved through:

- Portal analytics (usage rates, dashboard access, downloads from the repository).
- Participation records (attendance at meetings, webinars, and workshops).
- Quarterly reporting reviews (direct ICAO feedback on submissions).
- Annual surveys of national focal points to gauge clarity, accessibility, and effectiveness of guidance.

This continuous evaluation ensures that communication remains relevant, practical, and adapted to the realities of States. In doing so, it transforms communication from a one-way channel into an interactive process of learning and improvement.

9. Conclusions and next steps

The Communication Plan is not a supporting element but a core pillar of the Action Plan. It guarantees that the Regional Guidance Material, reporting templates, and integrated results are transmitted in a way that empowers States to act consistently and confidently. By combining traditional ICAO communication mechanisms with innovative digital tools like the KPI Portal, the Regional Dashboard, and the interactive guidelines website, the region establishes a sustainable and transparent framework for collaboration.

To consolidate this approach, several recommendations are put forward:

- Place the Regional Guidance Material at the center of all communications and ensure it is updated regularly.
- Promote the KPI Portal as the default channel for reporting, accessing guidance, and consulting integrated results.
- Use the Interactive Guidelines Website to foster continuous learning and capacity-building.
- Ensure that communication remains two-way, with States providing feedback to ICAO on their needs and challenges.
- Maximize the participation of partners such as EASA, IATA, and CANSO in communication efforts to bring both technical and operational perspectives.
- Use monitoring and feedback results to continually refine communication strategies and adapt them to evolving regional needs.

In conclusion, this plan transforms communication from a simple transmission of information into a dynamic enabler of regional performance monitoring. By keeping States informed, engaged, and supported, it ensures that the CAR/SAM Region moves together toward the successful implementation of the GANP KPIs and sustains that progress well beyond 2028.

Agenda Item 7 GREPECAS Work Programme and Projects

7.1 Under **WP/7.1 and P/3** the Secretariat presented a proposal for new and consolidated Programs/ Projects, within the framework of Decision GREPECAS/22/14, for enhancing the effectiveness and participation of States and Industry in the three key GREPECAS programmes. See Table with Description in **Appendix 7A** to this report.

7.2 Cuba considered the proposal to be both timely and relevant, as it aligns the Region with ICAO's Strategic Objectives and consolidates programs and projects in accordance with those objectives. This alignment will support the MCAAP Strategic Execution Plan (PEC MCAAP) in better guiding the work of the MCAAP and, consequently, its operative implementation body, the NACC Working Group (NACC/WG). A similar approach could be reflected in the work project RLA/01/901 for the SAM Implementation Group (SAM/IG).

7.3 The United States recommended that the Action Plan to be developed under Project A2 "Management of GANP KPI for Vol. III of the CAR/SAM RANP" initially focus on the implementation of simple yet effective key performance indicators (KPIs) that can drive operational improvements, consistent with the recommendations outlined in WP 6.6 (See agenda Item 6 report).

7.4 IATA suggested that GREPECAS explore a more effective mechanism to ensure that its programmes and projects are fully utilized as coordination and harmonization tools for the activities carried out by the NACC/WG and SAM/IG Implementation Groups, thereby strengthening regional alignment and execution efficiency.

7.5 Consequently, the Meeting adopted the following Decision:

<table>
<tr><td colspan="3">DECISION
GREPECAS/23/06 APPROVAL OF NEW GREPECAS PROGRAMS AND PROJECTS</td></tr>
<tr><td colspan="2">What:
a) That the meeting approves the GREPECAS Programs and Projects as presented in Appendix 7A to this Report; and

b) The Secretariat, in coordination with the CAR/SAM States, will establish and present the reference values for the three Programme indicators, considering 2026 baseline year, and propose targets for the subsequent three-year period.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☒ Economic
☒ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="3">Why:
To comply with the item b) from GREPECAS Decision 22/14.</td></tr>
<tr><td>When:
a) Immediate
b) Reported to GREPECAS/24</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who: ☒ States ☒ ICAO ☐ Other:</td><td colspan="2"></td></tr>
</table>

7.6 The Meeting tasked the Secretariat to keep updated the Project Description Tables, jointly with the respective Project Leaders, also to publish the Tables at the GREPECAS website by no later than GREPECAS/24 Meeting.

Appendix 7A

GREPECAS Programmes/ Projects

PROGRAMMES				CORRELATED PROJECTS	
ID	**Title**	**Objective**	**Meta/Goal**	**ID**	**Title**
A	Program for Strengthening the CAR/SAM Regional Plan (RANP) and National Plans (NANP)	Strengthen the planning, harmonization, and performance-based implementation of Air Navigation Services (ANS) in the CAR/SAM Regions through updated and integrated Regional (RANP) and National Air Navigation Plans (NANPs), fully aligned with the Global Air Navigation Plan (GANP).	Percentage of CAR/SAM States with updated and aligned NANPs and effective contribution to the updated CAR/SAM RANP (Vol. I, II, III)	**A1**	Assistance for the Implementation of National Air Navigation Plans (NANP).
				A2	Management of GANP KPI for Vol. III of the CAR/SAM RANP
B	CAR/SAM Air Navigation Operational Efficiency Programme	Strengthen the operational efficiency, capacity, interoperability, and performance of Air Navigation Services in the CAR/SAM Regions through the implementation of GANP/ASBU modules and associated performance improvement strategies.	Percentage of priority ASBU elements implemented by CAR/SAM States across CNS, AIM, MET, ATM.	**B1**	NEOSPACE-01: Increasing Efficiency and capacity; Implementation of Improved operations through enhanced en-route trajectories (FRTO) and Improve arrival and departure operations (APTA)
				B2	Improvement of Airport Surface Operations
				B3	Enhanced Navigation infrastructure: GNSS implementation (*TBD*)
				B4	Improvement of AIM supporting the Implementation of Digital Aeronautical Information Management (DAIM) and evolution to SWIM supporting the FF-ICE implementation (*TBD*)
				B5	Improvement of MET supporting the implementation of FF-ICE and improving the resilience of ANSP and AGA (*TBD*)

C	Air Navigation Safety Improvement Program	Enhance air navigation safety levels in the CAR/SAM Regions through strengthened airspace and ATS safety management, increased aerodrome certification, and improved cybersecurity resilience in air navigation services.	Percentage of international aerodromes certified	**C1**	Aerodrome Certification and Oversight Support Project
				C2	Improvement of airspace and ATS services safety (contributions from the GTE, LHD reduction, monitoring, Performance-Based Communications and Surveillance (PBCS) (*TBD*)
				C3	Cybersecurity guidance (*TBD*)

See Projects A1, A2, B1, B2 and C1 Descriptions (DP) below.

GREPECAS PROJECT A1

ID: A1	PROJECT DESCRIPTION (PD)	Program for Strengthening the CAR/SAM Regional Plan (RANP) and National Plans (NANP)	
ICAO Coordinator: NACC and SAM ANS officers	**Project Title**	**Start date**	**End date**
Project Leader (State): *TBD*	**Assistance for the Implementation of National Air Navigation Plans (NANP).**	**April/26**	**April/29**
Objective	Recognizing the limited implementation of National Air Navigation Plans (NANPs) by the administrations of the CAR/SAM Regions, the project aims to build States' capacities for the development and management of their National Air Navigation Plans, based on a minimum NANP content tailored to each State and streamlined procedures for the approval and subsequent management of the Plan.		
Scope	Targeted to five States in SAM and five states in CAR Region identified as needing an updated NANP, the project aims to provide individualized assistance for the formulation of a NANP tailored to each State's legal and technical framework and aligned with the RANP and GANP. The assistance includes Teleconferences and face-to-face meetings and the establishment of an appropriate team of planners with the knowledge and skills required for the management of the Plan.		
Justification	• Assembly Resolution A42-6[1] expressed support for the Eighth Edition of the GANP. Appendix B of this Resolution tasks the ICAO Council, among other matters, with promoting guidance for the development of National Air Navigation Plans (NANPs). • GREPECAS/23 adopted Conclusion 23/02, indicating that the Secretariat should manage mechanisms to assist States in the development of NANPs, in line with the strategic objective of "No Country Left Behind".		
Indicators/Targets	• Number of NANPs approved, adopted, and officially published by States over a three-year period. • Other applicable metrics.		
Resources Needed	• For the development of the Project in one (01) State: • Teleconferences requiring 30 man-hours per month. • In-person meetings, 4 days in each state. • Regional Implementation Project funds for in-person meetings, development of manuals, studies, and training. • Funds from other sources. • Estimated international financial resources for the Project: USD (TBD).		

[1] Link to the Provisional Edition of Assembly Resolution A42: https://www.icao.int/events/assembly-42nd-session/Resolutions

Main risks identified	• Lack of interest in the project and limited participation by States in project activities. • Reluctance or delays in the approval of the NANP due to the complexity of the State's political or legal framework. • Insufficient financial resources. • Lack of specialized personnel with adequate technical knowledge in the State receiving assistance. • Lack of industry support.

*** PROJECT A1 ACTIVITY TABLE**

National Air Navigation Plans (NANP)

** Reference table for the implementation of a NANP.*
Project Officers and Coordinators should formulate the activities in detail.

Activity	Responsible	Start date	End date	States	Comments
1. Planning					
1.1. Identification of States receiving assistance. Prioritization					
1.2. Sources of resources					
1.3. Development of the annual work plan					
1.4. Project documentation.					
2. Training					
2.1. Webinar on the 8th Edition of the GANP					
2.2. Webinar on the CAR/SAM RANP, Volume III, and performance-based planning.					
2.3. Webinar on national planning – NANP. Alignment with the GANP and RANP					
2.4. Other content					
3. Analysis of the State's operational and technical data. Identification of stakeholders					
4. Analysis of the State's political, legal, and technical framework					

Activity	Responsible	Start date	End date	States	Comments
5. Gap analysis. Analysis of improvement ambitions within the national air navigation system					

GREPECAS PROJECT A2

A3	PROJECT DESCRIPTION (PD)	Program for Strengthening the CAR/SAM Regional Plan (RANP) and National Plans (NANP)	
ICAO Coordinator: NACC and SAM ANS officers	**Project Title**	**Start date**	**End date**
Project Leader (State): *TBD*	**Management of GANP KPIs for Vol. III of the CAR/SAM RANP**	**Sept 2025**	**sept 2028**
Objective	Achieve progress in managing the progress of KPI for CAR/SAM eANP, VOL III.		
Scope	Development a sustainable and comprehensive management of KPIs in CAR/SAM Regions		
Justification	According to the GREPECAS/22 Report Final, we had the following result from the worktable related "Performance-based planning and KPI management of the Global Air Navigation Plan." *1. "The provision of Regional Technical Guides that complement the information presented in the ICAO GANP portal is required, in order to have a harmonized methodology for developing KPIs. These guides should be the basis for the preparation of instruction manuals on this subject.* *2. The formation of an Ad- hoc group within GREPECAS is required to consolidate the efforts of the administrations and to assist in processes for data collection, KPI calculations and management of air navigation performance.* *3. The group should identify regional priorities, aligned with the ongoing air navigation rollout, and the resources required for harmonized progress on these tasks. At the same time, it must strengthen the integrated work of the industry, users, States, and ANSPs.* *4. It was identified that benchmarking activities between administrations and/or ANSPs (on a voluntary basis), carried out at regional and interregional level, can boost the management of KPIs of CAR/SAM States.* *5. The dissemination of the enacted KPIs must be improved, through appropriate tools (dashboards, etc.). Likewise, it is necessary to develop a Communications Plan."* Therefore, this project is initiated to ensure a cost-efficient KPI management process and to strengthen regional planning aimed at safe, efficient, and sufficiently capable air navigation, thereby supporting industry growth through a performance-based planning methodology implemented by the States.		

Indicators/Targets	Monitoring the level of implementation of the following GANP KPIs by each State in the CAR and SAM Regions: • KPI01: Departure punctuality (SOBT vs AOBT) • KPI02: Additional Taxi-out time • KPI04: Planned en-route distance • KPI05: Actual en-route flown distance • KPI06: En-route airspace capacity • KPI09: Airport peak capacity • KPI10: Airport peak throughput • KPI13: Additional Taxi-in time • KPI14: Arrival punctuality (SIBT vs AIBT) • KPI17: Level-off during climb • KPI19: Level-off during descent
Required Resources	• High-level engagement of participating States, industry, airport operators and air navigation service providers. • Resources for data management. • Training programmes.
Main risks identified	• Lack of interest in the project and limited participation by States in project activities. • Insufficient financial resources. • Lack of specialized personnel with adequate technical knowledge in the State receiving assistance. • Lack of industry support.

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Activity/Action	Deliverables	Deadline	Responsible	Status (SAM)	Status (CAR)	Remarks
Initial assessment of the current status of GANP KPI implementation in the CAR and SAM States.	Evaluation report in the CAR and SAM Region.	Nov/2026	CAR and SAM States	**0%**	**0%**	
Development of Action Plan for the progressive implementation of KPIs, identifying priorities and resources required, harmonized with the progress of the implementation groups	Action Plan for the progressive implementation of KPIs, identifying priorities and resources required, harmonized with the progress of the	TBD	GADHOC Members	**80%**	**80%**	• ICAO NACC and SAM Regions can explore resources support from existing regional Projects (MCAAP, SAM IG, others) to support this activity. • GREPECAS DECISION/22/19

Activity/Action	Deliverables	Deadline	Responsible	Status (SAM)	Status (CAR)	Remarks
and States from CAR and SAM.	implementation groups and States from CAR and SAM.					
Cooperation with EASA for development of proposal CAR/SAM regional guidance material on the methodology of performance indicators KPI.	First proposal CAR/SAM Regional guidance material on the methodology of performance indicators KPI.	Sep/2025	EASA Consultant	**20%**	**20%**	The regional guidance material was developed for KPIs 01 to 06 by EASA Consultant.
Analysis of CAR/SAM regional guidance material on the methodology of performance indicators KPI to submit to GREPECAS.	Proposal CAR/SAM Regional guidance material on the methodology of performance indicators KPI.	Dec/2025	GADHOC Members	**100%**	**100%**	GREPECAS DECISION/22/19
Development of Communications Plan detailing the adequate means of dissemination (dashboards, etc.) of the KPIs.	Communications Plan detailing the adequate means of dissemination (dashboards, etc.) of the KPIs.	Dec/2025	GADHOC Members	**100%**	**100%**	• GREPECAS DECISION/22/19
Management and development of a regional dashboard to present data and technical performance of ADS stations in the SAM region.	Regional dashboard to present data and technical performance of ADS B stations.	Dec/2026	ICAO SAM and NACC ROs	**0%**	**0%**	
Workshop on GANP KPIs is relevant to the aerodrome area for CAR and SAM Region.	Dissemination of knowledge on a proposed practical guide for collecting and analyzing AGA KPI data.	2026	ICAO SAM and NACC RO-	**0%**	**0%**	

Activity/Action	Deliverables	Deadline	Responsible	Status (SAM)	Status (CAR)	Remarks
Populate the Tables of Volume III of the RANP CAR/SAM with the data of performance indicators – KPIs, prioritizing and harmonizing the management of these indicators according to the progress of the Working Groups for the regional implementation of air navigation by GREPECAS/23.	Tables of Volume III of the RANP CAR/SAM with the data of performance indicators - KPIs	2027	CAR and SAM States	**0%**	**0%**	GREPECAS CONCLUSION/22/2

GREPECAS PROJECT B1

B1	PROJECT DESCRIPTION	CAR/SAM Air Navigation Operational Efficiency Programme	
ICAO Coordinators: ATM Officers NACC and SAM	**Project Title**	**Start date**	**End date**
Project Leaders: **- Julio Cesar de Souza Pereira (IATA)** **- Riaaz Mohammed (Trinidad and Tobago)** **- Sergio Kebach (Brasil)**	**NEOSPACE-01: Increasing Efficiency and capacity; Implementation of Improved operations through enhanced en-route trajectories (FRTO) and Improve arrival and departure operations (APTA)**	**Ene 2024**	**Dec 2027**
Objectives	Recognizing the current progress of implementation activities for certain elements of the APTA and FRTO modules of the GANP2, it is required: a) Support and reorient the optimization of the airspace structure of the CAR/SAM Region in a harmonized and coherent manner, strengthening ongoing implementations. b) Promote the activities of the States and CAR/SAM organizations for the effective implementation of Volume III of the ANP CAR/SAM. c) Generate environmental benefits by saving fuel and reducing CO2 emissions.		
Scope	✓ Initiate and/or reinforce the implementation of selected elements of the GANP FRTO module: a) to increase performance in the area 'Efficiency', in the focal areas; flight time, distance and vertical flight, focusing on fuel savings and CO2 emissions; and b) to increase performance in the area 'Safety', in specific objectives of avoiding deviations in lateral/horizontal navigation and improving the early detection of conflicting ATC authorizations. ✓ Initiate and/or reinforce the implementation of selected elements of the GANP APTA module (Approach, SID/STAR, CDO and CCO) to increase performance in the area 'Capacity', in the focal areas, capacity, performance and utilization. ✓ Evaluate and implement the necessary CNS/ATM enablers to FRTO and APTA		

[2] *See GANP portal: https://www4.icao.int/ganpportal/. Note that the 42nd ICAO Assembly approved the Eighth Edition of the GANP. This project will be updated accordingly.*

	✓ Optimize longitudinal separation in continental space, to increase performance in the Efficiency and Capacity area.
Justification	o GREPECAS/20 identified that activities in the CAR/SAM region are advancing together with the industry, and harmonization between them should begin as soon as possible. It was agreed that these initiatives should be grouped under a single GREPECAS Program, to develop in a harmonized and interoperable manner the concepts for the optimization of airspace that cover, in addition to PBN implementation, several modules/operational elements of the GANP. o This project focuses on the key performance areas (KPA) **Capacity, Efficiency and Safety** in order to reduce the gap between the actual flight path and the optimal trajectory desired by users. Likewise, implement routes and instrument flight procedures that increase the airport's arrival ratio and increase accessibility to the airport, while ensuring operational safety. o The project supports the optimization of the airspace structure of CAR/SAM regions that is in progress since the beginning of the implementation of the APTA module in 2013, as well as the implementation of the FRTO module that was initiated through several initiatives in CAR and SAM after the pandemic period, with a view to supporting the recovery and sustainability of the Industry, as well as restoring air connectivity. ✓ At the same time, the effective implementation of Volume III of the ANP CAR/SAM is promoted.
Supporting metrics	✓ Number of SID/STAR PBN routes implemented, where required for International Airports (Application of CCO and CDO techniques) ✓ Number of RNAV/RNP routes implemented (new routes/improved navigation specification/replacement of conventional routes). ✓ Number of Flight Information Regions that have implemented strategic direct routing (SDR). Volume of airspace implemented. ✓ Number of Flight Information Regions that have implemented Free Route Airspace (FRA). Volume of airspace implemented. ✓ Number of routes preferred by the UPR user implemented. ✓ Percentage of thresholds with APV approaches in International Airports. ✓ Reduction of fuel consumption and CO2 emissions ✓ Other metrics that are applicable. ✓
GANP Key performance indicators (KPI)	o According to the project planning, FRTO and APTA elements and respective KPI indicators (GANP and Doc. 9883 performance-based planning process) will be selected. Performance improvement targets require the definition of a baseline for KPIs. From this baseline, it is feasible to establish performance improvement ambitions for a given KPI, within a defined period. o Proposed project KPIs are shown below (States/Organizations, according to their needs, can calculate/monitor other GANP KPIs or develop their own indicators)

	APTA MODULE	FRTO MODULE
	Basic Indicator - Capacity KPI 10 – Airport peak throughput **Advanced Indicators - Efficiency** KPI 17 – Level-off during climb KPI 19 - Level-off during descent	**Basic Indicators - Efficiency** KPI 04 – Filed flight plan En-route extension. KPI 05 – Actual en-route Extension **Basic Indicators – Safety** KPI20 – Number of aircraft accidents KPI23 – Number of airprox events/TCAS alerts/separation loss/mid-air near collision/mid-air collision (MAC) **Advanced Indicators - Efficiency** KPI 17 – Level-off during climb KPI 19 - Level-off during descent **Advanced Indicator – Capacity** KPI 06 – En-route Airspace capacity
Resources Needed	• Teleconferences that require 40 man-hours per month. For the remaining life cycle totals 960 man-hours	
Main risks identified	• Lack of interest in the project. Low participation of States in project activities. Reluctance or delays to the effective implementation of changes in airspace, including publication in AIP. • Scarcity of economic resources. • Lack of technical knowledge. • Lack of Industry Support	

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TABLE OF ACTIVITIES

1. FRTO CAR SAM PLANNING AND IMPLEMENTATION ACTIVITIES (REFERENCE ONLY)

Activity	Responsible	Start date	End date	Status	Comments
6. Documentation					
6.1. Develop Version 2 FRTO Implementation Guide					
6.2. Produce CONOPS FRA CAR/SAM					
6.3. Set a target for SDR and FRA implementation in the next 5 years					
6.4. Develop and disseminate national FRTO implementation strategy					
6.5. Studies on FPL/AIDC in an SDR and FRA environment					
7. FRTO Publication					
7.1. Review aeronautical publication model for UPR, SDR and FRA implementation					
7.2. Harmonize UPR, DTS and FRA publications					
8. CNS Infrastructure					
8.1. Evaluate the implementation status of the requirements for implementation FRTO B0/1 and B1/1 (ATS Surveillance Coverage, VHF Coverage, MTCD, Trajectory Monitoring)					
8.2. Perform FPL processing tests for SDR and FRA cross-border environments with and without					

Activity	Responsible	Start date	End date	Status	Comments
"floating points". Check for interference with AIDC					
9. Support Metrics and Key Performance Indicators					
9.1. Set support metrics					
9.2. Develop interactive maps with SDR and FRA airspaces					
9.3. Establish key performance indicators.					
9.4. To verify the feasibility of implementing the methodology used in Brazil					
10. Longitudinal separation between aircraft					
10.1. Track the Implementation Status of longitudinal separation with a view to achieving 30/10NM separation					

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2A. APTA PLANNING AND IMPLEMENTATION ACTIVITIES IN SAM REGION (REFERENCE ONLY)

Activity	Responsible	Start Date	End Date	Status	Comments
1. Review of the APTA Implementation Roadmap in the SAM Region					
1.1. Review the Operational Concept Capacity and Efficiency	SAMIG/GESEA	2026	2028	Not started	
1.2. Review of the PBN Roadmap	SAMIG/GESEA	2026	2028	Not started	
1.3. Prepare an APTA Roadmap. Document integration	SAMIG/GESEA	2026	2028	Not started	

Activity	Responsible	Start Date	End Date	Status	Comments
1.4.					
1.5.					
1.6.					
1.7.					
1.8.					
1.9.					
1.10.					
1.11.					

2B. APTA PLANNING AND IMPLEMENTATION ACTIVITIES IN CAR REGION (REFERENCE ONLY)

Activity	Responsible	Start Date	End Date	Status	Comments
1.					
1.1.					
1.2.					
1.3.					
1.4.					
1.5.					
1.6.					
1.7.					

GREPECAS PROJECT B2

B2	PROJECT DESCRIPTION (PD)	CAR/SAM Air Navigation Operational Efficiency Programme	
ICAO Coordinator: ROs AGA	**Project Title**	**Start date**	**End date**
Project Leader (State): ***Joel Cordero - PERÚ***	**Improvement of Airport Surface Operations**	**Nov 2025**	**Nov 2028**
Objective	Support the implementation of appropriate Apron Management and Surface Movement Guidance and Control Systems (SMGCS) services at selected aerodromes in the CAR/SAM regions, as a critical basis for improving the apron operations safety, increasing airport capacity, and prepare the terrain for future implementations of advanced collaboration concepts, such as the A-CDM and other operational efficiency improvements.		
Scope	Selected aerodromes in the CAR and SAM Region		
Justification	The origin of this project is the A-CDM F3 project, which was restructured at the Twenty-Second GREPECAS Meeting. This new project is based on a comprehensive assessment of the regional context and the actual needs of aerodromes in the CAR/SAM Regions. 6. Studies conducted by the ICAO NACC and SAM Regional Offices under the F3 project concluded that the implementation of A-CDM, as originally defined in the European context, is not directly applicable to the CAR/SAM Regions, as it was designed to mitigate the effects of airspace management policies and departure delays that have not been implemented in our region.. 7. A significant lack of apron management and systems to improve situational awareness on the ground at airfields in the region was identified, a prerequisite for more advanced collaborative approaches in airports. 8. Although capacity is an issue at some airports in the region, the implementation of A-CDM is not the direct solution to this challenge. 9. It is recognized that the basis for an improvement in airport capacity is the implementation of appropriate platform management services and advanced SMGCS systems. 10. This restructuring aligns with the correct implementation of the provisions contained in sections 9.5 and 9.8 of Annex 14, Volume I, Chapters 1, 7 and 9, Part II of PANS-Aerodromes (Doc 9981), and the guidance provided by Doc 9137, Part 8 (Platform Management), Doc 9476 (SMGCS) and Doc 9430 (A-SMGCS). Therefore, this restructuring seeks to address the specific needs of the CAR/SAM region, focusing on the implementation of Apron Management and SMGCS and/or A-SMGCS as a fundamental basis for future improvements in airport safety, efficiency, and capacity.		

Indicators	• Percentage of international aerodromes that have implemented Apron Management services, among the ones that the necessity was determined. • Percentage of aerodromes that have implemented or improved their SMGCS. • Reduction in apron safety incidents. • Improved break-in times and reduced surface delays. • Increase in the operational capacity of the apron and maneuvering areas. • GANP KPI01, KPI02, KPI 09, KPI10, KPI 11, KPI13, KPI14, KPI21
Required Resources	• High-level engagement of participating States, airport operators and air navigation service providers. • Appointment of experts in airport management and SMGCS systems. • Resources for evaluation, implementation and updating of systems and procedures. • Training programmes for airport and air traffic control personnel. • Training programs for airport and air traffic control personnel.
	•

Activity/Action	**Deliverables**	**Deadline**	**Implementation Status (SAM)**	**Implementation Status (CAR)**	**Remarks**
Initial assessment of the current apron management situation and SMGCS at selected aerodromes.	Evaluation report in the CAR and SAM Region	2026	**0%**	**0%**	
Determination of aerodromes where implementation of Apron Management is necessary and priority of implementation	1. Methodology for determining necessity for Apron Management 2. List of aerodromes where Apron Management is necessary, in order of priority	2026	**0%**	**0%**	
Development of regional guides for the implementation of Platform Management services and improvement of SMGCS.	SMGCS Regional Guides	2026	**0%**	**0%**	

Activity/Action	Deliverables	Deadline	Implementation Status (SAM)	Implementation Status (CAR)	Remarks
Pilot implementation of Apron Management services at selected airfields	1.List of priority aerodromes. 2. Report on the pilot case	2027	**0%**	**0%**	
Implementation or improvement of SMGCS in selected aerodromes.	1.Technical assistance missions. 2. Reports on results.	2028	**0%**	**0%**	
Development and realization of knowledge dissemination events	Taller Webinar	2026	**0%**	**0%**	

GREPECAS PROJECT C1

C1	PROJECT DESCRIPTION (PD)	Air Navigation Safety Improvement Program	
ICAO Coordinator: NACC & SAM AGA ROs	**Project Title**	**Start date**	**End date**
Project Leader (State): *TO BE DEFINED*	**AERODROME CERTIFICATION AND OVERSIGHT SUPPORT PROJECT**	**Jan/2026**	**Dec/2028**
Objective	• Address the critical gap in aerodrome certification across the Caribbean, Central American and South American States and Territories. Currently, resource constraints and technical capacity gaps prevent many Member States from meeting the Regional Air Navigation Plan and ICAO Annex 14 obligations. • Main objectives: o Increase aerodrome certification in the CARSAM Region o Build institutional capacity within the CAAs or group of CAAs to maintain certification conditions. o Strengthen the role of horizontal cooperation and RSOO. o Contribute to AGA ICAO audit preparation.		
Scope	The scope of the project includes identifying latent problems or obstacles in the aerodrome certification process, with the aim of better assessing States in meeting regional goals and developing specific needs related to documentation, processes and procedures, development of guidelines, training, expert advice, best practices and collection of data and information, to facilitate initial aerodrome certification and ongoing oversight.		

Justification	Aerodrome certification has been an ICAO Standard for aerodromes with international operations since 2003 (as per Amendment 4 to Annex 14, Volume I, 1.4.1). However, after over two decades, as per December 2025, the NACC Region reached 69% of certified aerodromes and the SAM Region 67% and some States haven't certify any of their aerodromes with international operations. This directly affects States level of Effective Implementation with ICAO SARPs. Some States lack of sufficient qualified personnel, including an appropriate mix of disciplines, to certify their aerodromes. In addition, other States lack technical guidance and tools to carry out the certification, especially, in the area of safety assessments / aeronautical studies assessment. The project is part of the activities that will enable and support the achievement of ICAO Safety Strategic Goals, the goals of ICAO GASP of increasing States effective implementation, and will support States to comply with their licensing, certification, authorization and approval obligations (CE-6) and subsequently their surveillance obligations (CE-7). In addition, the implementation of aerodrome certification has demonstrated that States are in more control of the gaps and challenges in their aerodromes, identify better the hazards and assess the risks for the safety of civil air operations, and serve as a baseline to plan better the safety oversight, thus reducing the CAA's workload and saving important resources.
Indicators/Targets	Indicator / Target • Number of aerodromes certified per State | All States with at least 1 (one) certified international airport • Percentage of aerodromes certified per region | 5% increase per year • Percentage of Effective Implementation (EI) by State in the AGA area | Regional EI average above Global average
Resources Needed	• High-level commitment from each participating State. • High-level commitment from each airport operator involved. • The designation of experts by the States (direct assistance) is required for the execution of the aforementioned activities. • Access to regulations, guidance materials, manuals, procedures, guidance circulars, and other available best practices. • International cooperation with human and/or financial resources for assistance and training missions.
Main risks identified	• Risk 1 (Political): Changes in government administration in Member States may de-prioritize aviation safety funding or sharing of resources. o Mitigation: Embed commitments in international treaties/agreements. • Risk 2 (Resources): Trained inspectors move to the private sector or are fired due to non-technical reasons. o Mitigation: Bonded training agreements. • Risk 3 (Resources): lack of resources to deploy missions or training. o Mitigation: involve international organizations and RSOOs with cost-effective solutions to support horizontal cooperation.

Activities/Actions	Deliverables	Delivery date	Implementation Status (SAM)	Implementation Status (CAR)	Comments
Foundation & Diagnostics • **Task 1.1: Regulatory Review:** • **Task 1.2: The Gap Analysis:**	Review and update Primary aviation law, AGA Regulations and supporting documentation in target States/Territories to ensure they have the legal requirements to certify. Virtual Pre-assessment (as needed) per Airport to be certified to establish the baseline of non-compliance and opportunities of direct assistance to implement certification.		**0%**	**0%**	Create a robust base for the implementation of all the enablers (procedures, checklists, templates, training) of the certification
Execution • **Task 2.1: Capacity Building** • **Task 2.2: The Certification Marathon**	"Aerodrome certification process" workshops for CAA staff and "Aerodrome Manual and certification preparation "workshops for Airport Operators Rolling support teams to assist and follow up States in moving from Phase 2-3 (Documentation) to Phase 5(Granting Certificate).		**0%**	**0%**	The objective is to train inspectors and aerodrome personnel based on the new revised regulations, to prepare the documentation necessary for the certification process (Aerodrome Manual). Next, implementation of Certification Implementation projects with the support of NACC & SAM AGA RO (as PM) with contributions from other stakeholders/donors and national AGA staff.

Activities/Actions	Deliverables	Delivery date	Implementation Status (SAM)	Implementation Status (CAR)	Comments
Sustainability & Oversight • **Item 3.1: RSOO Strengthening:**. • **Item 3.2: Digital Oversight Implementation:**	Formalizing legal frameworks for resource pooling (inspector sharing) between States/Territories With certification in place, and with ICAO support, States have in place the right procedures and evidence uploaded and updated to ICAO USOAP CMA Online Framework (OLF) platform.		**0%**	**0%**	Generate enough trained staff with the expertise needed to accomplish certification without ICAO support. RSOO formalizes resource pooling framework to enable safety oversight objectives as a group.

Agenda Item 8 CAR/SAM Air Navigation Implementation

Airspace Optimization matters

8.1 Under **WP/8.1** the meeting was reported on the progress made in optimizing airspace in the Caribbean and South American regions through coordinated efforts led by GREPECAS and its technical groups. The NEOSPACE project (Project B1) acts as the central framework that brings together initiatives from both regions to enhance capacity, efficiency, and safety in en route and terminal airspace. Both regions are gradually implementing more flexible route structures, beginning with direct routing and preferred user trajectories and progressing toward free route operations. This implementation considered the geographic and technical particularities of each region, such as the extensive oceanic environment in the CAR and the varied communications and surveillance capabilities across SAM.

8.2 Close coordination between air traffic management and flow management is highlighted as essential for handling busy traffic flows and maintaining predictability. The CAR region is focusing on strengthening coordination to support this integration, while the South American region has already conducted trials of preferred routes, floating points, and direct trajectories, including in the Pacific oceanic area. Training activities, workshops, and collaborative exchanges with in

8.3 dustry have been important to support these efforts. The SAM region continues to advance performance-based navigation in terminal areas to ensure that benefits achieved en route are matched during arrivals and departures.

8.4 IATA highlighted the efforts of States that have made progress in the implementation of concepts such as Free Route Airspace (FRA), Strategic Direct Routing (SDR) and User Preferred Routes (UPR), especially highlighting those that have already applied these solutions in most of their areas of responsibility.

8.5 Looking ahead to the coming period, it remains important to continue expanding cross border SDR routes, building on the initiatives already operating between Panama, Colombia, Ecuador and Peru, as well as those between Mexico and CENAMER. Within the AMCB and GESEA/GADHOC FRTO groups, coordinated by the NEOSPACE project, it is proposed to assess new opportunities that could involve Argentina, Uruguay, Brazil, Suriname, Guyana, Venezuela and Trinidad and Tobago. At the same time, it is recommended to promote the use of ten nautical mile longitudinal separation at FIR boundaries, supported by the technical capabilities and CNS enablers needed to ensure its safe application.

8.6 Referred to major airports, the need to develop APTA initiatives through multidisciplinary CDM groups with the participation of all the actors involved is emphasized, following the models already tested in Brazil and Chile. These initiatives should include airport efficiency programs aimed at optimizing the use of infrastructure, improving runway capacity and, as a result, facilitating more efficient airspace management, generating a positive domino effect throughout the operational chain.

8.7 Panama expressed its support for the proposed actions and recognizes the progress made. The State has been optimizing its longitudinal separation minimums through agreements with neighbouring FIRs and promoting direct routes under a progressive and safe approach, contributing both to regional efficiency and to the reduction of environmental impact.

8.8 CANSO highlighted the magnitude of the regional work and the benefits obtained through the CIIFRA project, especially on the SDR test routes, which have enabled significant operational savings for airlines, substantial reductions in CO_2 emissions and notable decreases in flight time. The results provided

by Volaris in coordination with CIIFRA and SENEAM are also highlighted, which demonstrate concrete benefits in costs, fuel consumption and emission reduction.

8.9 Under **WP/8.22**, COCESNA presented a diagnosis of Central American Airspace. The discussion reflected general support for the data-driven and phased approach presented by COCESNA as a technical baseline for future airspace optimization and coordinated planning. Ecuador, Cuba and the United States took note of the information; Uruguay and France indicated no comment.

8.10 Panama supported the methodological approach and underscored the importance of maintaining CAR-SAM interregional coordination in subsequent phases and any redesign proposals to ensure interoperability with adjacent FIRs. Brazil welcomed the update and highlighted the value of ICAO-aligned methods, including demand forecasting and fast-time simulations, recognizing Central America as a key North-South corridor.

8.11 ALTA took note and reiterated the importance of airspace-user participation in later phases. IATA recommended active participation of airspace users during both diagnostic and redesign phases, consideration of airport operations optimization as part of an integrated approach and sharing results with relevant regional groups to support harmonized evolution between regions.

8.12 Under **WP/8.39** Peru detailed the work in progress to expand Strategic Direct Routing (SDR) in the South Pacific and to begin coordinated trials with Ecuador and Chile. It explained that Strategic Direct Routing supports the evolution toward more flexible and efficient en route trajectories, aligned with the global air navigation modernization framework.

8.13 Peru has progressively implemented this concept in its oceanic airspace, publishing several updates that introduced floating waypoints and later improved their coding to ensure proper processing by automated systems and international operators. Peru has coordinated with neighbouring FIRs to harmonize operational elements, share navigation data, and ensure that automated coordination continues to function correctly. Joint trials assessed different flight-planning and coordination scenarios, confirming that current systems can manage direct routes, floating waypoints, user-preferred routes, and coordinates. These trials also revealed that transfers between FIRs still depend on common published points to maintain automation reliability.

8.14 The work expanded into preliminary crossborder scenarios that do not rely on airway-based transfer points. These trials highlighted differences in surveillance system versions and AIDC configurations, leading to occasional interruptions in automated coordination. They also showed that newer AIDC messages, such as the message that reproduces a complete flight plan, can behave differently depending on maturity levels of the system.

8.15 Overall, the trials demonstrate that Strategic Direct Routing (SDR) is operationally viable and beneficial, while also emphasizing the need for deeper technical harmonization, standardized AIDC message use, and enhanced training for ATS personnel. These lessons support the continued regional evolution toward more advanced trajectory-based operations and prepare the path for future enablers and free route environments.

8.16 The United States commended Peru on their systematic SDR implementation and sharing of lessons learned from cross-border trials. It strongly supports AIDC harmonization as a critical enabler of safe and efficient cross FIR border SDR operations. Also, support the recommended development of a phased regional SDR roadmap and strongly support the use of ICARD regulated 5-Letter Name Codes (5LNCs) for all fixes and waypoints.

8.17 IATA recognized the operational benefits obtained, as well as the effort made to update the concepts and the corresponding aeronautical publications aimed at optimizing the SDR airspace of the FIR Lima. IATA remarked on the results of the analysis of FPL processing and the operation of the AIDC, both with and without the use of "floating points" at the FIR boundaries, as well as the lessons learned during this process. These elements should be shared with the CAR/SAM States and used as a basis for a regional guide to move towards new phases of FRTO implementation, including the FRA. The Secretariat took note for this study to be expanded with the participation of other CAR/SAM States, within the framework of the NEOSPACE project.

8.18 Panama highlighted that the continuity and reliability of automated coordination depend on technical interoperability among PCAs, the standardization of AIDC versions and configurations, and the strengthening of the training of ATS personnel for these new operational scenarios. He also noted that the tests carried out are valuable in identifying technical, operational and training gaps before moving towards more advanced cross-border scenarios and future FRA configurations, promoting a progressive, secure and harmonized evolution in the SAM Region and in the CAR/SAM interface

8.19 Brazil took note of the information presented by Peru in this working paper and supports the extension of Strategic Direct Routing initiatives and cross-border trials, recognizing their alignment with regional airspace optimization efforts; Brazil considered that the lessons learned in terms of AIDC harmonization, standardization of messages and interoperability of systems are especially relevant, given that DECEA carries out similar coordination processes and advances towards the implementation of FRA, including future cross-border scenarios, being able to benefit from continuous technical exchange and regional collaboration.

8.20 **Under WP/8.30 Brazil** presented its national initiative to harmonize the Transition Altitude (TA) to a single value of ten thousand feet across all TMAs in the Brazilian Airspace Control System. The effort aligns with ICAO provisions and aims to improve operational safety, reduce pilot and controller workload, enhance procedural standardization, and support the implementation of modern PBN concepts such as Baro-VNAV and CDO.

8.21 Historically, Brazil operated with multiple Transition Altitudes across different FIRs and TMAs, which increased cockpit and ATC complexity and raised the risk of altimeter setting errors during high-workload phases of flight. Harmonizing to a single national TA eliminates ambiguity, simplifies procedures, and reduces human-factor risks.

8.22 A higher and standardized Transition Altitude also supports more accurate vertical navigation, facilitates optimized descent profiles, contributes to fuel-efficiency and environmental benefits, and enhances overall predictability of operations. The Brazilian implementation follows a phased, coordinated strategy aligned with aeronautical publication cycles.

8.23 Brazil encouraged GREPECAS to promote similar harmonization efforts across CAR/SAM and requests GESEA’s SG2 (PANS-OPS) to lead regional technical discussions to support harmonized implementation. Panama expressed support to this initiative.

8.24 IATA recognized the operational benefits derived from the process of harmonizing transition altitudes currently underway in the country. IATA would like to stress that the main benefit of such harmonisation is the reduction of the risk of errors in the altimeter configuration, which significantly reduces the likelihood of incorrect settings during the ascent and descent phases. IATA also refers to its comments made during the discussion of WP 8.24, on errors in the pilot´s adjustment of the QNH.

8.25 In this regard, IATA supports the action recommended by Brazil and, in addition, suggested incorporating in the middle term the harmonization of transition altitudes in the CAR/SAM Regions into the

GREPECAS work program, considering the obvious operational benefits – particularly in terms of safety – and taking as a reference the States that already apply or are in the implementation phase of this practice such as Brazil, Chile and the United States. In turn, the Secretariat recalled that ICAO is currently advancing new provisions and technical guidance on altitude correction due low temperature, therefore the Meeting agreed on wait until the implementation of such documents expected for November 2028.

8.26 Under **WP/8.28** Brazil analyses the operational performance at Brasília International Airport after the introduction of independent parallel simultaneous departures. The purpose is to understand how this procedure affected capacity, punctuality, departure-flow efficiency and safety levels during defined operational windows. The airport gradually reintroduced these parallel departure operations, making use of both runways to support a more dynamic departure flow. This approach resulted in clear improvements in traffic handling and in the stability of operations during the authorized periods.

8.27 Capacity indicators confirmed that the airport consistently operated with comfortable margins, well below saturation. This allowed for smoother flows, minimized queuing, and increased the system's ability to absorb fluctuations in demand. Efficiency gains were evident. The departure stream became more consistent, punctuality improved over time, and the taxi-out phase became shorter thanks to better runway throughput. These effects together demonstrated that the introduction of parallel departures provided more regular and predictable performance throughout the year.

8.28 Brazil concludes that the implemented strategy enhanced overall efficiency and supported growing traffic levels. It recommends continuing to monitor standardized capacity indicators, linking the benefits of improved performance with environmental metrics, and promoting cooperation among States to foster harmonized implementation of parallel operations under different operational conditions. Cuba, Ecuador United States took note of the exposed information.

8.29 IATA commended Brazil for its achievements in implementing independent parallel departures at Brasília Airport. The paper provides valuable lessons that can benefit CAR/SAM States with similar airport characteristics, including Cancun, Mexico City (in VMC), Lima, Panama, and Santiago, where work is already underway. It is also noteworthy that Brasília applies independent parallel approaches, which could be considered at these airports under IMC or VMC, as demonstrated successfully in Santiago under VMC.

8.30 A key lesson highlighted is that, even when an airport is operating well below maximum capacity, independent parallel departures—and, where suitable, independent parallel approaches—deliver meaningful operational benefits during peak periods, particularly when assessed using the R15 and R5 indicators included in the Working Paper.

8.31 IATA supports the actions proposed and encourages GREPECAS (through the NEOSPACE project), NACC/WG, and SAM/IG to incorporate these lessons and actions into their work programs.

8.32 **Referring to WP/8.29** presented by Brazil, the Secretariat noted broad acknowledgment of the information presented on performance-based deliverables achieved under collaborative "AGILE" initiatives, highlighting the value of structured stakeholder engagement, performance monitoring, and collaborative decision-making to support improvements in capacity, efficiency, predictability and operational resilience, while maintaining appropriate levels of safety. The WP also invited the Meeting to encourage the exchange of experience on collaborative and performance-based airport and TMA optimization initiatives.

8.33 Comments during the virtual phase generally took note of the paper and commended the approach as a practical example of integrating strategic planning, ATFM mitigation for infrastructure constraints, and controller capacity-building within a performance-driven framework. Stakeholders highlighted that several operational concepts described in the WP could be considered by airports facing peak-period congestion, including initiatives such as runway occupancy time reduction programmes, reduced runway separation minima (RRSM), intersection departure optimization, preferential runway concepts, omni-directional SIDs, and other high-density departure/arrival sequencing measures. The Secretariat took note of these interventions and supported the importance of sharing such experience regionally, including maintaining alignment with GANP performance indicators to reinforce a performance-based implementation approach.

8.34 The **WP/8.31** presented by Brazil addressed the status of implementation of Performance-Based Communication and Surveillance (PBCS) in the Atlantico FIR (SBAO) and the associated responsibilities of CAR/SAM States. The paper recalls that the PBCS concept, in accordance with ICAO Documents 9869 and 10063, enables the safe application of reduced separation minima in oceanic and remote environments through compliance with RCP, RSP, and RNP specifications.

8.35 Brazil reports that implementation will be conducted in three phases between 2026 and 2027, including the progressive introduction of reduced separation minima and the subsequent application of the ADS-C-based Climb and Descent Procedure (CDP). Regulatory, operational, and technological progress was highlighted, including the publication of national documentation, modernization of ATM systems for RCP/RSP monitoring, and regional coordination within the SAT framework. It was also indicated that a significant proportion of aircraft operating in Atlantico FIR already meet PBCS requirements.

8.36 The paper emphasizes that all CAR/SAM States retain responsibilities related to operational approvals, maintenance of national approval registries, notification to the Regional Monitoring Agency (RMA), and performance monitoring, irrespective of whether the concept is implemented domestically.

8.37 Cuba expressed explicit support; the United States and IATA highlighted Brazil's leadership and the importance of coordinated implementation; Panama supported the strengthening of regional awareness; while Uruguay, Ecuador, and Argentina took note without objections. No technical discrepancies were recorded.

8.38 Under paper **WP/8.24**, France highlighted concerns related to the use of barometric vertical guidance during performance-based navigation approaches. Having extensive experience with satellite-based augmentation and barometric guidance, reports that variations or mistakes in altimeter settings can create dangerous deviations from expected vertical paths during approach and landing.

8.39 A recent serious incident in major French airspace prompted renewed analysis. French investigators and air navigation authorities examined large datasets to understand how often discrepancies occur between the pressure setting selected on board and the value provided by air traffic control. The study confirmed that such inconsistencies appear regularly and may persist throughout the approach, especially when crews forget to switch from the standard pressure setting or inadvertently select an incorrect local value.

8.40 These issues affect all instrument approaches that rely on barometric information, but the operational impact is much more severe for procedures using barometric vertical guidance, since the entire descent path depends on the pressure setting. Procedures using geometric guidance, such as satellite-based

augmentation or instrument landing systems, are far less vulnerable because deviations can be detected or corrected.

8.41 As a mitigation measure, France is raising minima for barometric guided procedures and reinforcing procedures for controllers to remind crews of the atmospheric pressure earlier and more systematically. Additional studies in Europe confirm that the integrity requirements defined internationally for vertically guided approaches are not being met by barometric guided operations, while satellite-based systems remain within expected safety levels.

8.42 IATA said that the implementation of PBNs with Baro VNAV is a key element to improve safety and operational efficiency in the CAR/SAM Regions. It acknowledges the risks related to QNH insertion errors, but stresses that the use of Baro VNAV significantly reduces unstabilized approaches – the main precursor to runway excursions – decreases the risk of loss of control and contributes to mitigating CFIT precursors through better "aircraft energy management" during arrival and approach.

8.43 IATA recalled that the consideration of the SBAS in the CAR/SAM Regions has shown, over several years, aspects of unsatisfactory cost-benefit and technical infeasibility in some areas of the Region due to ionospheric issues. Therefore, IATA recommended continuing to promote the implementation of PBN based on Baro VNAV, therefore, does not recommend increasing the decision height in PBN procedures based on Baro VNAV, as this would affect the efficiency and accessibility of airports in the region.

8.44 IATA, supported by Brazil and United States, suggested applying the mitigation measures contained in recent documents and bulletins from authorities and expert groups, such as RASGPA, see link:

https://www.icao.int/sites/default/files/RASGPA/Documents/RSIA01-Altimeter-Setting.pdf

8.45 The Safety information Bulletin EASA SIB No.: 2023-03R1, was also mentioned as a part of IATA's analysis, however, the said bulletin is not intended to speak in favour or against the use of SBAS, as it does not challenge the use of any PBN approach. The SIB was amended in view of the lack of improvement in the number of occurrences related to altimeter setting error, and with a view to provide firmer actions for stakeholders to take and mitigate this issue. This SIB does not advocate either specifically the continuation of the use of BaroNAV in the long run and in fact it recommends the use of ILS, GLS, and SBAS approaches in order to remove the risk of erroneous vertical guidance, since they are not vulnerable to incorrect QNH setting errors. EASA is conducting at the moment a study within the Data4Safety program on incorrect barometric pressure settings, which should be completed by June 2026. EASA will share the result of this study with the RASG-PA/ PA-RAST in time. See link:

https://ad.easa.europa.eu/ad/2023-03R1

8.46 The Meeting recommended that CAR/SAM States adopt additional mitigation measures, such as the implementation of D-ATIS and the harmonization of transition altitudes, practices already successfully implemented in countries such as Brazil and Chile.

8.47 Under **WP/8.37** Mexico presented the Adoption of RF Legs as the default design option in PBN/RNP approaches without AR: application at Mexico City International airport (MMMX). The discussion reflected positive engagement and substantive technical inputs. Mexico presented operational evidence supporting the use of RF legs to enhance trajectory predictability and efficiency; the Secretariat noted the operational relevance and the linkage with broader regional needs, including validated FIR data, enhanced ATFM coordination and collaboration aligned with FRA and ASBU priorities.

8.48 The United States provided detailed comments recognizing the benefits of RF legs while noting fleet-equipage considerations and emphasizing that, in the near term, the FAA's default design

philosophy generally remains Track-to-Fix (TF) to accommodate the least-equipped operators in single-procedure design; this perspective was noted as valuable context for regional discussion.

8.49 Brazil supported broader use of RF legs where operationally justified, while emphasizing case-by-case safety assessment, fleet capability considerations and local operational validation. Panama recognized the benefits of RF segments in complex environments and supported progressive consideration where operationally relevant, emphasizing the value of regional best-practice exchange.

8.50 IATA recognized Mexico's progress and suggested considering A-RNP as a natural evolution, recommending transitional options and potential regional harmonization guidance under the NEOSPACE work programme, referencing experiences from Brazil and Chile. Cuba supported the suggested action; Ecuador took note; Uruguay and France indicated no comment

8.51 Under **IP/8.1**, Brazil describes the development of new airspace concepts for the Rio de Janeiro and Belo Horizonte Terminal Control Areas (TMAs), aimed at improving operational efficiency, optimizing airspace utilization, and reducing environmental impact. The initiative is part of broader airspace restructuring efforts conducted by DECEA and includes the participation of air traffic controllers, procedure designers, airspace planners, pilots, airlines, and other stakeholders of the Brazilian Airspace Control System (SISCEAB). The proposed airspace improvements are expected to enhance traffic predictability, reduce trajectory length, fuel consumption and CO_2 emissions, decrease operational conflicts between traffic flows, and align procedures with international best practices such as CDO/CCO and A-RNP operations. States took note of the information provided.

8.52 Under **WP/8.35**, Brazil exposed the developing of its national Unmanned Traffic Management initiative, known as the BR UTM Project. It describes the evolution from simple digital authorization systems toward a modern, autonomous ecosystem capable of supporting growing drone operations. The project emphasizes interoperability, equitable access, and a multi provider environment to ensure safe and efficient integration of unmanned aircraft into national airspace.

8.53 Brazil's approach is collaborative, involving regulators, industry, and academia in the design of technological, operational, and governance frameworks. The model supports emerging UTM services, facilitates interaction between manned and unmanned traffic management environments, and promotes the use of open interoperability standards to allow multiple service providers to function together under State oversight.

8.54 Brazil has strengthened its regulatory basis and adopted an innovation-oriented architecture, prioritizing transparent data exchange, safety, and sector sustainability. The paper stressed that harmonized standards and coordinated governance are essential to avoid regional fragmentation, which could impact safety and economic development.

8.55 Brazil encouraged the creation of a regional Study group to support harmonized UTM implementation across South America. It also offers its experience as a basis for regional standardization and invites States to participate in collaborative testing and future project phases.

8.56 Argentina, Ecuador, Cuba, France took note of the information provided. Panama backed the creation of a regional UTM Study Group in the SAM Region and considered early regional coordination to be critical to ensure that UTM development evolves in a manner that is harmonized with existing ATM systems and ICAO regulatory frameworks.

8.57 Secretariat reported that the ICAO NACC Office is working on this matter, initially establishing the baseline of the States of our region, in order to determine more precisely how to provide more effective support. It is recognized that more needs to be done to strengthen regional capacities and

move towards harmonized implementation. Brazil's valuable offer to contribute to the proposed regional work and, subsequently, to work to integrate these efforts into a joint CAR/SAM initiative, ensuring an aligned and coordinated regional vision, is recognized.

8.58 Under **IP/8.3** Brazil highlighted safety considerations related to the design and review of instrument approach procedures following the issuance of EASA Safety Directive SD 2025-02, which identified potential errors in the calculation of final approach minima (OCA/H) for non-precision approaches due to certain versions of the FPDAM procedure design software.

8.59 The paper explained that some States may rely on procedure design services using this software, creating the possibility that affected procedures could exist within the region. Consequently, States are encouraged to verify whether their procedure design providers use impacted versions of the software, review all non-precision approach procedures that may have been developed using these versions, issue NOTAMs when discrepancies in OCA/H values are identified, and update instrument approach charts as necessary. The paper also notes that the technical findings were validated by members of the Instrument Flight Procedures Panel (IFPP) and confirmed by the software developer, reinforcing the technical basis of the analysis. States took note of the information provided.

ATFM Implementation in the CAR/SAM Regions

8.60 Under **WP/8.2** Secretariat reported on the uneven progress of ATFM implementation in the CAR and SAM Regions. The SAM Region shows more advanced development, with automated systems, published capacity calculations, active participation in BRISA, and ongoing work on cross-border procedures. The CAR Region still faces challenges with manual processes, limited automation, data gaps, and staffing constraints.

8.61 Regional coordination is improving through mechanisms such as CADENA, BRISA, and the cross-border task group, but participation is not yet complete, which reduces the effectiveness of collaborative decision-making. Strengthening ATFM units with dedicated personnel, harmonized procedures, and consistent data sharing remains essential for achieving a fully interoperable regional ATFM service.

8.62 The discussion reflected strong engagement and general support from States and international organizations for strengthening regional ATFM implementation and CAR-SAM interoperability. Brazil, Argentina, Guatemala and Ecuador took note of the information and supported the actions described.

8.63 Panama shared their national progress to formalize the ATFM function and strengthen its FMU, including improved publication of capabilities and participation in regional tools such as CADENA, and emphasized the need for adequate resourcing and specialized training (basic/advanced ATFM and practical pre-tactical/tactical coordination) aligned with GREPECAS priorities.

8.64 CANSO provided substantive operational inputs on CADENA, including its growing multi-stakeholder community and sustained regional support to ATFM/CDM and contingency coordination, highlighting its contribution to hurricane and space-launch conferences and its role as a regional model with global reach; CANSO also noted ongoing work with the ICAO NACC Office to support CAR operational ATFM coordination for high-demand events such as the FIFA World Cup 2026.

8.65 ALTA took note and highlighted the strategic importance of ATFM for CAR/SAM operations. Overall, participants reinforced that ATFM implementation is collaborative and interregional, aligned with the GANP and the No Country Left Behind principle.

8.66 Under **WP/8.32** Brazil detailed the ongoing work to develop the SAM ATFM Portal, a collaborative web-based platform designed to support cross border Air Traffic Flow Management in the South American Region. The tool was created within SAMIG - GESEA's ATFM Subgroup and aims to improve communication, coordination, and operational efficiency among States. It enables shared access to operational, planning, and performance information relevant to regional traffic flow management.

8.67 Portal offers multiple functionalities, including real time message exchange between ATFM units, monitoring of traffic demand and capacity, tracking of performance metrics, and access to meteorological and NOTAM information. It also standardizes the publication of daily ATFM plans and serves as a regional historical database to support analysis and decision making. The system is multilingual and accessible worldwide, with certain features reserved for authenticated users to ensure secure operations.

8.68 The development and enhancement of the Portal are coordinated collaboratively by States under the guidance of the ICAO SAM Regional Office. Its implementation includes regional training, operational trials, and progressive use across participating States. The Working Paper encourages States to actively use the Portal to strengthen cross border coordination, improve situational awareness, and support major regional events, including aviation activities tied to the FIFA World Cup 2026.

8.69 IATA thanked Brazil for the support to the implementation of the ATFM SAM Portal, developed in conjunction with GESEA/SG3 – especially the Cross-Border ATFM Working Group (XB WG) – and the ICAO SAM Regional Office. The benefits of the portal will contribute significantly to the regional advancement of the ATFM. IATA requested that airlines be considered in the pre-operational phase of the portal, in order to provide suggestions from the perspective of airspace users. IATA recommended that GREPECAS include in its work programme tasks aimed at integrating the ATFM initiatives currently underway in the NACC and SAM Regions, with the aim of building on the lessons learned in each region and facilitating access to ATFM information by airspace users.

8.70 The United States expressed that, as experienced with the CADENA (COMPASS) work, the need for ATFM planning is critical for mitigating delays and enhancing situational awareness across our regions. With FIFA World Cup 2026 fast approaching and looking into the future, the United States believes that there is potential opportunity to leverage the work outlined in this working paper along with what is being done through CADENA (COMPASS).

8.71 The United States encourages ICAO along with the leadership of these two groups to work together to identify a way to potentially harmonize these efforts improving the flow of information among NACC and SAM Member States as well as all aviation stakeholders. The Meeting tasked Secretariat to push discussions on such cooperation initiatives.

ATM Contingency Activities

8.72 **WP/8.3** presented by the Secretariat provided a summary of the main activities undertaken by ICAO to address issues related to contingencies affecting air traffic management in the CAR/SAM Regions, while requesting support for the proposed harmonization activities.

8.73 In accordance with GREPECAS Conclusions and Decisions, the CAR and SAM Regions have implemented several initiatives to enhance the resilience of their air navigation systems by strengthening contingency planning and response capabilities.

8.74 Throughout 2025 and into early 2026, the CAR and SAM Regions faced contingency situations that significantly impacted air operations in the Region, some of which required a major reassessment of various ICAO-driven implementation strategies. The CAR Region faced meteorological

events that significantly impacted the aviation infrastructure of several States, in some cases successively, as occurred with Hurricane Melissa in October.

8.75 Additionally, the number of space operations in the northern part of the CAR Region has increased and is expected to continue growing with the introduction of new and more advanced vehicles, which will affect the normal flow of air traffic in the CAR and SAM Regions.

8.76 In the SAM Region, during 2025, degradations raised in ATS services in Chile, Peru, Ecuador, Panama and Suriname (contingency plan was activated), caused by temporary interruptions in ATS communications and surveillance facilities, as well as insufficient staffing of air traffic control (ATCO) personnel that generated imbalances on ATS capacity. The aforementioned States and others in the Region are executing actions to strengthen the CNS, and for the normalization of the ATCO staff. Due to the development of major military operations, the CAR/SAM Regions have been affected by limitations to the Global Navigation Satellite System (GNSS), as well as airspace restrictions due to the presence of military operations.

8.77 The WP emphasized the need to expand ICAO's contingency planning and support activities in the CAR/SAM regions, adapting them to more complex events and circumstances, and promoting multidisciplinary communication to provide up-to-date guidance and appropriate support. Due to the nature of the interaction between both regions and the flow of operations to and from North America, it is considered necessary to foster interregional coordination. Contingency planning and response remain a priority in ICAO's global implementation support initiatives. Recent events emphasize the importance of the effective integration of different state entities in contingency coordination, especially civil-military coordination.

8.78 Panama highlighted the growing complexity of events affecting ATS continuity in the CAR/SAM Regions and emphasized the need to harmonize the regional framework for contingency management. It expressed support for strengthening the systematic use of contingency matrices and bilateral contingency agreements, as well as advancing cross-border ATFM as a key measure to reduce the impact of ATS limitations. The United States underscored the importance of establishing comprehensive contingency plans to address both expected and unexpected disruptions in air traffic services. France reiterated its commitment to progress on declaring contingency plans for its territories in the CAR/SAM Regions.

8.79 IATA expresses its support for ICAO's initiatives focused on the global harmonization of guidance materials for the development and implementation of ATS contingency plans. IATA emphasizes the significance of integrating contingency planning into ATFM processes to more effectively mitigate operational impacts arising from contingency situations. Additionally, IATA notes concern regarding the need for thorough planning to avoid ATS contingency measures or strict ATFM actions, particularly those associated with human resource limitations or suboptimal resource utilization.

8.80 IFAIMA acknowledges that operational contingencies are inevitable; therefore, business continuity plans should be implemented to minimize their impact on air navigation processes. Including contingency plans in the aeronautical information publication is crucial for effective communication and for managing activation or deactivation through NOTAM. Harmonizing CAR/SAM contingency procedures would greatly improve both the safety and efficiency of operations. CANSO provided guidance material produced by this Organization for reference purposes.

8.81 The United States presented **WP/8.20** addressing the FAA response to ICAO and State requests made regarding sharing contingency routes and use of routes without surveillance and communication capabilities during past GREPECAS, NACC WG and NAM/CAR/CONT meetings. In response

to GREPECAS Conclusion 13/68, ATM CONTINGENCY PLANS FOR THE CAR/SAM REGIONS the FAA has -for many years- complied with the development and implementation of contingency plans for airspace under their jurisdiction but internal FAA policies have limited their ability to establish bilateral or multilateral agreements with neighbouring States and sharing the copy of their contingency procedures with the corresponding ICAO Regional Office.

8.82 After reviewing their Operational Contingency Plan (OCPs) and Letters of Agreements (LOAs) which contained contingency procedures and thorough and comprehensive internal collaboration regarding ICAO's request to develop contingency routes that will redirect aircraft around affected airspace, as well as being able to share these routes in advance, the United States reported that the FAA will be updating its existing policy (JO 1900.47H, Air Traffic Control Operational Readiness and Contingency Planning) to include operational contingency procedures detailed in the WP. These operational contingency procedures will be incorporated into an existing FAA policy to ensure facilities collaborate with their foreign partners in the development of these routes.

8.83 Panamá acknowledged the significance of harmonizing contingency plans as an essential factor for maintaining operational safety during periods of ATC limitations or total service interruption. Panamá expressed support for the recommended actions to revise bilateral contingency letters of agreement and concurred that the utilization of ATS routes lacking surveillance should be restricted to scenarios in which effective communications are sustained and relevant procedures are implemented by adequately trained personnel. IATA agreed that coordination of contingency procedures to ensure minimal operationality is critical for airspace users.

8.84 Although this WP was well received during the asynchronous discussion, suggested action b) is suitable for the CAR Region only. The GREPECAS endorsed this information and suggested that the pertinent actions by conducted by the NACC working groups (NACCWG).

8.85 COCESNA presented **WP/8.21** to propose the update of the ATM contingency plans of the Central American States and COCESNA, in alignment with the CAR Region ATM Contingency Plan, through the conduct of a Regional Workshop with ICAO technical support. In addition, the execution of contingency simulations is to validate the effectiveness of the updated plans and to strengthen the operational preparedness of the regional ATM system.

8.86 COCESNA and the Central American States have an ATM contingency planning framework in place to ensure the continuity of air traffic services and to maintain operational safety in situations of service degradation or interruption. This framework is supported by an existing Regional ATM Contingency Plan, complemented by ATS contingency agreements and addenda with the States.

8.87 The contingency experienced in 2025 at the CENAMER Control Centre made it possible to validate this framework and to generate lessons learned that highlight the need to update the contingency plans and associated agreements as part of the continuous improvement process. The modernization of the CENAMER Control Centre has expanded the available backup capabilities through the incorporation of the ATM Simulation and Contingency System (SIM/CONT), which features an independent technical architecture and is in immediate proximity to the CENAMER ACC, improving response times and operational transition during contingencies.

8.88 Updating the ATM contingency plans and associated agreements is necessary to take advantage of these new capabilities and ensure regional consistency. The conduct of a Regional Workshop and the execution of contingency simulations, with ICAO technical support, constitute complementary mechanisms to validate the effectiveness of the updated plans and strengthen the resilience of the regional ATM system.

8.89 Brazil endorses the initiative to update the Central American and COCESNA ATM contingency plans, acknowledging the significance of harmonized planning and regional coordination. Furthermore, Brazil emphasized the value of conducting contingency simulations with ICAO's support to validate procedures, thereby strengthening operational readiness and enhancing the resiliency of Regional ATM. Panamá, as a neighbour to the Central American FIR, recognizes the need for up-to-date contingency plans backed by ATS agreements and aligned with current technical capabilities. Panamá also supports regional workshops on contingency planning and values simulations for validating procedures, transition timing, and inter-FIR coordination during ATS disruptions.

8.90 IATA acknowledged COCESNA's leadership in strengthening the resilience of the regional air navigation system and indicated that, following the update of the regional contingency framework, COCESNA could serve as an outstanding candidate for a pilot testing project. Although this WP received only a small amount of feedback during the asynchronous discussion, the proposals submitted were thoroughly supported. IATA's suggestion to involve COCESNA and Central American States in a pilot project for the regional contingency framework is well aligned.

Search and rescue in the CAR/SAM regions

8.91 With **WP/8.4** the Secretariat provided a report on the progress of activities to support the implementation of search and rescue in the CAR/SAM regions, highlighting the importance of conducting SAR exercises as a tool for verifying the effectiveness of the response to complex situations involving aircraft in distress.

8.92 The GREPECAS/22 held in Lima, Peru, from 20 to 22 November 2024, adopted Conclusion GREPECAS/22/4 – Support for Search and Rescue Exercises, which requested the States of the CAR/SAM Regions to schedule SAR exercises to assess their coordination and response capabilities, including autonomous monitoring of hazardous situations. This Conclusion served as the basis for ICAO's support for the conduct of interregional SAREX exercises.

8.93 For the CAR Region, France conducted a large-scale SAR simulation in Martinique (SAREX PELICAN), the objective of which was to evaluate inter-agency coordination (air, sea, and land) and validate regional SAR procedures in accordance with ICAO and International Maritime Organization (IMO) standards, as described in the IAMSAR Manual (Vol. I – Organization and Management). The SAREX scenario was meticulously designed to activate and test all the protocols of the Global Aviation Distress and Safety System (GADSS).

8.94 Supported by the ICAO South American Regional Office, the Civil Aviation Authority of Colombia conducted a SAR (SAREX) exercise, named ORIÓN 2025 (Barranquilla, August 4-6, 2025). This SAREX consisted of a regional search and rescue simulation exercise that brought together representatives from Colombia, Curaçao, Jamaica, and Panama. In November 2025, Argentina conducted Exercise SAREX XII Resistencia 2025, held in the Resistencia Search and Rescue Subregion (SRS Resistencia).

8.95 From October 13 to 15, 2025, a workshop on the GADSS was held at the ICAO South American Regional Office. The workshop aimed to raise awareness among air traffic control and search and rescue centres about the capabilities of this system to improve the tracking, location, and response of commercial aircraft in distress anywhere in the world. The workshop covered the various requirements, roles, and responsibilities of all participants in the operation of this system and included a live demonstration of the Location of Aircraft in Distress Repository (LADR/S), a key component of the GADSS.

8.96 Conducting search-and-rescue exercises is highlighted as an effective way to confirm that all parts of the SAR system are functioning properly, as long as the exercises realistically represent operational conditions. It is also important to follow up on any improvements identified during these activities.

8.97 The implementation of the global distress and safety system requires coordinated participation from both air traffic service providers and search-and-rescue organizations. To support timely and effective responses, air traffic control centers and rescue coordination units must keep their information updated in the LADR/S database.

8.98 Strengthening civil–military coordination remains essential for efficient SAR operations, and efforts should continue at national and regional levels to promote integrated coordination.

8.99 The United States expressed its support to SAR exercises, which greatly benefit organizers and the region, especially with international involvement. The U.S. Coast Guard valued participating in Colombia's successful SAR exercise. Additionally, they encouraged search and rescue and air traffic services to update their contact details in the ICAO Location of an Aircraft in Distress Repository (LADR) to ensure efficient responses to aircraft in distress. Cuba reiterated its support for SAREX and conveyed its strong commitment to participate.

8.100 France expressed their support to the NACC/WG SAR/TF/6 Conclusions, emphasizing the importance of defining the SAR responsibilities and formalizing through SAR agreements to ensure clear and shared view on the SAR in the CAR/SAM region. France invited its partners to progress on the definitions of their SAR responsibilities and the signature of the SAR agreements. Panamá recognizes the value of the SAREX to evaluate interinstitutional coordination and regional interoperability, supporting GADSS implementation, adding value for civil-military coordination.

8.101 **WP/8.34** provided information on the Brazilian SAREX (Carranca) at Florianopolis Air Base in the South of Brazil, held between October 06th and 18th and the invitation to international participants for the 2026 edition, aiming international cooperation and the development of Search and Rescue services in the CAR/SAM regions. Accordingly, personnel from the various Brazilian Rescue Coordination Centres (RCCs) and Search and Rescue Units (SRUs) participated in the Exercise.

8.102 Brazil invited interested States to participate in Carranca 2026, provide suggestions and share best practices to improve future editions of the Brazilian SAREX. The Secretariat took note to support the international participation in the named event.

Communication infrastructure implementation and services

8.103 Under **WP/8.5**, presented by the Secretariat, addressed the joint progress achieved by the CAR and SAM Regions in the modernization of regional aeronautical communication networks. The paper underscored that communications constitute one of the fundamental pillars supporting ATM, AIM and MET services, enabling interoperability and ensuring that States can conduct air traffic control coordination effectively. These networks are a critical enabler for the safe and efficient provision of CNS/ATM services, supporting essential applications such as AMHS, AIDC, ATS/VoIP, and the exchange of operational data between ATS units and CNS centres.

8.104 Progress was reported on the REDDIG III project in the SAM Region and the CANSNET-NextGen project in the CAR Region, both aimed at transitioning to high-availability, multiservice IP/MPLS architectures that enhance resilience, interoperability, and interregional latency performance. The paper also emphasized the importance of ensuring operational continuity during technological transition

processes, including the temporary extension of MEVA III, the strengthening of interregional interconnection arrangements, and the update of regional and interregional contingency plans whose validation through coordinated exercises is essential for system resilience.

8.105 It was highlighted that communication infrastructure is essential to support contingency mechanisms and backup channels, and that MEVA III, CANSNET and REDDIG Member States should leverage both current and future infrastructure—including the new modern digital networks expected to enter service in 2027 to establish stronger contingency and backup capabilities, and to enable new operational services.

8.106 States and participating organizations expressed broad support for these initiatives. Uruguay, Cuba, Ecuador, Argentina, Brazil, Panama and Guatemala reiterated the strategic importance of consolidating resilient and interoperable regional infrastructures. IATA acknowledged the fundamental role of these networks as the backbone of the ATM system and stressed the need to ensure that emerging architectures support regional digitalization requirements, including B2B information exchange under the SWIM framework.

8.107 The Secretariat also stressed that while CNS experts work intensively to establish and modernize these networks, the identification of operational needs and priorities must come from ATS and operational personnel to ensure that the deployed capabilities fully respond to service-level requirements. Stakeholder engagement and the sharing of operational objectives are therefore essential to achieve efficient implementation of innovative services and to fully exploit technological advancements. All States and ANSPs were invited to share their ideas and need to take advantage of these new infrastructures.

8.108 These initiatives are fully aligned with GREPECAS Conclusion 21/06 (Update of Part III – CNS of the CAR/SAM ANP), GREPECAS Conclusion 21/09 (Actions to reinforce contingency planning in the CAR/SAM Regions), and GREPECAS Conclusion 22/5 (Harmonization of the CAR/SAM Regional ATM Contingency Framework), recognizing that REDDIG III and CANSNET-NextGen constitute strategic enabling infrastructures for CNS/ATM interoperability, operational continuity, and regional resilience, in coherence with the GANP and the valid conclusions of GREPECAS.

8.109 Under **IP/8.7** the Secretariat provided a consolidated overview of CAR/SAM joint progress (2024–2025) in Communications, Navigation, and Surveillance (CNS). It highlights modernization of regional networks (REDDIG, CANSNET), GNSS resilience and MON development, enhanced regional spectrum management through the Frequency Finder tool, and expansion of ground and satellite ADS-B. Strong cross-domain coordination among CNS, ATM, AIM, and MET ensures alignment with GANP (Doc 9750) and GREPECAS Conclusions. Interoperability efforts (GT INTEROP) advanced ADS-B CONOPS harmonization, strengthened AIDC interconnections among adjacent ACCs (currently reaching approximately 77% of planned interconnections), as well as ATM message harmonization efforts, AMHS/VoIP integration, and IWXXM implementation. Cyber resilience and contingency planning were strengthened, integrating ICAO guidance (Doc 9985, Doc 10146). Regional dashboards and GANDD updates support performance-based planning. Overall, activities reinforce operational safety, digitalization, and full CAR/SAM interoperability toward 2035. Activities were coordinated through NACC/WG, SAM/IG, and the GT INTEROP mechanisms, ensuring structured regional planning and implementation. Ecuador acknowledged and took note of the Paper.

8.110 Under **WP/8.15**, presented by IATA, addressed the implementation of Digital Automatic Terminal Information Service (D-ATIS) and Datalink Departure Clearance (DCL) at international airports in the CAR and SAM Regions. These applications are key enablers to enhance operational safety, reduce pilot and controller workload, and improve air-ground communication efficiency through data link technologies,

in alignment with the ICAO GANP and ASBU Modules (Block 0 and Block 1). Although their operational benefits and relatively low implementation cost are widely recognized, regional deployment remains limited.

8.111 D-ATIS and DCL help mitigate risks associated with misunderstandings of critical information—such as departure clearances and altimeter settings—and enhance traceability and consistency in ATS data exchanges. The working paper recalls that GREPECAS Conclusion 21/13 (Actions to advance the implementation of D-ATIS and DCL) remains valid, and that the SAM/IG has advanced this matter through Action S33/08, which requests States to develop progressive implementation plans with harmonized technical criteria.

8.112 In parallel, the CAR Region, supported by the NACC/WG, conducted an assessment to identify an airport with the appropriate infrastructure and operational capabilities to serve as a pilot site. IATA's office in Miami facilitated a coordination meeting with airlines to present the proposed testing framework. IATA, American Airlines, Delta and United expressed their expectations and confirmed their willingness to provide operational data to support the pilot. As a result of these consultations, the CAR Region selected Santa María Airport in Costa Rica as the pilot location, with testing planned for the coming months. Coordination is currently being finalized, and once the pilot concludes, the NACC/WG together with the participating airlines will assess the results and define appropriate next steps.

8.113 States and organizations expressed broad support for the initiative. The United States explicitly supported the proposed actions, while Guyana, Uruguay and Panama reported national progress or ongoing evaluations, including technical assessments and cost-benefit analyses. Panama emphasized the importance of a progressive and harmonized approach based on technological maturity and operational needs.

8.114 Under **WP/8.18** United States exposed the pending improvements to FAA managed Caribbean airspace were discussed with broad support and constructive engagement. The NACC Office welcomed the U.S. initiative and highlighted complementary regional work to strengthen infrastructure and operational resilience in the CAR Region, including CANSNET surveillance data-sharing and backup mechanisms, updates to CAR contingency plans through the Communications Task Force, and a developing regional ADS-B project through the NACC/WG and ECAR/CAT Surveillance Task Forces; coordinated efforts with FAA support were encouraged. Cuba supported the actions described and noted ongoing harmonized coordination with the FAA (Miami and Houston ACCs). IATA recognized U.S. leadership under the Caribbean Call to Action (CCTA) and inquired whether the technical improvements described are expected to be accompanied by future operational and ATC capacity improvements to meet projected demand.

8.115 Under **WP/8.19** United States presented the new air traffic control system. The Secretariat provided recommendations based on regional lessons learned, emphasizing early planning for interoperability between control centers, strengthening voice/data backup channels with CAR States, exploring configurable surveillance data sharing where feasible, integrating data analytics and AI capabilities to support regional KPIs, and ensuring alignment with the GANP and ASBU evolution. The United States acknowledged these recommendations and indicated they would be shared with the program management team.

8.116 France expressed willingness to share its modernization experience with the FAA to promote a common understanding of safety and security issues. Cuba supported the actions described and noted ongoing coordination with the FAA (Miami and Houston ACCs). IATA and ALTA welcomed the information and recommended its use as input for regional strategic planning, stressing consideration of regional operational requirements and appropriate cost-benefit analysis. Panama highlighted the relevance

of these initiatives to CAR/SAM operational interfaces (surveillance, ATFM, automation, data exchange and continuity).

8.117 **WP/8.33** presented by Brazil addresses the implementation status of FANS 1/A CPDLC in Brazilian continental FIRs above FL245, where the service has been fully operational since November 2024. However, effective operational utilization remains below 15% of aircraft operating in upper airspace, limiting the realization of benefits such as reduced controller and pilot workload, improved communications performance, potential capacity gains, and enhanced operational safety.

8.118 The WP identifies as the primary factors the limited proportion of FANS 1/A-equipped aircraft, particularly within domestic fleets, as well as deficiencies in the correct declaration of CNS capabilities in Items 10 and 18 of the ICAO flight plan in accordance with Doc 4444. It emphasizes that a coordinated regional effort aimed at raising operator awareness and harmonizing flight plan filing practices would contribute to maximizing CPDLC operational benefits and support the evolution of the regional ATM system in line with the GANP and ASBU framework.

8.119 The United States expressed explicit support and recognized Brazil's leadership. Cuba supported the suggested actions, while Ecuador, Argentina, and Uruguay took WP without objection. Panama emphasized the importance of progressive implementation based on regional interoperability and measurable results. IATA supported the initiative, noting that full benefit realization in continental environments requires progressive adoption and cost-benefit analysis.

8.120 During the NACC/WG/10 meeting, the importance of developing a regional CPDLC implementation strategy was recognized, with current work underway in the oceanic areas of the United States, the Central American FIR, Curaçao, and Trinidad and Tobago. A regional project was proposed to strengthen ADS-C/CPDLC communications and surveillance, reduce reliance on HF communications, optimize air traffic management in oceanic and long-range routes, enhance operational safety, and improve efficiency in separation and airspace management providing direct benefits to air operators and air navigation service providers. In addition, regional infrastructures in States that already have CPDLC oceanic operations are being analyzed to support the development of a continental CPDLC trial.

8.121 Under **IP/8.5**, Brazil referred to the progress of the implementation of the ATN-Br (Air Traffic Network – Brazil), an aeronautical communications infrastructure based on the IP suite and Software Defined Network (SDN) architecture, designed to support critical CNS/ATM services, including VHF voice communications, radar data transfer, and migration from AFTN to AMHS.

8.122 It was reported that ATN-Br is operational at the Recife and Curitiba ACCs — including the Rio de Janeiro-Sao Paulo corridor, which accounts for approximately 50% of national air traffic -and that its implementation is expanding toward Brasilia ACC. The architecture incorporates the multilink concept in accordance with Amendment 93 to Annex 10, Volume III, enabling dynamic and prioritized use of multiple media (MPLS, satellite and other IP links), with automatic selection based on Quality of Service (QoS) parameters (delay, jitter and packet loss), ensuring high availability through automatic switching ("brown-out") mechanisms. The migration of legacy E1 links to a second redundant MPLS network is also highlighted, as well as the evaluation of LEO satellite technologies for remote stations.

8.123 This initiative has significantly increased the resilience and operational flexibility of Brazil's CNS system, as demonstrated during contingency events such as the floods in Rio Grande do Sul in 2024, when ATS services were remotely reconfigured, ensuring operational continuity.

Navigation infrastructure implémentation and services

8.124 Under the **WP/8.6** the Secretariat reported joint CAR/SAM progress (2024–2025) on GNSS-based navigation under GREPECAS Conclusions 21/10 and 21/12. It focuses on strengthening resilience against GNSS interference (jamming/spoofing) and ensuring service continuity. Key actions include monitoring and mitigating RFI, progressing toward the development of a regional MON framework based on VOR/DME., and enhancing regional coordination. The Frequency Finder tool has been consolidated to support aeronautical spectrum protection. The NACC/SAM Radio Navigation Workshop (Mexico City, Sept 2025) reinforced consensus on RFI reporting, MON maintenance, GNSS authentication (OSNMA, SBAS, ARAIM), and WRC-27 spectrum protection. Regional cooperation with FAA, EUROCONTROL, COCESNA and others strengthened technical alignment. ICAO's Global Roadmap milestones (2025–2035) guide future GNSS authentication and DFMC implementation. The paper invited continued CAR/SAM joint activities in 2026, and regular reporting aligned with GANP (Doc 9750) ASBU priorities related to CNS resilience and PBN continuity.

8.125 Participants provided comments on the joint CAR/SAM advances in air navigation, particularly regarding GNSS resilience and the development of a regional Minimum Operational Network (MON). Besides, the paper outlines Secretariat activities supporting States in mitigating GNSS interference and developing a regional MON, in response to requests from States and IATA. States are encouraged to support the proposed actions.

8.126 States expressed support, highlighting the importance of GNSS resilience, RFI reporting procedures (Doc 9849), MON implementation, spectrum protection, and preparation for WRC-27. IATA supported the initiative and requested that its recommendations (NE 8.16) be reflected in the CAR/SAM MON guidance, emphasizing rationalization of ground-based aids, cost efficiency, multi-domain impact (CNS/ATM), and broader stakeholder participation.

8.127 The Secretariat acknowledged these comments and confirmed that MON guidance is being developed in alignment with ICAO provisions, incorporating GNSS interference mitigation, operational continuity, infrastructure optimization, and international best practices.

8.128 Under **WP/8.16**, presented by IATA, addresses the sustained increase in Global Navigation Satellite System (GNSS) radio-frequency interference (RFI) events and highlights the urgent need to strengthen CNS system resilience through the development of Minimum Operational Networks (MON) in the CAR/SAM Regions. The paper underscores that GNSS is a fundamental enabler for Performance-Based Navigation (PBN), ADS-B surveillance, Flight Management Systems (FMS), and multiple airborne systems, and that the degradation or loss of GNSS signals caused by jamming or spoofing represents a growing and persistent operational safety risk. Data presented indicates a significant rise in GPS signal loss events in recent years, including occurrences reported within FIRs of the CAR/SAM Regions.

8.129 The working paper stresses that the implementation of a MON—based on the preservation, rationalization, and optimization of conventional navigation aids (VOR, DME, ILS), together with harmonized contingency procedures—constitutes an effective mitigation measure. In this context, the paper proposes that GREPECAS include in its work programme the development of harmonized regional guidance material, taking into account ongoing activities within the NACC/WG and SAM/IG, as well as best practices developed by Brazil, EUROCONTROL and other international organizations. The subject matter is aligned with Decision GREPECAS/21/24 (GNSS A2 Augmentation Updates), Conclusion GREPECAS/21/09 (Strengthening Contingency Plans), and Conclusion GREPECAS/22/5 (Harmonization of the CAR/SAM Regional ATM Contingency Framework), given that GNSS resilience and MON constitute essential components of the regional CNS/ATM contingency architecture and the CNS planning elements of the CAR/SAM ANP.

8.130 In complement to these considerations, both the CAR and SAM Regions currently have parallel projects underway for the development of a MON proposal. The initial objective is for each region to develop its own independent proposal in Phase 1, which will subsequently be reviewed and approved at the regional level. In Phase 2, both regions will integrate the information into joint CAR/SAM regional guidance material. For the CAR Region, the first draft is planned for completion by July 2026, to be presented to the SAM/IG and the NACC/WG as scheduled.

8.131 Furthermore, a NAM/CAR/SAM workshop held in September 2025 provided all States in both regions with concrete tools and methodologies to identify GNSS interference events, analyze their operational impact, and apply the appropriate mitigation measures. This workshop constituted a key regional milestone in fostering a harmonized approach to GNSS interference monitoring. States are encouraged to review the material provided, ensure that the personnel who participated in the workshop lead this activity within their respective administrations, and directly engage with the ICAO CAR and SAM Regional Offices should they require additional support.

8.132 The Secretariat also informed that ICAO is jointly coordinating with Headquarters in Montréal a NAM/CAR/SAM event to be held in Lima (August–September of this year) to further address MON development, GNSS interference mitigation, and aeronautical frequency management issues in support of regional CNS/ATM resilience.

8.133 States and organizations expressed broad support for the proposal. The United States, Argentina and Cuba explicitly endorsed the initiative, while Panama, Ecuador, Uruguay and France acknowledged the operational relevance of reinforcing GNSS resilience. COCESNA and ALTA also supported the proposed approach.

8.134 Working Paper **WP/8.38** presented by Argentina addressed the evolution of Global Navigation Satellite System (GNSS) interference events in the SAM Region during the period January 2025 to January 2026.

8.135 The WP provided a comparative analysis based on open-source ADS-B derived data, including GPSJAM and Stanford University platforms. The maps included in the paper (pages 4 to 6) illustrate jamming and spoofing patterns affecting specific sectors, including sectors of the South Atlantic.

8.136 While the regional impact remains relatively limited, the geographical expansion of events over the analysed period justifies strengthening monitoring mechanisms and enhancing analytical capabilities at the regional level. The WP emphasized: the need to advance toward standardized regional data collection tools; the development of coordinated preventive and corrective measures; the possible establishment of a regional GNSS event repository; the importance of maintaining conventional CNS capabilities (VOR/DME, DME-DME, radar) as contingency measures. llustrative national examples include DME-DME coverage assessments using EUROCONTROL’s DEMETER tool.

8.137 Brazil, Cuba, Panama, Uruguay, Ecuador, and Argentina expressed support for the recommendations, highlighting the importance of strengthening GNSS resilience and improving regional information exchange mechanisms. IATA indicated its willingness to actively collaborate in the proposed actions. The United States supported the initiative and noted its alignment with international efforts related to spectrum protection and CNS resilience.

8.138 The Secretariat recommended that States begin carrying out these activities within their own operations, and a good practice would be to provide the necessary mechanisms perhaps through the ICAO NACC and SAM Regional Offices to share lessons learned and open forums in which we can exchange information among States. Note is taken of suggestion “b” from Argentina’s paper, which will be jointly addressed by CAR and SAM to make it possible.

Surveillance infrastructure implémentation and services

8.139 Under the **WP/8.13** The Secretariat reported CAR/SAM joint progress (2024–2025) in surveillance under GREPECAS Conclusions 21/11 and 21/21. Significant expansion of ground-based and satellite-based ADS-B has been achieved across both regions. A regional ADS-B performance monitoring tool is being developed to assess coverage, redundancy, data quality, and KPIs, led by FAA, IDAC, and COCESNA, with additional State participation. Mexico, COCESNA, and Central America completed ADS-B installations, with mandates effective January 2025.

8.140 Workshops addressed technical integration, ASTERIX CAT021, advanced monitoring techniques, and REDDIG infrastructure support. GNSS resilience is recognized as critical for ADS-B continuity, given interference risks. The paper invites continued interregional cooperation in 2026 to strengthen surveillance performance and operational safety.

8.141 The Secretariat appreciates IATA's constructive comments regarding ADS-B implementation and regional harmonization. In the CAR Region, an airline survey was completed in 2024, and the statistical analysis for the entire Region was finalized and shared with all airlines in September 2024.

8.142 Ten CAR States have implemented ADS-B as support to their existing surveillance infrastructure without imposing additional equipment costs on airlines. Similarly, several SAM States are advancing implementation under the same approach. The operational benefits of ADS-B in both Regions are being actively assessed by the respective operational groups, with the objective of delivering tangible improvements to airspace users, including the implementation of more efficient and direct airways.

8.143 The Secretariat takes note of the importance of continuing to support the operational groups in order to achieve the benefits provided by surveillance systems, aimed at enhancing operational efficiency and safety.

8.144 The United States, Ecuador, and ALTA took note of the paper. Argentina, Costa Rica, Guatemala, and Panama supported the proposal and the ADS-B Tool project. Panama further stressed interoperability, data quality (ASTERIX CAT021), GNSS resilience, and continued CAR/SAM technical cooperation in 2026.

8.145 The Meeting was invited to take note of the information presented and to support the development of the regional ADS-B Tool.

8.146 Under **IP/8.8** presented by Argentina reports on the progress of the national Air Traffic Surveillance modernization programme led by EANA S.A., with participation from national industry, particularly INVAP S.A.U. The programme encompasses the progressive renewal of surveillance sensors through: upgrade of Monopulse Secondary Surveillance Radars (MSSR) with Mode S and ADS-B capability; deployment of standalone ADS-B ground stations; implementation of multi-sensor surveillance systems; in compliance with ICAO SARPs and aligned with the Global Air Navigation Plan (GANP).

8.147 Currently, ten RSMA-S/A systems with ADS-B capability, five standalone ADS-B stations, and new en-route and terminal multi-sensor systems have been installed and commissioned. These are supported by technical personnel training and full integration with ATM systems across the five national ACCs. The Information Paper also highlights the development and certification process of nationally manufactured ADS-B receivers in accordance with EUROCAE ED-129B specifications, including laboratory testing and operational validation, contributing to progressive technological autonomy in aeronautical surveillance systems.

8.148 Brazil presented **IP/8.4** updating the ongoing modernization of its air traffic surveillance infrastructure through the deployment of ADS B and Multilateration technologies, in alignment with ICAO standards and the Global Air Navigation Plan.

8.149 In oceanic areas, Brazil is expanding ADS B coverage across major offshore oil basins and plans to introduce additional land based and maritime stations in the coming years, with the intention of establishing a future equipage requirement for operations in that environment.

8.150 Within continental airspace, Brazil has already advanced through multiple stages of its ADS B implementation, establishing wide in route coverage at higher flight levels while retaining radar systems to ensure service continuity during the transition.

8.151 The State also outlined plans to implement Multilateration in the Porto Alegre terminal area, intended to enhance surveillance resilience and maintain operational continuity in the event of radar outages at lower altitudes. Brazil highlighted several lessons learned, stressing the importance of robust telecommunications infrastructure, reliable power systems, and adequate grounding arrangements to ensure the integrity and reliability of surveillance services across a large and diverse territory.

Implementation of Meteorological Services

8.152 Under **WP/8.8** Secretariat outlines recent progress in aeronautical meteorology across the Caribbean and South American regions, emphasizing expanded training, improved coordination, and the dissemination of new ICAO meteorological provisions. Regional and national workshops strengthened severe weather monitoring, volcanic ash surveillance, and aerodrome meteorology.

8.153 Efforts continue to harmonize foundational air navigation elements, modernize digital meteorological information exchange, and improve SIGMET coordination between neighboring regions. Quality management practices have advanced in several States, although staffing shortages and cross-border harmonization remain key challenges.

8.154 Cooperation with the global meteorological community has deepened through expert teams and aircraft-based observation programs, supporting modernization and interoperability. The earlier regional conclusions and decisions remain in effect, and States are encouraged to continue strengthening digital, harmonized, and resilience focused MET services.

8.155 Secretariat took note of the comments provided by the States of Argentina, Cuba, Ecuador, Guatemala, the United States, France, Panama and Uruguay, as well as by IATA, in its capacity as the representative of airspace users, who agreed on the need to strengthen the implementation and verification of the Basic Building Blocks (BBBs) of MET services, recognizing that the quality and accuracy of critical products such as TAF and METAR, among other MET services, depend directly on the robustness of these elements.

8.156 In this context, it is reaffirmed that Conclusion 22/10 remains valid as a regional framework for the periodic verification of BBBs and for its contribution to operational safety. Likewise, the importance of articulating the BBBs with Quality Management Systems (QMS) was highlighted, as a key enabler to improve the consistency, reliability and operational performance of MET services in support of air operations in the CAR/SAM Regions, acknowledging the work of the COMM/TF in support of IWXXM implementation.

8.157 The discussions underscored the relevance of the progressive implementation of IWXXM as an enabler of the SWIM environment and the transition toward FF-ICE, as well as the strengthening of

meteorological watch within FIRs and the harmonized coordination of SIGMET, and the adoption of the multi-hazard approach (MHEWS) to enhance resilience to severe meteorological phenomena and climate variability. It was also noted that the shortage of Aeronautical Meteorology Personnel constitutes a regional challenge requiring sustainable capacity-building strategies.

8.158 Finally, taking note of the support expressed for the paper and the recommended actions, the Secretariat considers that Conclusions 22/9 and 22/10 remain valid, supporting the continuity of coordinated work in MET matters in the CAR/SAM Regions.

8.159 With **WP/8.36**, the meeting was informed on the initiative presented by Mexico to promote regional collaboration through the Tulum Meteorological Watch Office (MWO-Tulum), highlighting its strategic value for IWXXM implementation, tropical cyclone monitoring, and capacity building.

8.160 In this context, Cuba informed that its air navigation service provider (ECNA) is coordinating with SENEAM for the signing of a memorandum of understanding. Panama recognized the strategic location of MWO-Tulum for the surveillance of severe meteorological phenomena and expressed interest in exploring mechanisms for technical cooperation, data exchange, and capacity strengthening. The Bahamas expressed appreciation to Mexico and supported the initiative as an opportunity for regional harmonization and professional development. Ecuador and Uruguay noted the proposal.

8.161 The United States thanked Mexico and expressed its interest in collaborating with MWO-Tulum through actions under the MET/TF and COMM/TF, including IWXXM testing, training programs through WMO and the International Training Desk, and the development of a regional platform for SIGMET coordination in collaboration with the Washington VAAC, which will soon be available to CAR/SAM States.

8.162 The Secretariat reiterates its invitation to States to take the necessary steps to participate in technical cooperation, information exchange, or training activities related to this initiative.

8.163 Brazil, through the **IP 8.6**, provided an update on the implementation of the Tropical Cyclone Advisory Center (TCAC), following the approval of its candidacy during the 42nd ICAO Assembly. The initiative aims to address an existing gap in the global meteorological watch system by establishing a TCAC responsible for monitoring tropical and subtropical cyclones in the Western South Atlantic. The implementation is being led by DECEA through CIMAER, in coordination with national meteorological institutions, with the goal of achieving full operational capability by December 2026. Ongoing efforts include developing the operational model for tropical cyclone monitoring and establishing the workflow for issuance of Tropical Cyclone Advisories (TCA)

8.164 To support accurate forecasting, Brazil is advancing specialized training programs for meteorologists and technicians, ensuring the staff can detect precursor systems, classify tropical cyclones, and follow international protocols. Significant investments are being made in Numerical Weather Prediction (NWP) capabilities, including the integration of cyclone tracking modules into the MONAN model developed by INPE/CPTEC, and the acquisition of global high-resolution datasets from ECMWF. The implementation also relies on a multi-institutional coordination framework involving CIMAER, the Navy's Hydrographic Center (CHM), INMET, and INPE, ensuring operational synergy. Brazil is additionally working with the WMO to secure the inclusion of "TCAC Rio de Janeiro" within the Tropical Cyclone Programme (TCP)

8.165 Regionally, the TCAC is expected to significantly enhance the consistency and timeliness of cyclone advisory information for aviation across the ICAO SAM Region, improving coordination among Meteorological Watch Offices and supporting harmonized decision-making processes. Early awareness among States is considered essential to ensure the seamless integration of TCAC products into national meteorological and ATM infrastructures. By advancing meteorological monitoring capabilities, strengthening institutional collaboration, and investing in forecasting technologies, Brazil confirms its

commitment to aviation safety and fills a long-standing operational gap in South Atlantic cyclone surveillance (watch).

8.166 The Secretariat thanked Brazil for the information shared and the actions implemented for the operation of the Atlantic Tropical Cyclone Advisory Centre (TCAC). Finally, the Secretariat also informed that these actions by GREPECAS are included under Decision 22/11 – Regional Agreement for the Implementation of a Tropical Cyclone Advisory Center (TCAC).

Implementation of Aeronautical Information Management

8.167 Under the **WP 8.9,** Secretariat presents an overview of progress, challenges, and priority implementation areas for Aeronautical Information Management (AIM) in the CAR/SAM regions, aligned with ICAO's AIM Roadmaps of 2009 and 2021. It highlights the importance of AIM as a foundation for safe, efficient, and interoperable air navigation, emphasizing its role as an enabler for SWIM. The document reports on follow up actions by the CAR and SAM Secretariats, including the implementation of Digital Data Sets (DDS), e AIP data exchange models, and monitoring of foundational Building Block (BBB) elements. It summarizes discussions from AIM/TF meetings, advancements in competency-based training (CBTA), progress toward Quality Management System (QMS) certification in both regions, and efforts to reduce inconsistencies in flight plan (FPL) data through a dedicated subgroup.

8.168 The paper also outlines regional advancements such as SWIM implementation roadmaps, enhanced AIM training under ICAO SIP projects, and the status of digital data set publication, noting limited progress in the SAM region except for Peru, which expects to complete its e AIP in 2026. It presents AIM targets for 2028, including 100% compliance with Annex 4 and 15, AIRAC adherence, QMS certification, full WGS 84 implementation, and significant progress toward digital data sets and aerodrome mapping databases. The discussion emphasized the need of completing Phase 2 of the AIS to AIM transition and building the necessary competencies and electronic information management capabilities to enable SWIM.

8.169 IFAIMA emphasizes the need to update the AIS to AIM roadmap with realistic timelines, noting that several States remain in Phase 2 due to economic constraints. It stresses that no State should be left behind, as uneven progress could undermine AIM interoperability and safety, and highlights the importance of competency-based training (CBTA), strengthened quality management systems, and enhanced technical skills for AIS/AIM personnel. States agreed with the proposals for the AIS -to-AIM roadmap.

8.170 IATA acknowledges regional efforts toward AIM transition and highlights several urgent AIM deficiencies affecting safety and efficiency—such as AIRAC cycle deviations, lack of trigger NOTAMs, absence of AIPs in English, and limited digital AIP availability—recommending these issues be prioritized by NACC and SAM implementation groups. IATA also calls for expanding the SWIM roadmap to include the SAM Region and requests better coordination on flight plan error reduction initiatives.

8.171 The United States supports the recommended actions except 4.1(d), explaining that FAA's existing training and credentialing system better fits its specific AIS workforce needs, and endorses expanding the subgroup's work to address regional requirements for TBO and FPL 2034. The Secretariat indicated that the proposed training and accreditation guidance is not intended to replace or impose existing national schemes, but rather to serve exclusively as a reference for States, to support the identification of topics of greatest relevance and impact in the AIM domain. Likewise, it seeks to prioritize competency-based instruction and assessment, aligned with the specific functions and responsibilities of

each operational environment, allowing States to adapt its application in accordance with their own needs and regulatory frameworks.

8.172 In general, the State supports competency-based AIS/AIM training aligned with Doc 9991 and the development of a regional implementations support plan, recognizing human capacity development as essential for AIM and SWIM.

8.173 Regarding the deficiencies indicated by IATA, the AIM working groups in both regions continue working to urge their resolution, achieving progress but not yet 100%. The secretariat evaluated IFAIMA proposal concerning updating the AIS-to-AIM Roadmap. Secretariat took note and was committed to foster a discussion on this matter during the presential meeting, in order to define feasibility of submission of the proposal to the Air Navigation Commission for the review and update of the roadmap, specifically regarding the timeline and phases for the implementation.

8.174 Under **WP/8.10** Secretariat highlighted SWIM as a key enabler for ATM modernization, interoperability, and efficiency in the CAR/SAM Regions. The paper stressed the need for alignment with ICAO's three pillar - standards, infrastructure, and governance—and called for a harmonized regional approach, interoperable registries, and strong cybersecurity, while also referencing relevant ICAO guidance and outcomes from the 42nd ICAO Assembly on the subject.

8.175 During the asynchronous review, the WP received broad support from Argentina, ahamas, Belize, Brazil, Costa Rica, Cuba, Ecuador, the United States, France, Guyana, Panama, Uruguay, ALTA, IATA, and IFAIMA. CANSO provided a notable contribution by sharing its SWIM Implementation Kits.

8.176 Additionally, IATA noted that the AIM SWIM Implementation Checklist developed by the NACC AIM/TF (appended to the WP) should be expanded to incorporate the SAM Region within the GREPECAS framework and should include technical (e.g., B2B networking) and operational elements supporting MET and FF ICE/TBO. The Secretariat clarified, concerning to IATA comments, that these aspects are already being addressed in the SAM Region under the SAM/IG framework through GT Interop and the specialized MET (IWXXM) and AIM (DDS) groups and the interoperability, B2B, and operational components related to SWIM/FICE/TBO are currently under development; The Secretariat also indicate, when necessary, coordination will be established with the NACC Office to ensure regional harmonization and prevent duplication of efforts.

8.177 SWIM is widely recognized as essential for standardized digital information exchange, and Brazil stressed the need for a federated regional SWIM registry along with clear definitions of governance, data ownership, interoperability, and cybersecurity to support regional integration.

8.178 Overall, the WP received consensus from participants, who acknowledged that the implementation of SWIM should progress in a phased, sustainable manner aligned with each State's technical capabilities and resources and framed within a coordinated regional strategy.

8.179 Following these discussions a draft Conclusion was adopted:

DRAFT CONCLUSION GREPECAS/23/07	**SWIM IMPLEMENTATION FOR THE CAR/SAM REGIONS**		
What:			**Expected impact:**
	That: a) The NACC and SAM Regional Offices establish a CAR/SAM regional SWIM working group, including all relevant stakeholders, to: i Plan the deployment of "CAR/SAM SWIM" under a common governance structure; ii Implement an interoperable regional SWIM Registry, considering feasibility of applying a Federable* architecture; iii Define Service Definitions/Descriptions (AIM/MET/ATFM/FF-ICE) and AIXM/FIXM/IWXXM, among other models. iv Integrate Security by Design measures, including authentication/authorization, encryption, network segregation, access control, and vulnerability management. b) States and industry stakeholders support and actively contribute to the progress of the regional SWIM working group, in accordance with their respective roles and capabilities c) The expanded SWIM implementation checklist be made available as a voluntary reference tool for States, as appropriate; and d) That the NACC and SAM regional offices establish coordination to avoid duplication of efforts and ensure regional coherence in planning and implementation related to SWIM		☒ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Operational/Technical
Why:			
	Establish a dedicated regional task force to define regional roadmaps, architecture models, and SWIM service definitions; and b) To strengthen integration among States and acknowledging the complementary roles of industry and international organizations—as industry representatives, technical facilitators, and promoters of interoperability— in ensuring the effective and harmonized implementation of System Wide Information Management (SWIM) in the CAR/SAM Regions as a platform for several enablers such as FF ICE.		
When:	GREPECAS/24	**Status:**	☒ Valid / ☐ Superseded / ☐ Completed
Who:	☒ States ☒ ICAO ☒ Others:	States, Industry and international organizations	

* NOTE: "Federable" is a term used (by analogy with federated systems) to describe a 'federated' architecture in which multiple States or regions operate under common standards and interfaces that enable interoperability and the exchange of information/services, while each participant retains autonomy and control over its own data, systems, and infrastructure (without centralizing them on a single platform).

8.180 Working Paper **WP/8.14**, presented by IATA, addresses the adoption of international best practices in the filing and processing of the Flight Plan (FPL 2012) as a transitional measure toward the implementation of the FF-ICE (Flight and Flow Information for a Collaborative Environment) concept, whose global adoption is foreseen no later than 2034.

8.181 The paper highlights the importance of progressively advancing toward FF-ICE through harmonization of flight plan practices, while emphasizing the need to ensure alignment with ICAO global provisions and coordination with existing regional groups.

8.182 The paper highlights structural limitations of the FPL 2012 format in terms of rigidity, interoperability constraints, and fragmented processes, which affect data quality, operational efficiency, and coordination among ATM stakeholders.

8.183 It proposes the harmonization of regional practices in the CAR/SAM Regions, including delegation to operators for flight plan generation and updates, harmonized treatment of destination alternates (DEST ALTN), consistent application of ICAO Doc 4444 provisions concerning Item 19, and strengthened feedback mechanisms between ANSPs and operators. The paper emphasizes that several of these improvements could be implemented through regulatory and procedural harmonization without requiring significant investment in new systems

8.184 States and organizations expressed differentiated technical positions. The United States and IATA supported strict application of Doc 4444 provisions, including the non-systematic transmission of Item 19. Other participants, including the Secretariat and regional organizations, indicated that Item 19 fulfills relevant operational functions, particularly in Search and Rescue (SAR) and emergency management, and that any modification would require careful technical assessment.

8.185 Brazil highlighted that transition mechanisms toward FF-ICE are already under development within the SAM/IG and GESEA SG4 frameworks, emphasizing the importance of avoiding duplication of regional structures.

8.186 The proposal is aligned with: GREPECAS Conclusion 22/2 (Progress in the development of Volume III of the CAR/SAM RANP), insofar as improvements in flight plan data quality and interoperability contribute to regional performance management; GREPECAS Conclusion 21/06 (Update of Part III – CNS of the CAR/SAM ANP), given that FF-ICE constitutes a digital enabler of the CNS component; and GREPECAS Conclusion 21/23 (Support to the GREPECAS GTE), in relation to enhancing the quality and consistency of flight plans as a key element to reduce operational deviations and strengthen safety performance.

8.187 **WP/8.25**, presented by Brazil, addressed the global status of implementation of Flight and Flow Information for a Collaborative Environment (FF-ICE/R1) services and the associated challenges for the SAM Region.

8.188 The paper emphasized that FF-ICE constitutes a key element of the GANP, aimed at progressively replacing the ICAO FPL 2012 format prior to its planned global discontinuation by 2034. The implementation of FF-ICE/R1 enables early and standardized exchange of operational intent, enhanced automation capabilities, and strengthened collaborative decision-making (CDM).

8.189 It was reported that several Regions and States — including EUROCONTROL, Canada, and States in the APAC Region — have initiated implementation programmes between 2025 and 2032. Within

the SAM Region, GESEA Subgroup 4 (SG4) was established to coordinate the implementation of GANP FICE elements, including AIDC enhancement, FPL 2012 transition, system interoperability, and information governance.

8.190 Brazil presented concrete progress through the FF-ICE BR Project under DECEA's SIRIUS Programme, including development of a National Operational Concept, establishment of a dedicated FF-ICE portal, and organization of technical workshops in November 2025, which may serve as regional references.

8.191 The Working Paper identified relevant technical challenges, including global API harmonization, alignment with FIXM, SWIM integration, incorporation of ATFM services, cybersecurity considerations, and information architecture governance. Chile expressed explicit support for the initiative. ALTA, IFALIMA and other participants took WP of the information presented and emphasized the strategic relevance of modernizing flight plan systems in accordance with international standards.

AGA Implementation

8.192 Under **WP/8.11,** Secretariat reported on the progress of aerodrome related projects in the CAR and SAM regions and proposes shifting them into a newly updated GREPECAS programme structure. Aerodrome certification continues to advance in both regions, though full certification has not yet been achieved. Updated work programmes, new staff support, and regional dashboards are helping improve monitoring and decision making. Guidance material on Airport Advisory Committees was completed, leading to the closure of the aerodrome planning project, with future planning activities to be handled directly by the regional offices.

8.193 For the ACDM–related project, the focus is being redirected toward strengthening surface movement guidance and control as a prerequisite for broader collaborative decision making improvements. Relevant ICAO provisions and manuals are identified as references for States and operators. The paper recommends transitioning these projects into the new GREPECAS programme structure, aligning work with updated strategic objectives, and improving multidisciplinary participation.

8.194 The Secretariat noted that the discussion on WP/8.11 showed overall support for the update on the AGA Programme projects in the CAR and SAM regions and for the proposed transition of the current projects to the new GREPECAS programme/project framework (refer to WP 7.1). The paper recalls the scope and status of F1 (Aerodrome Certification and Safety), F2 (Airport Planning) and F3 (Paving the future ACDM through Apron Management and SMGCS), and proposes: migration of F1 to the new framework, closure of F2 following delivery of the Airport Consultative Committees guidance, and migration of F3 to a new project aligned with the new GREPECAS structure, with SMGCS implementation prioritized as a foundation for future collaboration concepts.

8.195 Comments during the virtual phase broadly acknowledged the information and proposals, while emphasizing: the need to complement certification progress metrics with effective oversight quality considerations; the importance of maintaining continued follow-up on airport planning even after formal project closure, to keep it connected to air navigation planning; and that implementation of SMGCS/ASMGCS and apron management should be preceded by robust cost benefit and risk based assessments, recognizing that such solutions may be applicable only to a limited number of airports, while remaining critical for key nodes in the regional network.

8.196 The Secretariat took note of these points and reiterated that certification efforts support progressive infrastructure/process improvements and should be implemented through coordinated, risk-

based approaches with stakeholders, while airport planning actions would continue through regional activities under ICAO work programmes.

8.197 Under **WP/8.17** IATA introduced a toolkit designed to help airports implement A-CDM in a consistent and collaborative way. Although GREPECAS shifted its focus toward apron control and SMGCS, some States in the region are already implementing or planning to implement A-CDM, so the toolkit is shared as support material.

8.198 It highlighted that apron control and SMGCS are ICAO standards and that any upgrades should be justified through appropriate business cases. The document explains that A-CDM improves predictability and efficiency by enabling real-time information sharing among all airport stakeholders. It stresses that successful implementation requires cultural change, clear operational concepts, proper system specification, training, strong communication, and a coordinated transition phase.

8.199 The Meeting encouraged business cases for SMGCS and apron control improvements and consider the IATA toolkit—especially its guidance on critical elements and challenges. The discussion showed broad acknowledgment of the information presented in the working paper. Several States, including Argentina, Cuba, Ecuador, Uruguay, Panama, the United States, and ALTA, indicated that they took note of the content without proposing amendments. Panama additionally expressed support for considering the material as technical guidance, emphasizing the need to respect regional flexibility and GREPECAS prioritization.

8.200 From the Secretariat's perspective, it was noted that the IATA work related to the IATA A CDM Toolkit is appreciated, and that although the related GREPECAS project shifted its focus toward SMGCS implementation as a foundational element of A CDM, several airports in the region are already progressing with A CDM implementation. The Secretariat highlighted the importance of collaboration and cooperation among stakeholders, consistent with IATA guidance.

Environmental benefits from ANS

8.201 Under **WP 8.12** Secretariat outlined the key environmental outcomes of ICAO's 42nd Assembly, including Resolutions A42-21 and A42-22, and highlights the integration of environmental sustainability and climate resilience into ICAO's 2026–2050 Strategic Plan and the 8th edition of the Global Air Navigation Plan (GANP). It stresses that GREPECAS/22 identified operational improvements—such as more direct routes, CCO/CDO procedures, and enhanced ATFM—as the most immediate means to support the Long-Term Aspirational Goals (LTAG) for reducing aviation emissions. The document urges States to incorporate the Environment Key Performance Area into national and regional planning, implement emissions-reducing technologies and procedures, strengthen infrastructure resilience to climate change, and align regulations with ICAO's environmental objectives to advance sustainable aviation.

8.202 Brazil highlighted that the GANP Portal has not yet been updated to the 8th Edition and recommends revisiting the proposal at GREPECAS/24 to ensure alignment and avoid additional effort. IATA notes the information presented and endorses the operational improvement measures that contribute to fuel savings and CO_2 reduction but expresses concern about the proliferation of non-harmonized noise-mitigation procedures in CAR/SAM airports, which increase fuel burn and emissions.

8.203 States and organizations recognized that integrating environmental sustainability and resilience into the ICAO Strategic Plan and the GANP would drive the implementation of operational improvements that will reduce fuel consumption and CO_2 emissions.

8.204 The Secretariat will promote workshops to highlight the contribution of operational improvements to LTAGs. Additionally, it will disseminate the changes introduced to the Eighth Edition of the GANP regarding the Environmental KPA, promoting the consideration of operational improvements as part of the State Action Plans (SAPs) for CO2 emission reductions starting in 2027, in line with Brazil's proposal.

8.205 The Secretary recalled that, considering the valid Conclusion GREPECAS 22/2 - Development Progress of Vol. III of the RANP, the inclusion of environmental objectives in line with the GANP, Eighth Edition, should be initiated, based on the information provided to the 42nd Assembly by both the GANP study group and the ICAO environment branch, starting with a review process of possible links between the objectives of the NANP and the measures that should be included in the State Action Plan for CO2 emission reduction in each State.

8.206 With **WP/8.23** COCESNA presented its perspective on climate change as a factor that directly affects the provision of air traffic services at both the global and regional levels. ICAO and other international technical organizations have indicated that the increasing variability of meteorological conditions is impacting operational safety, capacity, and the efficiency of the air navigation system.

8.207 Within Central American airspace, and specifically in the MHCC FIR, these impacts are manifested not only through extreme meteorological events such as tropical storms and hurricanes, but also through recurrent adverse weather conditions. These conditions increase operational complexity, raising the workload of ATS personnel, and reduce the margins for anticipation in decision-making.

8.208 Regional operational experience demonstrated that dynamic airspace management, integration of meteorological information, and regional coordination make it possible to sustain service continuity and operational safety in an increasingly variable climatic environment. In this regard, this Paper invited GREPECAS to consider climate change as a cross-cutting element in the regional planning of operational safety, capacity, and air navigation efficiency

8.209 Panamá noted that increasing weather variability reduces predictability in air traffic flow, sector configuration, and ATS workload, affecting safety and efficiency. Panamá also supports considering climate change as a cross-cutting issue in GREPECAS activities, integrating risk assessment, airspace planning, and operational resilience in line with GANP and ICAO climate guidelines.

8.210 IATA acknowledged efforts to maintain safety and operational efficiency during severe weather conditions and to support ATC contingency operations, underscoring the importance of integrating lessons learned into each operational context. IATA further recommended that the examples and best practices provided by COCESNA be adopted by ATFM groups within NACC/WG and SAM/IG to enhance regional preparedness and ensure a coordinated response to contingencies.

8.211 ALTA acknowledged the significance of incorporating lessons learned from severe weather events, which are increasingly frequent and necessitate the implementation of operational strategies to maintain appropriate standards of safety and efficiency.

8.212 Under **WP 8.26**, Brazil presented its environmental analysis of operational improvements in national air navigation. Following ICAO’s incorporation of the environment as a Key Performance Area (KPA) in the Global Air Navigation Plan (GANP), and guided by the Committee on Aviation Environmental Protection (CAEP), Brazil’s Department of Airspace Control (DECEA) applies Key Performance Indicators (KPIs) such as KPI 02 (additional taxi out time) and KPI 13 (additional taxi in time) as indirect metrics for estimating CO_2 emissions. These actions support the objectives of ICAO Resolution A42 21, which recognizes the role of Air Traffic Management (ATM) improvements in enhancing operational efficiency and reducing emissions.

8.213 To strengthen its assessment capabilities, Brazil development the Environmental and Sustainability Indicators (IMAS), a proprietary methodology and model designed to quantify CO_2 emissions within the Landing and Take Off (LTO) cycle. The IMAS use operational data from national systems such as BIMTRA and VRA, enabling DECEA to better identify environmental impacts, support decision making, and evaluate the qualitative and quantitative effects of operational improvements aligned with the ASBU framework. Although IMAS provide numerical results, Brazil emphasizes that meaningful conclusions require complementary qualitative analysis. The working paper concludes by encouraging States to recognize environmental impacts, enhance assessment tools, link operational measures to KPIs, and strengthen knowledge sharing across the SAM Region.

8.214 United States noted the information presented in the working paper. Ecuador acknowledged the content of WP 8.26 and Brazil's approach, highlighting the relevance of KPA, KPIs, IMAS, and the work of DECEA. Panama took note of the analysis and appreciated Brazil's willingness to share methodologies, emphasizing the importance of promoting regional training spaces to strengthen States' capabilities for environmental monitoring as part of their national air navigation plans.

8.215 IATA acknowledged the strong progress in developing and applying operational performance indicators, which are openly shared within the CDM groups coordinated by DECEA. It supported the proposed actions, particularly the idea of linking current operational measurements with KPIs and national systems to enhance environmental benefits. IATA also recommended broadening this work to include planned operational improvements and aligning them with the most suitable KPIs, whether or not they appear in the GANP.

8.216 Cuba expressed appreciation for Brazil's work and supported the actions in section 5.1, as did Uruguay, which also took note and endorsed the proposed actions.

8.217 Brazil thanked the delegates for their contributions, reaffirming that since 2019 the GANP has included the environment as a key performance area, leading ICAO CAEP to recommend the use of KPIs for environmental assessment—guidance that DECEA has applied to monitor the environmental impacts of operational improvements. The Secretariat appreciated Brazil's contribution to the development of a tool for assessing the environmental benefits of operational improvements.

8.218 Under **WP 8.27**, Brazil informs the meeting about the ECO Norte Project, a performance-based initiative designed to modernize airspace organization and Air Traffic Management (ATM) operations in the Amazon FIR and its TMAs (Belém, Manaus, Cuiabá). The project applies a fully integrated methodology—combining Collaborative Decision Making (CDM), accelerated and real time simulations, operational validation, structured training, and performance monitoring.

8.219 The paper highlighted that the consolidated results show clear operational and environmental benefits, including improved predictability, increased capacity, reduced controller workload, an estimated 28-ton annual fuel saving, and approximately 88 tons of CO_2 emissions reduction in the initial TMAs. The paper emphasizes alignment with the Global Air Navigation Plan (GANP) KPAs and the Aviation System Block Upgrade (ASBU) framework, demonstrating that structured planning, CDM, and simulation-based validation support sustainable ATM modernization.

8.220 Panama valued the document and endorsed regional exchange of methodologies, tools, and best practices to strengthen the linkage between operational improvements and measurable environmental outcomes within National Air Navigation Plans.

8.221 IATA thanked Brazil for presenting the paper and highlighted the successful application of CDM in the ECO Norte Project, as well as in other related initiatives (Rio/Belo Horizonte TMA modernization and Viracopos). IATA emphasized the strong multidisciplinary CDM process facilitated by DECEA,

contributing significantly to operational objectives, and shared CIRCEA 100 121 as a reference for other CAR/SAM States.

8.222 The Secretariat appreciated Brazil's contribution in sharing the implemented project and highlighting the results obtained in terms of reducing fuel consumption and CO_2 emissions through the operational improvements included in the project.

8.223 From these discussions, the Secretariat shall organize a regional workshop (virtual or in-person), directed to regional air navigation planners to share the good practices of Brazil´s methodology.

8.224 Under **IP/8.2** Brazil described the "ViraCO_2pos Project" developed by the Department of Airspace Control (DECEA), aimed at improving operational efficiency and reducing environmental impact in the São Paulo Terminal Control Area (TMA-SP), particularly at Viracopos International Airport. The initiative focuses on optimizing airspace structure and operational procedures in a highly complex terminal environment that integrates multiple major airports, including Guarulhos, Congonhas and Viracopos. The project builds upon previous modernization initiatives and promotes performance-based operational improvements, including expanded application of Continuous Climb Operations (CCO) and Continuous Descent Operations (CDO), in line with the Global Air Navigation Plan (GANP) and the ASBU framework. Quantitative assessments indicate significant operational and environmental benefits, including an estimated annual reduction of more than 302,000 nautical miles flown and approximately 5.4 million kilograms of CO_2 emissions avoided.

Agenda Item 9 Other business to be addressed in the virtual phase

9.1 Through **WP/9.1** Mexico identified that the absence of a uniform competency framework—together with the lack of mandatory English language proficiency requirements for AIS/AIM personnel— may pose potential risks to international safety. The working paper therefore proposes establishing a global license or competency certificate, developing an associated training and instruction Programme, and extending Annex 1 language proficiency requirements to this personnel category, including mandatory English proficiency at ICAO Level 4 (LPR Level 4).

9.2 COCESNA and IFAIMA reiterated that licensing all AIS/AIM personnel would allow staff to assume greater responsibilities and receive increased institutional recognition from ANSPs, noting that AIM-related competencies have expanded significantly due to AIM's central role in supporting aeronautical information across all air navigation domains.

9.3 Brazil recommended that the mandatory ICAO English Language Proficiency Level 4 requirement be referred to the appropriate ICAO expert groups for detailed technical examination, considering existing national training structures and the need for gradual and feasible implementation. Panama similarly supported further analysis within competent ICAO forums, emphasizing the importance of assessing regulatory implications, State impact, and potential phased implementation models while ensuring regulatory consistency and sustainability.

9.4 Cuba recalled that this issue has been extensively discussed in AIM/TF, NACC/WG, GREPECAS, AN-Conf and that proposals to amend Annex 1 to include AIS personnel as licence holders have not been accepted. Cuba also noted that its national regulations apply English examinations according to operational needs for each AIS function, using descriptors approved at the AIM/TF/8 meeting.

9.5 The Secretariat reminded States that several tools already exist to enforce competency requirements for AIS/AIM personnel. These include the QMS requirements in Annex 15 (which incorporate training and qualification provisions), the option to establish mandatory education and experience prerequisites for AIS functions—including English proficiency—based on national regulations or the guidance contained in Doc 9991, and the competency guidance in Section 3.4 of the AIS Manual (Doc 8126).

9.6 Additionally, the Secretariat recalled that ICAO language proficiency requirements, as stated in Doc 9835, apply exclusively to aeronautical radiotelephony communications and therefore concern only air traffic controllers and flight crew (Section 3.2.7).

9.7 The Secretariat further noted that the topic presented in WP/9.1 had already been thoroughly discussed at GREPECAS/21 (Dominican Republic, November 2023). As mentioned; previously, several States also indicated that the subject was presented at the Thirteenth Air Navigation Conference and at ICAO Assembly A42 (Montreal, September-October 2025). In both cases, the recommended way forward for the interested States was to submit the issue to the ICAO Licensing Panel for determination of whether licensing and linguistic proficiency provisions should be applied to AIS/AIM personnel.

9.8 Under **WP/9.2** Ecuador proposes updating procedures for air traffic services when a civil aircraft is intercepted. Current guidance in ICAO Doc 4444 outlines communication and coordination

actions during such events, but it does not explicitly require controllers to ensure separation between the intercepted aircraft, the interceptor, and other surrounding traffic.

9.9 Ecuador proposed that Section 15.5.2.1 of Doc 4444 be amended to include the following text:

> 15.5.2.1 "As soon as an air traffic services unit learns that an aircraft is being intercepted in its area of responsibility, it shall, as appropriate, take such of the following steps as the circumstances may require:
> [a, b, c, d, e, f...]
> **g) provide separation from other traffic in accordance with in-flight contingency considerations."**

9.10 The proposal introduces a new subparagraph to emphasize the responsibility of air traffic services to maintain appropriate separation based on in-flight contingency provisions. This addition aims to enhance safety, reduce collision risks, and ensure controllers proactively manage nearby traffic during unpredictable interception maneuvers.

9.11 Ecuador stated that the proposed update reinforces consistent and clear traffic management protocols during interception events. The United States and Panama expressed support to the proposal. Cuba, Uruguay and Argentina expressed concerns on feasibility of the proposal, and the responsibilities that should be assumed by the ATS units when applying separation procedures to these aircraft. Accordingly, the Secretariat took note of the discussion on this proposal and was tasked to start consultation with ICAO HQ via formal procedures.

9.12 The discussion on **WP/9.3** reflects broad acknowledgment and general support for the proposal presented by CARSAMPAF, particularly regarding the creation of a regional, centralized repository for wildlife hazard management documentation. Several States (including Argentina, Belize, Cuba, Ecuador, Panama, and the United States) took note of the proposal, with Belize explicitly expressing support and interest in participating in the planning and implementation stages. Argentina highlighted the potential value of the initiative, especially for States with lower regulatory maturity, emphasizing its usefulness for sharing best practices and strengthening technical capacities, while stressing the importance of clarifying its non-binding and referential nature.

9.13 The Secretariat acknowledged these comments and clarified that the collaboration of CARSAMPAF with GREPECAS is governed by Appendix D of the GREPECAS Procedures Manual, which explicitly states that materials presented by regional associations do not imply ICAO positions and do not constitute a binding regulatory framework. The Secretariat further noted the need to assess operational challenges related to data diversity and informed participants that ICAO is updating the IBIS Manual, which had been withdrawn due to obsolescence; this update will allow analysis of how the proposed repository could complement the objectives of the new ICAO guidance.

9.14 Referring to **IP/9.2**, the meeting recognized that the activities proposed by CARSAMPAF are technically sound and aligned with ICAO Annex 14 vol I and highlighted their contribution to regional technical cooperation. Argentina emphasized the need to clearly link these activities to regulatory requirements, to ensure that outcomes lead to verifiable safety improvements without creating additional

administrative burdens or quasi-auditing perceptions. The Secretariat took note of the comments, and indicated that it will engage with collaborating groups, including CARSAMPAF, to ensure alignment with the GREPECAS Procedures Manual (Appendix D) and responsiveness to States' needs.

9.15 Under **WP/9.4**, Peru presented information on the commissioning of a new passenger terminal and the start-up of complex runway-operation configurations under a framework where operational safety and operational continuity were primary objectives, highlighting the importance of effective capacity management and post implementation monitoring to enable timely adjustments in highly complex operational environments.

9.16 Comments during the virtual phase generally took note of the paper and welcomed it as a useful reference and case study for States and stakeholders facing similar large-scale airport expansions or reconfigurations. Emphasis was placed on the value of integrated planning, coordinated capacity management, and post implementation monitoring to safeguard safety and enable timely adjustments in highly complex operational environments.

9.17 The paper also recalled that safety occurrences observed during the transition were addressed through collaborative mechanisms (e.g., runway safety coordination and corrective actions such as procedure reviews and operational publications), reinforcing the role of continuous monitoring and stakeholder coordination in maintaining operational continuity. The Secretariat highlighted that, as demand continues to grow, it should be considered long-term airport capacity planning over the next 15–20 years should be considered, building on the gains achieved through the transition.

9.18 Under **IP/9.1** Brazil informed that it is carrying out several ATM training initiatives to support regional capacity building and promote No Country Left Behind. One initiative trained Paraguayan controllers in nonradar approach operations using theoretical instruction and simulator practice, improving safety in areas without surveillance. Another -focused-on airspace planning and design, bringing together professionals from multiple Latin American States to strengthen skills in modern airspace concepts. A third initiative provided flight inspection training, with participation from neighbouring countries, enhancing standardization and technical expertise across the region. States took note of the information provided. Guatemala suggested that the training initiatives were extended to other states in CAR Region.

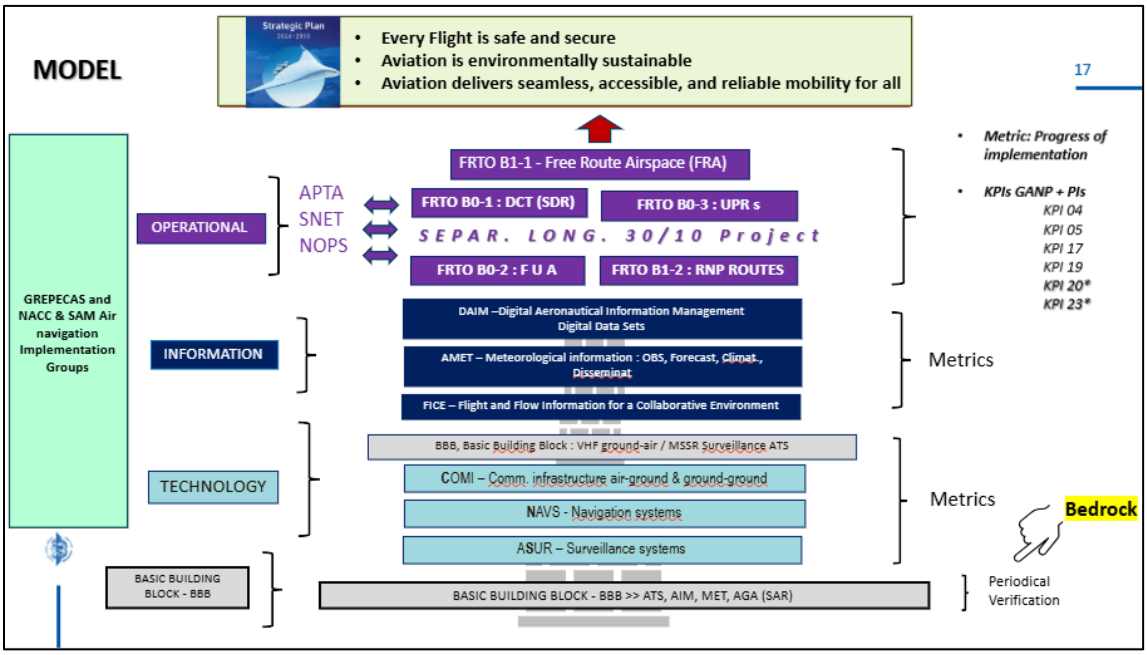
Agenda Item 10 Preliminary Results from GREPECAS/23 Virtual Phase

10.1 Under **WP/10.1 REV.2**, the Secretariat presented the results from the virtual phase of the meeting (Agenda Items 1 to 9 refer) for consideration during the Plenary in-person meeting.

10.2 States and International Organizations submitted observations and requested clarifications and improvements to the text, including for the proposed Decisions and Conclusions. The Secretariat reviewed these inputs and incorporated the agreed amendments into this report.

Agenda Item 11 **Strategic Approach Towards the Implementation of Air Navigation Improvements**

11.1 Under this agenda item (see presentation **P/04**), a proposal for a strategic model for the implementation of air navigation priorities was exposed, in order to ensure the harmonization of all components of GREPECAS Programme B (Air Navigation Implementation Programme aligned with the GANP, the ASBU Framework and the Performance Framework) with the ICAO Strategic Plan 2026–2050 and its ongoing implementation, as example:



11.2 This model should enable States and international organizations to better identify priorities in the CAR/SAM Regions. As well, considering the analysis and consensus on matters under Agenda Item 6, the meeting recognized that this approach will be very useful to develop the Strategy for Air navigation as agreed under the Conclusion GREPECAS/23/05.

Agenda Item 12 Review of GREPECAS Work Programme

12.1 The Secretariat recalled from the GREPECAS HANDBOOK that the GREPECAS work programme shall be developed through:

- permanent activities corresponding to the primary functions of a PIRG: management and maintenance of the Air Navigation Plan (ANP), deficiencies, etc. as well as ensuring that the implementation of Air Navigation Systems in the CAR/SAM regions is consistent and compatible with developments in adjacent regions, and is in line with the ATM Operational Concept (Doc 9854), GANP, ASBU and the Air Navigation Plan/Strategy of the CAR/SAM Regions.
- Specific activities to be carried out through programmes and projects

12.2 Based on the deliberations and feedback received from the virtual and in-person phase, the Meeting reviewed the GREPECAS Work Programme, as shown under Agenda Item 7 Report. See WP/7.1 and P/03 for the revised Programme and Projects for GREPECAS.

12.3 **Under P/02C,** the Secretariat presented an overview of the review conducted by the Air Navigation Commission of the reports submitted by GREPECAS and RASG-PA in June 2025. The review highlighted the strong level of coordination between both regional groups, particularly in areas such as runway safety implementation, performance-based navigation procedures, and joint initiatives aimed at mitigating controlled flight into terrain occurrences. The Commission also acknowledged improvements in working methodologies, including the use of hybrid meeting formats and greater reliance on data-driven analysis.

12.4 The presentation also addressed regional safety performance trends. While most States have established National Aviation Safety Plans, the implementation of State Safety Programmes remains comparatively limited. The review further noted significant challenges in the implementation of aircraft accident and incident investigation systems, which are essential components of a proactive safety framework. In addition, the Commission drew attention to the increase in large height deviation events, which rose from 520 in 2021 to 711, and requested further analysis to determine whether this trend indicates a deterioration in operational safety.

12.5 The Commission also emphasized that weaknesses in safety data collection, analysis, and information sharing represent a broader systemic concern affecting effective safety oversight. These deficiencies are now recognized as a global safety challenge that extends beyond accident investigation activities and impacts multiple areas of aviation safety management.

12.6 Regarding the GREPECAS reported matters, the Commission noted several regional challenges, including the need for clearer guidance material and a standardized template for the Regional Air Navigation Plan. Persistent non-compliance with ICAO Annex 12 was observed in many States, together with shortages of trained personnel, limited RCC/RSC capabilities, and the absence of effective regional SAR agreements.
Implementation of practical ATFM procedures remains limited and largely driven by domestic priorities, with cross-border and interregional planning still at an early stage.

12.7 Progress in IWXXM adoption for OPMET has been slow, quality management systems are inconsistently implemented, and stronger ICAO–WMO collaboration is required. Regional readiness for SWIM remains low, while the transition to AIXM and e-AIP is incomplete, with continued issues related to NOTAM quality and AIM QMS auditing.

12.8 Regarding FF-ICE, the ANC noted that implementation in the CAR and SAM Regions remains in the early stages. The Commission agreed that increased focus should be placed on SWIM, and that further discussions would support better-informed planning.

Agenda Item 13 Any Other Business

13.1 Under the **WP/13.1** the Secretariat recalled that the current GREPECAS Chairpersonship and Vice-chairpersonship was elected in the GREPECAS/20 meeting in November 2022, designating Mr. Alessander De Andrade Santoro from Brazil as Chairperson (later replaced by Mr. André Eduardo Jansen), and Mr. Orlando Nevot from Cuba as Vice Chairperson.

13.2 GREPECAS Procedural Handbook states the following:

> "3.7 In order to ensure the necessary continuity in the work of GREPECAS, and unless special circumstances determine otherwise, the Chairperson and the Vice- Chairperson of GREPECAS should assume their functions at the end of the meeting at which they are elected, normally for a period of three years. They may also be re-elected only once, if the group deems it appropriate to do so".

13.3 The Handbook mentions a mandate of three (3) years, but it could be interpreted also as three (3) meetings, in which case the Chairperson and Vice-Chairperson act in the GREPECAS/21, 22 and 23 meetings.

13.4 Therefore, elections were taken place at the end of the meeting. Mr. Roger Perez was proposed for the chairpersonship by Belize, Costa Rica, El Salvador, Honduras and Guatemala. The Meeting expressed broad support to the proposal and acclaimed the election. For the Vice-chairpersonship, Peru and Chile proposed Mr. Ruben Rios from Panama, then the Meeting expressed wide support to the proposal and praised the election. The two Elected authorities assumed their duties by the end of the meeting for the term 2026-2029.

13.5 The Meeting expressed its especial and deep gratitude to Mr. Orlando Nevot, Mr. Alessander De Andrade Santoro and Mr. André Eduardo Jansen for the extraordinary support and dedication given to the Group.

Agenda Item 14 Draft GREPECAS/23 Conclusions and Decisions

14.1 Under **WP14.1** the Meeting was presented with the reviewed texts of Decisions and Conclusions to be adopted under a final consensus. The adopted Decisions and Conclusions were integrated to this report as a part of the correspondent Agenda Items.