



WORKING PAPER

**SPECIAL AFRICA-INDIAN OCEAN (AFI)
REGIONAL AIR NAVIGATION (RAN) MEETING**

Durban, South Africa, 24 to 29 November 2008

Agenda Item 6: Development of a set of comprehensive work programmes in the air navigation field, aimed at improving efficiency of the air navigation system (Efficiency Committee)

**IMPLEMENTATION OF A GLOBAL ATM SYSTEM
ICAO TECHNICAL COOPERATION PROJECT**

(Presented by the Secretariat)

SUMMARY

This working paper presents a brief summary of ICAO Technical Cooperation Regional Project RLA/06/901, which was developed for the CAR/SAM Region, to assist States in their transition to a Global ATM system.

Action by the meeting is in paragraph 5.

1. INTRODUCTION

1.1 States and planning and implementation regional groups (PIRGs) recognize that Technical Cooperation (TC) projects serve as an important mechanism to support the implementation of air navigation systems in a progressive, cost-effective and cooperative manner in order to achieve a global air traffic management (ATM) system. Also, TC projects allow for active and timely participation of specialists from different areas of States/international organizations that would ensure an orderly implementation of the infrastructure.

2. INITIATION OF A PROPOSAL FOR A TC PROJECT FOR THE CAR/SAM REGION

2.1 The ninth meeting of Civil Aviation Directors held in Santiago, Chile in April 2005, analyzed the results of the ICAO Eleventh Air Navigation Conference taking into account the Global ATM Operational Concept and the Global Air Navigation Plan and consequently, requested ICAO to prepare and circulate a technical cooperation project document for assistance in CNS/ATM systems implementation leading to a global ATM system.

3. ASSISTANCE TO STATES: DEVELOPMENT OF RLA/06/901 TC PROJECT

3.1 Further to the above request, the project document prepared by ICAO (jointly by the Technical Co-operation Bureau and the Lima Regional Office) was circulated to South American

States on 17 November 2006, whereby States were requested to review the project document and advise of their interest and commitment to the TC project. At the same time, the Mexico Regional Office was invited to consider its dissemination among the States of its accreditation.

3.2 As a result, replies advising of the participation in the project were received from the following nine States: Argentina, Bolivia, Brazil, Chile, Panama, Paraguay, Peru, Uruguay and Venezuela. The annual budget for the implementation of project activities was estimated at USD\$ 250 000. Therefore, with nine States involved in the project, the annual cost-sharing contribution per State resulted in USD\$ 27 778.

3.3 Subsequent to the formalities of adherence to TC projects concluded and cost-sharing contributions received, activities of project RLA/06/901 commenced in January 2008 with a target date of completion in 2012. The details of project RLA/06/901 are available in the appendix, hereto. It should be noted that objectives, results and related activities of this project are part of a living document, which can be amended, created, deleted, as required by the dynamics of the implementation process and is managed through the Coordination Committee formed by the representative of States and ICAO. The goals of the RLA/06/901 are aligned with performance objectives of the region and States and serves primarily to support implementation of the Regional Air Navigation Plan.

4. ASSISTANCE TO STATES: RELATED PROJECTS

4.1 In addition to major project RLA/06/901 enveloping many national performance objectives, the TC would also assist States in developing and implementing specific related projects such as addressing air navigation deficiencies; training on performance framework; planning and implementation of quality assurance systems; and establishment of State Safety programmes (SSP).

5. ACTION BY THE MEETING

5.1 The meeting is invited to:

- a) take note of the information provided herein; and
- b) consider establishing an ICAO Technical Cooperation project as appropriate for implementation of the performance objectives, embodied in the performance framework forms, as contained in the appendices of several of the working papers of the meeting.

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INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO)

ANNEX

to the Letter of Agreement between the American States and ICAO
for the provision of technical cooperation financed with a trust fund

PROJECT DOCUMENT

Project Number:	RLA/06/901
Project Title:	Assistance in the implementation of a ATM regional system according to the ATM operational concept and the corresponding technological support for communications, navigation, and surveillance (CNS).
Duration:	5 years, renewable
Executing government agencies:	Civil aviation authorities
Executing organization:	ICAO
Foreseen start-up date:	January 2007
Project cost (estimated):	US\$ 1,250,000

Participating States and organizations:

Brief description: The purpose of this project is to provide assistance to the civil aviation authorities of participating States and organisations in the development of global air navigation plan initiatives that will contribute to the implementation of a regional air traffic management system, taking into account the global ATM operational concept and the corresponding CNS technology support, including the necessary AGA, AIS, and MET elements, the exchange of experiences concerning the processes, and the training of personnel in the topics involved.

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A. CONTEXT

1. Sub-sector description

1.1. The industry of air transportation plays an important role in the economic activities of States and it is still one of the sectors having quicker growth on world economy. States depend of the aeronautical industry to maintain and stimulate economical growth as well as to render essential services to local communities. Taking this into account, it can be considered that civil aviation contributes in an important way to general welfare and to economic vitality of each nation and of the world in general.

1.2. The Convention on International Civil Aviation, signed in Chicago on December 7, 1944 (Chicago Convention), establishes certain principles and arrangements in order that the international civil aviation may be developed in a safe and orderly manner and that international air transport services may be established on the basis of equality of opportunities and operated soundly and economically.

1.3. The Convention provides the appropriate reference framework to identify and define the responsibilities of the States in connection with the administration of civil aviation and the organization and methods to be followed in order to comply with their mandate. The Chicago Convention gave origin to the International Civil Aviation Organization (ICAO), a specialised agency charged with developing the principles and techniques of international air navigation and promoting the organisation and development of international air transportation in order to develop a safe and orderly international civil aviation worldwide. All the States that participate in this regional project are parties to the Chicago Convention and members of ICAO.

1.4. During the 1994-2004 period, scheduled passenger traffic (in passenger-kilometres performed) of airlines in the Latin American and Caribbean Regions grew in average 3.3% per year, compared to the global annual average growth rate of 5.1%. In some areas of the Caribbean and South American (CAR/SAM) Regions, traffic grew up to 13% in 2005, and it is expected to continue improving in the medium term in hand with economic activity.

1.5. One of the keys to maintaining civil aviation vitality in face of its continuous growth is to ensure the availability of a safe, protected, efficient and environmentally sustainable air navigation system. This requires the implementation of an air traffic management system that permits full use of the improved capabilities offered by technical developments.

1.6. In recent years, major technological developments have taken place in aeronautics, giving rise to opportunities that led to the successful completion of research studies and tests, and the development of the applicable procedures and specifications. As an example, automatic dependent surveillance – broadcast (ADS-B) is being successfully implemented and is available everywhere for surveillance in domestic airspace; modern aircraft are equipped with data link and automatic dependent surveillance systems that are improving air traffic control efficiency and effectiveness in oceanic areas; the concept of required navigation performance has emerged, and ICAO will soon publish new guidance material and standards on performance-based navigation, taking advantage of the capabilities available on board. All this will optimise the use of global navigation satellite systems (GNSS).

1.7. The global air traffic management (ATM) operational concept, endorsed by the Eleventh Air Navigation Conference convened by ICAO in 2003 (AN-Conf/11), offers a new vision for the implementation of a global ATM system. Following a consultation meeting held in 2004 with the ICAO Air Navigation Commission, the industry partners developed an ATM implementation guide with a view to obtaining short- and medium-term benefits while pursuing the implementation of the global ATM system foreseen in the operational concept. As requested by the Commission, this guide was included in a revision of the global air navigation plan for CNS/ATM systems.

1.8. The revised global plan contains a set of initiatives aimed at facilitating the evolution of the work already done by the regional planning and implementation groups (PIRGs). Most importantly, the global plan will have the support of planning tools (for example, software applications, planning documentation, web-based reporting forms, and project management tools) that the States and PIRGs will use as a guide for their work and as a basis for the establishment of efficacy objectives and implementation dates.

1.9. According to the revised global plan, planning will ensure an effective interaction between the staff at ICAO headquarters and the regional offices, resulting in the harmonisation and alignment of regional programmes and implementation activities. The global plan is gradually becoming the point of reference to measure the progress made and the implementation of a global ATM system, while the ground system-based approach to the planning and implementation of an air navigation infrastructure continues to evolve to an aircraft performance-based approach.

1.10. The revised global air navigation plan will facilitate the planning and implementation of these developments, applying new and innovating methods. A set of global plan initiatives (GPIs) will ensure full use of available short- and medium-term opportunities, while the related planning tools will provide guidance for planned activities and will serve as a basis for the establishment of performance objectives and implementation dates.

2. Strategy of the States of the region

2.1. As ICAO contracting States and as signatories to the Convention on International Civil Aviation, the States participating in this project have accepted specific obligations regarding the adoption of internationally agreed upon standards and recommended practices to regulate international civil aviation. The Director of Civil Aviation or similar administrative authority of each State is responsible for ensuring that the civil aviation administration abides by and complies with these international obligations.

2.2. Among such obligations, the civil aviation administrations are responsible for the development and implementation of the facilities, services and procedures necessary to conduct safe, regular, and efficient air operations. The orderly and timely implementation of said facilities, services, and procedures is agreed upon by the contracting States and coordinated by ICAO through air navigation regional plans.

2.3. The air navigation plans describe in detail the facilities, services, and procedures necessary for international air navigation within a specified area. These plans contain recommendations that the governments may follow in their air navigation facility programmes, with the certainty that, if provided according to the plan, they will make up, along with those of the other States, a general network that will be adequate for a long time.

2.4. Each contracting State is responsible for providing the facilities and services within its territory, pursuant to Article 28 of the Convention. The ICAO Council has recommended that these facilities and services include those specified in the air navigation plans. These plans are revised and updated by ICAO on an ongoing basis, with the support of the corresponding regional planning and implementation group (PIRG), based on a global plan that consolidates and brings together general requirements. With regard to the Caribbean (CAR) and South American (SAM) Regions, the planning of said facilities is contained in Document 8733, Air Navigation Plan - Caribbean and South American Regions - Volume II-FASID.

2.5. The air navigation plan for the CAR and SAM Regions describes in a concise manner the ICAO plan to provide international air navigation facilities, services, and procedures in the Caribbean and South American Regions. The plan also includes some facilities and services outside the described regional boundaries in order to maintain the integrity of the systems and ensure, as far as possible, that all facilities and services made available by a State are included in a document of the air navigation plan. Most of the plan is derived from the recommendations issued by the corresponding regional air navigation conferences convened by ICAO, mainly, and in the case of the CAR/SAM Regions, the recommendations of the Third Caribbean/South

American Regional Air Navigation Meeting (CAR/SAM RAN/3).

2.6. Each State is responsible for providing the facilities within its territory, as established in the plan. Since the financial and technical resources vary significantly from one State to the other, some parts of the plan may be implemented in different ways. For this reason, ICAO makes all possible efforts to ensure the homogeneous implementation of the plans and to assist governments in the implementation of the facilities foreseen, including those systems that require multinational mechanisms for their operation and maintenance, considering for this purpose the guidance material contained in the CAR/SAM FASID and the relevant recommendations of the CAR/SAM RAN/3 meeting.

2.7. According to the revised Global Air Navigation Plan, planning will focus on the set of Global Plan Initiatives (GPIs). These initiatives are air traffic management improvement options that, when implemented, will result in a direct increase in performance. This project intends to assist the participating States and organisations in the implementation of the following global plan initiatives:

GPI-1	Flexible use of airspace
GPI-5	Performance-based navigation
GPI-6	Air traffic flow management
GPI-7	Dynamic and flexible management of ATS routes
GPI-8	Collaborative airspace design and management
GPI-9	Situational awareness
GPI-10	Terminal area design and management
GPI-11	RNP and RNAV SIDs and STARs
GPI-12	FMS-based arrival procedures
GPI-13	Aerodrome design and management
GPI-14	Runway operations
GPI-15	Maintaining the same operational capacity under IMC and VMC conditions
GPI-16	Decision-making support systems and alert systems
GPI-17	Implementation of data link applications
GPI-18	Aeronautical information
GPI-19	Meteorological systems
GPI-20	WGS-84
GPI-21	Navigation systems
GPI-22	Communication network infrastructure.

2.8 The revised Global Air Navigation Plan and its planning approach will thus serve as a starting point for measurable achievements, as system-based management evolves towards performance-based management and the planning and implementation of a global air traffic management system that permits global interoperability and continuity for all users during all flight stages across the Regions, meets the agreed safety levels, provides for cost-effective operations, is environmentally sustainable, and meets national security requirements. The goal is to achieve door-to-door flight operations where successive planning and the operational phases of their processes can be managed and performed in a continuous and consistent manner.

2.9 The Ninth Meeting of Civil Aviation Authorities of South America (RAAC/9), held in Santiago, Chile, on 18-20 April 2005, upon analysing the results of Project RLA/98/003 on the Transition to CNS/ATM Systems in the CAR and SAM Regions and the conclusions of AN-Conf/11, deemed it necessary to establish a new regional technical cooperation project to guide SAM States in the implementation of a regional ATM system, taking into account the global ATM operational concept and the corresponding CNS support.

2.10 In response to this requirement, this project has been designed with immediate objectives directly linked to the following ICAO strategic objectives and the corresponding suggested measures for their attainment (fully reproduced in Attachment A):

A: Safety – *Improve the safety of global civil aviation*, through the following measures:

- ✓ Draft corrective plans aimed at the root causes of deficiencies;
- ✓ Assist States in the resolution of deficiencies through regional corrective plans;
- ✓ Encourage the exchange of information among States in order to foster mutual trust among the States regarding the level of aviation safety and to expedite safety oversight improvements;
- ✓ Support the application of safety management systems in all safety-related disciplines in all States.

C: Environmental protection – *Minimise the detrimental impact of global civil aviation on the environment*, through the following measures:

Develop, adopt and promote new or amended measures in order to:

- ✓ limit or reduce the number of people affected by significant levels of aircraft noise;
- ✓ limit or reduce the impact of aircraft engine emissions on local air quality; and
- ✓ limit or reduce the impact of greenhouse gases on global climate.

D: Efficiency – *Improve the efficiency of aeronautical operations*, through the following measures:

- ✓ Draft, coordinate and implement air navigation plans that reduce operational unit costs, facilitate an increase in traffic (of both passengers and goods), and optimise the use of existing and emerging technologies.
- ✓ Assist States in the improvement of air operation efficiency through technical cooperation programmes.

E: Continuity – *Maintain the continuity of aeronautical operations*, through the following measures:

- ✓ Assist States with the resolution of discontinuities that hinder air navigation.

3. Previous or existing assistance to the same sub-sector

Transition to CNS/ATM systems in the CAR/SAM Regions (RLA/98/003)

3.1. The purpose of this project, funded by 15 CAR and SAM countries, was to assist the States with the implementation of the new communications, navigation and surveillance/air traffic management (CNS/ATM) systems, in keeping with the CAR/SAM regional implementation plan and ICAO standards and recommended practices. It started in 1998 with a expected duration of 3 years, and was extended until 2006. Project operations were a major tool for the restructuring of the ATS route network through area navigation (RNAV) routes, involving the implementation of 64 RNAV routes, the realignment/extension of 44 ATS routes, the elimination of 19 ATS routes and the implementation of 12 ATS route segments, as well as the plan for the implementation of reduced vertical separation minima (RVSM) and the implementation of the required navigation performance (RNP 10) in the Santiago-Lima segment. This translated into better safety and efficiency levels. The regular practical and theoretical meetings and seminars organised and promoted to that end by the project contributed significantly to the improvement of regional coordination.

3.2. Project RLA/98/003 also developed the document entitled “*Guidance material for the evolution towards the ICAO Global ATM in the CAR/SAM Regions*”, which will be an important guide on this matter in

the coming years. Likewise, a software tool known as *Planning and Evaluation Tool (PET)* for the implementation of the CNS/ATM systems was distributed to all States. Three seminars on institutional aspects of CNS/ATM systems, studies on possible institutional arrangements to support the GREPECAS Institutional Aspects Subgroup, advisory missions to the States to verify the status of implementation of the world geodetic system WGS-84, and four seminars on WGS-84 coordinates and aeronautical information issues were held, providing training to more than 150 specialists of the more than 1,400 CAR/SAM professionals who participated in various seminars and workshops organised by the project.

Implementation of the SAM – REDDIG Digital Network (RLA/98/019)

3.3. The purpose of this project, which was implemented between 1999 and 2003, was to provide assistance to the States for the acquisition, installation, start-up and initial management of a digital network in South America, aimed at modernising aeronautical fixed service communications at the regional level.

Regional safety oversight cooperation system (RLA/99/901)

3.4. Funded by eleven member States, and having AIRBUS, EMBRAER and the DGCA of Spain as observers, and a contribution by the European Commission, this project seeks to establish a regional safety oversight system in the South American Region with the necessary technical, logistic and administrative support. It started in 2002, and was expected to last 5 years, extendable for equal periods. Its activities help to improve cooperation among civil aviation administrations in the area of safety oversight, and to harmonise national regulations on licensing, aircraft operation and airworthiness.

Regional GNSS augmentation trial (RLA/00/009)

3.5 This project was financed by twelve States and the *Corporación Centroamericana de Servicios a la Navegación Aérea* (Central American Air Navigation Service Corporation - COCESNA). Its goal was to develop a plan to test and assess the technical and operational advantages of the WAAS satellite-based augmentation system (SBAS) of the Federal Aviation Administration (FAA) of the United States in the Caribbean and South American Regions, in order to contribute to the establishment of the operational model for satellite-based augmentation systems. It started in 2001 with an expected duration of 3 years, and was extended until 2007.

REDDIG management system and satellite segment administration (RLA/03/901)

3.6 The purpose of this project, which is financed by thirteen States, is to establish a multinational mechanism for the management of the South American digital network (REDDIG), taking into account regional developments and the need to modernise aeronautical fixed service communications so that they can be homogeneous, interconnected and interoperate with other digital networks. It started in 2003 with an expected duration of 5 years. Trinidad and Tobago became a member of REDDIG in 2005.

GNSS transition in the CAR/SAM Regions – South American, Central American and Caribbean Augmentation Solution– SACCSA (RLA/03/902)

3.7 The governments of Cuba, Colombia and Spain and COCESNA, with the support of the European Commission and the European Spatial Agency (ESA), through the Galileo Joint Undertaking (GJU), are funding this project that is aimed at planning the development of the technical, financial and operational aspects of a pre-operational EGNOS-type satellite-based augmentation system (SBAS) for the CAR and SAM Regions. It started in 2003 with an expected duration of 4 years.

Projects by country

3.8 Through country projects in Argentina, Bolivia, Brazil, Colombia, Cuba, Ecuador, El Salvador, Guatemala, Haiti, Panama, Paraguay, Peru, Trinidad and Tobago, and Venezuela, ICAO, in some cases with the assistance of UNDP, is providing the technical assistance that States require to solve the specific problems they face for the application of ICAO standards, recommended practices and procedures and for the implementation of the regional air navigation plan.

4. Regional institutional framework for the sub-sector

4.1. ICAO has Regional Offices in Lima (for South America) and Mexico (for North America, Central America and the Caribbean) accredited before the States that participate in this project, which are responsible for promoting the application of the standards, recommended practices and international procedures established in the Annexes to the Chicago Convention and for implementing the regional air navigation plan.

4.2. The Regional Air Navigation Planning and Implementation Group for the Caribbean and South American Regions (GREPECAS) is the regional mechanism (PIRG) responsible for ensuring the continued implementation of the regional air navigation plan and for identifying the specific problems that affect air navigation, and suggesting the appropriate solutions. Some of the States that participate in this project are members of GREPECAS.

4.3. The ICAO Technical Co-operation Bureau (TCB) with headquarters in Montreal, maintains contact through the Lima and Mexico Regional Offices with the contracting States that require or receive technical cooperation in the civil aviation field, and coordinates the management and provision of the agreed assistance.

B. PROJECT JUSTIFICATION

1. Problems to be addressed: Current status

Limitations in the provision of air traffic services

1.1. The air traffic management (ATM) system has limitations that may occur at different times and places, including, but not limited to, the following:

- a) differing services and procedures as a result of having different systems and limited supporting tools for making decisions and adopting systems;
- b) increasingly congested voice radio communication units for air-ground exchange;
- c) rigid airspace sub-divisions and route structures that prevent making full use of all ATM resources;
- d) inadequate planning of collaboration among ATM, aerodrome and aircraft operators;
- e) sub-optimal use of scarce resources, such as airspace and air side capacity;
- f) insufficient facilities for real-time exchange of information among ATM, aerodromes and aircraft operators, leading to sub-optimal solutions to real-time events and changes in the operational requirements of users;
- g) limited capacity to maximise the benefits for the aircraft equipped with advanced avionics; and
- h) long time required for the development and installation of improved systems in the aircraft fleet or ground infrastructure.

1.2 It has been recognised that the approach applied to the provision of air traffic services (ATS) and to the air navigation system was restricting the continuous growth of aviation and the introduction of

improvements to flight safety, efficiency and regularity. The shift in scope started with the adoption of the CNS/ATM system concept, which reached a certain degree of maturity with the implementation and utilisation of new technologies aimed at improving air operations. However, it was later acknowledged that technology was not an end in itself, and that there was a need for an integrated global air traffic management system concept, based on clearly established operational requirements.

1.3 The new approach involves the achievement of a global inter-functional air traffic management system for all users during all flight phases, which meets the agreed safety levels, permits economically optimum operations, is environmentally sustainable, and meets national security requirements.

1.4 The implementation of the global ATM operational concept has a long-term horizon, until the year 2025 and beyond. The transition process that has already started includes the adoption of several operational initiatives in the CAR and SAM Regions, some of which have been implemented with the support of the ICAO technical cooperation programme. The process is expected to continue with the assistance of the present project, which has been prepared at the request of the States in order to facilitate the implementation of new operational initiatives and the training of the personnel involved.

1.5 The CAR and SAM Regions are planning short- and medium-term activities for the implementation of the global air navigation plan initiatives, the results of which will lead to an air traffic management system as the one envisaged in the global ATM operational concept.

Performance-based navigation (PBN)

1.6 A significant number of aircraft have the capacity required for area navigation (RNAV) and the required navigation performance (RNP). These capacities should be further exploited to develop more efficient routes and aircraft paths that are not directly linked to air navigation ground aids. Some RNAV-equipped aircraft are also capable of better meeting runway sequencing requirements, especially through the use of the “required time of arrival” function of the flight management system (FMS).

1.7 The performance-based navigation (PBN) concept, which is a variation of the RNP concept, recognises that, when designating operations, a clear distinction must be made between aircraft operations that require an airborne autonomous performance control and alert system and those that do not require it. The global navigation satellite navigation (GNSS)-oriented PBN permits a seamless, harmonious and profitable navigation from departure to final approach, thus resulting in safety, efficiency and capacity benefits. Short-term GNSS applications are aimed at enabling the early introduction of satellite-based area navigation, without the need to invest in infrastructure, using the basic satellite constellations and the integrated multiple-sensor systems on board the aircraft. The use of these systems already provides greater reliability of non-precision approach operations at some airports.

Air traffic flow management (ATFM)

1.8 At some airports and airspace sectors of the CAR and SAM Regions, special periods and hours have been identified in which some congestion occurs that should be avoided, even though, in general terms, there is no air traffic congestion at the present time that requires a complicated flow management. This congestion occurs basically due to limitations in airport infrastructure and lack of air traffic flow management.

1.9 In view of the above, GREPECAS has considered that the early implementation of ATFM will guarantee an optimum air traffic flow to or through given areas during periods in which traffic demand regularly exceeds capacity, with the resulting frequent and continuous traffic delays, or when it is obvious that the demand for traffic forecasts will exceed the available capacity. In such cases, the appropriate ATM units, after consulting with aircraft operators, should consider the adoption of measures to improve the use of the existing system

capacity and to develop plans aimed at increasing capacity in order to meet actual or expected demand. Capacity increases should be planned in a structured and collaborative manner.

1.10 The States and the Regions should evolve towards a collaborative approach to capacity management. The ATM operational concept foresees a more strategic approach to ATM in general, and, through the adoption of collaborative decisions, aims at relying less on tactical traffic flow management. Tactical intervention in traffic flow management is unavoidable, but a better coordination between airspace users and ATM service providers can reduce the need for routine tactical interventions that usually disturb aircraft operations.

1.11 The final objective of ATFM is to balance the demand for, and capacity of, air traffic services, and the airport acceptance regime, by applying strategic, pre-tactical and tactical measures aimed at organising and managing traffic flows in such a way that all the traffic that needs to be organised at any time or in any airspace or aerodrome is compatible with the capacity of the air traffic management system.

Communication capacity improvements

1.12 ATM relies to a great extent, and more and more so, on the availability of relevant, precise, validated, and quality information in real time or quasi-real time, to permit the adoption of informed decisions. The timely availability of appropriate aeronautical mobile and fixed (voice and data) communication capabilities is essential to meet ATM requirements and provide the appropriate capacity and quality required by the service. The aeronautical communication network infrastructure should be adapted to the growing need to collect and exchange information within a seamless network in which all stakeholders can participate.

1.13 The gradual introduction of performance-based standards and recommended practices, functional requirements, and the whole system will permit a greater use of available voice and data telecommunication technologies and services. Within the framework of this strategy, the States should maximise the use of the appropriate technologies, services, and products offered by the telecommunication industry.

1.14 Taking into account that communications play a fundamental role since they permit aeronautical operations, the common objective is the attainment of a more efficient communication network system that provides the services desired with the required performance and interoperability in order to maintain the appropriate safety levels at the lowest cost.

1.15 The implementation of ground aeronautical telecommunication network (ATN) applications, such as the aeronautical message handling system (AMHS) and ATS interfacility data communication (AIDC), will enable faster, safer navigation aid services with increased capacity. The implementation of said systems has already started in the CAR/SAM Regions, and there is a need to develop a regional interface protocol (IP) addressing plan to ensure communications among ATN applications installed by the participating States and organisations.

1.16 A regional implementation plan will be required for the harmonised implementation of ground-air ATN applications, such as controller-pilot data link communications (CPDLC).

Navigation system improvements

1.17 It is necessary to foster GNSS implementation in order to provide navigation systems during all flight phases. GNSS trials conducted in the CAR/SAM Regions under projects RLA/00/009 and RLA/03/902 have shown the difficulty of implementing SBAS augmentation systems to support non-precision approach procedures that require vertical accuracy (APV-1 and APV-2).

1.18 Taking into account the results of these SBAS GNSS system trials, the implementation of a new civilian satellite positioning system (Galileo), the implementation of new GPS and GLONASS satellites, and the availability of a second frequency for civilian use, a GNSS implementation plan for the medium and long term needs to be developed in order to ensure air navigation during all flight phases.

Surveillance capacity improvements

1.19 There is a need to encourage the application of improved surveillance techniques that will reduce separation minima, enhance safety, increase capacity, and improve flight efficiency in a cost-effective manner. These benefits can be achieved by providing surveillance in areas that lack primary or secondary radar, when profitability models warrant it. In airspaces with radar coverage, improved surveillance could further reduce separation minima between aircraft and, in areas with high traffic density, it could improve the quality of surveillance information both on the ground and in the air, thus increasing safety levels.

1.20 The existing surveillance systems have limitations that prevent them from meeting the capacity, flexibility and efficiency requirements of the expected air traffic growth. In order to overcome these limitations, the aeronautical industry has developed various surveillance technologies, including extended squitter Mode S on 1090 MHz (1090 ES) as a means of interoperation for ADS-broadcast (ADS-B) in the short term.

1.21 The implementation of surveillance systems for surface movement at aerodromes where it is justified due to meteorological conditions and capacity considerations will also improve safety and efficiency, while the display of traffic information in the cockpit and the associated procedures will permit the pilot to participate in the ATM system and improve safety through a better situational awareness.

1.22 In remote and oceanic airspace where ADS-C is used, many air transport aircraft have FANS capabilities that could be incorporated into commercial aircraft. ADS-B can be used to improve traffic surveillance in domestic airspace. In this regard, it should be noted that extended squitter 1090 is an available option that should be adopted as the preferred option worldwide for ADS-B data links.

1.23 In terminal areas and aerodromes surrounded by significant terrain and obstacles, the availability of terrain and obstacle databases of an assured quality, made up by digital data sets that depict the ground surface in terms of continuous elevation values, and digital data sets on obstacles that constitute terrain features that have vertical significance in relation to adjacent and surrounding features and which are considered a hazard for air navigation, will improve situational awareness and will contribute to a general reduction in the number of associated controlled flight into terrain events.

Aerodrome design and management

1.24 Activities to improve aerodrome design and management, including coordination and collaboration among ATM service providers, vehicle operators and aircraft operators, may have a significant impact on safety and aerodrome capacity.

1.25 In most cases, operations conducted in the aerodrome parking area are under the responsibility of the aerodrome operator or aircraft operator. The capacity of taking an aircraft from its gate to the departure-holding position, or from the exit taxiway to its gate is essential to meet performance expectations. Coordination among all parties is required in order to use parking areas efficiently. Surface traffic management would also include the organisation of ground vehicle movement in the manoeuvring area.

1.26 In many places, structural improvements in aerodromes will result in a significant increase in efficiency. This would include the implementation of additional taxiways; taxiways running parallel to the main runways for two-way traffic to and from the runways; additional runway exits, including high-speed or quick exit taxiways; and improved lighting and signs.

1.27 Local collaborative decision-making processes should seek the sharing of key flight scheduling data in such a way that all the participants (aerodromes, ATC, ATFM, aircraft operators, ground handling providers) will have a more precise knowledge of the aircraft status throughout the “ground handling” process. This would permit the adoption of minimum and precise ATFM measures and make flight scheduling more predictable. The benefits to be derived include a more efficient use of aerodrome and ground handling resources, reduction of delays, and greater flight scheduling predictability.

Runway operations

1.28 The improvement of runway operation performance starts with the establishment of runway capacity reference values that are usually defined as the maximum number of flights to which an aerodrome can provide routine services in one hour for operations with weather minima above Category I. These reference values are estimates that vary according to runway configuration and aircraft type combinations. The objective should be the use of aircraft capabilities and available runways in the most appropriate manner so that the number of all-weather operations will be as close as possible to the number of operations under visual meteorological conditions.

1.29 Achieving the optimum capacity for each runway is a complicated task that involves many factors, both tactical and strategic. In order to accomplish this task in an effective manner, it is absolutely necessary to measure the impact of the changes and to control the performance of airspace users and ATM providers. The latter will apply to the analysis of pilot and controller performance, recognising the need to maintain the trust of the users and to work within the existing safety culture. A performance indicator system should be designed to serve as the basis for measurements and analyses. The tactical factors that affect runway occupancy include flight operations and ATM factors. Aspects related to flight operations include operator performance, the effects of corporate procedures, the use of airport infrastructure, and issues related to aircraft performance.

1.30 Limitations in runway capacity are defined by the procedures, the design of the surface area, aircraft performance capabilities, surveillance capabilities, aircraft spacing, and weather restrictions. The application of improved procedures to minimise spacing, such as the application of reduced separation minima in the runway, runway precision control (PRM) and RNP and RNAV approaches for parallel runways that are close to each other, will optimise spacing capacity.

Aeronautical information

1.31 ATM, RNAV, RNP and computer-based navigation system requirements introduced the need to have new AIS requirements to ensure the quality and timely distribution of information. In order to provide information and meet these new requirements, the traditional function of aeronautical information services will become an information management service with changing obligations and responsibilities.

1.32 In order to facilitate coordination, improve efficiency and safety, and make sure that the various members of the ATM community have the same information for collaborative decision-making, it is essential to have quality-assured real-time electronic information (aeronautical information on the terrain and obstacles). Electronic information will improve the situational awareness of pilots during en-route, terminal area, and aerodrome operations, to which end the aircraft will be equipped with geographical reference data sets containing information for the en-route, terminal and aerodrome phases. The same information can be provided at different AC positions, pre-flight planning units, and made available to airline flight planning departments or general or private aviation users. Electronic information can be adapted and its format modified in order to meet ATM user requirements and match their applications. Standard data formats will be used to create databases that will incorporate quality-assured data sets.

World geodetic system – 1984 (WGS-84)

1.33 The geographic coordinates used in several States worldwide to determine the position of runways, obstacles, aerodromes, navigation aids and ATS routes are based on a broad variety of local geodetic reference systems. With the introduction of RNAV, the problem of having geographic coordinates referenced to local geodetic data has become more apparent and has clearly shown the need to have a universal geodetic reference system. To address this issue, in 1994, ICAO adopted the world geodetic system – 1984 (WGS-84) as the common horizontal geodetic reference system for air navigation, effective 1 January 1998.

1.34 GNSS implementation requires that use be made of a common geographic coordinate system. ICAO adopted the geodetic reference system WGS-84 as the standard geodetic reference system, and many States have also implemented it or are in the process of implementing it. If this system is not implemented, or if the decision is made to use another reference system, a discontinuity in ATM service will be created, which will delay the full realisation of GNSS benefits. Full implementation of the geodetic reference system WGS-84 is a prerequisite for numerous ATM improvements, including GNSS.

Meteorological systems

1.35 The improvement of the world area forecasting system (WAFS), of the international airways volcano watch (IAVW), and of the ICAO tropical cyclone advisory system, with a view to enhancing the precision, timely distribution and usefulness of the information produced by these systems will facilitate an optimum use of airspace. Increased use of data links for the transmission of meteorological information through uplinks and downlinks so as to contribute to the automatic ordering of aircraft during approach will help maximise capacity.

1.36 The global ATM system will require immediate access to global real-time meteorological information. These stringent requirements will call for the automation of most meteorological systems. Automatic downloading of MET information *via* downlink, which is included in ADS messages, will provide precise real-time upper wind fields and wind profiles. The use of data link to send meteorological information to the aircraft *via* uplink during approach and departure should gradually increase, including the application of the data link-automatic terminal information service (C-ATIS) and D-VOLMET.

1.37 Said improvements will give ATC units access to precise upper wind field displays, both in the form of WAFS global upper wind forecasts and of “real-time” wind fields and wind profiles derived from wind information automatically sent by the aircraft through the automatic dependent surveillance (ADS) system, and to reports and forecasts of hazardous meteorological conditions, particularly volcanic ash, tropical cyclones, storms, clear air turbulence, icing, and wind shear. This information will assist ATM in the adoption of tactical decisions for aircraft surveillance, air traffic flow management, and flexible and dynamic aircraft routing, and will contribute to optimise the use of airspace.

1.38 To this end, the States and the Regions will have to implement the following improvements on the planned dates:

- a) *WAFS*: universal binary form of representing BUFR-coded meteorological data; significant weather forecasts (SIGWX); improvement of space and time resolution in WAFS forecasts; and GRIB2-coded turbulence, icing and convection cloud forecasts;
- b) *IAVW*: volcano observatories of selected States;
- c) *Tropical cyclone advisory system* (EC): graphical tropical cyclone advisories;
- d) *Data links*: ICAO provisions on the use of data links, taking into account the implementation of ADS and SSR Mode S data links; the replacement of VOLMET broadcast with D-VOLMET in Regions where appropriate data link communications are available.

Training

1.39 Aeronautical authorities and technical officials of civil aviation administrations must receive the training that is deemed necessary in order for them to learn about, and become involved with, the new systems, programmes, and technological developments, through their participation in meetings, panels, seminars, workshops and other activities.

Institutional aspects

1.40 At present, each individual State is responsible for the provision of the facilities, services, and procedures recommended in the ICAO regional air navigation plan. Some States provide some services to each other by virtue of bilateral agreements that benefit both parties. However, technological developments, high costs, and the multinational nature of CNS/ATM systems and other air navigation services have led to the consideration and establishment of various institutional arrangements for the joint collaborative planning, funding, implementation and management of certain facilities.

1.41 An example of this are the arrangements developed through the ICAO multinational technical cooperation projects described in this document, some of which are seeking to become permanent. On the other hand, GREPECAS has selected a series of systems that need to be implemented on a regional basis in the short and medium term.

1.42 The analysis and discussion at various fora of the institutional aspects involved in the implementation of a regional air navigation management system has resulted in a proposed set of tools that would enable a multilateral agreement for the establishment of an international organisation at the regional level, with legal status and administrative and financial autonomy, that would bring together and centralise the existing arrangements, consider the additional requirements for multinational facilities contained in the regional plan, and would be in charge of its implementation, management and operation.

1.43 Once the corresponding multilateral agreement is reached, additional assistance will be required for its implementation. It will be necessary to agree upon and propose the appropriate arrangements for the establishment and initial operation of a regional organisation responsible for the implementation, management and operation of air navigation facilities, taking into consideration the possibility of doing so through an ICAO regional technical cooperation project similar to those currently in operation.

Quality assurance systems

1.44 ICAO standards and recommended practices prescribe the establishment of quality assurance systems to monitor compliance with aircraft operation procedures and to guarantee the accuracy and integrity of aeronautical information and data, as required by Annexes 6, 11, and 14 to the Chicago Convention. As established in Annex 15, each contracting State shall take the necessary measures to establish a duly organised quality system containing the necessary procedures, processes and resources for the implementation of quality management at each stage of the production and distribution of the integrated aeronautical information package. The implementation of quality management should be demonstrable at every functional stage, when so required. The quality system could be established in keeping with ISO 9000 quality assurance standards, and certified by a recognised organisation.

1.45 A quality assurance system defines and establishes the quality policies and objectives of an organisation, and makes sure that the organisation has the necessary elements to improve efficiency and reduce risks. If properly applied, a quality assurance system ensures that procedures are conducted in a uniform manner and in keeping with applicable requirements, that problems are identified and resolved, and that the organisation is continuously analysing and improving its procedures, products, and services.

Safety management system (SMS)

1.46 Although major air disasters rarely occur, accidents that do not reach the level of a catastrophe and a whole range of incidents occur more frequently. These less serious events can be an indication of underlying safety problems. To ignore these underlying safety hazards could lead to an increased number of more serious incidents.

1.47 Safety has always been a major consideration in all aviation activities. Article 44 of the Chicago Convention charges ICAO, within its goals and objectives, with *achieving the safe and orderly development of international civil aviation worldwide*. This is reflected in the corresponding standards and recommended practices contained in Annexes 6, 11, and 14 to the Convention. Upon establishing the requirements that States must meet for safety management, ICAO makes the following distinction between safety programmes and safety management systems (SMS):

- a) A **safety programme** is an integrated set of regulations and activities aimed at improving safety.
- b) A **safety management system (SMS)** is a systematic approach to safety management, which includes the necessary organisational structures, responsibilities, policies, and procedures.

1.48 ICAO standards and recommended practices (SARPS) require all States to establish a **safety programme** in order to achieve an acceptable level of safety in aeronautical operations. The States concerned will define the acceptable level of safety.

1.49 A **safety programme** may be very broad, including many activities aimed at achieving its objectives. The safety programme of a State includes the regulations and directives issued in order to conduct safe air operations from the perspective of certified aircraft operators, aircraft maintenance organisations, air traffic service providers, and aerodrome operators. The safety programme may include requirements as diverse as incident reporting, investigations, audits, promotion of safety, etc. In order to carry out these activities consistently, a safety management system is required.

1.50 As part of their safety programme, the States will require certified aircraft operators, maintenance organisations, air traffic service providers and aerodrome operators to implement a safety management system that is acceptable to the State and which, at least:

- a) identifies safety hazards,
- b) ensures the enforcement of the necessary corrective action in order to keep an acceptable safety level; and
- c) provides for continuous monitoring and periodical assessment of the level of safety achieved.

1.51 An approved safety management system must clearly define safety responsibilities. States need advice and training in order to successfully implement safety management systems in the areas concerned.

ATM automated systems

1.52 There are several States and service providers that have implemented or are in the process of implementing automated technologies, thus the need to provide guidance for the implementation of a regional integrated, safe, evolutionary, and harmonious methodology, in keeping with ICAO guidelines and the directives of GREPECAS and its contributory bodies. To this end, GREPECAS agreed to recommend a regional strategy for the integration of ATM automated systems, whose development requires professional assistance and support through this project.

1.53 The integration of electronic databases with communication and surveillance systems for purposes of coordinating all demand/capacity balancing activities provides automated methods and tools and improves ATM situational awareness for the resolution of problems through collaborative decision-making by airspace users and service providers, while providing full operational capacity in all weather conditions.

1.54 ATFM coordination requires the use of voice communications and automated methods to ensure a complete exchange of information. Both methods provide a common analytical support for the broader situational awareness functions, such as the collection of all available data on capacity, traffic flows, congestion areas, peak hours, etc.

1.55 Under project RLA/98/003, the task of integrating automated systems between CAR/SAM ACCs has begun. In a first stage, interface control documents (ICDs) have been developed in order to integrate flight plan and radar data applications. To complete this task, other applications need to be integrated, such as real-time aeronautical information and operational meteorological information (OPMET) data banks, which calls for the development of an implementation plan that involves data quality and integrity assurance and harmonisation criteria. This will expedite RNAV and RNP implementation and coordination, thus improving efficiency and safety in the ATM community.

2. **Situation foreseen upon completion of the project**

2.1 The coordinated and homogeneous planning and implementation of various initiatives of the global air navigation plan in the CAR/SAM Regions will have been accomplished, together with the exchange of experiences throughout the process, and of information and knowledge through meetings, seminars and other training activities, with a view to the implementation of a safe, integrated, interoperable, and cost-efficient regional ATM system, within a global safety and interoperability framework that meets the needs of international civil aviation, including:

- a) The application of the PBN concept, with the incorporation of advanced aircraft navigation capabilities into the air navigation system infrastructure, which will translate into greater capacity and efficiency through reduced separation minima, thus benefiting operators that equip their aircraft to meet performance requirements. PBN will also enhance safety, particularly during approach, through a reduction of controlled flight into terrain events.
- b) Regional application of demand/capacity measures, commonly known as air traffic flow management (ATFM), whenever necessary, thus increasing airspace capacity and operational efficiency through the implementation of strategic, pre-tactical, and tactical measures aimed at the organisation and management of air traffic flows in such a way that the whole traffic being managed at a given point in time or in a given airspace or aerodrome is compatible with ATM system capacity.
- c) The evolution of the aeronautical mobile and fixed communication infrastructure, in such a way that it may be applied to voice and data communications, adapt to the new functions, and provide the appropriate service capacity and quality to support ATS requirements.
- d) The implementation of an interface protocol 2.1(IP) addressing plan, in order to harmonise aeronautical telecommunication network (ATN) applications at regional level.
- e) The drafting of a medium- and long-term GNSS facility plan to support navigation system performance during all flight stages.

- f) Operational implementation of data link-based surveillance, using equipment that will permit the display of traffic information on board the aircraft to support conflict forecasting and collaboration between flight crews and the ATM system. This will improve situational awareness in the cockpit, through the provision of electronic quality data concerning the terrain and obstacles.
- g) Implementation of aerodrome management and design strategies to improve the use of the movement area and reduce runway occupation time.
- h) Broadcasting of real-time quality-assured electronic information, including aeronautical information concerning the terrain and obstacles, and the availability of meteorological information to support a global ATM system with seamless components.
- i) Indoctrination of authorities and training of the technical personnel involved, in the topics addressed by the project.

2.2 Based on the incorporation instruments approved by the States, the appropriate multinational arrangements will be made for the establishment and start-up of a regional organisation charged with the implementation, management, and operation of multinational air navigation facilities, with legal status and administrative and financial autonomy.

2.3 Pursuant to the provisions of Annexes 6, 11, 14, and 15, the States will have established quality assurance systems that will help the administration ensure the necessary standardisation of the services under its responsibility, in order to reduce the risk of accidents.

2.4 In keeping with the ICAO Safety Management Manual (Doc 9859), States will establish safety programmes and will require each certified aircraft operator, maintenance organisation, air traffic service provider, and aerodrome operator to implement a safety management system (SMS) approved by the State.

2.5 The automation of air traffic management and the integration of its services will improve the quality of traffic information exchanged among sectors, making it more predictive, timely and reliable, thus permitting the application of reduced separation minima, reduced work loads, and increased capacity, efficiency and safety in flight operations.

2.6 The implementation of real-time databases for satellite navigation, including aeronautical and meteorological information, flight plans, radar information and its corresponding integration, will be a key task for the implementation of the global ATM.

3. **Need for future assistance**

3.1. Depending on the roll out of the Project, it is possible that the participating States and organisations will require additional assistance for the establishment and initial operation of a regional organisation charged with the implementation, management and operation of air navigation facilities, as well as for the implementation of new initiatives of the global air navigation plan, and for the resolution of deficiencies that affect air navigation services.

4. **Expected beneficiaries**

4.1. The following will benefit from the results of this project:

- a) Airspace users, through the reduction of aircraft spacing and increase in capacity;

- b) Aircraft operators, who will be able to better accommodate their preferred flight profiles, thus reducing operating costs and delays, and using a minimum amount of avionics;
- c) General and utility aviation, through better access to avionics that will allow them to depart and arrive under flight conditions under which they could not operate before, due to the associated costs and requirements;
- d) Administrations and air traffic service providers, through the reduction of infrastructure and maintenance costs of traditional air navigation systems and the modernisation of infrastructure at a very low cost;
- e) The ATM community, through better conflict detection and resolution systems;
- f) The community in general, through the reduction of aircraft noise and emissions as a result of optimised routes and flight levels; and
- g) Passengers, through a reduction in flight time.

5. **Project strategy and institutional arrangements**

5.1. In keeping with the general purpose of the project, which is to guide the States in the implementation of a regional ATM system, taking into account the global ATM operational concept and the corresponding CNS support, its strategy is based on the development and availability to the participating States and organisations of a series of model action plans and guidelines for the implementation of various global plan initiatives, in addition to other instruments, and on the programming and implementation of the necessary coordination and training activities.

5.2. Project implementation must be sufficiently flexible to adjust to any future changes, provided the activities can be carried out within budget limitations and within the established time frames. To this end, there will be continuous monitoring of its development, including a periodic update of the work plan and, whenever necessary, a revision of its scope and activities, through the participation of civil aviation authorities and the respective personnel from the States and organisations that participate in the Project Coordination Committee.

5.3. The civil aviation administrations of the States and organisations participating in the project will designate their representatives to the Project Coordination Committee, which shall meet at least once a year at the request of the executing body, and will provide the necessary facilities, services, supplies, and experienced personnel to ensure the appropriate development of project activities and to contribute to the execution of the work plan.

5.4. As soon as feasible, project activities will be executed by experienced professionals of the required specialties, who will be proposed and assigned to the project by the participating States and organisations. From the experienced personnel proposed by the participating States and organisations, ICAO will select the most appropriate professionals to carry out the planned activities, using project funds to cover transportation, insurance and *per diem* expenses throughout the assignment period. The participating States and organisations that assign professionals to the project will continue paying their regular salary throughout the assignment period.

6. **Reasons for ICAO assistance**

6.1. As the international aeronautical community knows, ICAO, for more than half a century, has been the United Nations agency specialised in civil aviation and, as such, is responsible for providing the frame of reference for virtually all of the civil aviation regulations of its contracting States. The same experts that provide assistance for the development and maintenance of this frame of reference provide technical support to the ICAO Technical Cooperation Programme. Therefore, since 1952, ICAO has been executing technical assistance projects for its contracting States in a neutral, non-profitable, and therefore more cost-effective way.

6.2 The States and organisations participating in project RLA/98/003 on the Transition to the CNS/ATM Systems in the CAR/SAM Regions, executed by ICAO between 1998 and 2006, have considered that the project has been an effective and successful supporting tool for the implementation of the regional plans of the regular ICAO programme, and of assistance to the States for the timely implementation of the ATM and CNS elements foreseen in the regional air navigation plan. They also felt that the project contributed to the timely and successful achievement of the objectives envisaged by GREPECAS, which permit an increase in airspace capacity and efficiency.

6.3 In view of the above, the ninth meeting of civil aviation authorities of the SAM Region, held in Santiago, Chile, in April 2005, adopted a conclusion charging ICAO with the drafting of this technical cooperation project document to serve as a guide for the States in the implementation of a regional ATM system, taking into account the global ATM operational concept and the corresponding CNS support.

7. Special considerations

7.1. This project will maintain links with existing regional projects that are related to its objectives, and with the national technical cooperation programmes that the participating States may already have in progress for the same sub-sector, in order to coordinate and complement the activities required on a national level with the support of their national projects.

8. Coordination arrangements

8.1. The administrative coordination of the project will be centralised at the ICAO Technical Co-Operation Bureau in Montreal, which shall appoint the International Coordinator and report this appointment to the participating States and organisations. TCB will fulfil its tasks in keeping with the policies, regulations, and instructions established for the ICAO Technical Cooperation Programme.

8.2. Regarding the technical aspect, the ICAO Regional Offices in Mexico and Lima will support the International Coordinator in the monitoring of the project and will make the necessary arrangements for the control and follow-up on its activities and results, taking into account the conclusions and recommendations adopted by the States within GREPECAS on matters related to the objectives of the project.

9. Counterpart support capability

9.1. The States and organisations that participate in the project will undertake to fully participate in all the activities concerning planned assistance and accept the technical and monitoring missions that may be scheduled to visit airports and air navigation facilities. They also agree to apply or implement the results and recommendations of the project in those aspects that concern them.

9.2. The States and organisations participating in the project will provide the counterpart support that may be required for the successful implementation of the activities foreseen and to ensure the sustainability of their results. This support may include full-time or part-time participation of professionals or other personnel, and the provision of office facilities, classrooms, furniture, equipment, materials, local transportation, telephone, telefax, internet and other essential services for the effective fulfilment of the activities by the personnel assigned to the project throughout the duration of their mission.

C. DEVELOPMENT OBJECTIVE

The project will contribute to maintain a safer, more efficient and economical air transport system, as a means to support the social, economic, and cultural development of the CAR/SAM Regions.

D. IMMEDIATE OBJECTIVES, RESULTS AND ACTIVITIES

They are presented in the following pages. The abbreviations used in the third column mean:

ATM	Air traffic management specialist
RO	ICAO Regional Office in Lima or Mexico
CNS	Communication, navigation and surveillance specialist
CBA	Cost-benefit analysis specialist
OPS	Aircraft operation specialist
AIR	Airworthiness specialist
AGA	Aerodrome specialist
AIS	Aeronautical information service specialist
MET	Aeronautical meteorology specialist
TCB	ICAO Technical Co-operation Bureau in Montreal
PCC	Project Coordination Committee
CAAs	Civil aviation authorities
SRVSOP	Regional safety oversight cooperation system

Immediate objective No. 1

Development and implementation of global air navigation plan initiatives that will lead to the transition from an air traffic management system based on ground systems to another one based on aircraft performance.

Success criterion: A number of global plan initiatives (GPIs) developed and implemented at regional level. A minimum of 30 specialists from the participating States and organizations trained in each related matter.

Results	Activities	Party responsible for each activity
1.1 Implementation of performance-based navigation (PBN) – (GPIs 5, 7, 10, 11, 12, and 21).	1.1.1. Obtain and complete the information, learning about the current status in the participating States and organisations with respect to: a) Available CNS infrastructure, with the corresponding coverage and plans for future facilities; b) Characteristics of available ATM automated systems and future automation plans; c) Aircraft fleet operating in the CAR/SAM ATS route network and its RNAV and RNP capabilities, including capacity for arrival procedures based on the flight management system (FMS) and future plans of the users; d) Airworthiness and operational approval capabilities; e) Airports that might derive operational benefits from the use of RNAV and/or RNP; f) Status of implementation of WGS 84; g) Existing SIDs and STARs connecting international airports to ATS routes; h) Real-time and accelerated simulation of operations;	

	i) Cost-benefit analysis of facilities; j) Safety assessment models; k) Regulation of GNSS use (secondary, primary means) l) Documentation concerning the training of air traffic controllers; m) Terminal control area design and control. Start-up date: week 1 Estimated duration: 2 weeks	
	1.1.2. Analyse the application of GNSS to support all flight stages, including: a) The required ground navigation infrastructure for the operations contemplated in current plans, based on the development of system technology; b) En-route operations without using precision values with RNAV-5 (continental airspaces) and with RNP-4 (oceanic airspaces); c) TMA operations (RNAV 1) and approaches (RNP 0,3 and RNP AR), with ABAS; d) Operational benefits of using GBAS, taking into account the impact of the implementation of Galileo and the L5 frequency on the GPS, likely implementation dates, and the convenience of including APV operations in the planning. Start-up date: week 3 Estimated duration: 2 weeks	ATM, CNS, RO
	1.1.3. Develop a model action plan based on the information processed in 1.1.1 and 1.1.2, to be used by the participating States and organisations in the implementation of PBN in TMA and approach, according to the following regional planning: I. Short term (until 2010) a) Terminal area operations, including standard instrument departures and arrivals (RNAV 1 in radar environments with the proper navigation infrastructure and RNP 1 in non-radar environments without the proper DME coverage infrastructure); and b) Instrument flight rule approaches (RNP 0.3 in as many aerodromes as possible and in all international airports, and RNP AR in airports deriving operational benefits). II. Medium term (2011 to 2015) a) Terminal area operations, including standard instrument departures and standard instrument arrivals (extended application of RNAV1/RNP1	ATM, OR

	and mandatory use of RNAV1/RNP1—exclusionary airspace—in TMAs with greater air traffic density); and b) Instrument flight rule approaches (extended application of RNP 0.3 in as many aerodromes as possible and in all international airports, RNP AR in airports deriving operational benefits, and start-up of the application of GLS procedures). Start-up date: week 5 Estimated duration: 1 week	
	1.1.4. Develop guidelines based on the information processed under 1.1.1, 1.1.2, and 1.1.3, to be used by the participating States and organisations in the implementation of PBN in TMA and approach, including the following main tasks: a) Cost-benefit analysis; b) Safety assessment; c) Design of procedures; d) Real-time and accelerated simulation of operations; e) ATC automated systems; f) Training of air traffic controllers; g) Aircraft and operator approval; h) Terminal control area design and management; i) Model regulations for GNSS application (primary, secondary means, operational restrictions, etc.). Start-up date: week 6 Estimated duration: 4 weeks	ATM, RO
	1.1.5. Develop an action plan based on the information processed under 1.1.1 and 1.1.2 for the implementation of PBN for en-route operations, according to the following regional planning: I. Short term (until 2010) Oceanic airspace RNP 10 and continental airspace RNAV 5. II. Medium term (2011 to 2015) Oceanic airspace RNP 4 and selected continental airspaces RNP 2. Start-up: week 11 Estimated duration: 1 week	ATM, OR
	1.1.6. Prepare a working paper supporting the submission of the model action plan and guidelines for PBN implementation in TMAs and approach, and the	ATM, RO

	action plan for PBN implementation, for consideration and approval. Start-up date: week 11 Estimated duration: 1 week	
	1.1.7 Submit the working paper to the consideration of the corresponding GREPECAS bodies through the established channels. Start-up date: to be determined Estimated duration:	RO
	1.1.8 Make the necessary adjustments or changes to the material mentioned in 1.1.6 based on the comments generated, and update the proposal and working paper for consideration and approval by GREPECAS. Start-up date: to be determined Estimated duration:	ATM, RO
	1.1.9 Process, edit, and distribute the material, introducing the amendments made by GREPECAS during its approval. Start-up date: to be determined Estimated duration:	RO
	1.1.10 Determine and develop the necessary material for PBN implementation for en-route operations, in coordination with the participating States and organisations, taking into account environmental protection methods and procedures, and including the following aspects: a) PBN operational concept; b) Cost-benefit analysis; c) Aircraft and operator approval requirements and processes; d) Modification of national norms and airspace regulations; e) RNAV and RNP document formats to be included in the CAR/SAM web; f) Required AICs/NOTAMs and AIP supplements; g) Amendment to Doc 7030 as required; h) Amendments to the corresponding letters of agreement; i) Procedures for pilots and ATC; j) Procedures to accommodate non-RNAV and non-RNP aircraft where applicable; k) Transition procedures, if necessary; l) ATC training; m) Post-implementation follow-up plan. Start-up date: to be determined	ATM, CBA, OPS, AIR, RO

	Estimated duration:	
	1.1.11 Provide assistance to the participating States and organisations for the implementation of the PBN implementation action plan, including the programming of the necessary coordination and training activities. Start-up date: to be determined Estimated duration:	ATM, OPS, AIR, RO
	1.1.12 Prepare a final report on activities performed, including relevant recommendations. Start-up date: to be determined Estimated duration:	ATM
1.2 Regional implementation of air traffic flow management (ATFM) wherever necessary to improve airspace capacity and operational efficiency -(GPI 6)	1.2.1 Obtain and complete the information, learning about the current status in the participating States and organisations with respect to: a) The methods for estimating airport and ATC capacity; b) ATFM procedures for the following phases: ✓ Airport strategic ✓ Airport tactical ✓ Airspace strategic ✓ Airspace tactical Start-up date: week 12 Estimated duration: 1 week	ATM, AGA, RO
	1.2.2 Obtain and complete the information, learning about the current status in the participating States and organisations of the electronic databases required for the ATFM evolutionary phases, in relation to the following aspects: a) Flow management data processing and display: ✓ Flight planning and flight plan processing data (FPL, RPL, etc.); ✓ Airspace and airport structure data; ✓ Display of the situation in the air; ✓ Automatic messages to support decision-making (access to SLOTS, reporting of delays, alternate routes, etc.); ✓ Monitoring of the operational status of air navigation infrastructure; ✓ Capacity of the airport acceptance regime (AAR); ✓ ATC capacity; ✓ Air traffic demand; ✓ Airspace structure and ATS route network; ✓ Radio navigation aids, radar, etc.; ✓ Aircraft performance.	ATM, AIS, AGA, CNS, MET, RO

	b) Surveillance system data (SSR, ADS, etc.); c) AIS/MAP (mapping, ATFM advisories, AIRAC updates, etc.); d) Meteorological information (MET); e) Data for historical and statistical analysis of air operations, meteorology, etc.; f) Communication systems in support of collaborative decision-making (CDM) with: ✓ Other centralised ATFM systems; ✓ Other FMUs and/or FMPs and/or ATS units; ✓ Operators and users (airlines, general aviation, State aircraft, etc.); ✓ Airport authorities; ✓ Meteorological authorities; ✓ Aeronautical information services. g) The necessary communication requirements to effectively support centralised air traffic flow management in its linkage with: ✓ Other centralised ATFM systems; ✓ FMUs, FMPs and/or ATS units involved; ✓ Operators and users; ✓ Airport authorities; ✓ Meteorological authorities; ✓ Aeronautical information services; ✓ The transmission of ADS and radar data to the ATFM. Start-up date: week 13 Estimated duration: 1 week	
	1.2.3 Develop model action plans based on the information processed under 1.2.1 and 1.2.2, to be used by the participating States and organisations for the implementation of: a) Airport strategic ATFM; b) Airport tactical ATFM; c) Airspace strategic ATFM; and d) Airspace tactical ATFM. Start-up date: week 14 Estimated duration: 4 weeks	ATM, RO
	1.2.4 Develop guidelines, based on the information processed in the preceding activities, to be used by the participating States and organisations for the implementation of flow management units (FMUs) or flow management positions (FMPs) and for the incorporation of new procedures applicable to FMUs or FMPs concerning: a) Airport strategic ATFM; b) Airport tactical ATFM; c) Airspace strategic ATFM; and	ATM, RO

	d) Airspace tactical ATFM. Start-up date: week 18 Estimated duration: 4 weeks	
	1.2.5 Develop a model action plan, based on the material processed in the preceding activities, for the implementation of the centralised ATFM in each of the CAR and SAM Regions. Start-up date: week 22 Estimated duration: 1 week	ATM, RO
	1.2.6 Draft a working paper to support the submittal of the action plan for the implementation of the centralised ATFM for consideration and approval. Start-up date: week 23 Estimated duration: 1 week	ATM, RO
	1.2.7 Submit the working paper introducing the plan to the consideration of the corresponding GREPECAS bodies through the established channels. Start-up date: to be determined Estimated duration:	RO
	1.2.8 Make the necessary adjustments or changes to the plan based on the comments generated, and update the proposal and the working paper for consideration and approval by GREPECAS. Start-up date: to be determined Estimated duration:	ATM, RO
	1.2.9 Process, edit, and distribute the plan, introducing the amendments that GREPECAS may have made in the course of its approval. Start-up date: to be determined Estimated duration:	RO
	1.2.10 Identify and develop the necessary material for the implementation of the centralised ATFM, in coordination with the participating States and organisations, taking into account environmental protection practices and procedures, and including the following aspects: a) Cost-benefit analysis; b) Definition of data collection plans; c) Determination of the required automated systems, including performance parameters and the necessary tests and assessments; d) Updating of the CAR/SAM ATFM operational concept, if necessary; e) Drafting of a handbook on common operational	ATM, CNS, AIS, RO

	procedures for air traffic flow management, including, <i>inter alia</i>, the following aspects: ✓ Procedures applicable to the strategic, pre-tactical, and tactical phases; ✓ Procedures for coordination and teleconferencing with FMUs/FMPs, ATS units, ATFM, users, airports, and other organisations involved; ✓ Collaborative decision-making procedures; ✓ Methodology to determine airport and ATS capacity; ✓ Procedure to keep ATFM databases permanently updated; ✓ Procedures for pilots and ATC; ✓ Required ATFM messages. f) Models of the required AICs/NOTAMs and AIP supplements; g) ATFM document formats to be included in the CAR/SAM web; h) Amendment to Doc 7030, if necessary; i) Amendments to the corresponding letters of agreement; j) ATC simulations; k) Harmonisation of applicable ANP requirements; l) ATFM training; m) Contingency plans. Start-up date: to be determined Estimated duration:	
	1.2.11 Provide assistance to the participating States and organisations for the execution of the ATFM implementation action plan, including the programming of the necessary coordination and training activities. Start-up date: to be determined Estimated duration:	ATM, OR
	1.2.12 Draft a final report of the activities carried out, including relevant recommendations. Start-up date: to be determined Estimated duration:	ATM
1.3 Implementation of communication and surveillance (CNS) capacity improvements for en-route and terminal area operations – (GPIs 6, 7, 9, 17, 18, and 22)	1.3.1 Obtain and complete the information, learning about the current status in the participating States and organisations with respect to: a) Existing CNS facilities and equipment; b) Regional planning and documentation on existing CNS; c) Aeronautical message handling systems (AMHS); d) Very high frequency data link (VDL) and high-frequency data link (HFDL);	CNS, ATM, RO

	e) ATS interfacility data communication (AIDC); f) Automatic dependent surveillance by contract (ADS/C); g) Automatic dependent surveillance by broadcast (ADS/B); h) Multilateration, etc.; i) Communication protocols used. Start-up date: week 22 Estimated duration: 2 weeks	
	1.3.2 Analyse the operational scenarios of existing and planned ATS, in order to determine the operational requirements for improving communication and surveillance systems in the short and medium term, as well as other operational requirements to meet future ATM expectations, using, inter alia, the following tools: a) Aeronautical message handling system (AMHS), b) Very high frequency digital link (VDL), c) ATS interfacility data communication (AIDC), d) Automatic dependent surveillance by contract (ADS/C), e) Automatic dependent surveillance by broadcast (ADS/B), f) Multilateration, etc. Start-up date: week 24 Estimated duration: 2 weeks	CNS, ATM, RO
	1.3.3 Prepare a cost-benefit analysis of the various options available for communication and surveillance systems, comparing the existing structure with the improvement resulting from the implementation of the new systems, also taking into account the existence of two or more technologies to meet the same operational requirement (for example: multilateration or ADS/B). Start-up date: week 26 Estimated duration: 2 weeks	CBA, CNS, ATM, RO
	1.3.4 Develop a regional interface protocol (IP) addressing implementation plan for ATN applications. Start-up date: week 28 Estimated duration: 1 week	CNS, ATM, RO
	1.3.5 Identify medium- and long-term GNSS implementation requirements to provide support during all flight phases, taking into account: a) The results of trials conducted under projects RLA/00/009 and RLA/03/902; b) The status of development of GNSS technology; c) The coordination activities and training programmes required.	CNS, RO

	Start-up date: week 29 Estimated duration: 1 week	
	1.3.6 Develop a strategy for the implementation of communication, navigation, and surveillance improvements in the CAR/SAM Regions, taking into account the information obtained in the preceding activities. Start-up date: week 30 Estimated duration: 2 weeks	CNS, ATM, RO
	1.3.7 Develop a model action plan, based on the information processed in the preceding activities, to be used by the participating States and organisations in the implementation of improvements to CNS capabilities for en-route and terminal area operations, including the inputs and the programming of the necessary coordination and training activities. Start-up date: week 32 Estimated duration: 1 week	CNS, ATM, RO
	1.3.8 Draft a working paper to support the submittal of the strategy and action plan for the implementation of improvements to en-route and terminal area CNS capabilities, for consideration and approval. Start-up date: week 33 Estimated duration: 1 week	CNS, ATM, RO
	1.3.9 Submit the working paper introducing the strategy and plan to the consideration of the corresponding GREPECAS bodies, through the established channels. Start-up date: to be determined Estimated duration:	RO
	1.3.10 Make the necessary adjustments or changes to the strategy and the plan based on the comments generated, and update the proposal and the working paper for their consideration and approval by GREPECAS. Start-up date: to be determined Estimated duration:	CNS, ATM, RO
	1.3.11 Process, edit, and distribute the strategy and the plan, introducing the amendments that GREPECAS may have generated in the course of their approval. Start-up date: to be determined Estimated duration:	RO
	1.3.12 Follow up on the implementation of CNS facilities and capacity improvements for en-route and terminal area operations in the CAR/SAM Regions,	CNS, RO

	including the programming of the necessary coordination and training activities. Start-up date: to be determined Estimated duration:	
	1.3.13 Draft a final report on all the activities carried out, including the relevant recommendations. Start-up date: to be determined Estimated duration:	CNS, ATM
1.4 Implementation of improvements to aerodrome design and management -(GPIs 13 and 14)	1.4.1 Obtain and complete the information, learning about the current status of international aerodromes in the participating States, including: a) Available runways and their characteristics; b) Design and utilisation of the movement area; c) Number, location, and utilisation modality of aircraft parking positions; d) Available handling services; e) Aircraft arrival and departure procedures; f) Flight scheduling; g) Number of operations during peak hours. Start-up date: week 32 Estimated duration: 2 weeks	AGA, RO
	1.4.2 Develop a model action plan to be used by the participating States and organisations for the implementation of improvements to the design and management of international aerodromes, with a view to: a) Using aerodrome resources and ground handling services more efficiently; b) Reducing delays; c) Achieving greater predictability in flight programming; d) Increasing capacity by improving aircraft arrival, parking, and departure procedures; e) Improving coordination among all parties, in order to make efficient use of parking areas; f) Optimising collaborative decision-making processes among ATM service providers, vehicle operators and aircraft operators; g) Optimising the use of the movement area by introducing the necessary structural improvements, such as: ✓ Additional taxiways; ✓ Runways that run parallel to the main runways for two-way traffic; ✓ Additional runway exits, including high-speed or fast-exit taxiways; ✓ Improved lighting and signs, etc.	AGA, ATM, RO

	h) Sharing key data on flight programming among all stakeholders; i) Optimising surface traffic through improved organisation of ground vehicle movement in the manoeuvring area; j) Reducing runway occupation time, taking into account: ✓ Airspace user performance; ✓ ATS provider performance; ✓ Surface area design; ✓ Aircraft performance capabilities; ✓ Surveillance capabilities; ✓ Aircraft spacing; ✓ Meteorological limitations; ✓ Application of improved procedures to minimise spacing. k) Increasing safety and environmental protection. Start-up date: week 34 Estimated duration: 2 weeks	
	1.4.3 Develop guidelines based on the information processed under 1.4.1 and 1.4.2, to be used by the participating States and organisations for the implementation of international aerodrome design and management improvements that imply increasing capacity and reducing holding times. Start-up date: week 36 Estimated duration: 2 weeks	AGA, ATM, RO
	1.4.4 Draft a working paper supporting the presentation of the model action plan and the guidelines for their consideration and approval. Start-up date: week 38 Estimated duration: 1 week	AGA, ATM, RO
	1.4.5 Submit the working paper to the consideration of the corresponding GREPECAS bodies through the established channels. Start-up date: to be determined Estimated duration:	RO
	1.4.6 Make the necessary adjustments or changes to the material mentioned in 1.4.4, based on the comments generated, and update the proposal and the working paper for their consideration and approval by GREPECAS. Start-up date: to be determined Estimated duration:	AGA, ATM, RO
	1.4.7 Process, edit, and distribute the material, introducing the amendments that GREPECAS may have generated in the course of its approval.	RO

	Start-up date: to be determined Estimated duration:	
	1.4.8 Provide assistance to the participating States and organisations for the implementation of the model action plan, including the programming of the necessary coordination and training activities. Start-up date: to be determined Estimated duration:	AGA
	1.4.9 Draft a final report on the activities carried out, including the relevant recommendations. Start-up date: to be determined Estimated duration:	AGA, ATM
1.5 Implementation of functional improvements to the provision of aeronautical information services – (GPI 18)	1.5.1 Obtain and complete the information, learning about the current status in the participating States and organisations with respect to aeronautical information services, including: a) ATM, RNAV, and RNP requirements; b) Computer-based navigation system requirements; c) Availability of aeronautical information data banks; d) Availability of an automated AIP; e) Availability of electronic information; f) AIS automation plans; g) Implementation of the WGS-84 geodetic reference system. Start-up date: week 53 Estimated duration: 2 weeks	AIS, RO
	1.5.2 Develop a model action plan, to be used by the participating States and organisations in the implementation of AIS improvements that will: a) provide quality-assured and real-time aeronautical information on terrain and obstacles; b) ensure the timely distribution of information; c) facilitate coordination among the various members of the ATM community; d) improve efficiency and safety; e) ensure that all members of the ATM community have the same information when making collaborative decisions; f) improve situational awareness of pilots during en-route, terminal area, and aerodrome operations; g) enable the completion of the implementation of the WGS-84 geodetic reference system; h) increase safety. Start-up date: week 55	AIS, ATM, RO

	Estimated duration: 2 weeks	
	1.5.3 Develop guidelines based on the information processed in 1.5.1 and 1.5.2, to be used by the participating States and organisations in the implementation of functional improvements to the provision of aeronautical information services. Start-up date: week 57 Estimated duration: 2 weeks	AIS, ATM, RO
	1.5.4 Draft a working paper supporting the presentation of the model action plan and the guidelines for their consideration and approval. Start-up date: week 59 Estimated duration: 1 week	AIS, ATM, RO
	1.5.5 Submit the working paper to the consideration of the corresponding GREPECAS bodies through the established channels. Start-up date: to be determined Estimated duration:	RO
	1.5.6 Make the necessary adjustments or changes to the material mentioned in 1.5.4, based on the comments generated, and update the proposal and the working paper for their consideration and approval by GREPECAS. Start-up date: to be determined Estimated duration:	AIS, ATM, RO
	1.5.7 Process, edit, and distribute the material, introducing the amendments generated by GREPECAS in the course of its approval. Start-up date: to be determined Estimated duration:	RO
	1.5.8 Provide assistance to the participating States and organisations for the implementation of the model action plan, including the programming of the necessary coordination and training activities. Start-up date: to be determined Estimated duration:	AIS
	1.5.9 Prepare a final report on the activities carried out, including the relevant recommendations. Start-up date: to be determined Estimated duration:	AIS, ATM
1.6 Implantación de mejoras funcionales en la provisión de servicios meteorológicos para la navegación aérea	1.6.1 Obtain and complete the information, learning about the current status in the participating States and organisations with respect to the meteorological services for international air navigation, including:	MET, RO

internacional – (GPI-1.6 Implementation of functional improvements to the provision of meteorological services for international air navigation – (GPI-19)	a) ATM requirements; b) World area forecast system (WAFS) requirements; c) The international airways volcano watch; d) Tropical cyclone advisory system requirements; e) Use of data link for the transmission of meteorological information; f) Availability of meteorological information data banks; g) Automation of meteorological systems; h) Availability of electronic information; i) Plans for the automation of aeronautical meteorological services. Start-up date: week 59 Estimated duration: 2 weeks	
	1.6.2 Develop a model action plan to be used by the participating States and organisations for the implementation of improvements to the provision of MET services that will: a) Improve the availability of meteorological information in support of a seamless global ATM system; b) Improve the precision, timely distribution, and usefulness of the information produced by world area forecast, international airways volcano watch, and tropical cyclone advisory systems; c) Permit immediate access to real-time global meteorological information; d) Achieve the automation of meteorological systems; e) Assist ATM in the adoption of tactical decisions for aircraft surveillance, air traffic flow management, and flexible and dynamic aircraft routing; f) Increase safety. Start-up date: week 61 Estimated duration: 2 weeks	MET, ATM, RO
	1.6.3 Develop guidelines, based on the information processed in 1.6.1 and 1.6.2, to be used by the participating States and organisations in the implementation of functional improvements to the provision of meteorological services to international air navigation. Start-up date: week 63 Estimated duration: 2 weeks	MET, ATM, RO
	1.6.4 Draft a working paper to support the presentation of the model action plan and the guidelines for their consideration and approval. Start-up date: week 65 Estimated duration: 1 week	MET, ATM, RO

	1.6.5 Submit the working paper to the consideration of the corresponding GREPECAS bodies through the established channels. Start-up date: to be determined Estimated duration:	RO
	1.6.6 Make the necessary adjustments or changes to the material mentioned in 1.6.4, based on the comments generated, and update the proposal and working paper for their consideration and approval by GREPECAS. Start-up date: to be determined Estimated duration:	MET, ATM, RO
	1.6.7 Process, edit, and distribute the material, introducing the amendments generated by GREPECAS in the course of its approval. Start-up date: to be determined Estimated duration:	RO
	1.6.8 Provide assistance to the participating States and organisations for the implementation of the model action plan, including the programming of the necessary coordination and training activities. Start-up date: to be determined Estimated duration:	MET
	1.6.9 Draft a final report on the activities carried out, including the relevant recommendations. Start-up date: to be determined Estimated duration:	MET, ATM
1.7 Training of at least 30 officials from the CAAs in each topic related to the preceding results.	1.7.1 Develop annual plans for the conduction of courses, seminars, workshops, and other activities that might be required concerning: a) Airspace planning; b) Construction of air navigation procedures; c) Airworthiness and operation approval; d) Safety assessment; e) Airspace monitoring; f) Performance-based navigation; g) Planning of air traffic flow management; h) National air navigation planning, incorporating the global ATM operational concept; i) New trends in communication systems; j) New trends in navigation systems; k) New trends in surveillance systems; l) New trends in flight test systems; m) Current and future use of the radio electric spectrum for aeronautical applications; n) Integration of automated systems;	ATM, CNS, RO Consultants

	o) Other topics that may be required. Start-up date: September of every year Estimated duration: 2 weeks	
	1.7.2 Determine input requirements for organising and conducting each training activity. Start-up date: September of every year Estimated duration: 1 week	ATM, CNS, RO, Consultants
	1.7.3 Determine the costs of the inputs required for each activity, and the budget available for its execution. Start-up date: September of every year Estimated duration: 3 days	TCB
	1.7.4 Draft a working paper to submit the annual training plans and their logistic and financial requirements to the consideration and approval of the Project Coordination Committee. Start-up date: October of every year Estimated duration: 1 week	ATM, CNS, RO, Consultants
	1.7.5 Examine and approve the annual training plans and their requirements. Start-up date: November of every year Estimated duration: 1 day	CCP
	1.7.6 Prepare the information, the teaching material, and the presentations for each approved activity. Start-up date: according to the annual plan Estimated duration:	ATM, CNS, Ro, Consultants, Lecturers
	1.7.7 Advise the participating States and organisations about the details of the training activities and the logistic and financial arrangements for their implementation. Start-up date: according to the annual plan Estimated duration:	RO
	1.7.8 Nominate the candidates for training activities, and introduce them to the respective ICAO Regional Office. Start-up date: according to the annual plan Estimated duration:	CAAs and participant organizations
	1.7.9 Consider the requests for scholarships, and assign them according to the established budgetary provisions. Start-up date: according to the annual plan Estimated duration:	RO, TCB Fellowships
	1.7.10 Carry out training activities and assess their results.	ATM, CNS, RO, Consultants, Lecturers

	Start-up date: according to the annual plan Estimated duration:	
	1.7.11 Draft a report on the conduction of each activity and its results. Start-up date: according to the annual plan Estimated duration:	ATM, CNS, Consultants
1.8 Adoption of the appropriate multinational arrangements for the establishment and start-up of a regional organisation in charge of the implementation, management, and operation of multinational air navigation facilities.	1.8.1 Learn about the incorporation instruments approved by the States for the establishment of a regional organisation charged with the implementation, management, and operation of multinational air navigation facilities. Start-up date: week 27 Estimated duration: 1 week	Consultants
	1.8.2 Draft and propose an ICAO regional technical cooperation project document, based on the incorporation instruments of the new organisation, that will permit the establishment and initial operation of the latter. Start-up date: week 28 Estimated duration: 1 week	TCB, Consultants
	1.8.3 Draft a working paper supporting the submittal of the project document for its consideration and approval. Start-up date: week 29 Estimated duration: 2 days	Consultants, RO
	1.8.4 Submit the working paper presenting the proposed project document to the consideration of the civil aviation authorities, requesting their comments. Start-up date: to be determined Estimated duration:	RO
	1.8.5 Make the necessary adjustments or changes to the project document, based on the comments generated. Start-up date: to be determined Estimated duration:	Consultants
	1.8.6 Submit the final project document proposal to the approval of the corresponding bodies of each State. Start-up date: to be determined Estimated duration:	RO
	1.8.7 Make arrangements for the implementation of the project as soon as it has been approved by the States concerned. Start-up date: to be determined Estimated duration:	TCB, RO

Immediate Objective No. 2

Implementation of AIS quality assurance and safety management systems in CAR/SAM States, in keeping with international standards and recommended practices.

Success criterion: Quality assurance and safety management systems approved and established in no less than 10 CAR/SAM States.

Results	Activities	Party responsible for each activity
2.1 Implementation of quality assurance systems in no less than 10 States, in keeping with the corresponding provisions contained in Annexes 6,11,14 and 15.	2.1.1. Obtain and complete the information, learning about the current status with respect to the adoption of quality assurance systems in the participating States and organisations. Start-up date: week 66 Estimated duration: 2 weeks	AIS, RO
	2.1.2. Develop a model action plan, based on the information obtained and the regional guidance material available, to be used by the participating States and organisations for the implementation of a quality assurance system, including: Documented procedures; Inspection and trial methods; Supervision of equipment and operations; Internal and external audits; Supervision of the corrective action taken; and Use of the appropriate statistical analyses, when necessary. Start-up date: week 68 Estimated duration: 2 weeks	AIS, RO
	2.1.3. Draft a working paper to support the submittal of the model action plan for its consideration and approval. Start-up date: week 70 Estimated duration: 1 week	AIS, RO
	2.1.4 Submit the working paper to the consideration of the corresponding GREPECAS bodies through the established channels. Start-up date: to be determined Estimated duration:	RO
	2.1.5 Make the necessary adjustments and changes to the model action plan, based on the comments generated, and update the proposal and working paper for their consideration and approval by GREPECAS. Start-up date: to be determined Estimated duration:	AIS, RO

	2.1.6 Process, edit, and distribute the model action plan, introducing the amendments generated by GREPECAS in the course of its approval. Start-up date: to be determined Estimated duration:	RO
	2.1.7 Assist the participating States and organisations in the implementation of the model action plan, including the programming of the necessary coordination and training activities. Start-up date: to be determined Estimated duration:	AIS
	2.1.8 Draft a final report on the activities carried out, including the relevant recommendations. Start-up date: to be determined Estimated duration:	AIS
2.2 Implementation of a State safety programme in no less than 10 States.	2.2.1 Obtain and complete the information, learning about the current status of safety management and the establishment of a safety programme in the participating States. Start-up date: week 71 Estimated duration: 2 weeks	ATM, AGA, SRVSOP
	2.2.2 Develop a model action plan, based on the information obtained and the guidelines of the Safety Management Manual (Doc 9859), to be used by the States in the implementation of a State safety programme. Start-up date: week 72 Estimated duration: 1 week	ATM, SRVSOP
	2.2.3 Draft a working paper supporting the submittal of the model action plan for its consideration and approval. Start-up date: week 70 Estimated duration: 1 week	ATM, AGA, SRVSOP
	2.2.4 Submit the working paper to the consideration of the corresponding GREPECAS bodies through the established channels. Start-up date: to be determined Estimated duration:	ATM, AGA, SRVSOP
	2.2.5 Make the necessary adjustments and changes to the model action plan, based on the comments generated, and update the proposal and the working paper for their consideration and approval by GREPECAS. Start-up date: to be determined Estimated duration:	RO

	2.2.6 Process, edit, and distribute the model action plan, introducing the amendment generated by GREPECAS in the course of its approval. Start-up date: to be determined Estimated duration:	ATM, AGA, SRVSOP
	2.2.7 Assist the participating States and organisations in the implementation of the model action plan, including the programming of the necessary coordination and training activities. Start-up date: to be determined Estimated duration:	RO
	2.2.8 Draft a final report on the activities carried out, including the relevant recommendations. Start-up date: to be determined Estimated duration:	SRVSOP
2.3 Implementation of a safety management system by the corresponding bodies in no less than 10 States.	2.3.1 Obtain and complete the information, learning about the current status with respect to the adoption of a safety programme by the corresponding bodies in the participating States. Start-up date: week 74 Estimated duration: 2 weeks	ATM, AGA, SRVSOP
	2.3.2 Develop a model action plan, based on the information obtained and the guidelines of the safety management manual (Doc 9859), to be used by the participating States and organisations for the implementation of the safety management system that should be put in place by each certified aircraft operator, maintenance organisation, ATS provider, and aerodrome operator, and that will: a) Identify safety hazards; b) Make sure that the necessary corrective action is taken to mitigate risks and hazards; c) Contemplate the permanent supervision and periodic assessment of the level of safety achieved; d) Clearly define safety responsibilities; and e) Include the direct responsibility that top management has regarding safety. Start-up date: week 76 Estimated duration: 1 week	ATM, AGA, SRVSOP
	2.3.3 Develop guidelines to be used by the participating States for the establishment of a national acceptable level of safety, taking into account: a) safety efficiency indicators; b) safety efficiency objectives; and	ATM, SRVSOP

	c) safety requirements. Start-up date: week 77 Estimated duration: 1 week	
	2.3.4 Develop guidelines to be used by the States for the adoption of a systemic approach to gradually and consistently address the various elements necessary to build an effective safety management system, comprising the following steps: a) Planning; b) Commitment of top management with respect to safety; c) Organisation; d) Identification of hazards; e) Risk management; f) Investigation capacity; g) Safety analysis capacity; h) Promotion of safety and training; i) Documentation on safety and information management; j) Safety oversight and safety efficiency monitoring. Start-up date: week 78 Estimated duration: 1 week	ATM, SRVSOP
	2.3.5 Draft a working paper supporting the submittal of the model action plan and the guidelines for their consideration and approval. Start-up date: week 79 Estimated duration: 1 week	ATM, SRVSOP
	2.3.6 Submit the working paper to the consideration of the corresponding GREPECAS bodies through the established channels. Start-up date: to be determined Estimated duration:	RO
	2.3.7 Make the necessary adjustments or changes to the material referred to in 2.3.5, based on the comments generated, and update the proposal and working paper for their consideration and approval by GREPECAS. Start-up date: to be determined Estimated duration:	ATM, SRVSOP
	2.3.8 Process, edit, and distribute the material, introducing the amendments made by GREPECAS in the course of its approval. Start-up date: to be determined Estimated duration:	RO

	2.3.9 Assist the participating States and organisations in the implementation of the model action plan, including the programming of the necessary coordination and training activities. Start-up date: to be determined Estimated duration:	ATM, SRVSOP
	2.3.10 Draft a final report on the activities carried out, including the relevant recommendations. Start-up date: to be determined Estimated duration:	ATM, SRVSOP
2.4 Adoption of safety assessment programmes by the corresponding organisations of each State.	2.4.1 Obtain and complete the information, learning about the current status with respect to the adoption of safety assessment programmes by the corresponding organisations in the participating States and organisations. Start-up date: week 80 Estimated duration: 2 weeks	ATM, SRVSOP
	2.4.2 Develop a model action plan, based on the information obtained and the guidelines of the safety management manual (Doc 9859), to be used by the participating States and organisations for the adoption of a safety assessment programme by the corresponding organisations, that will permit: a) The identification of requirements regarding when safety assessments should be conducted; b) The drafting of safety assessment procedures; c) The development of organisational hazard classification criteria for the hazards identified; d) The development of safety assessment acceptance criteria; and e) The development of documentation and process requirements to maintain and disseminate the safety information derived from the assessments. Start-up date: week 82 Estimated duration: 1 week	ATM, SRVSOP
	2.4.3 Draft a working paper to support the submittal of the model action plan for its consideration and approval. Start-up date: week 83 Estimated duration: 1 week	ATM, SRVSOP
	2.4.4 Submit the working paper to the consideration of the corresponding GREPECAS bodies through the established channels. Start-up date: to be determined Estimated duration:	RO
	2.4.5 Make the necessary adjustments and changes to the	ATM, SRVSOP

	model action plan, based on the comments generated, and update the proposal and working paper for their consideration and approval by GREPECAS. Start-up date: to be determined Estimated duration:	
	2.4.6 Process, edit, and distribute the model action plan, introducing the amendments made by GREPECAS in the course of its approval. Start-up date: to be determined Estimated duration:	RO
	2.4.7 Assist the participating States and organisations in the implementation of the model action plan for safety assessment, including the programming of the necessary coordination and training activities, and taking into account the following steps: a) Drafting (or obtention) of a complete description of the system to be assessed and of the environment where the system will operate; b) Identification of hazards; c) Rating the seriousness of the consequences of a possible hazard; d) Identifying the likelihood of occurrence of a hazard; e) Risk assessment; f) Risk mitigation; g) Drafting of safety assessment documents; Start-up date: to be determined Estimated duration:	ATM, SRVSOP
	2.4.8 Draft a final report of the activities carried out, including the relevant recommendations. Start-up date: to be determined	ATM, SRVSOP
2.5 Training of at least 100 officials in matters related to the preceding results.	2.5.1 Develop training programmes to disseminate the safety culture among the corresponding organisations, and a modern prevention-based safety approach, taking into account the following factors: a) Legal and regulatory framework, based on ICAO standards and recommended practices; b) Application of scientifically-based risk management methods; c) Commitment by top management to safety management; d) A corporate safety culture that promotes safe practices, encourages safety-related communications, and enables active safety management, giving the results the same attention as that given to financial	ATM, SRVSOP, RO

	management; e) Effective application of standard operational procedures, including the use of checklists and information sessions; f) A non-punitive environment (or justice culture) in order to encourage an effective reporting of incidents and hazards; g) Systems to collect, analyse and share safety-related data generated by normal operations; h) Competent investigation of serious accidents and incidents that permits the identification of systemic safety-related deficiencies (instead of finding someone to blame); i) Integration of safety training (including human factors) for operational personnel; j) Forms of sharing the experience gained and best safety practices, through an active exchange of safety information (between companies and States); and k) Systemic safety oversight and efficiency monitoring, in order to assess safety efficiency and reducing or eliminating new problems. Start-up date: week 86 Estimated duration: to be determined	
	2.5.2 Identify the necessary requirements for organising and conducting each activity, following the sequence of actions defined for Result 1.7. Start-up date: week 88 Estimated duration: to be determine	ATM, SRVSOP, OR, TCB

Immediate objective No. 3

Develop a strategy for the operational implementation and integration of automated air traffic management systems in the CAR and SAM Regions, with a safe, gradual, evolutionary, and interoperable vision that facilitates the exchange of information and collaborative decision-making with respect to all the components of the ATM system.

Success criterion: A number of integrated automated ATM systems that permit a seamless, flexible, optimum, and dynamic management of international airspace and aerodromes, while increasing the safety levels required.

Results	Activities	Party responsible for each activity
3.1 Operational implementation of new automated ATM systems, and integration of the existing ones – (GPIs 6, 7, 9, 16, 17, and 18). ATM,	3.1.1 Obtain and complete the information, learning about the current status in the participating States and organisations with respect to: a) Existing facilities and equipment, especially for adjacent airspaces; b) Existing regional planning and	ATM, CNS, AIS, MET, RO

CNS, AIS, MET, RO	documentation; c) Existing interface control documents (ICDs); d) Implementation of new ATM automation tools (minimum safe altitude warning, conflict prediction, conflict alert, conflict resolution advisory, path conformity control, functional integration of ground and aircraft systems); e) Implementation of flight data processing systems (FDPS); f) Implementation of radar data processing (RDPS) and ADS ATS surveillance systems, and exchange of radar/ADS data, including mono-radar, multi-radar, and radar data sharing; g) Implementation of digital communication networks at State and regional level; h) Implementation of ATM applications, such as radar control handoff, automated hands-free system, AIDC, CPDLC, etc.; i) Implementation of AIS data banks; j) Processes to ensure quality and timely distribution of aeronautical information; k) Functional integration of ground and aircraft systems; l) Implementation of MET data banks; m) Availability of meteorological information in support of ATM systems, including ✓ D-ATIS, D-VOLMET and other information (volcanic ash, tropical cyclones, storms, clear air turbulence, icing, wind shear, etc.) using up-linked ADS messages; ✓ MET information from down-linked ADS messages (upper wind fields, real-time wind profiles, etc.) n) Implementation of collaborative decision-making (CDM) aspects for other ATM requirements, in keeping with the global ATM operational concept. Start-up date: week 105 Estimated duration: 2 weeks	
	3.1.2 Analyse the operational scenarios of current and planned ATS, with a view to determining the operational requirements for the short- and medium-term integration of existing automated systems and other operational requirements to meet future ATM expectations, as well as the identification of system requirements for non-automated ATS units. Start-up date: week 107	ATM, CNS, RO

	Estimated duration: 2 weeks	
	3.1.3 Develop a strategy for the integration and implementation of automated systems in the CAR/SAM Regions, taking into account the guidance contained in Appendix K to agenda item 3 of the GREPECAS/12 report, and including the following aspects: a) The information processed under 3.1.1 and 3.1.2, and the operational scenarios of current and planned ATS; b) Implementation by stages, considering the required level of automation according to the volume and complexity of air traffic, taking into account: ✓ The new tools (minimum safe altitude warning, conflict prediction, conflict alert, conflict resolution advisory, path conformity control, functional integration of ground and aircraft systems); ✓ The flight data processing system (FDPS); ✓ The radar (RDPS) and ADS ATS surveillance data processing system, and radar/ADS data exchange, including mono-radar, multi-radar and radar data sharing; ✓ Automated digital communications, including radar control handoff, automated hands-free system, AIDC, CPDLC, etc.; ✓ Implementation of collaborative decision-making (CDM) aspects for other ATM requirements, in keeping with the global ATM operational concept; ✓ Implementation of AIS data banks; ✓ Functional integration of ground and aircraft systems; ✓ Processes to assure the quality and timely distribution of aeronautical information; ✓ Implementation of MET data banks; - Availability of meteorological information to support ATM systems, including: - D-ATIS, D-VOLMET and other information (volcanic ash, tropical cyclones, storms, clear air turbulence, icing, wind shear, etc.) using up-linked ADS messages; - MET information from down-linked ADS messages (upper wind fields, real-time wind profiles, etc.).	ATM, CNS, AIS, MET, RO

	Start-up date: week 109 Estimated duration: 4 weeks	
	3.1.4 Draft technical guidelines for the functional operation of ATM automated systems, including: a) New tools (minimum safe altitude warning, conflict prediction, conflict alert, conflict resolution advisory, path conformity control, functional integration of ground and aircraft systems); b) The data communication interface control document (ICD) for the various automated systems to be implemented and common coordination among ATM centres, based on ICAO SARPs; c) Input and output data and interfaces applicable to service functions and sub-functions; d) The functional breakdown required by all ATM components, in hierarchical order; e) Determination of the various operational applications, from the lowest to the highest functional level or interface; f) Technical requirements concerning interoperability, databases, equipped aircraft, software tools, etc., that will facilitate the implementation and integration of automated systems; g) The implementation of AIS and MET data banks. Start-up date: week 113 Estimated duration: 8 weeks	ATM, CNS, AIS, MET, RO
	3.1.5 Conduct a cost-benefit study for the implementation/integration of ATM automated systems. Start-up date: week 121 Estimated duration: 2 weeks	CBA
	3.1.6 Develop bilateral or multilateral technical/operational agreement models, as appropriate, between States and international organisations responsible for adjacent airspaces and regions, with respect to the conduction of trials and the implementation/operational integration of automated ATM systems. Start-up date: week 123 Estimated duration: 1 week	ATM, CNS
	3.1.7 Develop a plan of national and regional training	ATM, CNS, AIS, MET,

	activities for the personnel involved that will facilitate the implementation or integration of automated ATM systems. Start-up date: week 124 Estimated duration: 1 week	RO
	3.1.8 Develop a model action plan based on the material prepared, to be used by the participating States and organisations for the interoperable implementation of new automated ATM systems, and for the integration of the existing systems. Start-up date: week 125 Estimated duration:	ATM, CNS, AIS, MET, RO
	3.1.9 Draft a working paper supporting the submittal of the action plan for its consideration and approval. Start-up date: week 126 Estimated duration: 1 week	ATM, CNS, RO
	3.1.10 Submit the working paper introducing the plan to the consideration of the corresponding GREPECAS bodies through the established channels. Start-up date: to be determined Estimated duration:	RO
	3.1.11 Make the necessary adjustments or changes to the action plan, based on the comments generated, and update the proposal and working paper for their consideration and approval by GREPECAS. Start-up date: to be determined Estimated duration:	ATM, CNS, RO
	3.1.12 Process, edit, and distribute the plan, introducing the amendments made by GREPECAS in the course of its approval. Start-up date: to be determined Estimated duration:	RO
	3.1.13 Give advice to the participating States and organisations regarding the implementation of the action plan for the automated systems and their integration, including the programming of the necessary coordination and training activities. Start-up date: to be determined Estimated duration:	ATM, CNS, RO

	3.1.14 Draft a final report of the activities carried out, including the relevant recommendations. Start-up date: to be determined Estimated duration:	ATM, CNS, AIS, MET, RO

E. **INPUTS**

1. **Inputs of the participating States and organisations**

1.1 **Staff**

1.1.1 The participating States and organisations shall provide:

- a) Professionals in the required specialties, as candidates to be selected by ICAO to carry out project activities;
- b) National counterpart personnel corresponding to the specialties of project consultants;
- c) Administrative support personnel for project advisory missions, as required.

1.1.2 The participating States and organisations shall continue paying the normal salary of their personnel that is selected by ICAO to carry out project activities, throughout the agreed assignment period.

1.2 **Training**

1.2.1 The participating States and organisations shall cover the cost of air tickets to and from the places where training activities and programmes sponsored by the project take place abroad, and will continue paying their grant-holding personnel their salary and other regular allowances to which they are entitled, as long as these activities last.

1.3 **Offices and equipment**

1.3.1 The participating States and organisations shall provide office facilities, equipment, supplies, as well as local transportation and international communications *via* telephone or other electronic media to the project consultants.

2. **Project inputs**

2.1. **Assignment of professional staff**

2.1.1 International consultants will be provided to carry out the activities foreseen in those specialties in which the participating States and organisations do not have professionals available.

2.2. **Administrative support**

2.2.1 The necessary administrative personnel will be provided to support the development of project activities.

2.3 **Official trips and missions**

2.3.1 Funds are provided, as necessary, to cover the cost of project coordination, monitoring, or review missions.

2.3.2 Funds are provided to finance the trips, insurance and *per diems* of the professionals of the participating States and organisations that are selected by ICAO to carry out project activities.

2.4 Training

2.4.1 Funds are provided to offer training grants, according to the implementation plan approved by the Project Coordination Committee every year.

2.4.2 Occasionally, and according to the available budget approved to that end, international round-trip tickets will be provided to enable the participation of State representatives in activities sponsored by the project.

2.5 Equipment

2.5.1 Funds are provided for the purchase of the necessary equipment and supplies to carry out project activities.

2.6 Others

2.6.1 Budget provisions are included to cover various project expenses, the drafting of reports, plans and manuals, simultaneous interpretation services, translation of documents, and administrative expenses of the project executing body.

F. RISKS

1. The factors that could delay or impair the achievement of the results and objectives of the project are the lack of timely payment of contributions or shared costs by the participant States and organisations, possible delays in the selection of the professional staff for the project and the candidates to receive grants, and bureaucratic delays in purchase approvals.

2. A likely factor that in time could cause serious delays or prevent the achievement of project results and objectives would be a drastic change in the political or economic situation of the participant States.

G. OBLIGATIONS AND PREREQUISITES

1. The participating States and organisations undertake to deposit their cost-sharing contributions to the project on the dates foreseen in the payment schedule that appears in the project budget, so that the executing body may begin its activities.

2. The States hosting project activities shall provide the professional staff of the project with all the reference material and background information available with regard to the activities to be carried out, as well as the authorisations, approvals, permits, and logistic support that may be required to fulfil their functions.

3. The participating States and organisations shall provide the necessary counterpart support so that the project may be carried out effectively, meet its objectives, and sustain its results. To that end, the organisations receiving the technical cooperation provided for under this project will participate by assigning the necessary counterpart personnel and will provide the necessary premises, office equipment, vehicles, materials and services.

4. The participating States and organisations will ensure the application of the necessary legal provisions to retain the personnel trained by the project, at least, for the duration of the project.

5. ICAO will sign the project document and will provide the assistance agree upon, subject to the fulfilment or likely fulfilment of the aforementioned obligations and prerequisites. If one or more of the prerequisites is not fulfilled, ICAO may, at its own discretion, suspend or end the assistance.

H. SUPERVISION, REPORTING AND PROJECT REVIEWS

1. At least once every 12 months, the project will be subject to a joint review by the representatives of the participating States and organisations, who make up the Project Coordination Committee, and the first of said reviews will take place within the first 12 months from the start of full implementation. The international coordinator of the project will draft and submit a project performance assessment report at each of the joint review meetings. During the execution of the project, additional reports of this kind may be requested as necessary.

2. A final project report will be prepared for submittal at the final joint review meeting. The draft of this report will be prepared sufficiently in advance so that the executing body may examine it and adjust its technical aspects at least four months before the final joint review.

3. The parties will jointly determine if the project must be subject to an assessment. If so decided, the necessary budgetary provisions and arrangements must be made through consultations among the signatories to the project document regarding the composition of the assessment mission, its terms of reference and the time it will require.

4. The following types of project document reviews will only require the approval of the executing body, provided it has the assurance that the other signatories to the project document have no objections to the proposed changes:

- a) The review of any of the project document attachments or their addenda;
- b) Reviews that do not imply significant changes to the immediate objectives, results or activities of the project, but which respond to a redistribution of the inputs agreed upon or to expenditure increases due to inflation; and
- c) Mandatory annual reviews to reschedule the delivery of inputs agreed for the project, or to increase expenditures due to inflation, or to accommodate the flexibility margin of the executing body in terms of expenses.

I. BUDGET

The following pages contain the project budget.

A-51

PROJECT BUDGET

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ICAO STRATEGIC OBJECTIVES FOR 2005-2010

REVISED VISION AND MISSION STATEMENT

The International Civil Aviation Organization, a specialized agency of the United Nations, is the global forum for civil aviation.

ICAO pursues the vision of a safe, protected and sustainable development of civil aviation, through cooperation among its member States.

To achieve this vision, the Organization has established the following strategic objectives for the 2005-2010 period:

Safety – Improve the safety of global civil aviation

Security – Improve the protection of global civil aviation

Environmental protection – Minimise the detrimental impact of global civil aviation on the environment

Efficiency – Improve the efficiency of aeronautical operations

Continuity – Maintain the continuity of aeronautical operations

Rule of law – Strengthen the legislation concerning international civil aviation

Strategic objective A: Safety – *Improve the safety of global civil aviation*

Improve the safety of global civil aviation through the adoption of the following measures:

To identify and monitor the existing types of civil aviation safety risks, and develop and implement an effective and relevant global response to emerging risks.

To ensure the timely implementation of ICAO provisions, constantly monitoring the progress made by the States in terms of compliance.

Conduct aviation safety oversight audits to identify deficiencies and promote their resolution by the States.

Develop global corrective plans aimed at the root causes of deficiencies.

Assist the States in the resolution of deficiencies, through regional corrective plans and the creation of regional or sub-regional safety oversight organisations.

Encourage the exchange of information among the States, in order to foster mutual trust in terms of the level of aviation safety, and expedite safety oversight improvements.

Promote the timely resolution of critical safety problems identified by the regional planning and implementation groups (PIRGs).

Support the application of safety management systems in all safety-related disciplines in all the States.

Assist the States in the improvement of safety through technical cooperation programmes, and drawing the attention of donors and financial organisations to critical needs.

Strategic objective B: Security – *Improve the protection of global civil aviation*

Improve the protection of global civil aviation through the adoption of the following measures:

- To identify and monitor the existing types of security threats, and to develop and implement an effective and relevant global response to emerging threats.
- To ensure the timely implementation of ICAO provisions, constantly monitoring the progress made by the States in terms of compliance.
- Conduct security audits to identify deficiencies and promote their resolution by the States.
- Develop, adopt, and foster new or amended measures to improve the protection of travellers worldwide, while promoting efficient procedures for crossing borders.
- Develop teaching material sets on security and e-training, and keep them updated.
- Encourage the exchange of information among the States, in order to promote mutual trust in terms of the level of security.
- Assist the States in the training of all categories of personnel responsible for the implementation of security measures and strategies, and, when appropriate, the certification of said personnel.
- Assist the States in the resolution of security-related deficiencies, through the security mechanism and technical cooperation programmes.

Strategic objective C: Environmental protection - *Minimise the detrimental impact of global civil aviation on the environment*

Minimise the detrimental impact of global civil aviation activities on the environment, particularly aircraft engine noise and emissions, through the adoption of the following measures:

- To develop, adopt, and promote new or amended measures to:
 - limit or reduce the number of people affected by significant levels of aircraft noise;
 - limit or reduce the impact of aircraft engine emissions on local air quality; and
 - limit or reduce the repercussions of greenhouse gases on global climate.
- To cooperate with other international organisations, particularly the United Nations Framework Convention on Climate Change, in the tasks related to the contribution of aviation to global climate change.

Strategic objective D: Efficiency – *Improve the efficiency of aeronautical operations*

Increase the efficiency of aeronautical operations, by resolving the problems that hinder the efficient development of global civil aviation, through the adoption of the following measures:

- To develop, coordinate, and implement air navigation plans that reduce operational unit costs, facilitate traffic growth (of both passengers and goods), and optimise the use of existing and emerging technologies.

Study the trends, coordinate the planning, and develop guidelines for the States that will contribute to the sustainable development of international civil aviation.

Develop guidelines and assist States in the process of liberalising economic regulations concerning international air transport, with the corresponding safeguards.

Assist States improve the efficiency of aeronautical operations, through technical cooperation programmes.

Strategic objective E: Continuity – *Maintain the continuity of aeronautical operations*

Identify and address threats to the continuity of air navigation, through the adoption of the following measures:

Assist States resolve disagreements that hinder air navigation.

Respond in a prompt and positive manner to mitigate the effects of natural or human-caused events that may interrupt air navigation.

Cooperate with other international organisations to prevent the dissemination of diseases by air travellers.

Strategic objective F: Rule of law – *Strengthen the legislation concerning international civil aviation*

To develop the international aeronautical law and keep it updated in light of the changing needs of the international civil aviation community, through the adoption of the following measures:

Develop international aeronautical law instruments that support the ICAO strategic objectives, and provide a forum where the States can negotiate said instruments.

Encourage the States to ratify the international aeronautical law instruments.

Provide aeronautical agreement registration services, and act as depository of international aeronautical law instruments.

Provide mechanisms for the resolution of conflicts related to civil aviation.

Provide the States with a model legislation.

BASIC IMPLEMENTATION STRATEGIES

In order to achieve the strategic objectives, the Organization will take the necessary measures to:

operate in a transparent manner and communicate efficiently both at the external and internal level;

maintain the efficacy and relevance of all documents and texts;

identify risk management and mitigation strategies, as necessary;

continuously improve the efficient use of its resources;

improve the use of information and communication technology, integrating it into its work procedures as soon as possible;

take into account the possible impact of its practices and operations on the environment;

improve its use of the various human resources, in keeping with the best practices of the United Nations system; and

work efficiently, with the highest level of legal propriety.

ANNUAL PROJECT REPORT

Purpose

The annual project report is intended to reflect the independent opinion of the main project stakeholders with respect to its relevance, performance, and likelihood of success. The main stakeholders are the target groups, project administrators, the government body responsible for the project, and the international executing body.

The annual report has the following objectives:

- To facilitate a written rating and assessment of the progress made by the project in the achievement of its objectives;
- Present the opinion of stakeholders on issues that have an impact on the implementation of a project, and their proposals to resolve such issues; and
- Be a source of contributions to the annual report of the regional office, which is the official means of communication between the regional offices and headquarters, and serves to collect the experiences attained in the countries for their integration and dissemination among all parties interested in development.

Questions on relevance are intended to determine to what extent the objectives and target groups of the project continue to be as valid and relevant as conceived initially, or whether they were modified subsequently in view of the new circumstances in the immediate context and outside of the project.

Questions on performance are related to efficacy, efficiency, and opportunity.

Questions on success are referred mainly to possible effects, the sustainability of results, and the contribution of the project to capacity building.

Drafting and presentation of the annual report

The drafting of the annual project report must begin in early October. The final report must be submitted to the corresponding regional office no later than 31 October.