International Civil Aviation Organization
South American Regional Office
Fourth SAM Workshop/Meeting on ATS Routes Network Optimisation (SAM ATSRO/4) - RLA/06/901
Lima, Peru, 2 to 6 July 2012

Agenda Item 2: Analysis of Version 01 of the SAM ATS routes network

Flexible Use of the Airspace in the South American Region

(Presented by the Secretariat)

Summary

The meeting is invited to analyse the guidance material for the implementation of the Flexible Use of the Airspace in the ICAO South American Region (SAM/FUA guidelines).

References:

- ICAO Annex 11
- ICAO Doc 4444 – PANS
- ICAO Doc 9426 – Manual on Air Traffic Services Planning
- ICAO Doc 9850 Global Air Navigation Plan
- SAM Region ATS routes network optimisation programme
- Ninth Workshop/Meeting (SAM/IG/9) Report

ICAO Strategic objectives	***A*** ***Safety*** ***C*** ***Environmental Protection***

1 Background

1.1 As part of the airspace optimisation programme, a recommendation was made to develop guidelines for the implementation of the ICAO flexible use of airspace concept in the South American Region (SAM/FUA guidelines).

2 Analysis

2.1 In developing the guidelines, consideration was given to the relevant recommendations of the International Civil Aviation Organization, the Global Air Navigation Plan (Doc 9850), and the guidelines contained in the SAM Performance-Based Air Navigation System Implementation Plan

(SAM-PBIP), which specify that an optimum, balanced, and equitable use of airspace by civil and military users would be expedited by strategic coordination and dynamic interaction, thus enabling optimum flight paths while reducing operating costs for airspace users and protecting the environment.

2.2 The meeting approved in first instance and provisionally, the guidance manual of the FUA (**Appendix A**) and requested States that for the SAM ATSRO/4 meeting they should indicate any adjustment to carry out so as to approve it at the forthcoming SAM/IG meeting as a final document.

3 Suggested action

3.1 The meeting is invited to:

a) Take note of the information presented in the working paper;

b) Analyse the SAM/FUA guidelines (**Appendix A**) and issue comments deemed pertinent;

c) Analyse other aspects related to this agenda item, as appropriate.

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APÉNDICE - APPENDIX A

Project RLA 06/901
Assistance for the implementation of a regional ATM system based on the ATM operational concept and the corresponding technological support for communications, navigation, and surveillance (CNS)

GUIDANCE FOR THE IMPLEMENTATION OF FLEXIBLE USE OF AIRSPACE (FUA) CONCEPT IN THE SOUTH AMERICAN REGION

First Edition
April 2012

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Guidance for the Implementation of Flexible Use of Airspace (Fua) Concept in the South American Region

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PREFACE

The Guidance for the Implementation of the Flexible Use of Airspace (FUA) Concept at ICAO South American Region (Guidance FUA / SAM) is published by the ICAO's South American Regional Office on behalf of ICAO's South American Regional Implementation Group (SAMIG). It considers the different aspects that States should take into account for the coordination and cooperation between civil and military air traffic, recognizing that the airspace is a common resource of civil and military aviation, that allows to achieve safety, consistency and efficiency of civil aviation and to meet military air traffic requirements through the implementation of dynamic airspace.

The Regional Office, on behalf of SAMIG shall publish revised versions of the SAM/FUA Guidance needed to keep a duly updated document.

You can request copies of the SAM/FUA Guidance at:

ICAO's SAM OFFICE LIMA, PERU

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This edition (*Version 0.0)* includes all other revisions and amendments as of April 2011. Subsequent amendments and corrigenda shall appear in the Amendment and Corrigenda Record Table, pursuant to the procedure set forth below.

The publishing of amendments and corrigenda is announced regularly through correspondence with the States and International Organisations, and at the ICAO's Regional South American Office website, mandatory reference for those who use this publication. Blank cells are meant to facilitate note-taking.

RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS			
Num.	Effective date	Date recorded	Recorded by

CORRIGENDA			
Num.	Effective date	Date recorded	Recorded by

ACRONYMS AND ABBREVIATIONS

ACC	Area Control Centre
AD	Aerodrome
ADIZ	Air Defence Identification Zone
AIP	Aeronautical Information Publication
AMC	Airspace Management Cell (AMC)
ANSP	Air Navigation Service Provider
ASM	Airspace Management
ATC	Air Traffic Control
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATS	Air Traffic Services
AUP	Airspace Utilization Plan
CADF	Centralised Airspace Data Function
CBA	Cross Border Area
CBP	Customs and Border Protection
CDM	Collaborative Decision Making
CDR	Conditional Route
CFMU	Central Flow Management Unit
CNS/ATM	Communication, Navigation and Surveillance/Air Traffic Management
CRAM	Conditional Route Availability Message
ENR	En route
EUROCONTROL	European Organisation for the Safety of Air Navigation
FAA	Federal Aviation Administration
FAUP	Forecast Airspace Utilization Plan
FIR	Flight Information Region
FMU/FMP	Flow Management Unit/Flow Management Position
FUA	Flexible Use of Airspace
FUUP	Forecast Update of the Utilization Plan
GAT	General Air Traffic
GEN	General
GNSS	Global Navigation Satellite System
GPI	Global Plan Initiatives
LOA	Letter of Agreement
MOA	Military Operation Area
MOU	Memorandum of Agreement
MSL	Mean Sea Level
NextGen	Next Generation
NOTAM	Notice to Airmen
PANS	Procedures for Air Navigation Services
PBN	Performance-Based Navigation
PIRG	Planning and Implementation Regional Group
PFF	Performance Framework Form
RPA	Remotely Piloted Aircraft
RPAS	Remotely Piloted Aircraft System
RPS	Remotely Piloted Station
SAR	Search and Rescue
SARPS	Standards and Recommended Practices

SAM-PBIP	Performance-Based Implementation Plan for SAM Region
SESAR	Single European Sky ATM Research
SMS	Safety Management Systems
SUA	Special Use Airspace
SUPPS	Regional Supplementary Procedures
TRA	Temporary Reserved Areas
TSA	Temporary Segregated Areas
UAS	Unmanned Aircraft System
UIR	Upper Flight Information Region

APPLICABLE DEFINITIONS IN THIS SAM/FUA GUIDANCE

Remotely Piloted Aircraft. Aircraft whose pilot is not on board.

Temporary Reserved Area (TRA). Airspace temporarily reserved and allocated for the specific use of a particular user during a determined period of time, through which other flights may pass with permission from air traffic control (ATC).

Temporary Segregated Area (TSA). Airspace temporarily reserved and allocated for the exclusive use of a specific user during a determined period of time, through which no other flights may pass.

Cross Border Area (CBA). Reserved or segregated airspace established for specific operational requirements on international borders.

Air traffic service unit. A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.

Segregated Airspace. Airspace of specific dimensions allocated for the exclusive use of a user or users.

Remote Pilot Station (RPS). A station from which the pilot remotely operates the flight of an unmanned aircraft.

Air Traffic Flow Management (ATFM). A service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that AT capacity is utilised to the maximum extent possible, and that the traffic volume is compatible with the capacities declared by the appropriate ATS authority.

Airspace Management (ASM). Process whereby airspace options are selected and applied in order to meet the airspace users' needs.

Air Traffic Management (ATM). The dynamic, integrated management of air traffic and airspace (including air traffic services, airspace management and air traffic flow management) under safe, cost-effective, and efficient conditions by providing facilities and seamless services in collaboration with all stakeholders and incorporating ground and on-board features.

Global Plan Initiatives (GPI). They are designed to support the planning and implementation of performance objectives in ICAO Regions.

Performance-Based Navigation (PBN). Performance-based area navigation requirements applicable to aircraft operating along an ATS route, on an instrument approach procedure, or in a designated airspace.

Standards and Recommended Practices (SARPS). The Council adopts standards and recommended practices pursuant to Articles 54, 37 and 90 of the Convention on International Civil Aviation and are defined as follows:

Standard. A standard is a specification of physical characteristics, configuration, material, performance, personnel or procedure, whose uniform application is recognized as necessary for the safety or regularity of international air navigation which contracting States shall comply pursuant to the Convention; in case

compliance is not possible, notification to the Council is mandatory, as set forth in Article 38 of the Convention.

Recommended practice. A recommended practice is a specification of physical characteristics, configuration, material, performance, personnel or procedure, whose uniform application is deemed convenient for safety, regularity or efficiency of international air navigation which contracting States shall comply pursuant to the Convention.

Remote pilot. Person remotely operating the flight controls of a remotely piloted aircraft during flight.

Procedures for Air Navigation Services (PANS). Procedures adopted by the Council, including general operational procedures that are not considered mature enough to be adopted as international standards and recommended practices, or more permanent texts that are inappropriate or too detailed to be included in an Annex.

Regional Supplementary Procedures (SUPPS). Operational procedures that supplement the Annexes and PANS developed largely through ICAO's regional air navigation meetings to meet the needs of a specific ICAO region. It addresses issues related to safety and consistency of international air navigation. They are published in a single document for all regions. ICAO's Regional Supplementary Procedures (SUPPS) are part of the air navigation plan prepared by the Regional Air Navigation Conferences (ANC) to meet those needs in certain areas not covered by global provisions.
They complement the requirement exhibition for facilities and services contained in the air navigation plan publications.

Collaborative Decision-Making (CDM). A process whereby all ATM decisions, except for ATC tactical decisions that are based on the exchange of all relevant information for transit operations between civilian and military parties.

Flight Information Region (FIR). An airspace of defined dimensions within which flight information service and alerting service are provided.

Conditional Route (CDR). A non-permanent ATS route or part of it that can be planned and used under special conditions.

ATM security. Contribution of the ATM system to the protection of civil aviation, safety, and national defence, law enforcement and protection of the ATM system against security threats and vulnerabilities.

Air Traffic Services (ATS). A generic term meaning variously, flight information, alerting, air traffic advisory, air traffic control services (area control, approach control or aerodrome control services).

Customs and Border Protection Services (CBP). Protect the State by preventing illegal entry of persons and goods while facilitating legitimate travelling and trade.

Unmanned Aircraft System (UAS). Aircraft and its associated elements operated without a pilot on board.

Remotely Piloted Aircraft System (RPAS). Configurable set of elements consisting of a remotely piloted aircraft, its remote pilot station(s), the mandatory command and control links, and any other system element required at some point during the flight operation.

Air Traffic Management. A system that provides ATM through the integration of human resources, information technology, and facilities, in collaboration with the support of ground-, air-, and/or space-based communications, navigation and surveillance.

Global Navigation Satellite System (GNSS). A worldwide position and time determination system that includes one or more satellite constellations, aircraft receivers and system integrity monitoring, augmented as necessary to support the required navigation performance for the intended operation.

Flexible Use of Airspace (FUA). Concept of airspace management based on the principle that airspace should not be designated as exclusively military or civilian, but as a continuous space that meets the requirements of all users to the extent possible.

Danger area. An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

Prohibited area. An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

Restricted area. An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.

1 Preamble

1.1 Objective

1.1.1 The Guidance for the Implementation of the Flexible Use of Airspace in ICAO's South American Region (SAM/FUA Guidance) has been designed to help ensure that the States of the Region have the applicable regional procedures, in harmonic fashion.

1.1.2 The development of the guidance has been taken into consideration the recommendations of the International Civil Aviation Organization in this regard, the Global Air Navigation Plan (Doc 9850) and the guidelines set forth in the Performance-Based Implementation Plan for the SAM Region (SAM-PBIP) which states that the optimal, balanced and equitable use of airspace by civil and military users, shall be facilitated through both strategic coordination and dynamic interaction, thus allowing the implementation of optimal flight paths, reducing operating costs of airspace users while protecting the environment.

1.2 Scope

1.2.1 The SAM/FUA Guidance has been developed to be used by SAM States in the FIRs under their jurisdiction, taking into account the operational improvements and airspace optimization initiatives in the short and medium term, and particularly in accordance with ATS route network optimization in the SAM Region.

2 Global background

2.1 Annex 2 - *Rules of the Air*, contains rules concerning flight and aircraft manoeuvring within the scope of Article 12 of the Convention, and provisions for coordination with military authorities for reasons of integrity and territorial sovereignty of a State, whereas Annex 11 - *Air Traffic Services*, contains provisions concerning the need to coordinate with military authorities or units, mainly to the extent that State aircraft activities may affect civilian operations and *vice versa*.

2.2 In addition, the *Procedures for Air Navigation Services - Air Traffic Management* (PANS-ATM, Doc. 4444) contain procedures applicable to other in-flight contingencies, such as lost or unidentified aircraft, that require coordination with military authorities, and describe procedures for the implementation of special military operations.

2.3 Information on coordination requirements between military units and air traffic services can also be found in the *Manual concerning safety measures relating to military activities potentially hazardous to civil aircraft operations* (Doc 9554) and in the *Air traffic services planning manual* (Doc 9426).

2.4 Likewise, the *Global Air Navigation Plan* (Doc 9750) proposes 23 initiatives (GPI) oriented to the implementation of the ATM operational concept. GPI 1 refers precisely to the *"Flexible use of airspace"* (**APPENDIX B**

Note: In light of the new aviation system block upgrade (ASBU) methodology fostered by ICAO, the Global Air Navigation Plan shall be updated and the current global plan initiatives (GPI) shall be inserted in the different modules of each block proposed in this methodology.

2.5 The *ICAO Global Air Traffic Management Operational Concept* (Doc 9854) describes the services required to operate the global air traffic system in the near future and beyond, and lists the requirements to provide more flexibility for users, maximize efficiency, and increase system capacity, while improving safety. Integral parts of these elements are interoperability and military system operations.

2.6 *Appendix O of Assembly Resolution A 37-15: Consolidated statement of continuing ICAO policies and associated practices related specifically to air navigation* (**APPENDIX B**

2.7 The resolution states, among other things, that the joint use of airspace and some facilities by civil and military aviation will be provided in such a way so as to attain safety, regularity and efficiency of civil aviation and to meet the requirements of military air traffic, and promotes the dissemination of best practices and the adoption of follow-up action building upon the success of the *Global air traffic management forum on civil-military cooperation* (2009) with the support of the civil and military stakeholders.

2.8 The Forum recognized that most ICAO Regions had made great progress in airspace management and military-civilian cooperation; however, it recognized the need to further improve cooperation between authorities and with air navigation service suppliers. It was suggested that, in order to promote cooperation, military representatives should participate at ICAO meetings, seminars and other relevant events as part of State delegations.

2.9 Upon summarizing the results of the Forum, the following was stated:

a) Peace and stability are essential conditions for social and economic development;

b) Trust and mutual understanding are key requirements for collaboration between civil and military authorities;

c) The safety, security and efficiency are common civil and military values;

d) For civil aviation, efficiency means greater capacity, less delays, and a reduction in costs, fuel consumption and emissions;

e) For military aviation, efficiency means mission efficacy (in times of peace and crisis) and realistic training, together with greater capacity, less delays and a reduction in costs, fuel consumption and emissions;

f) Cooperation and coordination require communication;

g) Civil-military cooperation is essential at national, regional and international level;

h) Airspace is a continuum and a limited common resource for all civil and military users;

i) Better knowledge and application of flexible use of airspace principles are a good basis for civil-military coordination of ATM;

j) Civil-military interaction is essential to optimize the safe and efficient use of airspace for all users, and the global aviation community must properly resolve gaps;

k) The integration of UAS is a challenge as well as an opportunity for the growth of the aviation system;

l) Civil-military cooperation and coordination are essential, both in times of peace and crisis;

m) A global civil-military approach to security and incident management is needed, taking into account positive experiences that can help improve the system;

n) Greater efforts are needed, not only within the context of flexible use of airspace, but also in terms of standards and compatible procedures and global interoperability of ATM systems; and

o) Good collaboration requires communication, education, good relationships and trust.

2.10 Finally, in response to the agreements reached at the 2009 Global air traffic management forum on civil-military cooperation, ICAO and civil and military experts developed Circular 330-AN/189, which contains examples of good practices in civil-military cooperation and recognizes that growing civil air traffic and military air missions would benefit significantly from a more flexible use of airspace, and recommends and provides guidance on best practices in civil-military cooperation that could be adopted by States.

3 Regional background

3.1 Civil-military cooperation and coordination in the South American Region have traditionally been based on a dialogue between civilian and military authorities with the view to making better use of airspace for both and improving cooperation for the use and integration, where possible, of their respective air traffic control facilities.

3.2 The States of the South American Region, taking into account the provisions of the Global Air Navigation Plan, the ATM operational concept and the conclusions of the Caribbean and South American Regional Planning and Implementation Group (GREPECAS), developed the Performance-Based Air Navigation System Implementation Plan for the SAM Region (SAM-PBIP), a plan that was approved for regional implementation through *Conclusion RAAC/12-1 Performance-Based Air Navigation System Implementation Plan for the SAM Region (SAM PBIP)* of the Twelfth Meeting of Directors of Civil Aviation (RAAC/12) of the SAM Region held in October 2011 (**APPENDIX C**

3.3 The main gap identified in the current system is the lack of a policy and procedures for the flexible use of airspace, which hampers airspace design and management by not allowing the application of an optimal airspace structure and the use of optimum flight paths. The limitations that have been identified include the existence of permanently reserved airspace, primarily for military purposes, and inadequate airspace planning, which prevents direct flights between airports of origin - destination and/or city pairs.

3.4 The period considered by the SAM PB ANIP runs from 2012 to 2018 and the expected evolution is based on the Global Plan Initiatives that apply to en-route operations, TMA operations, and air operations in general.

3.5 ATM planning has been based on seven global aspects, for which the respective performance framework forms (PFF) have been developed. One of these aspects is the Flexible Use of Airspace, which has been identified as (PFF SAM/ATM 04 **APPENDIX D**). This activity identified the following benefits for the ATM community, which should be attained through operational and technical activities aligned with this performance objective:

a) Improved civil/military coordination and cooperation strengthens airspace safety;

b) It allows for a more efficient ATS route structure, reducing miles flown and fuel consumption and, consequently, CO^2 emissions into the atmosphere;

c) It increases airspace capacity; and

d) Increased availability of reserved airspace at times when there is no activity by the users of such airspace.

Note: In light of the new aviation system block upgrade (ASBU) methodology fostered by ICAO, the SAM Region will have to update the SAM PB ANIP, as well as the PFFs that will be replaced by the air navigation report forms (ANRF).

3.6 As part of regional activities and in order to improve civil/military coordination and cooperation and in response to Assembly Resolution A 37-15, ICAO organized the Seminar on Civil/Military Coordination and

Cooperation and flexible use of airspace in the NAM, CAR and SAM Regions, which was held on 16-19 August 2011, in Lima, Peru.

3.7 This seminar was attended by civil and military authorities, that had the opportunity to exchange views, receive valuable information on activities being carried out worldwide. As a result of the discussions, they issued a series of recommendations that should be implemented by the States and ICAO as appropriate:

a) Support to the holding of an event as a follow-up to the Global Civil-Military Cooperation Forum (2009);

b) The seminar requested ICAO to coordinate the drafting of regional guidelines on civil-military cooperation for the CAR/SAM regions;

c) The seminar recommended to make arrangements for civil-military work at regional level;

d) States are encouraged to apply the Flexible Use of Airspace (FUA) principles (Annex 11 - Air Traffic Services, Procedures for Air Navigation Services - Air Traffic Management (PANS-ATM, Doc 4444) and Circular 330-An/189 Civil-Military Cooperation in Air Traffic Management);

e) ICAO is requested to develop guidance material on the Flexible Use of Airspace (FUA);

f) The participation of military authorities at ICAO meetings is recommended (Resolution A37-15, Appendix O: Coordination and Cooperation of Civil and Military Air Traffic);

g) The ICAO NACC and SAM Regional Offices are requested to organize a workshop on ATM crisis management; and

h) CAR/SAM States, whenever possible, should establish a liaison office for civil-military coordination within their Civil Aviation Department in order to facilitate coordination between civil and military sectors.

4 Rationale

4.1 As world economies grow, demand for air travel multiplies; thus, airspace and airport capacity must increase to meet this demand. Traditional methods of increasing capacity have reached the end of their possibilities, so new, improved methods and concepts will be needed to maximize existing capacity and increase it where possible.

4.2 In the context of the ATM Operational Concept, airspace management (ASM) is the process whereby options for the use of airspace are selected and applied to meet user needs. The objective of ASM is to achieve a more efficient use of airspace, taking into account actual needs and, whenever possible, to avoid permanent segregation of airspace.

4.3 There are several and sometimes conflicting interests regarding the use of airspace, so ASM is a complex exercise. Additionally, there are also activities that require the reservation of a certain volume of airspace for its exclusive or special use (SUA) for defined periods of time due to the characteristics of its flight profile, the importance of its operations or the risks involved by the operations to be performed in said space and the need to separate them effectively and safely from other types of aeronautical activities.

4.4 Airspace management should be based on the following principles and strategies:

a) all available airspace should be managed in a flexible manner;

b) airspace management processes should incorporate dynamic flight paths and provide optimal operational solutions;

c) when conditions require segregation, based on different types of operations and/or aircraft, the size, shape and time zones of said airspace should be determined to minimize impact on operations;

d) the use of airspace should be coordinated and monitored to meet the different requirements of all users and minimize operational limitations;

e) Airspace reservation should be planned in advance, making dynamic changes where possible. The system must also be able to meet unexpected last minute requirements; and

f) The complexity of operations may limit the degree of flexibility.

g) According to the guidelines established in the SAM PBIP, the optimal, balanced, and equitable use of airspace by civil and military users shall be facilitated through both strategic coordination and dynamic interaction, allowing for the establishment of optimal flight paths while reducing operating costs for airspace users.

4.5 The flexible use of airspace must also include airspace over high seas within the jurisdiction of the FIR, considered without detriment to the rights and obligations of Member States under the Convention on International Civil Aviation (Chicago Convention) of 7 December 1944 and its Annexes.

5 Basic guiding principles of civil-military coordination and cooperation

5.1 The concept of flexible use of space should basically consider the following guiding principles:

a) coordination and cooperation between civil and military authorities shall be organized at strategic, pre-tactical and tactical management level by establishing letters of operational agreement and/or special procedures for a given activity, aimed at increasing airspace safety and capacity and improving the efficiency and flexibility of air operations;

b) consistency among airspace management, air traffic management, air traffic flow and management, and air traffic service functions must be established and maintained to ensure efficient planning, distribution and use by all users at the three airspace management levels (strategic, tactical and pre-tactical);

c) airspace reservation for exclusive or specific use of certain user categories shall be temporarily applied only during limited periods of time depending on actual use and it shall be disregarded as the activity that motivated it ceases to be, and it shall follow the procedures set forth in ICAO documents and Annexes as well as those prescribed in the Letters of Operational Agreement and/or special procedures.

d) air traffic service units and users will make the best possible use of available airspace,

e) coordination and collaborative decision-making by ATS, ATFM units, and effective application of the flexible use of airspace concept must be consistent and permanent during the strategic, pre-tactical and tactical phases of airspace management; and

f) Adequate resources should be allocated for an effective implementation of the flexible use of airspace concept, taking into account both civil and military needs.

6 General guidelines for the implementation of the FUA concept

6.1 SAM States should establish policies on the use of temporarily or permanently reserved airspace in order to avoid the adoption of airspace restrictions as much as possible.

6.2 The process of implementing the Flexible Use of Airspace should start with an assessment of restricted, prohibited and danger airspace that affect or could affect air traffic. To this end, this paper provides an initial analysis from a regional perspective.

6.3 If they have not done it yet, States should implement the Civil/Military Coordination and Cooperation Committees or a similar body, aimed at assessing the various of airspace management and air traffic control issues that somehow affect civil and military activities.

6.4 The relevant aviation authority should encourage the development of the necessary letters of operational agreement between ATS and military units or other users for the dynamic and flexible use of airspace, avoiding restrictions on the use of airspace, thus meeting the needs of all users.

6.5 In cases where airspace restriction is inevitable, the letters of agreement should specify that the activation of airspace reservation should not extend beyond the time required. This will require the development of paths that permit the dynamic re-routing of aircraft to avoid such airspaces.

6.6 The aforementioned paths should be published in the AIP in order to alert users of the need to consider said possible deviations in flight planning.

6.7 Appropriate measures should be taken to improve the effectiveness of air traffic flow management in order to assist existing operational units ensure efficient flight operations.

6.8 The implementation of the FUA requires convincing the users of reserved airspace, mainly the military authorities of the States involved, that their needs will be met, regardless of the application of airspace restrictions. Thus, seminars/meetings with the authorities will be essential to demonstrate the importance of optimized use of airspace.

7 National policies for the implementation of the FUA concept

7.1 FUA is an airspace management concept based on the principle that airspace should not be designated as exclusively military or civilian, but as a continuum that meets the maximum possible requirements of all users.

7.2 The effective and harmonized implementation of the flexible use of airspace in the volume of airspace under consideration requires precise civil-military coordination rules and dynamics, taking into account the needs of all users and the nature of their various activities, avoiding permanent reservation inasmuch as possible and optimizing its flexible use, without detriment to the privileges and defense responsibilities of Member States.

7.3 In order to accomplish that stated above, the effectiveness of civil-military coordination procedures must be based on rules and procedures for the efficient use of airspace by all users, which should be reflected in the Letters of Operational Agreement between the military authorities and Air Traffic Services (ATS), and on some basic guiding principles.

7.4 The objective of establishing common policies for SAM States responds to the need to ensure a uniform and harmonized implementation of the provisions on the adoption of the flexible use of airspace concept.

7.5 The States should, if they have not done it yet, insert the text on the application of the flexible use of airspace concept in their national legislation. The purpose of regulating FUA is to support the concept of an operating airspace that is increasingly integrated into the framework of the common transport policy and to establish common design, planning and management procedures to ensure an efficient and safe air traffic management.

7.6 The legislation should reinforce the need for coordination and cooperation between civil and military authorities, especially for the allocation and efficient use of airspace for military purposes, including the criteria and principles that should govern said allocation and use, particularly its opening to civilian flights.

7.7 National legislation should include a safeguard clause enabling States to suspend the application of the standard if so required for national military purposes. **APPENDIX E** contains a sample of a national standard, as reference.

8 Analysis of the use and management of Restricted, Prohibited, Danger and Special use areas

8.1 In order to achieve a comprehensive ATS route network that serves the interests of all users, including commercial, military, general, sports aviation, and unmanned aircraft systems (UAS), it will be necessary to analyze all restricted, prohibited and danger areas that have been implemented in each State in order to apply the flexible use of airspace concept.

8.2 This work is not intended to eliminate or arbitrarily reduce the special use airspace assigned, but rather, through the implementation of collaborative decision making (CDM), find the best options that may satisfy all airspace users and ensure that the needs identified are met, regardless of the application of airspace restrictions.

8.3 The States should analyze the different cases in which, for safety reasons, it would be necessary to establish procedures or letters of agreement to avoid tactical airspace management, as this implies the adoption of real-time decisions by the control service. While tactical management should be included in every action plan, this should be the tool of last resort, as it is not possible to apply the most appropriate solution when time is scarce and data to consider are varied.

8.4 Note was taken of the existence of permanently reserved airspace, primarily for military purposes, in a way that could prevent proper airspace planning, not allowing direct flights between airports of origin - destination and/or city pairs, as well as operations at inappropriate flight levels and/or speeds that prevented aircraft from maintaining optimum flight profiles, and major ground and/or en-route system delays.

8.5 SAM States should establish policies on the use of temporarily or permanently reserved airspace, to avoid, as much as possible, the adoption of airspace restrictions, and to consider and integrate the unmanned aircraft systems (UAS) into its air navigation system, which adds a new component to the aviation system that should start being considered.

8.6 There is a high percentage of special use airspace that should be analyzed within the context of civil/military cooperation in each particular State. There are 124 published prohibited areas, 421 restricted areas, 41 danger areas and 83 special areas in the Region, including volcanic areas and other special areas for aerial sports and recreational activities (**APPENDIX F**).

8.7 In order to proceed to assess the Restricted, Prohibited, Hazardous and Special use areas, the States could use as a model the form in **APPENDIX G**.

8.8 The purpose of the form is to identify the type of area or special use airspace, the lateral dimension in square kilometers and the vertical dimension with upper and lower limits, the period of use, the nature of the activity, the body or entity responsible for activating the area, the impact on the current design of airspace and finally, if planning could be potentially affected by the area.

9 Establishment of the Civil/Military Coordination and Cooperation Committee

9.1 ICAO Standards and Recommended Practices (SARPs), the recommendations and conclusions of different events on Civil/Military coordination and cooperation that have been approved for regional application aim at mutual cooperation between civil and military authorities; however, not every State has a formal civil/military coordination and cooperation committee.

9.2 In order to ensure FUA implementation, each State should establish a civil/military coordination and cooperation committee or similar body to assess opportunities for implementing Special Use Airspace (SUA). It is noteworthy that success of this initiative depends on the committee having the power to ensure the use of airspace by all users according to their specific needs, while avoiding, inasmuch as possible, the permanent reservation of airspace that would lead to a limited use of airspace when not being used.

9.3 These civil/military coordination and cooperation committees ensure coordination of decisions on civil and military airspace management and air traffic control issues at all levels, and are essential for the implementation of an ATS route network that meets the current requirements of airspace users.

9.4 Civil/military coordination and cooperation committees should include representatives of civil and military aviation and other airspace users as needed.

9.5 For these civil/military coordination and cooperation committees to be established, civil aviation administrations must propose terms of reference or objectives for that committee and then agree on a work program based on those terms of reference. States may consider the following aspects, *inter alia*:

a) Achieve civil-military coordination and optimum joint use of airspace with the highest degree of safety, regularity and efficiency of international civil air traffic;

b) Develop national policies regarding flexible use of airspace (FUA);

c) Review and provide the necessary links between civil ATS units and the relevant air defense military units to ensure day-to-day integration or segregation of civil/military air traffic operating in the same airspace segments;

d) Review the existing ICAO provisions on cooperation and civil/military coordination;

e) Consider the special use of airspace in order to validate the actual use and reach agreement on the joint use of airspace;

f) Establish procedures for joint and flexible use of airspace;

g) Develop and implement security measures related to military activities potentially hazardous for civil aircraft operations;

h) Prepare and sign letters of operational agreement between civil and military ATS units for air traffic management in the airspace concerned;

i) If prohibited, restricted and danger areas need to be maintained, make sure that they conform to Annexes 2 and 15 and that the following principles are applied:

   i) Pay due attention to the need of not hampering the safe and economical operation of civil aircraft operations;
   ii) Provide appropriate intermediate areas within the designated area, based on the time and size of the activities to be conducted;
   iii) Use of standard ICAO terminology to define the areas;

j) Analyse and determine at regular intervals if it is still necessary to keep prohibited, restricted and danger zones;

k) Develop appropriate arrangements and procedures for establishing a temporary reservation of airspace, and

l) Other aspects that civil and military authorities consider should be analyzed in the context of the civil/military coordination and cooperation committee or body they deem most appropriate.

9.6 Based on the flexible use of airspace achieved through the civil/military coordination and cooperation committee, airspace planners in the States should develop proposals for the implementation, realignment or elimination of routes that would significantly influence the development of the ATS route network, taking into account the possibility of offering better flight profile to users and a possible reduction in airspace complexity.

9.7 The establishment of a civil/military cooperation and coordination committee to manage the application of the flexible use of airspace concept is absolutely necessary and it must be managed taking into account all users, applying guiding principles aligned with the flexible use of airspace concept.

10 Letters of Operational Agreement between civil and military ATS units

10.1 As provided in the PANS/ATM (Doc 4444), the Letters of Operational Agreement between civil and military ATS units may define agreements and procedures for the flexible use of airspace, and should specify, *inter alia*, the following points:

a) The horizontal and vertical boundaries of the airspace concerned;
b) The classification of airspace available for use by civil air traffic;
c) The units or authorities responsible for airspace handover;
d) Airspace handover conditions to the ATC unit concerned;
e) Airspace handover conditions from the ATC unit concerned;
f) Airspace availability periods;
g) Any limitations on the use of the airspace in question; and
h) Any other relevant procedures or information.

10.2 A sample Letter of Operational Agreement between civil and military authorities is shown in **APPENDIX H**

11 Airspace management within the scope of FUA

11.1 The flexible use of airspace is an airspace management concept based on the principle of accommodating all the users of that space to the extent possible, considering effective communication, cooperation and the necessary coordination to ensure the security, safety, efficiency and environmental sustainability.

11.2 This concept includes strategic (Level 1), pre-tactical (Level 2), and tactical (Level 3) self-management functions that are independent but closely linked, and that are to be carried out in a coordinated manner to ensure an efficient use of airspace.

11.3 When several aviation activities with different requirements take place in the same airspace, coordination must be aimed at the safe conduct of flights and the optimum use of available airspace.

11.4 The systematic application of this concept should be taken into account for the optimization of the route network, especially for the definition of scenarios with non-permanent or conditional routes.

11.5 In addition, some SAR activities, exercises or military operations may require coordination and cooperation with more than one State at a given moment, and the establishment of civil/military cooperation and coordination committees in every State acquires greater important in these cases.

11.6 The support of traffic flow management (ATFM) units to air operations is crucial to provide the necessary conditions for mitigating possible adverse effects on civil aviation.

11.7 **Strategic Management of Airspace (Level 1)**

11.7.1 To ensure the strategic management of airspace within the scope of FUA, civil and military air traffic service providers should perform at least the following functions:

a) Ensure the implementation of flexible use of airspace at the strategic, tactical and pre-tactical levels;

b) Review the needs of users on a regular basis;

c) Review and approve the activities that require reservation or restriction of airspace;

d) Define temporary airspace structures and procedures to offer multiple reservation options and routes;

e) Establish criteria and procedures for the creation and use of adjustable lateral and vertical boundaries of the airspace needed to accept variations in flight paths and short-term changes in flights;

f) Assess national airspace structures and the route network in order to plan flexible airspace structures and procedures;

g) Determine the conditions under which the responsibility for separating civil and military flights will rest on civil and military ATS units or on the controlling military units;

h) Establish and provide users with airspace structures in close cooperation and coordination with neighboring member States when the corresponding airspace structures have major repercussions on cross-border traffic or on the boundaries of flight information regions, with a view to ensuring an optimum use of airspace for all users;

i) Establish mechanisms for consultation between persons or agencies and all interested parties and organizations, in order to properly meet user needs;

j) Include the corresponding air traffic flow management (ATFM) units in the planning and implementation of the FUA concept from the beginning;

k) Develop, assess and periodically review the procedures, coordination and performance of operations within the flexible use of airspace concept;

l) Establish mechanisms for storing data about the requests, allocation and actual use of airspace for subsequent analysis and planning of activities;

m) Make sure that the areas designated for training, recreation, ATC sectors, route network, arrival and departure procedures are implemented and published on a timely basis, in coordination with the requirements of all airspace users, taking into account ICAO strategic objectives.

11.8 Pre-tactical Management of Airspace (Level 2)

11.8.1 The civil and military units should ensure the introduction of appropriate support systems, preferably automated, that will allow timely communication of airspace availability to all users involved, special airspace management units, if any, air traffic service providers, and all the corresponding parties and organizations by airspace managers.

11.8.2 Military control units and air traffic service units should inform each other of any change in the planned activation of airspace in a timely and efficient manner, and inform all the users involved about the actual status of airspace.

11.9 Tactical Management of Airspace (Level 3)

11.9.1 Tactical ASM should take place at the level of ATS and military control units. Safety procedures for coordination and cooperation between these agencies should be established to allow direct, real-time communication of relevant information in order to resolve specific traffic situations in the same volume of airspace and in adjacent airspaces to where civil and military controllers provide services.

11.9.2 Information should be available to civil and military controllers and military control units through a quick exchange of flight data, including aircraft position and flight intention, particularly when required for security reasons.

11.9.3 When civil and military controllers are providing services in the same airspace, there should be highly reliable direct communications between civil and military ATS units to resolve specific traffic situations. If minimum levels of safety are required, ATC civil units and military control units shall exchange flight data, including aircraft position and flight intention.

Post-operation analysis (Level 4)

11.9.4 The SAM region deemed it advisable to add a level of post-operation analysis to this process in order to assess the operations performed, communications, and possible safety gaps that may have been identified so as to ensure continuous improvement of civil-military coordination and cooperation.

11.9.5 A report registry can be created at this level to help the different stakeholders and the training section to focus on activities that will improve operations.

12 Flexible and adjustable airspace structures and procedures

12.1 Circular 330 -AN 189, in addressing this issue, states that the FUA concept may be based on the potential offered by flexible and adjustable structures and procedures, which are especially suitable for the assignment and temporary use of conditional routes, temporary reserved areas (TRA), temporary segregated areas (TSA) and cross border areas (CBA).

12.2 The FUA concept thus complements organizing airspace with a series of flexible structures as defined below:

12.2.1 Conditional Route (CDR): Non-permanent ATS route (see Figure 1) or portion thereof that can be planned and used under specified conditions. According to their foreseen availability and flight planning possibilities, and the level of activity expected from the associated TSA, conditional routes can be divided into the following categories:

a) Category one (CDR1): permanently schedulable;

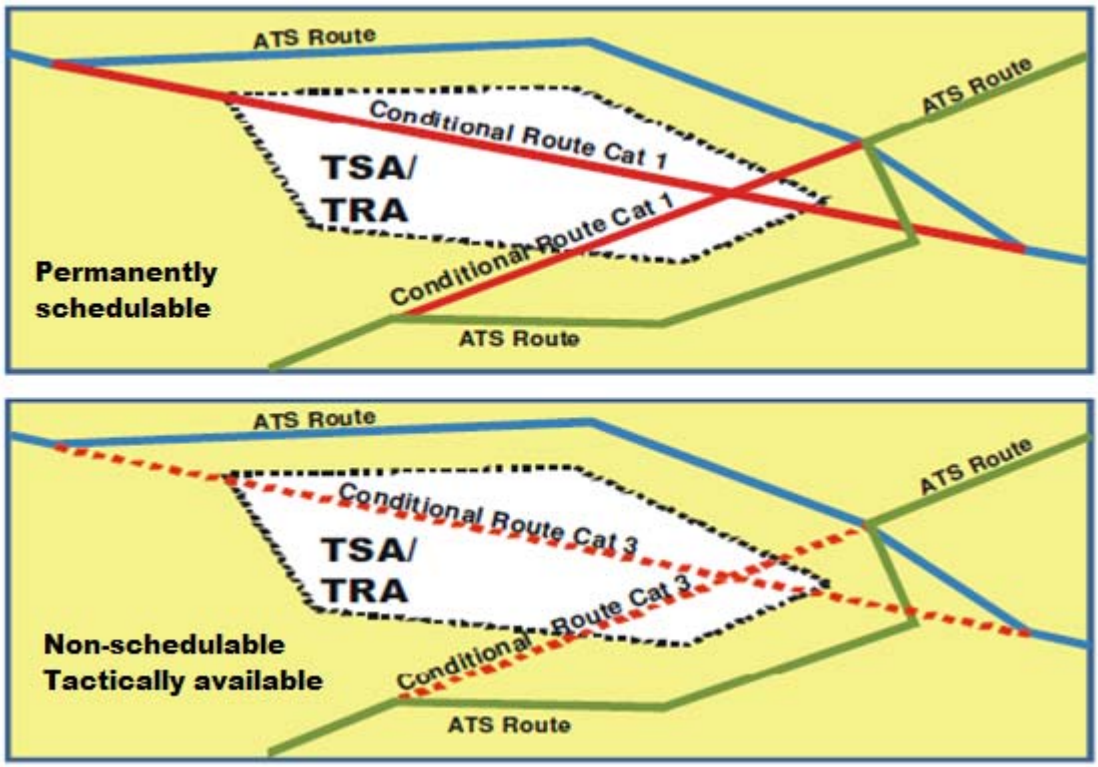
b) Category two (CDR2): non-permanently schedulable; and

c) Category three (CDR3): not schedulable.

12.2.2 Temporary reserved area (TRA): A TRA (see Figure 1) is airspace temporarily reserved and allocated for the exclusive use of a user during a determined a period of time, through which other flights can operate with ATC permission.

12.2.3 Temporary segregated area (TSA): A TSA (see Figure 1) is airspace temporarily reserved and allocated for the exclusive use of a specific user during a determined period of time, through which no other flight traffic is allowed.

12.2.4 Cross border area (CBA): A CBA (see Figure 2) is a reserved or segregated airspace established on international borders to meet specific operational requirements. CBAs are established for purposes of instruction and military training and for other flights operating on both sides of a border. Since CBAs are not bound to national borders, they can be defined so as to benefit both civil and military aviation. CBAs in combination with conditional routes crossing them improve airspace structure in border areas and help improve the ATS route network. Before establishing CBAs, political, legal, technical, and operational agreements between the States concerned are required. Formal agreements for the establishment and use of CBAs should take into account sovereignty, defense, law, operations, the environment, and search and rescue.



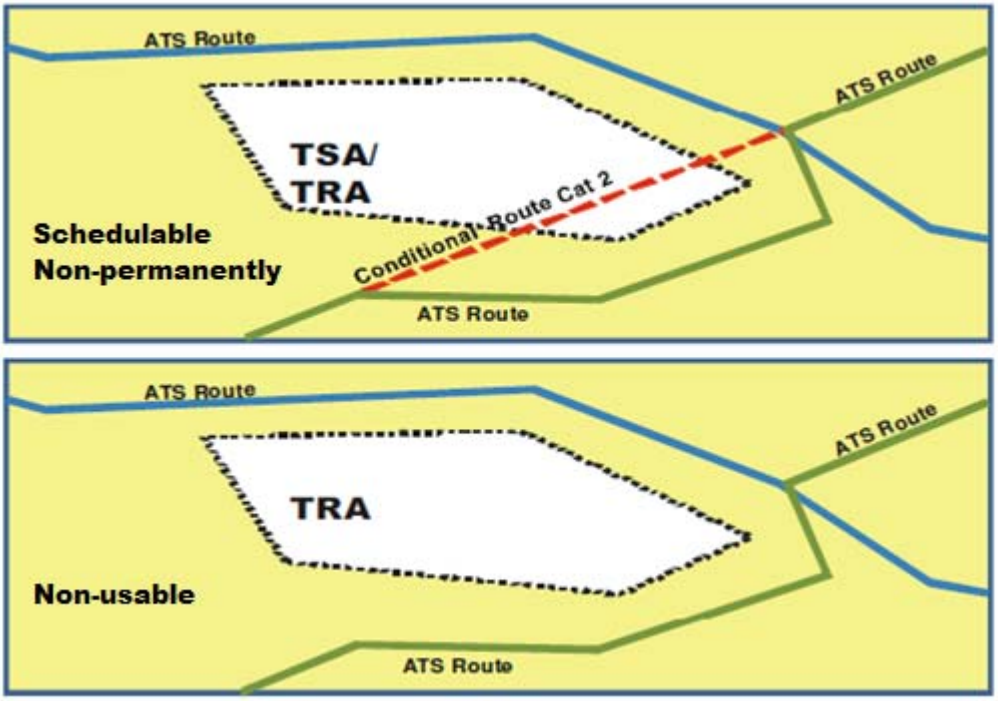


Figure 1

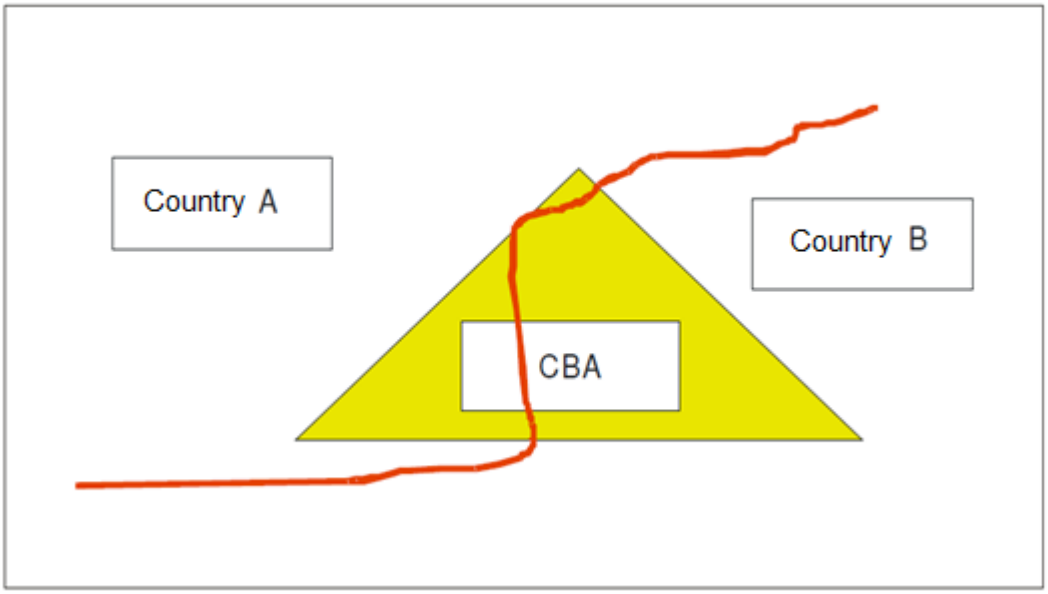


Figure 2

12.2.5 Airspace management cell (AMC): A national joint civil/military unit responsible for managing on a day-to-day basis or upon request (pre-tactical phase) the allocation of airspace in accordance with requests from users (ACC, FMU / FMP, management units and other military zones and accredited agencies).

12.2.6 There is no experience in the South American Region with this type of conditional routes. Therefore, the establishment of modes of employment of non-permanent routes should be assessed in light of experiences elsewhere in the world. The Region should take action on this issue and establish criteria for defining the scenarios where non-permanent routes are to be applied.

12.2.7 It would be interesting for States to begin implementation by adopting some procedures used in other Regions. To this end, **APPENDIX I** contains concepts and procedures of the European Region.

13 Safety assessment

13.1 During the safety management process and before introducing any change in the implementation of FUA, it is important to conduct a safety assessment that includes hazard identification and risk assessment and mitigation in accordance with SMS procedures.

13.2 In a stage following the operational phase, an assessment will be made of issues identified, inspection and audit findings, SMS analyses, which may produce important information that should be used for continuous airspace optimization.

13.3 Therefore, the reports of joint actions in the flexible use of airspace as well as the analysis by a multidisciplinary group of experts are of great importance for the analysis of lessons learned, with a view to improving the procedures and rules applied to optimize safety and the flexible use of airspace.

14 Information management

14.1 Good information management is critical to the successful implementation of the FUA concept; thus the critical importance of timely distribution and accuracy of information transmitted to civil and military controllers concerning airspace status and specific air traffic conditions that directly affect safety, efficacy and efficiency of operations.

14.2 In relation to the above, timely access to updated information on airspace status is vital for all parties wishing to use the available airspace structures for preparing or modifying their flight plan.

14.3 In accordance with the provisions of the AIS Manual (Doc 8126), the AIP is divided into three parts, Part 1 - General (GEN), consisting of administrative and explanatory information that is not of such importance or significance that requires the issuance of a NOTAM, Part 2 - En route (ENR), containing information on the airspace and its utilization, and Part 3 - Aerodromes (AD), with information on aerodromes / heliports and their utilization.

14.4 In light of the above, all aspects of the flexible use of airspace should be included in Part 2 ENR.

14.5 Section 3 - ATS routes, in Part 2, ENR includes detailed lists of all ATS routes established within the territory covered by the AIP, whether they are part of ICAO regional air navigation agreements or used only for domestic traffic. Where applicable, a description of the routes or portions thereof where special procedures are required to eliminate or reduce the need for interceptions should be included. The relevant special procedures should also be included. Particularly in ENR 3.5, *Other routes*, a description of other specifically designated routes that are mandatory within specified areas is required.

14.6 In order to comply with the provisions of Doc 8126, conditional routes (CDR) will be published in ENR 3.5.

14.7 Furthermore, in accordance with the AIS Manual, Section ENR 5.2 *Military exercise and training areas and air defense identification zone* (ADIZ), there shall be a description, as appropriate, of the areas established for the military exercise and training taking place at regular intervals and of the ADIZ zone.

14.8 In view of the above, this Section will contain temporary segregated areas, with the geographical coordinates of boundaries, upper and lower limits, and the system and the means established to announce the initiation of activities, together with all relevant information on civil flights.

15 Seminars/meetings

15.1 State administrations, working with air navigation service providers (ANSPs) and with the military authorities, should take steps to create the political will, establish institutional arrangements, bringing together civil and military authorities nationwide, set goals, apply practical and operational measures, and finally, make the necessary changes to make all this possible.

15.2 The seminars, meetings, and other similar events will raise awareness among all stakeholders about the need to achieve these common objectives for the benefit of international civil aviation.

16 Collaborative Decision Making (CDM)

16.1 Decision-making (CDM) is the process whereby all ATM decisions, except for ATC tactical decisions, are based on the exchange of all relevant information for traffic operations between civil and military parties. States and service providers should adopt CDM principles, with the participation of military planners as a means to support ASM.

16.2 CDM brings together airlines, civil aviation and military authorities and airports, in an effort to improve ATM through the exchange of information and data, and improved automated decision-support tools.

16.3 The collaboration philosophy may become an aviation standard. CDM allows the exchange of information and facilitates decision-making processes to ensure that stakeholders receive timely and accurate information essential to plan their operations, whether civil or military.

16.4 For example, accurate estimates of arrival or departure times can improve the processing of aircraft, apron services, the allocation of stands and exit gates, ATC and ATFM. The involvement of military airspace users and planners in national or regional airspace planning ensures proper planning, both in time and size, which not only benefits military aviation but also minimizes conflicts with civil traffic.

16.5 With decisions based on the sharing of accurate information, CDM improves predictability in case of unforeseen problems or events. If properly implemented, CDM also leads to an optimum use of airspace, with benefits for all participants in the system.

16.6 For CDM implementation, the use of the Manual on collaborative decision making that was approved for regional implementation by the SAMIG/6 Meeting, Conclusion SAMIG/6/7 is suggested. The *CDM Manual for South America (SAM)* is posted at the following address of the ICAO South American Regional Office:
http://www.lima.icao.int/eDocuments/ATM/ATFM/4CDM%20Manual%20Spa.pdf

16.7 The CDM Manual describes methods and procedures to manage the Collaborative Decision Making process to be applied in the SAM Region. The purpose of this paper has been to provide assistance to SAM States in reaching a common understanding of the collaborative Decision Making (CDM) process with a view to the application of this methodology, which seeks the participation of all parties involved in ATFM in the implementation of equitable measures among ATM system users.

17 Action Plan for the implementation of the FUA concept

17.1 As a reference and to assist SAM States in the implementation of the FUA concept, a model action plan has been developed, as shown in **APPENDIX J**. This action plan has been developed taking into account ICAO indications as well as the activities of the PFF SAM/ATM 04 of the SAM PB ANIP.

17.2 The action plan identifies some of the tasks to be executed by SAM States, starting with the establishment of a policy for developing standards related to the FUA concept, if it has not been done yet. It also encourages States to establish a high-level national civil-military coordination body, to conduct a uniform and collaborative national airspace planning process, taking into account the needs of all users as well as national security, defense and police requirements. It also invites States to establish rules and procedures of communication, negotiation and setting of priorities for civil-military coordination.

17.3 Furthermore, it encourages States to start assessing their special use airspace as soon as possible to verify the suitability and possibility of an early dynamic use or modification of such airspace for its use by civil aviation. It also defines some tasks for the establishment and publication of procedures for activities that require airspace reservation and restriction, and for the establishment of frame agreements or letters of operational agreement, as applicable, between civil and military authorities to facilitate coordination.

17.4 Finally, it includes tasks related to the need of establishing a system for periodically reviewing airspace requirements, organization and management, and conducting a timely risk assessment by applying the SMS methodology to ensure that changes in the system maintain and/or improve the agreed safety levels.

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APPENDICES

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APPENDIX A

GPI - Flexible Use of Airspace

Scope: Optimized, balanced and equitable use of airspace by civil and military users, facilitated by strategic coordination and dynamic interaction

Components associated to the operational concept: AOM and AUO

Strategy description

Airspace use could be optimized through dynamic interaction of civil and military air traffic, including real-time coordination among civil and military controllers. This needs system support, operational procedures, and appropriate information on the position and intentions of civil traffic.

The flexible use of airspace concept (FUA) is based on the principle that the airspace should not be designated as purely civil or military, but, instead, it should be a continuous space in which the requirements of all users are met inasmuch as possible. The flexible use of airspace should translate into the elimination of extended temporarily or permanently restricted airspace segments or special use airspace.

In those cases in which it is still necessary to reserve airspace for specific individual uses, thus blocking airspace of a given size, an attempt should be done to do it on a temporary basis. Airspace should be cleared immediately after the operations that gave rise to such restrictions have been completed.

Greater benefits associated to FUA implementation can be achieved through cooperation among States, which may require regional and sub-regional agreements since reserved airspace is frequently established along critical flight paths along national borders.

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APPENDIX B

Assembly Resolution A 37-15

A37-15: Consolidated statement of continuing ICAO policies and associated practices related specifically to air navigation

Whereas in Resolution A15-9 the Assembly resolved to adopt in each session for which a Technical Commission is established a consolidated statement of continuing policies related specifically to air navigation up to date as at the end of that session;

Whereas a statement of continuing policies and associated practices related specifically to air navigation as they existed at the end of the 36th Session of the Assembly was adopted by the Assembly in Resolution A36-131, Appendices A to W inclusive;

Whereas the Assembly has reviewed proposals by the Council for the amendment of the statement of continuing policies and associated practices in Resolution A36-13, Appendices A to W inclusive, and has amended the statement to reflect the decisions taken during the 37th Session; and

Whereas the statement of continuing policies in Resolution A36-13 is hereby superseded:

The Assembly:

1. *Resolves* that:

    a) the Appendices attached to this resolution constitute the consolidated statement of continuing air navigation policies and associated practices of the Organization as they exist at the close of the 37th Session of the Assembly; and

    b) the practices associated with the individual policies in the appendices constitute guidance intended to facilitate and ensure implementation of the respective policies; and

2. *Declares* that this resolution supersedes Resolution A36-13 with its Appendices A to W inclusive.

APPENDIX O TO ASSEMBLY RESOLUTION A 37-15

Coordination and cooperation of civil and military air traffic

Whereas the airspace is a resource common to both civil and military aviation and given that many air navigation facilities and services are provided and used by both civil and military aviation;

Whereas the Preamble of the *Convention on International Civil Aviation* stipulates that signatories thereto had “agreed on certain principles and arrangements in order that 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 opportunity and operated soundly and economically”;

Whereas Article 3 a) of the Convention states that "the Convention shall be applicable only to civil aircraft, and shall not be applicable to state aircraft" and Article 3 d) requires that "contracting States undertake, when issuing regulations for their state aircraft, that they will have due regard for the safety of navigation of civil aircraft";

Recognizing that growing civil air traffic and mission-oriented military air traffic would benefit greatly from a more flexible use of airspace used for military purposes and that satisfactory solutions to the problem of cooperative access to airspace have not evolved in all areas;

Whereas the flexible use of airspace by both civil and military air traffic may be regarded as the ultimate goal, improvement in civil/military coordination and cooperation, offers an immediate approach towards more effective airspace management; and

Recalling that the ICAO Global ATM Operational Concept states that all airspace should be a usable resource, any restriction on the use of any particular volume of airspace should be considered transitory, and all airspace should be managed flexibly:

The Assembly resolves that:

1. the common use by civil and military aviation of airspace and of certain facilities and services shall be arranged so as to ensure the safety, regularity and efficiency of civil aviation as well as to ensure the requirements of military air traffic are met;

2. the regulations and procedures established by Contracting States to govern the operation of their state aircraft over the high seas shall ensure that these operations do not compromise the safety, regularity and efficiency of international civil air traffic and that, to the extent practicable, these operations comply with the rules of the air in Annex 2;

3. the Secretary General shall provide guidance on best practices for civil/military coordination and cooperation;

4. Contracting States may include, when appropriate, representatives of military authorities in their delegations to ICAO meetings; and

5. ICAO serves as an international forum that plays a role in facilitating improved civil/military cooperation, collaboration and the sharing of best practices, and to provide the necessary follow-up activities that build on the success of the Global Air Traffic Management Forum on Civil/Military Cooperation (2009) with the support of civil/military partners.

Associated practices

1. Contracting States should as necessary initiate or improve the coordination and cooperation between their civil and military air traffic services to implement the policy in Resolving Clause 1 above.

2. When establishing the regulations and procedures mentioned in Resolving Clause 2, the State concerned should coordinate the matter with all States responsible for the provision of air traffic services over the high seas in the area in question.

3. The Council should ensure that the matter of civil and military coordination and cooperation in the use of airspace is included, when appropriate, in the agenda of divisional and regional meetings, in accordance with Resolving Clauses 3, 4 and 5 above.

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APPENDIX C

Conclusion RAAC/12-1 Performance-based Air Navigation Implementation Plan for the SAM Region (SAM PBIP)

The States of the ICAO South American Region and the international organisations involved:

a) approve the Performance-based Air Navigation Implementation Plan for the SAM Region shown in **Appendix A** (*i.e. RAAC 12 Report*), for its implementation at regional level;

b) encourage those States that have not done so to prepare their national performance-based air navigation plan in accordance with the guidelines contained in the cited implementation plan; and

c) request the ICAO South American Regional Office to review Project RLA 06/901 in order to align it with the performance objectives established in the cited implementation plan.

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APPENDIX D

REGIONAL PERFORMANCE OBJECTIVE: SAM/ATM 04 FLEXIBLE USE OF AIRSPACE	
Benefits	
Safety	• Enhanced civil/military coordination and cooperation reinforces airspace safety
Environment protection and sustainable development of air transport	• Permits a more efficient ATS route structure, reducing miles flown and fuel consumption, and thus CO2 emissions into the atmosphere. • Increases airspace capacity. • Increased availability of reserved airspace when there is no activity by airspace users.
Metrics	
• Percentage of implemented civil/military coordination committees or similar organisations • Number of implemented civil/military cooperation and coordination agreements • Reduction in the number of permanently reserved airspaces	
Strategy ***2012 – 2018***	

OC ATM COMPO-NENTS	TASKS	START-END	RESPONSIBLE PARTY	STATUS
AOM AUO CM	a) prepare guidance material on civil/military coordination and cooperation for the establishment of policies, procedures and national regulations	(*) - 2012	Regional Project States	In progress
	b) evaluate the number and size of reserved airspaces	(*) – 2012	States	In progress
	c) establish civil/military coordination committees or similar organisations	(*) - 2012	States	In progress
	d) make arrangements for permanent linkage and close cooperation between civil ATS units and the appropriate military units, as well as with reserved airspace users	(*) - 2012	States	In progress
	e) establish, when required by ANSPs, procedures for coordinating temporary reserved airspace through the issuance of NOTAMs or specific real-time reservation activation/deactivation procedures	(*) – 2013	States	Valid
	f) develop a strategy and work programme for the implementation of flexible use of airspace, through a stage-based approach, starting with a more dynamic sharing of reserved airspace	2012 - 2018	Regional Project States	Valid
	g) track progress during implementation	(*) – 2013	GREPECAS	In progress
Link to GPI	GPI/1: Flexible use of airspace; GPI/18: Aeronautical information. (*) Indicates that this task was started before the the scheduled date.			

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APPENDIX E

Example of national regulation for the implementation of flexible use of airspace

Preamble

Appendix O to Assembly Resolution A 37-15: *Consolidated statement of continuing ICAO policies and associated practices related specifically to air navigation* refers specifically to coordination and cooperation between civil and military air traffic. Hence, it recognizes that airspace is a common resource for civil aviation and military aviation and that a large number of air navigation facilities are available to, and used by, both civil and military aviation.

This resolution also states, among other aspects, that the shared use of airspace and certain facilities by both civil and military aviation will be arranged in such a way as to achieve safety, regularity and efficiency of civil aviation and meet the requirements of military air traffic.

Taking into account the organization of military aspects under its responsibility, XXX (*Name of State*) shall guarantee the sound application of the flexible use of airspace concept described by ICAO within the airspace under its responsibility to facilitate airspace and air traffic management.

Objective

The purpose of this standard is to define guidelines for the application of the flexible use of airspace (FUA) concept within Flight Information Regions (FIR) XXXX, **XXXX** (*name of FIR(s)*) to facilitate its use and harmonize its application within the context of airspace management (ASM) and air traffic management (ATM).

Background

The flexible use of airspace is a concept developed by the International Civil Aviation Organization (ICAO) that is being developed by the SAM Implementation Group (SAMIG) of the ICAO South American Region. FUA is an airspace management concept based on the principle that airspace should not be used exclusively for military or civil purposes but rather should be a continuous space in which the requirements of users are met as far as possible.

Likewise, it is recognized that the shared use of airspace and certain facilities by both civil and military aviation will be such that it will be possible to achieve safety, regularity and efficiency of civil aviation and meet the requirements of military air traffic, and encourages the dissemination of best practices.

Scope

These regulations establish a number of parameters to ensure better cooperation and coordination among civil and military entities responsible for managing the airspace under the responsibility of **XXX** (*name of State*).

FUA Principles

An FUA concept should be based on the following principles:

Coordination among civil and military authorities shall be articulated at a strategic, pre-tactical and tactical level in order to increase safety and airspace capacity, and improve the efficiency of air operations.

Consistency should be established and maintained between ASM, air traffic flow management (ATFM), and ATS at the three ASM levels.

Airspace reservation should be temporary, applied only during limited periods of time, and based on actual use of the airspace.

Wherever possible, the FUA concept should be applied beyond national borders or flight information region (FIR) boundaries.

Strategic Airspace Management

In order to ensure full application of the FUA concept at the ASM strategic level, it is necessary to establish airspace structures, develop coordination and airspace management procedures, and establish cross-border coordination and separation standards for civil and military flights.

Strategic airspace management is known as FUA Level 1.

Pre-tactical Airspace Management

An ASM entity should be established for the allocation of airspace in accordance with the conditions and procedures agreed at the strategic level.

In XXX (*State*), civil and military authorities are jointly responsible for airspace management. Therefore, the ASM entity shall be a joint civil-military unit. If necessary, the unit can also be established by two or more States. XXX (*name of State*) shall provide entities with the appropriate ASM support systems to ensure a timely and efficient process.

Pre-tactical airspace management is known as FUA Level 2.

Tactical Airspace Management

Tactical ASM should be carried out at the level of ATS units and military control units. Through special coordination and communication procedures, airspace data can be exchanged on a timely basis so that the airspace allocated to the pre-tactical level may be activated, deactivated or reassigned in real time. Updated airspace status should be communicated to all affected users.

When civil and military controllers provide services in the same airspace, direct and highly reliable communications should be available between civil and military ATS units in order to resolve specific traffic issues. If minimum safety levels are required, civil ATCs and military control units can exchange flight data, including aircraft position and flight intention data.

Tactical airspace management is known as FUA Level 3.

Post-operation analysis (Level 4)

At this level, an assessment shall be made of the mechanisms and processes used for management, creating a registry of reports on aspects that could be improved and lessons learned. This analysis will help to improve FUA processes and management, and material will be available to train all parties with a view to improving operations.

Safety Assessment

Within the safety management processes, and before introducing any change to the implementation of flexible use of airspace, it is necessary to perform a safety assessment for hazard identification and risk analysis and mitigation in accordance with SMS procedures.

Temporary Suspension

When the application of the FUA concept generates major operational difficulties, XXX (*Name of State*) may temporarily suspend such application provided the ATM community is immediately informed thereof.

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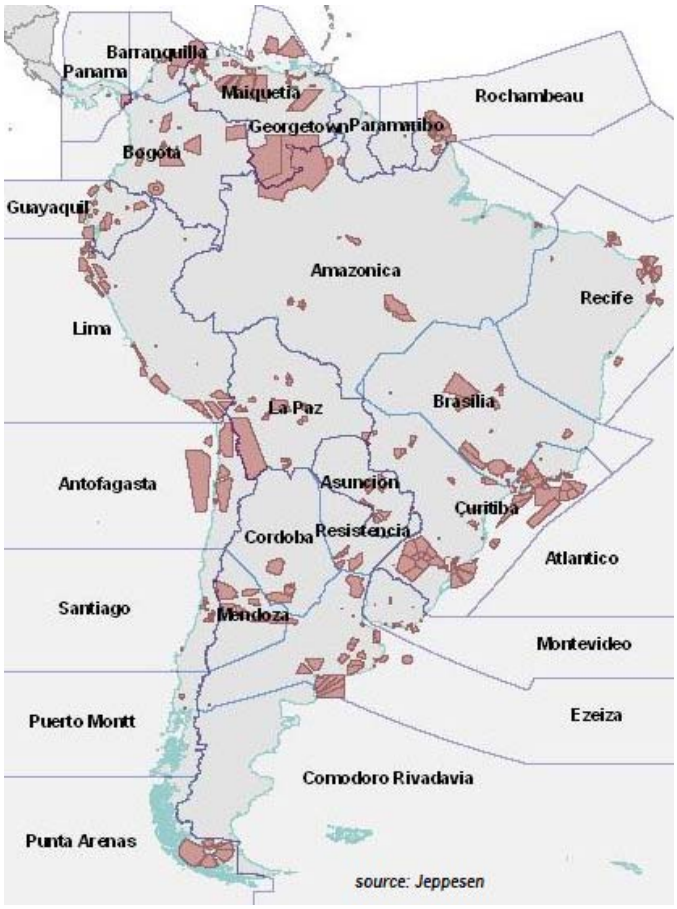
APPENDIX F

Prohibited, restricted and danger areas in the SAM Region

Country	PA	RA	DA	Others	Remarks
Argentina	15	50	1	N/A	
Bolivia	1	23	NIL	N/A	
Brazil	44	228	11	N/A	
Chile	12	32	9	78 areas of volcanic activity	Chile has defined climb areas for weather balloons (5) as prohibited areas.
Colombia	5	11	NIL		
Ecuador	2	11	1	N/A	Ecuador has designated SANGAY volcano area as a danger area.
French Guiana	1	4	9		
Guyana	1	NIL	NIL		
Panama	4	2	4	4 and 1 ADIZ	Panama has designated other areas for air sports and recreational activities
Paraguay	2	9	3	N/A	
Peru	14	22	NIL	N/A	
Suriname	2	1	NIL	N/A	
Uruguay	19	4	2	N/A	
Venezuela	6	36	2	N/A	
TOTAL	**126**	**432**	**42**	**83**	

PA: Prohibited Area
RA: Restricted Area
DA: Danger Area
N/A: Not applicable
NIL: Nothing

Prohibited, restricted and danger areas in the SAM Region



In the South American Region, there are 26 FIRs covering 38'565,578 km2.

Prohibited, restricted and danger areas in the ICAO South American Region
• 628 special use airspaces
• 683 in total, including special areas, such as volcanic, training and others areas

• 2'121,753 km2 in total, defined as special use areas

11.9% of the continental area

APPENDIX G

Sample Form on the use and management of restricted, forbidden and danger areas and special use airspace in the SAM Region

Country: _____
FIR: _____

Date: _____

Type of area or special use airspace (1)	Size (2)		Period of use (3)	Nature of the Activity (4)	Managed by (5)	Does it affect current operation? (6)	Does it affect ANSP planning? (7)	Remarks (8)
	Lateral in Km^2	Vertical limit						

Instructions to complete the form:

1. Type of area or special use aircraft: insert prohibited, restricted, danger area or special use area (recreational, farming activities, etc.).
2. Size: Insert lateral dimension in square kilometers, and vertical dimension indicating upper and lower limits
3. Period of use: Insert the area activation schedule or period, if applicable.
4. Nature of the activity: Insert detailed information of the activity carried out in the area (parachuting, training, etc.).
5. Managed by: Insert the name of the organization or person responsible for area activation.
6. Does it affect current operation? Insert information regarding the impact on the current design of the area.
7. Does it affect ANSP planning? Indicate if ANSP planning may be potentially affected by the area
8. Remarks: Insert additional information that the State should take into account.

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APPENDIX H

Sample of Letter of operational agreement for joint use of restricted areas

(ref. ICAO Circular 330 and Doc 9433)

SUBJECT: Procedures for drawing up the letter of operational agreement for joint use of restricted areas (identify the area or areas related to the LoA)

EFFECTIVE DATE: (insert date).

In accordance with ICAO regulations and procedures and national regulations (insert national reference), the procedures for the use of restricted areas (identify the list of Restricted/Danger Areas on which the LoA is based) are hereby established by (identify civil ATS units) and (identify military units)

Airspace under (identify civil or military units responsible, as required) jurisdiction is exhibited in Annex 1 to this LoA.

At least the following shall be included in Annex 1:

a) Horizontal and vertical limits of the corresponding airspace;

b) Classification of airspace available for civil air traffic;

c) Units or authorities responsible for airspace handover;

d) Conditions for airspace handover to the corresponding ATC unit;

e) Conditions for airspace handover from the corresponding ATC unit;

f) Airspace availability periods;

g) Any limitations on the use of the corresponding airspace; and

h) Any other appropriate procedures or information.

This letter revokes or supersedes the Letter of operational agreement (if any) for joint use of restricted areas (insert previous agreements) dated (insert date).

1. Personnel of (identify the coordinating unit) shall act as liaison between the user and the control body.

2. The user shall:

   2.1. Coordinate activation/release periods of (identify the area or areas related to the LoA) with (identify ATC units to coordinate with)

   2.2. Notify (identify unit) at least 30 minutes prior to the activation of airspace above (identify flight level or altitude expressed in feet, as appropriate) in area (identify the area(s) related to the LoA)

   2.3. Notify (identify unit) at least 2 hours prior to the activation of airspace during periods other than those published in the (identify the area(s) related to the LoA) AIP

   2.4. Notify (identify unit) at least 30 minutes prior to the activation of airspace (identify flight level or altitude expressed in feet, as appropriate) in area (identify the area(s) related to the LoA)

   2.5. Notify (identify unit) at least 48 hours prior to the activation of airspace in (identify the area(s) related to the LoA).

   2.6. Release the (identify the area(s) related to the LoA), as appropriate, above (identify flight level or altitude expressed in feet, as appropriate) to (identify unit) when the area is not being used for the designated purpose.

   2.7. Release the (identify the area(s) related to LoA), as may be appropriate, at maximum required altitudes above (identify flight level or altitude expressed in feet, as appropriate) to (identify unit) due to a traffic emergency situation. The release of airspace to (identify unit) shall be done within 30 minutes after the request is transmitted.

3. The control body shall:

   3.1. Exhaust all possible traffic management procedures before requesting user to release the airspace, as specified in paragraph 2 g.

   3.2. Return (identify the area(s) related to the LoA) promptly to the user once the traffic emergency situation has been resolved.

   3.3. Be responsible for issuing the appropriate NOTAMs for the airspace being use above (identify flight level or altitude expressed in feet, as appropriate)

   3.4. Notify (identify unit) of airspace release periods of (identify the area(s) related to the LoA).

   3.5. Submit in writing, upon written requested from the user, the reasons for requesting the recovery of airspace in restricted areas.

4. The (identify unit) shall be responsible for issuing the appropriate NOTAMs for the airspace being used (identify flight level or altitude expressed in feet, as appropriate)

5. During periods in which airspace is released to the control body, (the user) shall authorize traffic under instrument flight rules (IFR), visual flight rules (VFR) in and throughout the (identify the area(s) related to the LoA)

6. The decision to recover airspace from a restricted area shall be made by supervisory staff of the control body.

Note: Non-supervisory staff of (identify unit) may act as liaison with the user for the release/recovery of (identify the area(s) related to the LoA)

7. Communication between (the user) and (the control body)

7.1. In order to enable effective coordination between the units concerned regarding the procedures established in this LoA, the means of communication described in Appendix 2 will be used and/or implemented.

7.2. These means of communication shall enable communication within (insert time as necessary) seconds and shall have an automatic recording system.

8. Revisions

8.1. This LoA will be revised when the procedures contained therein or in its appendices are affected by amendments to ICAO SARPS, regional supplementary procedures or regional plans, or when the corresponding ATS units implement new communication facilities.

8.2. The body implementing new communication systems is responsible for initiating coordination with the counterpart body.

8.3. If the amendment only affects part of the Appendices, the new amendment may be inserted without modifying the LoA upon agreement between the parties. The effective date of the amendment shall be agreed between the parties.

(ORIGINAL DOCUMENT SIGNED BY) User Representative

(ORIGINAL DOCUMENT SIGNED BY) Control Body Representative

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APPENDIX I

Procedures applicable in Europe for the Flexible Use of Airspace (Ref. Spain AIP)

INTRODUCTION

The flexible use of airspace (FUA) concept is based on that airspace no longer being considered as military or civil airspace but rather as one single continuum that is used flexibly in accordance with day-to-day needs. Consequently, any necessary airspace segregation shall be only temporary.

There are three levels of airspace management:

- Level 1 - Strategic: where long-term planning of the national airspace and airspace structure management policy is defined through a joint civil/military process.
- Level 2 – Pre-tactical: where management is done on a day-to-day basis, on the day before operations, and temporary allocation of airspace is done through the Airspace Management Cell (AMC), which collects and analyses all airspace requests and decides airspace allocation on a daily basis.
- Level 3 - Tactical: where airspace use is managed in real time.

FLEXIBLE AIRSPACE STRUCTURES

The FUA concept complements airspace organization into a series of flexible structures as defined below:

- Temporary Segregated Areas (TSA): airspace of predefined dimensions established in response to civil and military needs that may require temporary reservation of airspace. TSAs are described in ENR 5.2. The AMC manages TSAs at the pre-tactical level the day before operations. They are activated during the period published in the AUP.
- Manageable Danger and Restricted Areas: military areas that, while maintaining their D or R concept, can be managed and allocated by the AMC in the same way as TSAs during the periods of time published in section ENR 5.1.
- Conditional Routes (CDR): non-permanent ATS routes or portions thereof that can only be planned and used under certain specific conditions within the periods of time published in the description of the Conditional Route. Each CDR published in section ENR 3.5 is associated to an alternative route.

CDRs are divided into three categories according to their possible use in the flight plans:

CDR 1 - they are established at the strategic phase (Level 1). They are available most of the time, so they can be permanently included in the flight plans (RPL and FPL). Every day, the AUP and CRAM are distributed with the CDR1 routes that are being closed. The RPLs affected by temporarily closed routes shall be cancelled and a new FPL containing item 15, the published alternate route corresponding to each unavailable CDR1, will be filed. If it is known sufficiently in advance that it will be closed, then it will also be included in the FAUP (AUP forecast issued 30 days in advance of the day of operation). If a CDR1 must be closed to traffic on a short notice, ATC will instruct flights to use alternate routes in the tactical phase.

CDR 2 – they are managed at the pre-tactical phase (Level 2). They cannot be permanently planned. CDR2s may only be included in the FPL, according to the conditions published daily, on the day before operations, though the Conditional Route Availability Message (CRAM). The AMC will issue an AUP forecast (FAUP).

CDR 3 they are managed at the tactical phase (Level 3). They cannot be planned in flight plan. They can only be used subject to ATC clearance, following civil-military coordination. CDRs cross Temporary Segregated Areas (TSA) or Manageable Danger and Restricted Areas. The periods of time during which such routes or route segments are classified as CDR 2 or CDR 3 must coincide with the activity periods of the areas crossed. One same ATS route segment may be conditional 1, 2, or 3 in different periods of times. In Spain, the ATS route is used normally outside of the periods of time and vertical limits published as CDR.

AIRSPACE MANAGEMENT UNITS

Airspace Management Cell (AMC)

It is a national joint civil/military unit responsible for day-to-day management (pre-tactical phase) and temporary allocation of airspace according to the requirements of airspace users (ACC, FMP, military area managing units and other approved agencies). It prepares the Forecast Airspace Use Plan (FAUP) 30 days before the operation. The day before the operation, it prepares the Airspace Use Plan (AUP). In exceptional circumstances, between day D-30 and day D-1, authorized agencies can make modifications to the FAUP, which shall be reflected in the corresponding AUP message.

Centralized Airspace Data Function (CADF)

CADF is a EUROCONTROL unit that collects, analyzes and consolidates all information related to CDRs, as provided by national AMCs through the "Airspace Use Plan" (AUP). The day before operations, the CADF prepares and issues a list of available CDRs through the Conditional Route Availability Message (CRAM)"

PUBLICATION OF INFORMATION ON THE AVAILABILITY OF FLEXIBLE STRUCTURES

Forecast Airspace Use Plan (FAUP)

Every day, the AMC prepares a "Forecast Airspace Use Plan" (FAUP) 30 days before the day of operations. This information will be disseminated through the CFMU, the NOP website and Aena's air navigation website, or through the most effective means available at any time. It is prepared before 1400 hours UTC and is valid for 24 hours starting at 0600 hours UTC of the day of operation. Any exceptional changes that may be introduced will be included in the corresponding AUP.

Update of the Forecast Airspace Use Plan (FUUP)

The AMC may issue and "Update to the Forecast Airspace Use Plan" (FUUP) to amend the FAUP. It will have the same means of distribution as the FAUP. The FUUP will be disseminated before 0900 UTC of day D-29, and will have the same validity period as the original FAUP to which it refers.

Airspace Use Plan (AUP)

The AMC sends the "Airspace Use Plan (AUP)" through the CIAM (CFMU Interface for airspace managers) to the CFMU/CADF before 1400 UTC of the day before the operation, with a validity period of 24 hours starting at 0600 UTC of the next day. The AUP may contain variations to the FAUP. The AUP has the following sections:

A) – List of available CDR 2s.

B) - List of permanent ATS routes and temporarily closed CDR1s.
C) – List of active TSAs and manageable R and D areas.

Example of AUP:

LECBUIR

No.	Route-Portion	FL Block	Validity Period	Remarks
1	UG850: VLC-RESTU	F350-F460	14:30 - 15:30	----
2	UH300: ADX-CLS	F250-F460	12:30 - 14:30	----

LECMUIR

No.	Route-Portion	FL Block	Validity Period	Remarks
1	UA31: CJN-ASTRO	F250-F460	12:30 - 15:00	-----
2	UA31: CJN-ASTRO	F250-F460	22:00 - 22:59	-----
3	UA31: CJN-ASTRO	F250-F460	05:00 - 06:00	-----

B) Closed ATS routes and Category 1 CDR.

LECMUIR

No.	Route-Portion	FL Block	Validity Period	Remarks
1	UG25: STG-KORET	F245-F300	09:00 - 11:30	-----

C) Active TSA and AMC Manageable R & D Areas.

LECMUIR

No.	Route-Portion	FL Block	Validity Period	Remarks	Resp. Unit
1	TSA 28 STG	F245-F300	09:00 - 11:30	----	LECMZAMC

Updated Airspace Use Plan (UUP)

The AMC issues the "Updated Airspace Use Plan (UUP)", which amends the AUP. It has the same format and addressees as the AUP. It makes reference to the number of the AUP it is updating and includes any changes that may occur on the day of operations. It is issued before 0900 UTC on the same day of operations. It has a validity period of 18 hours from 1200 UTC of that day to 0600 UTC of the following day.

Conditional Route Availability Message (CRAM)

The "Conditional Route Availability Message (CRAM)" is issued by the CADF to aircraft operators, ARO, ACC/FMP, AMC of the ECAC area and to the CFMU at 1500 UTC of the previous day of operations and is valid for 24 hours starting at 0600 UTC of the next day. The CRAM is transmitted through the AFTN or SITA and is available on CFMU terminals. It contains the list of airway segments classified as CDR2 that will be available for the period indicated in the message. For security reasons, information published by the AIS on the CDR1s and permanent ATS routes that are closed for specific periods is repeated in the CRAM.

Example of CRAM:

GG LEANZDZX
041524 EUCHZMTA
PART 001 OF 006
CRAM VALID FROM 05/01/1998 06:00 TO: 06/01/1998 06:00 RELEASED: 04:15

A) CDR TYPE 2 AVAILABILITY:

	UA10	TRA	RESIA (LSAZUIR)
1		F200-590	0700-1230
	UA23	ELVAR	BEJ (LPPCUIR)
2		F245-255	0600-0600
	UA31	CJN	ASTRO (LECMUIR)
3		F250-460	0600-0730
4		F250-460	1330-2359
	UA41	SRN	FRANE (LSAGUIR)
5		F200-590	0600-0730

.....

	UZ917	KRH	ADENU (EDUUUIR)
93		F250-290	0600-0600

B) ATS ROUTE AND CDR TYPE 1 CLOSURE:

	UG15	TRT	VIBER (EDBBUIR)
1		F310-350	0730-0930
2		F310-350	1100-1230
3		F310-350	1345-1600
	UG102	HAM	FLD (EDBBUIR)
4		F310-350	0730-0930
5		F310-350	1100-1230
6		F310-350	1345-1600

APPENDIX J

Model of Action plan for the flexible use of airspace (FUA)

NATIONAL PERFORMANCE OBJECTIVE XXX Flexible use of airspace (FUA)	
Benefits	
Safety	• Improved civil/military coordination and cooperation reinforces airspace safety. *Note: include other benefits as necessary)*
Environmental protection and sustainable development of air transport	• Allows for a more efficient ATS route structure, reducing miles flown and fuel consumption, and thus CO2 emissions into the atmosphere. • Increases airspace capacity • Greater availability of reserved airspace at times where there is no activity by the users of this airspace. *Note: include other benefits as necessary)*
Metrics	
• Percentage of special use areas (SUA) coordinated for the application of the FUA concept • Number of letters of operational agreements on civil/military coordination and cooperation • Permanent reduction of the amount of reserved airspace. • *Note: include other metrics as necessary*	

Strategy ***2012 – 2018***				
***Activity**	**Start**	**End**	**Responsible party**	**Remarks**
1. Establish policies and develop standards on FUA (subtasks)				
2. Establish a national high-level committee for civil-Military cooperation and coordination (subtasks)				
3. Sign a memorandum of understanding (MOU) between civil and military authorities (subtasks)				
4. Hold seminars/meetings with civil and military authorities and reserved airspace users to show the importance to airspace use optimization (subtasks)				
5. Evaluate, in an early stage, all restricted, prohibited and danger areas that affect or could affect air flow in order to reduce them as much as possible (subtasks)				
6. Develop a medium-term uniform and collaborative national airspace planning process, taking into account				

all user needs and national security, defense and police requirements (see subtasks)				
7. Implement an airspace management cell (AMC) to conduct an effective coordination in real time (subtasks)				
8. Adopt adequate measures to improve the efficacy of traffic flow management, by developing conditional routes (CDR) that allow dynamic rerouting of aircrafts to avoid special use airspace (subtasks)				
9. establish regulations and procedures to communicate, negotiate and determine priorities for civil-military coordination (subtasks)				
10. Establish, when required by ANSPs, **procedures to coordinate temporary reserved airspace** through the issuance of NOTAMs or specific real-time reservation activation/deactivation procedures (subtasks)				
11. Draft the necessary letters of operational agreement between ATS units and military units or other users for the activation of restricted airspace when necessary (subtasks)				
12. Manage information in order to establish and publish in the AIP the CDR routes and the procedures for activities requiring airspace reservation and restriction (subtasks)				
13. Carry out the safety assessment and risk analysis when FUA measures are introduced (subtasks)				
14. Establish a system to periodically revise airspace requirements, organization and management (subtasks)				
15. Assess training requirements for FUA application and provide the courses that are deemed necessary (subtasks)				
16. Track progress during FUA implementation (subtask)				
* Activity: Indicates the activities required for achieving the performance objective. * End: Insert the date when the task ends. * Responsible party: Insert the name of the unit/person responsible for carrying out the task. * Remarks: Insert any remarks that may help understand the purpose of the task.				

LIST OF SUBTASKS TO ACHIEVE THE FUA PERFORMANCE OBJECTIVE

Note: Tasks included here are for reference only, and are not exhaustive.

1 - Subtasks to establish policies and draw up FUA-related regulations

1. Analyze national documentation and verify if there are any regulations or policies related to the flexible use of airspace.
2. If there are no regulations, revise global and regional documentation as reference material
3. Draft the corresponding standard.
4. Submit the standard to the consideration of the corresponding authorities to check compliance with current legislation.
5. Review remarks that may have been identified in the previous item.
6. Finish the document
7. Submit the document to the aeronautical authority for approval.
8. Take all corresponding action for its inclusion in the national legislation, if applicable.

2- Subtasks to establish a High-Level Committee for Civil-Military Cooperation and Coordination

1. Select the person or group of persons in charge of developing the task and the Committee Secretariat.
2. Evaluate ICAO current provisions related to civil-military cooperation and coordination.
3. Analyze national regulations and status concerning civil-military coordination and cooperation.
4. Draft the terms of reference and committee objectives.
5. Develop a work program
6. Evaluate who is eligible to participate in the National Committee (civil/military aviation representatives, and/or other airspace users, where necessary)
7. Send invitations for the first Meeting of the Civil/Military Coordination and Cooperation Committee
8. Hold the first Meeting of the Committee
9. Submit the terms of reference and work program to the Committee for its consideration.
10. Approve the terms of reference and work program.
11. Set meeting schedule based on the work program.

3- Subtasks to draft the Memorandum of Understanding (MOU)

1. Review national regulations related to Civil-military coordination.
2. Evaluate previous global and national experiences
3. Draft the MOU
4. Submit the MOU for consideration by national authorities for review.
5. Review all observations made to the document, if applicable.
6. Submit MOU to the consideration of the high level Committee for civil-military cooperation and coordination.
7. Approve the MOU
8. Take appropriate actions for MOU to come into effect.

4 – Subtasks to hold seminars and meetings with civil and military authorities, and reserved airspace users

1. Evaluate the need for seminars related to FUA
2. Evaluate the need to hold meetings with the parties involved in the FUA concept.
3. Prepare a plan of activities regarding seminars and/or meetings.

4. Prepare material for seminars on FUA
5. Prepare material and documentation for holding meetings on FUA.
6. Coordinate the development of activities with all the parties involved.
7. Send invitations for scheduled activities.
8. Carry out the activity
9. Prepare a report with the results of the activities
10. Submit the results of the activities, as established.
11. If necessary, track results and their implementation in terms of time and form.

5- Subtasks to evaluate, in an early stage, all restricted, prohibited, and danger areas that affect or could affect circulation

1. Review national regulations related to the implementation of prohibited, restricted, and danger areas.
2. Analyze all restricted, prohibited, and danger areas that have been implemented in each State, using the sample form for the use and management of restricted, prohibited, and danger areas and special use airspace in the SAM Region contained in Appendix F.
3. Consider in the analysis the unmanned aircraft systems (UAS)
4. Verify if it is possible to reduce, eliminate or modify SUA structure
5. Identify those SUAs that may be used dynamically by applying the FUA concept.
6. Analyze different scenarios in order to apply strategic airspace management.
7. Analyze different scenarios in which, due to safety, it may be necessary to establish procedures or conventions to avoid tactical airspace management.
8. Establish guidelines, in an early stage, to allow timely and foreseeable access to restricted or reserved airspace, in order to maximize benefits.
9. Take appropriate action in order to authorize dynamic use of special use areas.

6- Subtasks to develop a uniform and collaborative national airspace planning process regarding FUA

1. Analyze ICAO regulations regarding CDM.
2. Evaluate national regulations on CDM, and if there are none, establish the criteria for their application (See CDM SAM).
3. Identify the areas that will participate in airspace planning.
4. Verify that FMUs and/or FMPs are represented.
5. Analyze airspace structure taking into account user needs, especially national security, defense and police requirements.
6. Identify special use airspace at national level that may prevent flexible use of airspace.
7. Create national plans to optimize airspace structure taking into account the application of the FUA and CDO concepts.
8. Review national plans to optimize airspace structure in accordance with FUA and CDO, where applicable.
9. Propose to the corresponding planning area the adjustments necessary to accommodate national, defense and police requirements.
10. Verify that all proposals are incorporated into the national air navigation plan of the State.

7- Subtasks to implement the airspace management cell (AMC)

1. Analyze the need to establish an AMC for the management of special use airspace in the pre-tactical and tactical phase.
2. Define activities that AMC will carry out when coordinating civil/military/police operations including the following:
   a) Granting of authorizations for aircraft overflights
   b) Coordination of unusual military traffic in airspace

c) Real-time coordination of SUA activation/release periods with ATC units
d) Application of the FUA concept in daily operations
e) Management of conditional routes (CDR) in close cooperation with ATC units.
f) Drafting of the Forecast Airspace Use Plan (FAUP)
g) Drafting of the Airspace Use Plan (AUP).

3. Establish agreements between ATC and AMC units.
4. Develop applicable procedures.

8 - Subtasks to adopt suitable measures to improve the efficiency of traffic flow management

1. Evaluate the application of conditional routes at global and regional level
2. Review national special use airspace planning that may affect the efficiency of civil operations.
3. Identify the SUAs that may be appropriate for implementing the CDRs.
4. In coordination with parties involved in CDM, develop conditional routes (CDR) for dynamic rerouting of aircraft to avoid special use airspace.
5. Training ATC staff on the application of CDR routes and procedures for coordination and cooperation with the areas involved.
6. Publish CDR routes in the AIP
7. Insert CDR routes and all associated procedures in the operational manuals.
8. Set the date(s) for CDR implementation.
9. Perform risk management before CDR implementation
10. Track CDR application

9- Subtasks to establish regulations and procedures to communicate, negotiate, and determine priorities for civil-military coordination

1. Evaluate existing State regulations and procedures.
2. Analyze means of communication between ATC and military units.
3. Establish means of communication
4. Develop applicable procedures.
5. Define the criteria to be used for determining civil-military coordination priorities
6. Submit these criteria to the consideration of involved parties for approval.
7. Include primary and secondary means of communication in letters of operational agreement.
8. Include applicable procedures in the letters of operational agreement.
9. Train ATC and military personnel on the use of applicable means and procedures.
10. If necessary, publish all corresponding procedures in the AIP
11. Implement the means of communication and procedures.
12. Periodically check the operation of the means of communication.
13. Periodically check if procedures meet airspace user requirements, and if civil-military coordination is being carried out effectively.

10 – Subtasks to establish procedures to coordinate temporary reserved airspace (TRA)

1. Verify TRA coordination procedures at national level.
2. If there are no procedures, define such procedures, including real-time activation/release.
3. Check if temporary reservation is done through NOTAM or through real-time specific reservation activation/deactivation procedures.
4. Submit procedures to the consideration of the parties involved.
5. Following their approval, include TRA coordination procedures in the letters of operational agreement between ATC and military units.
6. Train ATC and military staff on the implementation of TRA coordination procedures.
7. If necessary, publish all corresponding procedures in the AIP

8. Implement procedures
9. Periodically check if procedures meet TRA coordination requirements and if coordination is carried out effectively.

11 – Subtasks to draft Letters of Operational Agreement between ATS units and military units or other users

1. Assess current procedures for the activation of restricted airspace when so required
2. Agreements and procedures for flexible use of airspace may be established in the Letters of Operational Agreement, which shall include the following items:
   a) horizontal and vertical limits of the airspace concerned;
   b) the classification of the airspace available for use by civil air traffic;
   c) units or authorities responsible for airspace handover;
   d) conditions for airspace handover to the ATC unit concerned;
   e) conditions for airspace handover from the ATC unit concerned;
   f) airspace availability periods
   g) any limitations on the use of the airspace concerned; and
   h) any other relevant procedures or information.
3. Train ATC and military personnel on the use of the LoA.
4. If necessary, publish all corresponding procedures in the AIP
5. Implement the LoA
6. Periodically review the LoA to verify that it effectively meets civil-military coordination requirements.

12- Subtasks for managing information in order to establish and publish CDR routes in the AIP, and procedures for activities requiring reserved and restricted airspace

1. Negotiate with the corresponding AIS office.
2. Check the time required for the relevant information to be duly published
3. Coordinate with the AIS office the establishment of a publication timetable and the dates in which information must be available in the AIS
4. Check information before publication to ensure its accuracy.
5. Check that information is being published in accordance with national regulations.
6. Verify that publication dates are effectively met

13- Subtasks to carry out the safety assessment and the risk analysis when FUA measures are introduced

1. Contact the local safety office
2. Verify the time required to perform the safety assessment of FUA procedures and measures to be implemented.
3. Coordinate with the local safety office who will perform the risk analysis
4. Supply all the information needed by the safety office
5. Participate as an observer during risk analysis sessions.
6. Verify that the outcome meets the level of safety agreed by the State.
7. Communicate the outcome to the corresponding State authorities
8. Verify that risk mitigation actions are executed before FUA measures and/or procedures become effective.
9. Track FUA measures and procedures implemented to ensure that safety is not affected.

14- Subtasks to establish a system to periodically review airspace requirements, organization and management

1. Create a strategy to periodically review airspace requirements, organization, and management.

2. Submit this strategy to the Civil- Military Cooperation and Coordination Committee.
3. Approve the strategy
4. Implement appropriate action to comply with the strategy approved.
5. Verify compliance with the objective established in the strategy.

15- Subtasks to assess training requirements for the application of FUA and to provide the necessary courses

1. Evaluate national regulations and other documentation related to personnel training.
2. Verify if current documentation contains adequate material for FUA to be successfully implemented.
3. Analyze the topics that shall be included in the courses concerning FUA
4. Coordinate with the corresponding Civil Aviation Training Centre (CATC) the inclusion in the curriculum of topics related to FUA.
5. Coordinate with CATC the specific training and seminars that would be required for FUA implementation.
6. Assist the CATC in all matters related to FUA.
7. Verify that training related to FUA is being provided effectively.

16- Subtasks to track progress during the implementation of FUA

1. Strictly monitor progress in the implementation of FUA in the State.
2. Verify the results of all processes related to FUA.
3. Inform the Civil-Military Cooperation and Coordination Committee of all aspects that might prevent the effective implementation of the FUA
4. Take appropriate measures to overcome obstacles for the implementation of the FUA.
5. Verify that measures taken will overcome the difficulties encountered.

REFERENCE DOCUMENTS

- Convention on International Civil Aviation (The Chicago Convention)
- Annex 2, - *Rules of the air,*
- Annex 11 –*Air Traffic Services,*
- PANS-ATM, Doc. 4444 - *Procedures for Air Navigation Services — Air Traffic Management*
- Doc. 9554 -*Manual concerning Safety Measures Related to Military Activities Potentially Hazardous to Civil Aircraft Operations*
- Doc. 9426 –*Air Traffic Services Planning Manual*
- Doc. 9750 –*Global Air Navigation Plan*
- Doc. 9854 – *ICAO Global Air Traffic Management Operational Concept*
- Doc. 8126 – *AIS Manual*
- Assembly Resolution A 37-15 - Consolidated statement of continuing ICAO policies and associated practices related specifically to air navigation.
- Reports of Air Navigation Regional Meetings for the CAR/SAM Regions (CAR/SAM RAN)
- Global Air Traffic Management Forum on Civil/Military Cooperation (2009)
- Circular 330-AN/189 – *Civil-Military Cooperation in Air Traffic Management*
- GREPECAS meetings– Caribbean and South American Regional Planning and Implementation Group
- Performance-Based Air Navigation System Implementation Plan for the South American Region (SAM-PBIP)
- CDM Manual for the SAM Region
- ATFM Manual for the CAR/SAM Regions
- SAMIG Meeting Reports
- RAAC Meeting Reports - Meeting of Civil Aviation Directors
- Report of the Seminar on Civil/Military Coordination and Cooperation and flexible use of airspace for the NAM, CAR, and SAM Regions (2011)

- Spain AIP
- Regulation 2150/2005 - Common Rules for the Flexible Use of Airspace European Commission
- Single European Sky -European Organization for the Safety of Air Navigation (EUROCONTROL)
- NextGen –Federal Aviation Administration (FAA)