



International Civil Aviation Organization

NORTH AMERICAN, CENTRAL AMERICAN AND CARIBBEAN OFFICE

Regional North American/Caribbean (NAM/CAR) Air Traffic Management (ATM) Meeting

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NAM/CAR ATM - WP/07

10/04/06

Agenda Item 3: Strategy and regional implementation activities regarding airspace organization and management (AOM), ATS routes, RNAV, RNP, and the 5-letter name codes (5LNC) assignment system.

ATM DEVELOPMENTS RELATED WITH AIRSPACE ORGANIZATION AND MANAGEMENT

(Presented by the Secretariat)

SUMMARY

This Working paper presents information on the airspace organization and management AOM, with regard to conclusions of the CAR/SAM/3 RAN, NACC/DCA/2 and GREPECAS Meetings.

References:

- Report of the Third Regional Air Navigation Meeting (CAR/SAM/3 RAN) (Buenos Aires, Argentina, 5 to 15 October 1999)
- Report of the Second Meeting of North American, Central American and Caribbean Directors of Civil Aviation (Tegucigalpa, Honduras, 11 to 14 October 2005).
- Report of the Thirteenth Meeting of the CAR/SAM Regional Planning and Implementation Group GREPECAS/13 (Santiago, Chile, 14 to 18 November 2005).

1. Introduction

1.1 The CAR/SAM/3 RAN Meeting examined the Airspace Organization and Management of the CAR/SAM Regions and agreed that the related ICAO guidelines favoured the use of the global FIR concept, especially the upper airspace.

1.2 The meeting agreed that States should carry out cooperation efforts to increase airspace management efficiency, optimizing air routes and transfer points with the aim of decreasing the workload of pilots and controllers and of facilitating the safe, orderly and timely flow of air traffic, which in turn would mean savings for airspace users. It was recognized that when adopting these changes, the civil aviation administrations should also consider the impact of the new technology on their sovereignty and national security, and the military operations among other things.

1.3 The NACC/DCA/2 Meeting expressed its support to validate the ATM operational concept (Doc 9854), especially the aspects of safety and airspace organization and management for an interoperable ATM system in the NAM and CAR Regions, in line with the new Air Navigation Global Plan, and to that end, it updated the tasks to be carried out by the different Working Groups through the following conclusions:

- **Conclusion 2/9** - *Coordinated Development and Implementation of the CNS/ATM Systems in the NAM/CAR Regions*
- **Conclusion 2/11** - *Interface and Operational Integration of ATM Automation Systems of the NAM/CAR Regions*
- **Conclusion 2/14** - *Implementation of Performance-Based Navigation*
- **Conclusion 2/17** - *Support for the ATM Work in the NAM/CAR Regions*
- **Conclusion 2/19** - *Implementation of the ATFM System in the NAM/CAR Regions*
- **Conclusion 2/20** - *Implementation of a Safety Management System*

1.4 GREPECAS/13 issued several conclusions related with airspace organization and management for a regional and interoperable Air Traffic Management (ATM).

2 Airspace organization and management (AOM)

2.1 The States/Territories/International Organizations, in compliance with the recommendations of the CAR/SAM/3 RAN Meeting (**Appendix A** refers) and GREPECAS Conclusions, have achieved great progress in implementing ATM in the FIRs of the NAM and CAR Regions; notwithstanding, in spite of the efforts attained there are still inconsistencies to be solved regarding the airspace organization and strategic management. Some of these inconsistencies are:

- rigid airspace divisions and route structures which do not allow the totality of ATM resources to be used to best effects;
- differences in boundaries between lower and higher airspace;
- excessive amount of FIRs;
- discontinuities and differences in transition altitudes between adjacent airspaces;
- requirements to fly departure and arrival procedures;
- lack of civil military coordination for flexible and optimum use of airspace;
- exclusion of civil air traffic from airspace reserved for defense purposes;
- operation of aircraft at inefficient altitudes, speeds, and in unfavorable winds;
- less than optimum use of scarce resources such as airspace and aerodrome capacity;
- limited collaborative decision making between Civil Aviation authorities, ATM providers, aerodrome operating authorities and aircraft operators;
- limited facilities for real-time information exchange between ATM providers, aerodromes and aircraft operators; and,
- insufficient flexibility to permit optimum management of weather related disruptions to airline operations.

2.2 The totality of airspace should be considered as an available resource for users, establishing a dynamic and flexible management wherein any restriction be considered only on a temporary basis. In order to achieve this, one of the objectives of the ATM system is the flexible use of the global airspace through the optimization and equitable balance in the use of airspace between civil and military users, facilitated through strategic coordination and dynamic interaction of civil and military air traffic services including real-time civil/military controller-to-controller co-ordination. **Appendix B** shows the resolutions of the 35th session of the ICAO Assembly regarding ATS and SAR airspace.

2.3 The principle for flexible use of airspace (FUA) should not be designated purely as civil or military, but rather as a continuum in which all user requirements are accommodated to the greatest possible extent; should result in the removal of large tracts of permanent or transient restricted airspace or special use airspace. Where there are continued requirements to accommodate specific individual airspace uses, thereby blocking airspace of certain dimensions should be on a transient basis.

2.4 Integrated decision making is an extension of the principles of the flexible use of airspace to include airspace users in flight in decision making with respect to tactical assessment of the use of reserved airspace and requirements for transit times of special use airspace.

2.5 To the extent possible airspace should be structured as a continuum, free from operational discontinuities, inconsistencies and differing rules and procedures. Alignment of airspace classifications can facilitate the implementation of ATFM service, introduction and better utilization of data link communications, improved flight plan processing systems, and advanced airspace management coordination tools and message exchange capabilities, leading to progressively more flexible and dynamic airspace management. Airspace classifications should be intra-regionally harmonized and, where possible, across regions based on the ICAO airspace classification system as defined in Annex 11.

2.6 User-preferred routes make use of the capability of aircraft operators to determine optimum tracks, based on a range of flight parameters. In accordance with this concept, ATS routes or tracks would not be fixed to pre-determined routes or waypoints, except where required for control purposes. Random routing defines areas within which fixed routes are not designated and where aircraft determine an appropriate track from an entry point to an exit point.

2.7 Collaborative airspace design and management are aimed at organizing airspace in a cooperative manner involving all users so that airspace is managed to accommodate the preferred trajectories of the users. States/Territories/International Organizations should take advantage of aircraft capabilities when designing and implementing airspace changes, account needs to be taken of the fleet capabilities among airspace users within a given airspace. Collaboration with airspace users identify procedures and/or solutions that make use of available aircraft capabilities.

Implementation of RNAV Routes and Required navigation performance (RNP)

2.8 After finalizing all the coordination process, in late 2005, for a new proposal for amendment to the Basic ANP for its approval by ICAO Council, presently, in the CAR/SAM Regions 54 ATS routes have been implemented, 44 have been realigned and 9 have been eliminated.

2.9 The strategy approved by GREPECAS also considers RNAV/RNP implementation in terminal areas (TMAs) and airports serving as start/end routes between city pairs. With a new regional strategy or performance-based navigation (PBN) for en-route and approach flight phases, the NACC/DCA/2 meeting approved that the States, Territories and International Organizations of the NAM and CAR Regions take into account the new ICAO provisions for the future RNAV and RNP implementation.

2.10 The NACC Office has scheduled for the second half of 2006 a seminar on Performance-Based Navigation (PBN) which objective is to provide to the States, Territories and International Organizations the new ICAO guidance material for planning and development of procedures and routes in terminal areas and approach in line with the requirements of airspace users and ATS service providers.

5-letter name code (5LNC) assignment system

2.11 Nowadays the 5-letter name codes (5LNC) are assigned in accordance with Annex 11, by the ICAO Regional Offices through a methodology based on response according to the official request by the States, and this coordination among States and the ICAO Regional Offices is very complex and sometimes time-consuming.

2.12 ICAO has developed tools for Internet-based assignment using a global and centralized database called 5-letter name code (5LNC) assignment system, which objective is to expedite the process assisting States and the Regional Offices in the on-line assignment of 5-letter name codes. One of the most important objectives of the new 5LNC system is the elimination of the current 5LNC duplicity.

2.13 The database uses Internet-based tools and consists of two main components: Graphical User Interface (GUI) and Geographic Information System (GIS). The Internet-based GUI will allow users to view, search, reserve, allocate, modify and receive a confirmation of the assigned code. The GIS will allow to geographically visualize all existing 5LNC in the world, in relation with aerodromes, runways, flight information regions (FIR), approach area, landing area, etc.

2.14 The system also offers tutorials that will allow users to learn to use the system at their own convenience. Once ICAO proves its operation, it is expected that the system be available by the second half of 2006; member States will be timely invited to register in the 5LNC Assignment System and to begin using it.

RVSM Implementation

2.15 Additionally to the operational benefits, the cost/benefit analysis carried out after RVSM implementation was based on a conservative price of the gallon of fuel of \$ 1.98, resulting in a Cost/benefit ratio of 17:1 for North America, and 6:1 for the CAR/SAM Regions, obtaining a joint ratio of 15:1.

2.16 Taking into account the increase of the price of fuel in the past months, the benefits have been greatly exceeded; notwithstanding, before the economic crisis of most of the commercial airlines, it is necessary to study new strategies on airspace management and planning of air operations to support the efficiency in the consumption of fuel and environment caretaking.

2.17 In support of safety, GREPECAS agreed to activate a Scrutiny Working Group, which purpose is to analyze the information provided of all the notified large height deviations (LHDs) of 300 ft or above, and to issue recommendations to improve safety. Nowadays, the analysis of LHDs has shown that coordination errors among ATC units generate the greater percentage of deviations, and that not all the States, Territories and International Organizations of the CAR Region have timely notified LHDs.

2.18 Bearing in mind that these errors in the ATS coordination cycle directly affect safety, the States/Territories/International Organizations should ensure that LHDs be timely reported, and establish improvements to safety management, recommending the necessary corrective actions to reduce LHD reports caused by the occurrence of operational coordination errors among ATC units.

2.19 In order to assist the States and Territories of the Central Caribbean in the implementation of programmes and ATS Quality Assurance Units, the ICAO NACC Office periodically follows-up the corrective measures to the LHD reports and has coordinated several regional activities for the implementation of ATM safety management programmes.

ATM Contingency Plans

2.20 As from the effective date of 25 November 2003 of new requirements of Annex 11 for the development of the ATM contingency plans, as preventive measure for the possible total or partial disruption of air navigation services, the ICAO NAAC Office has kept a constant communication with the States, Territories and International Organizations in order to assist them in finalizing their ATM contingency plans, applicable to airspace and aerodromes of their jurisdiction.

2.21 Additionally, the NAM and CAR Regions are composed by continental and oceanic areas susceptible to earthquakes, seaquakes and hurricanes that have caused great human and material losses in the past years. The Meeting should also issue recommendations for the establishment in the contingency plans of additional measures facilitating the provision of humanitarian aid in case of natural disasters.

3. Suggested action

3.1 Bearing in mind the background expressed in the paragraphs above, the Meeting is invited to:

- a) note the information presented in this Working paper;;
- b) recommend the suitable actions to improve airspace organization and management in the NAM and CAR Regions;

- c) continue developing the contingency plans in the airspace and aerodromes of the NAM and CAR Regions;
- d) recommend the actions deemed appropriate to continue work for the development of the ATM system in the NAM and CAR Regions; and
- e) recommend other actions as appropriate.

APPENDIX A

RECOMMENDATIONS OF THE CAR/SAM/3 RAN MEETING AND PREVIOUS MEETINGS RELATED WITH AIRSPACE ORGANIZATION AND MANAGEMENT

Recommendation 5/1 – A cooperative approach to airspace management

That States, taking into account the need for cost-effective introduction and operation of CNS/ATM systems, give consideration to cooperative efforts for introducing more efficiency in airspace management, particularly through globalization of upper airspace management, in order to facilitate the safe, orderly and expeditious flow of air traffic.

Recommendation 5/2 – Amendment to the Mexican FIR boundaries

That the boundaries of FIRs Mazatlán, Monterrey, Mérida, Mexico and Mazatlán Oceanic be consolidated into two FIRs with the following delimitations:

- a) Mexico FIR:
 - 30 45N 120 50W;
 - along the Mexico/United States border;
 - 26 00N 95 55W;
 - 24 30N 93 00W;
 - 24 30N 88 00W;
 - 24 00N 86 00W;
 - 22 00N 86 00W;
 - 20 44N 85 21W;
 - 20 11N 85 17W;
 - 20 00N 86 00W;
 - 18 09N 87 45W;
 - along the Mexico/Belize/Guatemala border;
 - 14 32N 92 13W;
 - 13 00N 95 00W;
 - 11 30N 100 00W;
 - 15 00N 105 00W;
 - 30 45N 120 50W; and
- b) Mazatlán oceanic FIR:
 - 30 00N 120 00W;
 - 15 00N 105 00W;
 - 11 30N 100 00W;
 - 10 00N 104 30W;
 - 05 00N 120 00W
 - 30 00N 120 00W.

Recommendation 5/3 – Amendment to the boundaries of the Central American FIR

That the Central American FIR be amended as follows: from 01 25N 092 00W to 10 00N 104 30W to 11 30N 100 00W to 13 00N 095 00W, then follow the present FIR boundary to 01 25N 092 00W.

Recommendation 5/6 – Civil/military coordination

That, in order to achieve optimum civil/military coordination and joint use of airspace with a maximum degree of safety, regularity and efficiency of international civil air traffic, States which have not yet done so:

- a) establish appropriate civil/military coordination bodies to ensure, at all levels, the coordination of decisions relating to civil and military problems of airspace management and air traffic control;
- b) make known to military authorities the existing ICAO provisions (Assembly Resolution A32-14, Appendix P, Annex 11, paragraphs 2.16 and 2.17) and guidance material [*Manual Concerning Safety Measures Relating to Military Activities Potentially Hazardous to Civil Aircraft Operations* (Doc 9554) and *Manual concerning Interception of Civil Aircraft* (Doc 9433)] related to civil/military coordination and promote familiarization visits by military personnel to air traffic services (ATS) units;
- c) arrange permanent liaison and close coordination between civil ATS units and relevant military air defence units, in order to ensure the daily integration or segregation of civil and military air traffic operating within the same or immediately adjacent portions of airspace, employing civil and/or military radars as necessary, and to obviate the need for civil aircraft to obtain special “air defence” clearances; and
- d) take the necessary steps to prevent, as far as possible, penetration of controlled airspace by military aircraft without coordination with the air traffic control unit concerned.

Recommendation 5/7 – Review of special use airspace by States

That States:

- a) in light of evolving CNS/ATM systems’ technologies, conduct a review of special use airspace with the objective of validating actual use in order to release airspace for civil use or to obtain joint-use airspace agreements; and
- b) while conducting the review, take the necessary actions to ensure that the prohibited, restricted, and danger areas are in compliance with Annexes 2 and 15.

Conclusion 5/8 – Civil/military coordination workshops to promote joint-use airspace in the CAR/SAM Regions

That the ICAO NACC and SAM Regional Offices organize civil/military coordination workshops in their areas of accreditation with the goal of promoting joint-use airspace.

Recommendation 5/13 – Plane of division between the lower and upper airspace

That:

- a) States, where a division of the airspace into an upper and lower position is required, consider the establishment of a uniform plane of division at FL 245; and
- b) States unable to implement FL 245 as the plane of division between lower and upper airspaces, as far as possible select a level already used by adjacent States.

Recommendation 5/14 – ATS routes plan

That:

- a) the plan of air traffic services (ATS) routes shown at Appendix A to the Report on Agenda Item 5 form the ATS route network for the CAR/SAM Regions; and
- b) the proposed additions, deletions and changes to the requirements for the ATS routes network be coordinated through the ICAO Regional Office concerned.

Conclusion 5/15 – Network of RNAV routes

That GREPECAS, based on information to be provided by IATA, amongst others, study the possibility of establishing a network of RNAV routes and develop an appropriate implementation strategy.

Recommendation 5/16 – Near-term areas of application of area navigation (RNAV)

That States, through GREPECAS:

- a) identify those areas within their respective flight information regions (FIRs) where RNAV techniques can be applied, in order to take full advantage of the navigational capability of RNAV-equipped aircraft to meet a specified required navigation performance (RNP); and
- b) in the identification of such areas, the trajectories linking city-pairs of the CAR/SAM Regions as shown in Appendix E to the Report on Agenda Item 5 be taken into account, as well as major cities in the CAR/SAM Regions and those in adjacent regions.

Recommendation 5/31 – Implementation of reduced vertical separation minimum in the CAR Region

That, to facilitate early implementation of RVSM in the CAR Region, the Regional Supplementary Procedures (Doc 7030) be amended as indicated at Appendix D to the Report on Agenda Item 5.

Recommendation 5/32 – Establishment of standard departure (SID) and arrival (STAR) routes

That States, which have not yet done so, establish SID and STAR routes wherever necessary, taking into account the relevant ICAO provisions of Annex 11 — *Air Traffic Services*, Appendix 3, and guidance material in the *Air Traffic Services Planning Manual* (Doc 9426), as well as the *CAR/SAM Regional Plan for the Implementation of the CNS/ATM Systems* (Doc II, *Table on ATM evolution in the CAR/SAM Regions — Operations in Terminal Areas*).

Recommendation 5/33 – Implementation of air traffic control service

That States, which have not already done so, implement air traffic control service for IFR flights along all ATS routes used for international aircraft operations, except where the type and density of traffic clearly do not justify the provision of such service.

Promulgation of prohibited, restricted and danger areas
[CAR/SAM/2, Rec 5/26]

That States be encouraged to:

- I. refrain, to the extent possible, from establishing prohibited, restricted or danger areas, bearing in mind that, in accordance with Annex 15, prohibited areas or restricted areas may only be established over the territories of a State and not over international waters;
- b) apply the following principles when the establishment of prohibited, restricted or danger areas becomes unavoidable:
 1. give due regard to the need not to prejudice the safe and economical operation of civil aircraft;
 1. provide adequate buffer, in terms of time and size, within the designated area, appropriate to the activities to be conducted;
 1. use standard ICAO terminology in designation of the areas;
 1. promulgate information regarding the establishment and day-to-day use of the areas well in advance of the effective date(s);
 1. arrange for the closest possible coordination between civil ATS units and relevant units responsible for activities within the restricted or danger areas so as to enable the ATS units to authorize civil aircraft to traverse the areas in emergencies, to avoid adverse weather, and whenever the restrictions do not apply or the areas are not active;
 1. review the continuing need for the prohibited, restricted or danger areas at regular intervals;
- c) when the establishment of danger areas outside territorial limits becomes unavoidable, it should be of a temporary nature and States should apply the following principles:

- 1) prior to requesting the establishment of a temporary airspace reservation, the requesting authority shall obtain full information on the likely effect of such a reservation on air traffic. Such information shall include areas of high traffic density which may exist in the vicinity or at the planned location of the airspace reservation, as well as information on peak periods of traffic operating through such areas. In the light of that information, the requesting authority should, to the extent possible, select the site of the airspace reservation, and the time and duration so that this will have the least effect on normal flight operations conducted in the area in question;
- 2) in specifying the extent of a requested temporary airspace reservation and its duration, the requesting authority shall limit the size of the area to the absolute minimum required to contain the activities intended to be conducted within that areas, taking due account of:
 - the navigation capability of aircraft or other vehicles within the airspace reservation;
 - the means available to monitor those activities so as to guarantee that they will be confined within the airspace reservation; and
 - the ability to interrupt or terminate activities;
- 3) the duration of the airspace reservation shall be limited, taking a realistic account of preparation of the activities and the time required to vacate the reservation after the completion of the activities;
- 4) the actual use of the temporary airspace reservation shall be based on appropriate arrangements made between the ATS unit normally responsible for the airspace and the requesting authority. Such arrangements shall be based on the general agreement reached previously between the competent ATS authority or ATS authorities and the requesting authority. They should, *inter alia*, cover:
 - the start of the use of the temporary airspace reservation;
 - the termination of its use; and
 - emergency provisions in case of unforeseen events affecting the activities to be conducted within the temporary airspace reservation;
 - when developing the plans for its future ATS system, give prime consideration to the creation of an integrated civil/military ATS system capable of meeting the requirements of both categories of users in the most effective manner.

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**APPENDIX B
APPENDICES N AND O TO WP/304 OF THE ASSEMBLY – 35TH SESSION**

APPENDIX N

**Delineation~~Delimitation~~ of air traffic services (ATS) airspaces*
in regional air navigation plans**

Whereas Annex 11 to the Convention requires a Contracting State to determine those portions of airspace over its territory within which air traffic services will be provided and, thereafter, to arrange for such services to be established and provided;

Whereas Annex 11 to the Convention also makes provision for a Contracting State to delegate its responsibility for providing air traffic services over its territory to another State by mutual agreement;

Whereas both the delegating and the providing State can reserve the right to terminate any such agreement at any time; and

Whereas Annex 11 to the Convention prescribes that those portions of the airspace over the high seas where air traffic services will be provided shall be determined on the basis of regional air navigation agreements, which are agreements approved by the Council normally on the advice of regional air navigation meetings;

The Assembly resolves, with reference to regional air navigation plans, that:

1. the boundaries of ATS airspaces, whether over States' territories or over the high seas, shall be established on the basis of technical and operational considerations with the aim of ensuring **safety, and optimum~~optimizing~~** efficiency and economy for both providers and users of the services;
2. **established ATS airspaces should not be segmented for reasons other than technical, operational, safety and efficiency considerations;**
3. if any ATS airspaces need to extend over the territories of two or more States, or parts thereof, agreement thereon should be negotiated between the States concerned;
4. the providing State in implementing air traffic services within airspace over the territory of the delegating State shall do so in accordance with the requirements of the delegating State, which shall establish and maintain in operation such facilities and services for the use of the providing State as are mutually agreed to be necessary;
5. any delegation of responsibility by one State to another or any assignment of responsibility over the high seas shall be limited to technical and operational functions pertaining to the safety and regularity of the air traffic operating in the airspace concerned;

and furthermore, declares that:

6. any Contracting State which delegates to another State the responsibility for providing air traffic services within airspace over its territory does so without derogation of its sovereignty; and

* The expression "ATS airspaces" includes flight information regions, control areas and control zones.

7. the approval by the Council of regional air navigation agreements relating to the provision by a State of air traffic services within airspace over the high seas does not imply recognition of sovereignty of that State over the airspace concerned.

Associated practices

1. Contracting States should seek the most efficient and economic delineation of ATS airspaces, the optimum location of points for transfer of responsibility and the most efficient coordination procedures in cooperation with other States concerned and with the Organization.

2. The Council should encourage States providing air traffic services over the high seas to enter, as far as is practicable, into agreements with appropriate States providing air traffic services in adjacent airspaces, so that, in the event the required air traffic services over the high seas cannot be provided, contingency plans, which may require temporary modifications of ATS airspace boundaries **limits**, will be available to be put into effect with the approval of the ICAO Council until the original services are restored.

APPENDIX O

Provision of search and rescue services

Whereas in accordance with Article 25 of the Convention each Contracting State undertakes to provide such measures of assistance to aircraft in distress in its territory as it may find practicable and to collaborate in coordinated measures which may be recommended from time to time pursuant to the Convention;

Whereas Annex 12 to the Convention contains specifications relating to the establishment and provision of search and rescue services within the territories of Contracting States as well as within areas over the high seas;

Whereas Annex 12 to the Convention specifies that those portions of the high seas where search and rescue services will be provided shall be determined on the basis of regional air navigation agreements, which are agreements approved by the Council normally on the advice of regional air navigation meetings;

Whereas Annex 12 to the Convention recommends that boundaries of search and rescue regions should, in so far as practicable, be coincident with the boundaries of corresponding flight information regions **and, with respect to those areas over the high seas, maritime search and rescue regions;**

Whereas Article 69 of the Convention specifies that, if the Council is of the opinion that the air navigation services of a Contracting State are not reasonably adequate for the safe operation of international air services, present or contemplated, the Council shall consult with the State directly concerned, and other States affected, with a view to finding means by which the situation may be remedied, and may make recommendations for that purpose; and

Whereas the air navigation services referred to in Article 69 of the Convention include, inter alia, search and rescue services;

The Assembly resolves that:

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1. the boundaries of search and rescue regions, whether over States' territories or, **in accordance with regional air navigation agreement, over an area greater than a State's sovereign airspace** or over the high seas, shall be determined **delimited** on the basis of technical and operational considerations, including the desirability of coincident flight information regions, and search and rescue regions, **and, with respect to areas over the high seas, maritime search and rescue regions**, with the aim of ensuring optimum efficiency with the least overall cost;
2. **States shall ensure the closest practicable cooperation between maritime and aeronautical search and rescue services where they serve the same area and, where practical, establish joint rescue coordination centres to coordinate aeronautical and maritime search and rescue operations;**
23. if any search and rescue regions need to extend over the territories of two or more States, or parts thereof, agreement thereon should be negotiated between the States concerned;
34. the providing State in implementing search and rescue services over the territory of the delegating State shall do so in accordance with the requirements of the delegating State, which shall establish and maintain in operation such facilities and services for the use of the providing State as are mutually agreed to be necessary;
45. any delegation of responsibility by one State to another or any assignment of responsibility over the high seas shall be limited to technical and operational functions pertaining to the provision of search and rescue services in the area concerned;
56. remedies to any inadequacies in the provision of efficient search and rescue services, particularly **including** over the high seas, should be sought through negotiations with States which may be able to give operational or financial assistance in search and rescue operations, with a view to concluding agreements to that effect; and *furthermore, declares that*:
67. any Contracting State which delegates to another State the responsibility for providing search and rescue services within its territory does so without derogation of its sovereignty; and
78. the approval by Council of regional air navigation agreements relating to the provision by a State of search and rescue services within areas over the high seas does not imply recognition of sovereignty of that State over the area concerned.

Associated practices

1. Contracting States should, in cooperation with other States and the Organization, seek the most efficient delineation of search and rescue regions and consider, as necessary, pooling available resources or establishing jointly a single search and rescue organization to be responsible for the provision of search and rescue services within areas extending over the territories of two or more States or over the high seas.
2. The Council should encourage States whose air coverage of the search and rescue regions for which they are responsible cannot be ensured because of a lack of adequate facilities, to request assistance from other States to remedy the situation and to negotiate agreements with appropriate States regarding the assistance to be provided during search and rescue operations.

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