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**INTERNATIONAL CIVIL AVIATION ORGANIZATION**  
**SOUTH AMERICAN OFFICE**

**AERONAUTICAL INFORMATION SERVICES, AERONAUTICAL CHARTS AND  
AIS AUTOMATION COORDINATION AND IMPLEMENTATION MEETING**

**(SAM 03/03-AIS/MAP/AUTO)**

(Lima, Peru, 13 to 17 October 2003)

**Agenda Item 1: Analysis of the technical requirements of Part VIII (Aeronautical Information Services and Aeronautical Charts) of the CAR/SAM Air Navigation Plan; Vol. I, Basic Plan**

(Presented by the Secretariat)

**SUMMARY**

This working paper presents an analysis of the technical requirements of Part VIII (Aeronautical Information Services and Aeronautical Charts) of the CAR/SAM Air Navigation Plan; Vol I, Basic Plan.

**References:**

- Report of the Third CAR/SAM Regional Air Navigation Meeting (Buenos Aires, Argentina, 5 to 15 October 1999).
- Report of the AIS/MAP/SG/7 Meeting (Varadero, Cuba, 23 to 27 October 2000).
- Report of the Tenth and Eleventh Meetings of the CAR/SAM Regional Planning and Implementation Group - GREPECAS (Spain, 2001; Brazil, 2002).

**1. Introduction**

1.1 Under Agenda Item 12, the CAR/SAM/3 RAN Meeting reviewed the procedures and requirements of Aeronautical Information Services and Aeronautical Charts (AIS/MAP), based on the new AIS/MAP operational requirements in support of communication, navigation and surveillance/air traffic management (CNS/ATM) systems. In this respect, the meeting examined the CAR/SAM AIS/MAP requirements concerning the need for quality aeronautical information to support CNS/ATM systems, as well as the status, duties, proficiency and training of AIS/MAP personnel with respect to other technical services. This resulted in an AIS/MAP update of the CAR/SAM Air Navigation Plan.

1.2 The CAR/SAM/3 RAN meeting also based its work on the new planning methodology approved by the Air Navigation Commission, the aircraft operation forecasts, the statement of approved basic operational requirements and planning criteria, the new AIS/MAP procedures and the new AIS and MAP facilities and services to be provided by the States in order to comply with regional procedures. Consequently, the CAR/SAM/3 RAN meeting formulated the new AIS/MAP procedures and requirements that would constitute Part VIII – Aeronautical Information Services and Aeronautical Charts (AIS/MAP) of the CAR/SAM ANP; Vol I, Basic Plan and Part VIII (AIS/MAP) of the CAR/SAM Air Navigation Plan; Vol II, FASID, respectively, thus replacing Part VI of the CAR/SAM ANP (Doc 8733/14).

1.3 Under Agenda Item 12, and based on the basic operational requirements and planning criteria and on the general guidelines for aircraft operations obtained from the users, provider States, international organisations and the Secretariat before and during the meeting, the CAR/SAM/3 RAN meeting reviewed the aspects of the air navigation plan related to the creation of aerodrome AIS units and the supply of aeronautical information at international aerodromes, and the creation of international (NOTAM) offices (NOFs) in the area of concern. In this sense, the meeting agreed that a State's AIS service would not be efficient if it lacked the proper AIS organisation of the appropriate category, and the personnel and equipment required to produce and maintain updated a comprehensive AIP containing all of the required charts, prepare and distribute NOTAMs, and provide pre-flight and post-flight information services to all flights.

## 2. Discussion

2.1 In view of the foregoing, and under Agenda Item 12, the CAR/SAM/3 RAN meeting adopted Part VIII (Aeronautical Information Services and Aeronautical Charts) of the CAR/SAM Air Navigation Plan; Vol I, Basic Plan; and Part VIII (AIS/MAP) of the CAR/SAM Air Navigation Plan; Vol II, FASID, respectively. Consequently, it would be quite appropriate for this meeting to allow the States of the ICAO South American Region to analyse, for the first time, the AIS/MAP technical requirements of the CAR/SAM Plan. This will not only provide a better knowledge of the respective material, but will also facilitate its understanding and, thus, its effective implementation.

2.2 **Appendix A** to this working paper presents the contents of Part VIII (Aeronautical Information Services and Aeronautical Charts) of the CAR/SAM Air Navigation Plan; Vol I, Basic Plan. The meeting will, thus, be able to examine the contents of said material, not only to become familiar with it, but also to suggest any action to expedite the implementation of said technical requirements by SAM States.

## 3. Suggested action

3.1 It is suggested that, after reviewing this working paper and, especially, the material presented in Appendix A, which contains the CAR/SAM Basic Air Navigation Plan, the meeting take any action which might be required on this issue, and identify the need to propose amendments to the aforementioned material and submit them to the GREPECAS AIS/MAP Subgroup for action on this matter.

3.2 Based on the above, the meeting is invited to take any required action on the material presented in this working paper, and, if applicable, to adopt the following action:

**CONCLUSION 1/1: FAMILIARISATION WITH THE REQUIREMENTS OF PART VIII (AIS/MAP) OF THE CAR/SAM AIR NAVIGATION PLAN**

That, in view of the need to become familiar with Part VIII (AIS/MAP) of the CAR/SAM Air Navigation Plan:

- a) the relevant civil aviation administrations download the content of Part VIII (AIS/MAP); Vol I (Basic Plan) and Vol II (FASID) of the CAR/SAM Plan from the web page of the ICAO South American Regional Office for its effective application; and
- b) to the extent possible, the ICAO South American Office foster the holding of seminars/workshops aimed at a broader dissemination and understanding of the documentation referred to in the previous paragraph.

**CONCLUSION 1/2: IMPLEMENTATION OF THE TECHNICAL REQUIREMENTS OF PART VIII (AIS/MAP) OF THE CAR/SAM PLAN; VOL I (BASIC PLAN) AND VOL II (FASID)**

That, in view of the time elapsed since the CAR/SAM/3 RAN meeting, and considering that there are still many AIS/MAP requirements pending full implementation:

- a) the SAM States that have not done so yet, take the necessary action to establish a strategic plan for the effective implementation of all and each of the technical requirements of Part VIII (AIS/MAP) of the CAR/SAM Air Navigation Plan; Vol I, Basic Plan, and of Part VIII (AIS/MAP) of the CAR/SAM Air Navigation Plan; Vol II, FASID, and send copy of said plans to the SAM Regional Office as soon as possible; and
- b) the ICAO South American Office, through its regular work programme, renew its efforts to foster any action required to support the respective States in the effective implementation of the AIS/MAP requirements of the CAR/SAM Plan; and do the respective follow up of the strategic plans prepared by the States, in keeping with item a) above.

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## APPENDIX A

### CAR/SAM AIR NAVIGATION PLAN

#### Part VIII

### AERONAUTICAL INFORMATION SERVICES AND CHARTS (AIS/MAP)

#### Introduction

[CAR/SAM/3 RAN, Rec. 12/1]

1. This part of the Caribbean and South American Basic Air Navigation Plan contains basic planning principles, operational requirements and planning criteria, implementation guidelines and stable material related to aeronautical information services and charts (AIS/MAP) considered to be the minimum necessary for effective planning of AIS and MAP facilities and services in the CAR/SAM regions. A detailed description/list of the facilities and/or services to be provided by States in order to fulfill the requirements of the Basic ANP is contained in the CAR/SAM Facilities and Services Implementation Document (FASID), as agreed between the provider and the user States concerned. During the transition and pending full implementation of the future CNS/ATM systems, it is expected that the existing requirements would gradually be replaced by new CNS/ATM related requirements. Subsequently, it is expected that some elements of the CNS/ATM systems will be subject to amendment, as necessary, on the basis of experience gained in their implementation.

2. The Standards, Recommended Practices and Procedures to be applied, and related guidance material are contained in the following ICAO documentation:

- a) Annex 4 - *Aeronautical Charts*;
- b) Annex 15 - *Aeronautical Information Services*;
- c) Annex 11 - *Air Traffic Services*;
- d) Annex 14 - *Aerodromes, Volume I - Aerodrome Design and Operations* and *Volume II - Heliports*;
- e) *Aeronautical Information Services Manual* (Doc 8126);
- f) *Aeronautical Charts Manual* (Doc 8697);
- g) *ICAO Abbreviations and Codes* (PANS-ABC, Doc 8400); and
- h) *World Geodetic System - 1984 (WGS-84)* (Doc 9674).

3. Background information of importance in the understanding and effective application of the plan is contained in the *Report of the Caribbean/South American Regional Air Navigation Meeting* (Doc 9194) and the Reports of the Second and Third Caribbean/South American Regional Air Navigation Meetings (Doc 9543 and Doc 9749, respectively).

4. Regional Air Navigation Meeting recommendations shown in brackets below a heading indicate the origin of all paragraphs following that heading. A recommendation shown in brackets below a paragraph indicates the origin of that particular paragraph.

## **General procedures**

### **Introduction**

5. The major objective of aeronautical information services is to ensure the flow of information necessary for the safety, regularity and efficiency of international civil aviation. To support the CNS/ATM systems, the aeronautical information services and charts (AIS/MAP) should be directed towards the real-time provision of electronic aeronautical information/data that would ensure quality and integrity of the information provided.

6. In the CNS/ATM systems, the future users' requirement will be to access, on a global basis, quality aeronautical information by all users at all times. To achieve this high-level requirement, aeronautical information must be provided electronically, based on a commonly agreed and standardized data model. Strict quality assurance principles should be put in place in order to ensure that aeronautical data is of the required quality (accuracy, resolution and integrity), verified and validated before it is provided to the users. This will give users the required confidence in the quality of information that is critical to flight safety.

7. To support the CNS/ATM systems, the following basic AIS/MAP requirements should be satisfied in the future:

- a) real-time provision and exchange of electronic aeronautical information/data, through a system that guarantees the quality and integrity of the information provided;
- b) provision and exchange of aeronautical information/data through modern communication means including data link that would allow interrogation of aeronautical data bases on the ground from the aircraft; and
- c) harmonization of AIS and MET information/data to support combined automated pre-flight and in-flight briefing facilities.

### **Quality system**

8. The aeronautical services involved in the provision and maintenance of aeronautical data should be organized in such a manner that the quality system be introduced in all the functional stages of the aeronautical data process, from the data origination to the distribution/provision of data. The established quality system should be in conformity with the International Organization for Standardization (ISO) 9000 series of quality assurance standards and the system should be certified by an approved organization.

### **Support for the AIS and MAP services**

9. To enable the AIS/MAP services to function efficiently and in accordance with the defined requirements, sufficient funds should be allocated by States in their budgets that will ensure that all the administrative and operational requirements of AIS/MAP are met including the

availability of sufficient and properly qualified personnel with all the required facilities, equipment and material.

10. The highest priority should be established and ascertained to the requirements for printing of AIS documentation including charts. Where practicable, printing facilities should be placed under the direct control of the AIS Headquarters.

11. The personnel working for aeronautical information and charts services should possess the skills and competence required to perform specific assigned functions. The required skills and competencies should be demonstrated by the AIS/MAP personnel through initial and periodic assessments on which basis the corresponding certificate of competence equal to an AIS license may be accorded.

12. AIS and MAP personnel should be accorded the status comparable to that assigned to technical personnel of other air navigation services.

### **Coordination between AIS and other technical services**

13. Coordination/liaison on a permanent basis should be established between AIS/MAP and other technical services responsible for planning and operating air navigation facilities and services. At least one person from those services should be assigned and be responsible for maintaining continuous liaison with AIS/MAP.

14. Technical services responsible for origination of the raw aeronautical information should be acquainted with the requirements for promulgation and advance notification of changes that are operationally significant as established in Annexes 11 and 14 and other relevant ICAO documentation.

15. Appropriate AIS/MAP personnel should be included in the air navigation planning processes. This should ensure the timely preparation of appropriate AIS documentation and that the effective dates for changes to the air navigation system and procedures are satisfied.

### **Training of AIS and MAP personnel**

16. Within the context of the quality system implemented, the AIS and MAP training programme should ensure that AIS and MAP personnel are appropriately trained according to the skills and competences required to perform specific assigned functions.

17. AIS personnel should receive professional training commensurate with the most recent technological developments requiring high level of knowledge and skills. AIS personnel should have, as an essential part of their training, sufficient knowledge of aeronautical cartography to permit them to verify information that is published on charts. In addition, AIS personnel should possess sufficient background in automation and knowledge of the English language as are necessary for the performance of their duties.

18. In addition to the conventional cartographic and geography training programme, knowledge of the following elements should also be taken into account when developing a training programme for MAP personnel:

- a) hardware-scanners, plotters, computers, soft proofing devices (CRTs), image setters, and digital memory systems;
- b) local area networks and worldwide area networks;
- c) software - programming familiarity, flow chart usage and creation, operating systems, communication formats, digital code systems, and documentation skills; and
- d) cartographic equipment and software operations skills (developed through “hands on” experience).

19. AIS and MAP personnel should be able to demonstrate that they possess the skills and competencies required to perform assigned specific functions. Periodical checks should be undertaken to ensure that the personnel continue to meet the required standards and if shortfalls in knowledge, skills or competence are detected, corrective measures should be taken.

### **Organization of Aeronautical Information Services**

#### **Aerodrome AIS Units** (FASID Table AIS-1)

20. The aerodrome AIS units to be provided at international aerodromes listed in the Appendix to Part III of the CAR/SAM Basic ANP are set out in Table AIS 1 of the FASID.

21. The aeronautical information to be made available at international aerodromes listed in the Appendix to Part III of the CAR/SAM Basic ANP is set out in Table AIS 2 of the FASID.

22. The exchange of aeronautical information documentation and availability of such documentation from international aerodromes listed in the Appendix to Part III of the CAR/SAM Basic ANP is set out in Table AIS 4 of the FASID.

23. Aeronautical information service at aerodromes should be provided on a 24-hour basis, except as otherwise agreed between the AIS authority, the air traffic services authority and the operators concerned. Agreed operational hours of the aerodrome AIS units and details of the service provided should be indicated in the Aeronautical Information Publication in accordance with Annex 15.

24. English should be among the languages used in aeronautical information briefings and consultations.

25. The aerodrome AIS unit should provide full pre-flight information/briefing service to flight operations personnel and aircrew, for the entire coverage zone. The coverage zone for pre-flight information service at each aerodrome AIS unit should be determined taking into account the final destination of aircraft departing from the aerodrome concerned. This should be done in

consultation with aircraft operators and be reviewed from time to time and/or when the air traffic pattern is expected to change.

26. The aerodrome AIS units should be adequately staffed and properly equipped for the provision of effective pre-flight information service. Installation of systems for the automated processing (storage, retrieval and preparation of pre-flight information bulletins (PIB)) should be considered at an early stage.

27. Aerodrome AIS units that provide pre-flight information services should be established at locations conveniently accessible to flight operations personnel at the airports, preferably on the ground floor (apron level) of airport terminal buildings.

28. Arrangements should be made between the aerodrome AIS unit, airline operations personnel (including flight crews) and air traffic services for an effective cooperation, coordination and reporting of post-flight information on inadequacies in the status and operation of air navigation facilities. To ensure submission of post-flight reports to aerodrome AIS units without delay, arrangements should be made at airports that a suitable form like the one provided at Appendix B of the *ICAO Aeronautical Information Services Manual* (Doc 8126) be made available to ATS, airline operations offices and aerodrome AIS units.

29. Tables AIS 1 and AIS 2 of the FASID should be implemented as soon as possible.

**International NOTAM Offices (NOFs)**  
(FASID Table AIS 3)

30. The International NOTAM Offices to be provided in the CAR/SAM regions are set out in Table AIS 3 of the FASID.

31. International NOTAM Offices should be adequately staffed and properly equipped for the provision of effective 24-hour service.

32. Table AIS 3 of the FASID should be implemented as soon as possible.

**INTEGRATED AERONAUTICAL INFORMATION PACKAGE**

**Aeronautical Information Publication (AIP)**

33. States that have not already done so should, as a matter of urgency, prepare and publish in the new, restructured format their Aeronautical Information Publication (AIP), either individually or collectively. The format is prescribed by ICAO Annex 15 and the guidance material is provided in the *Aeronautical Information Services Manual* (Doc 8126), Appendix H.

34. Information contained in the AIP should be complete and thoroughly checked for correctness before it is provided to the users. To ensure consistency throughout the AIP, changes to the AIP should be made in such a way that information of the same facility, service, procedure, etc. affecting one part be changed in the other part(s), if applicable.

35. The differences between the national regulations and practices and the corresponding ICAO SARPs should be provided in the appropriate part of the AIP.

### **AIP Amendments**

36. In view of the vital importance to the safety of air navigation of the aeronautical information contained in the AIP, this information should be kept up to date. This should be done by publishing AIP Amendments on specific publication dates or in accordance with a publication schedule based on regular intervals.

37. AIP Amendments should be issued at least once every six months.

### **AIP Supplements**

38. Information in the AIP Supplement appropriate for inclusion in the AIP should be incorporated therein with a minimum of delay.

39. Information in the AIP Supplement that is still valid at the end of six months should be re-issued with a new number indicating clearly that the new Supplement is a replacement and that the information it contains remained unchanged from the one previously issued.

40. Aeronautical information of operational significance, requiring substantive amendments to flight documentation (e.g. promulgation of new and/or revised instrument approach procedures) promulgated by an AIRAC AIP Supplement, should be accompanied by charts or diagrams, as appropriate, to aid interpretation.

41. To enable users of aeronautical information to keep records of current information, checklists of AIP Supplements in force should be provided regularly through the monthly printed summary of NOTAM.

### **Aeronautical Information Circulars (AIC)**

42. Aeronautical Information Circulars (AIC) should be used to promulgate aeronautical information strictly in accordance with Chapter 7 of Annex 15.

### **Use and validity of NOTAM**

43. NOTAM should be mainly used for promulgation of information of a temporary nature and of short duration. Temporary information promulgated by NOTAM should not remain in force longer than three months. In exceptional cases, if temporary information promulgated by NOTAM remains in force for longer than three months, a replacement NOTAM should be issued.

44. Use of the abbreviations WIE (“with immediate effect”) and UFN (“until further notice”) in the NOTAM format under Items B and C respectively, must be avoided and instead, a ten-figure group giving year, month, day, hours and minutes in UTC should be used when originating NOTAM. When information on timing is uncertain, a ten-figure date-time group should be followed by an EST to indicate the approximate duration of information.

### **AIRAC system**

45. States that have not yet done so, should implement the AIRAC system in accordance with the requirements of Annex 15, with the minimum of delay.

46. Successful implementation of the AIRAC system depends directly on the level of coordination established among the relevant technical services and the AIS. To ensure a high level of coordination, States should prepare their national regulations so that they well define the duties and responsibilities of those technical services that provide raw AIRAC information to AIS for publication. The technical services involved should be familiar with the AIRAC system and comply with it in accordance with specifications provided in Annexes 11, 14 (both volumes) and 15.

47. To ensure that aeronautical information of operational significance reaches users at least 28 days in advance of the AIRAC effective date, measures should be taken to ensure that:

- a) information/data prepared in hard copy format be issued and distributed at least 56 days in advance of the effective date; and
- b) information/data provided in electronic format be distributed at least 35 days in advance of the effective date.

48. A schedule of AIRAC effective dates, publication dates and cut-off dates for the receipt by AIS of the raw information to be promulgated through the AIRAC system should be issued once a year and distributed to all services and agencies responsible for the origination of the raw information.

49. Changes to the information promulgated by the AIRAC system should be avoided by all means, especially during the first 28 days.

### **WORLD GEODETIC SYSTEM - 1984 (WGS-84)**

#### **Introduction**

50. In order to support implementation of the future CNS/ATM systems, States should make every effort to implement WGS-84 and provide geographical coordinates referenced to this system. A detailed description/list of the WGS-84 coordinate data to be provided by States in order to fulfill the requirements of the Basic ANP is contained in the CAR/SAM Facilities and Services Implementation Document (FASID).

51. The Standards, Recommended Practices and Procedures (SARPs) to be applied in respect of WGS-84 are contained in the following ICAO documents:

- a) for the accuracy of the field work (surveying):
  - 1) Annex 11 - *Air Traffic Services*; and
  - 2) Annex 14, *Aerodromes*, Volume I - *Aerodrome Design and Operations* and Volume II - *Heliports*; and
- b) for the charting and publication resolution, respectively:
  - 1) Annex 4 - *Aeronautical Charts*; and
  - 2) Annex 15 - *Aeronautical Information Services*.

52. To assist States in the uniform implementation of the WGS-84 related SARPs, the guidance material on the provision of geographical coordinates referenced to the WGS-84 datum is provided in the *World Geodetic System — 1984 (WGS-84) Manual* (Doc 9674). Background information on the importance and understanding and effective application of the Plan is contained in the Appendices 2E and 2F of the GREPECAS/6 Report, as amended by Conclusion 7/11 and Appendix 4E of the Seventh Meeting of GREPECAS.

#### **WGS-84 Requirements** (FASID Table AIS 5)

53. Table AIS 5 sets out the requirements for geographical coordinates referenced to the WGS-84 datum at international aerodromes, in flight information regions (FIR), en route and in terminal areas.

54. States which have not done so should make the necessary arrangements to develop a national WGS-84 implementation plan and such a plan should contain a timetable for implementation. When developing a national WGS-84 plan, States should establish a committee composed of personnel from the appropriate aeronautical as well as from the geographic/geodetic departments of the State. Such a committee should be tasked with the management of the WGS-84 implementation plan.

55. States in a position to do so should provide assistance in the implementation of WGS-84 to other States that need such assistance.

56. Before the geographical coordinates based on WGS-84 are published in the Aeronautical Information Publication (AIP) and on charts, every effort must be made to validate and verify them.

57. States which have common boundary points, should coordinate WGS-84 data for those points prior to publication of this information in their respective AIPs.

58. In order to ensure that quality (accuracy, resolution and integrity) and traceability requirements for the WGS-84-related geographical coordinate data are met, States must take measures to develop and introduce a quality system programme. This programme containing

procedures, processes and resources should be in conformity with the International Organization for Standardization (ISO) 9000 series of quality assurance standards.

## **AERONAUTICAL CHARTS**

### **Aeronautical charting programme** (FASID Table AIS 6)

59. States, individually or collectively, should include in their AIP derived from their aeronautical chart production programmes at least the following types of charts:

- a) Aerodrome Obstacle Chart - ICAO Type A;
- b) Aerodrome Obstacle Chart - ICAO Type C;
- c) Precision Approach Terrain Chart - ICAO;
- d) Enroute Chart - ICAO;
- e) Area Chart - ICAO;
- f) Standard Departure Chart Instrument (SID) - ICAO;
- g) Standard Arrival Chart Instrument (STAR) - ICAO;
- h) Aerodrome/Heliport Chart- ICAO;
- i) Instrument Approach Chart - ICAO;
- j) Visual Approach Chart;
- k) World Aeronautical Chart - ICAO 1:1 000 000.

*Note - In the production of Aerodrome Obstacle Charts - ICAO Type A, Aerodrome Obstacle Charts - ICAO Type C, Instrument Approach Charts - ICAO, Aerodrome/Heliport Charts - ICAO and Precision Approach Terrain Charts - ICAO, States shall take into account ICAO Annex 4 requirements and Table AOP 1.*

60. The detailed aeronautical chart requirements are set out in Table AIS 6.

### **Production responsibility for sheets of the World Aeronautical Charts - ICAO 1:1 000 000** (FASID Table AIS 7)

61. States which have not yet produced the World Aeronautical Chart-ICAO 1:1000 000, in accordance with the sheet distribution shown in Table AIS 7, should take the necessary measures to ensure the preparation of the sheets for which they are responsible, either through individual effort or with the collaboration of other States or specialized cartographic agencies.

62. The production responsibility for sheets of the World Aeronautical Chart - ICAO 1:1 000 000 are set out in Table AIS 7 and illustrated on Chart AIS 2.

63. Where the agency producing the charts is not under the control of the aviation administration, States should ensure good liaison between them, and accord the necessary priority in their national chart production programmes to the production of the required aeronautical charts.

### **Aeronautical chart production**

64. States which have not produced the aeronautical charts specified hereunder, should produce them as soon as possible.

- 1) Aerodrome Obstacle Chart - ICAO Type A;
- 2) Aerodrome Obstacle Chart - ICAO Type C;
- 3) Precision Approach Terrain Chart - ICAO;
- 4) Enroute Chart - ICAO;
- 5) Instrument Approach Chart - ICAO;
- 6) Aerodrome/Heliport Chart - ICAO;
- 7) World Aeronautical Chart - ICAO 1:1 000 000.

### **AUTOMATION IN AIS**

65. Automation in AIS should be introduced with the objective of improving the overall speed, accuracy, efficiency, and cost-effectiveness of the aeronautical information service in the region.

66. AIS automation should offer a service to meet the individual requirements of the various categories of users. This goes beyond the provision of pre-processed data and the pre-flight bulletin types traditionally provided manually or by early automated systems. For reasons of cost effectiveness, such a service should strike a balance between the degrees of complexity of the system required and the sophistication of the products provided.

67. The development of automation within AIS should be based on an integrated CAR/SAM regional automated AIS system concept, in order to obtain a general standardization of procedures, products and services to users and to avoid potential divergences, incompatibilities and duplication of effort.

68. The implementation of such a system should permit a cost-effective evolution of the regional system, taking account of the present and future technical possibilities and should be governed by the following principles:

-A11-

- a) participating national AIS System Centres (NASC) should closely cooperate in adopting the different elements that will make up the integrated CAR/SAM region automated AIS system, taking into account their current and planned degree of development;
- b) States that have not yet done so should initially automate NOTAM service within their own AIS while taking into account the users' requirements;
- c) certain NASC should cooperate with other not-yet-automated AIS systems, carrying out agreed functions to improve the efficiency and the quality of processing of basic aeronautical information and of its distribution both within an agreed area of the system and externally;
- d) optimum use should be made of available communication and public networks as well as of new communication technology for the dissemination, exchange and retrieval of aeronautical information, particularly NOTAM;
- e) the ICAO NOTAM format containing the necessary qualifiers to facilitate the sorting and retrieval of NOTAM information in accordance with users' requirements should be used exclusively;
- f) a system interrogation capability which takes account of the different categories of systems users should exist;
- g) common "user friendly" query procedures for the interrogation of AIS or NOTAM databases should be used. These procedures should be in accordance with the different levels of user requirements;
- h) States must establish quality systems and procedures which will ensure that the available aeronautical information is of appropriate quality (accuracy, resolution, integrity and timeliness);
- i) A State which decides not to automate its AIS may arrange, in the interest of improved efficiency, on the basis of bilateral or multilateral agreements between States or other non-governmental organizations, for the provision of automated services on its behalf. The arrangement must take into account the non-transferable responsibility of a State for the provision of aeronautical information as well as other technical and administrative aspects associated with such agreement.

69. The development of the integrated CAR/SAM region automated AIS system should take into account provisions of Annex 15 for the use of World Geodetic System - 1984 (WGS-84), the adopted common geodetic reference system, when aeronautical geographical coordinates are provided.

- END -