南京航空航天大学民航学院空中交通管理专业系列教材

刘继新 胡彬 编著

航空情报学

Aeronautical Information Service

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·北京·

内 容 简 介

本书以国际民用航空公约附件14、15和8126文件为基础，参考了其他民航院校的航空情报教材，并融合了国际民航航空情报的最新资料及国内航空情报的最新发展编写而成。全书系统、全面、深入地介绍了航空情报专业的基本内容。全书共分为9章，附录部分包括3个方面的内容。通过本书的学习，读者可以比较透彻地了解日常的航空情报工作。

本书可作为民航航空情报、空管、签派、飞行专业本科生和交通运输专业研究生的航空情报课程教材。

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前　言

近年来，随着我国民用航空事业的飞速发展，尤其是国际飞行业务的增加，航空情报服务作为民航空中交通管理的重要部门之一，正越来越受到重视。航空情报工作经过几十年的发展，在组织队伍、人员素质、技术手段等方面都跃上了新的高度，接近或达到国际民航组织及先进发达国家的标准，为中国民航的快速发展做出了贡献。航空情报工作的职能是收集编辑、设计制作和发布提供为保证飞行安全、正常和高效所需要的各种航空情报资料。它在实际工作中以 AIP、NOTAM、AIC、PIB、Chart、Manual 等形式向飞行、情报、空管、签派等人员提供一切影响飞行的信息，直接指导飞行。每一次民用航空飞行都必须有航空情报部门的密切配合，可见航空情报的地位至关重要，它是整个民用航空的信息数据中心，在民用航空的技术进步中具有举足轻重的作用。

航空情报涉及的技术范围很广，包括航行通告、飞行程序设计、航图、机场、领航等。国际民用航空组织也专门对此制定了国际民用航空公约各个附件，作为国际标准和各国发展本国民用航空的参考规则。民航飞行、管制、情报、签派等人员只有牢固地掌握了航空情报有关知识，才可能胜任自己的工作，保证与协作单位的交流通畅，确保飞行安全。

本书以国际民用航空公约附件 14、15 和 8126 文件为基础，参考了其他民航院校的航空情报教材，并融合了国际民航航空情报的最新资料及国内航空情报的最新发展，系统、全面、深入地介绍了航空情报专业的基本内容。本书共分为 9 章，附录部分包括 4 个方面的内容。通过本书的学习，读者可以比较透彻地了解日常的航空情报工作。本书可作为民航航空情报、空管、签派、飞行专业本科生和交通运输专业研究生的航空情报课程教材。

为提高和培养学生的专业英语水平和能力，本教材主要采用英语编写，在教学实践过程中使用双语教学。本教材得到南京航空航天大学民航学院教材基金资助，在此表示感谢。全书由南京航空航天大学民航学院刘继新副教授主编，胡彬老师参加了机场章节的编写。因编者水平有限，不妥之处在所难免，恳请读者指正。

编者

2011 年 1 月南京

Contents

Chapter 1 Introduction 1
1. Purpose of an Aeronautical Information Service (AIS) 1
2. Responsibilities 1
3. Functions 2
4. Users of Aeronautical Information 3
5. Scope of Information Handled by an AIS 3
6. Organization of an AIS 4
Chapter 2 Collection of Aeronautical Information 9
1. Domestic Information 9
2. Foreign Information 9
3. Channels of Communication 10
4. Screening and Distribution of Information 11
5. Basic Reference Material 11
Chapter 3 NOTAM 14
1. Origination 14
2. General Specifications of NOTAM 16
3. Distribution 17
4. SNOWTAM 32
Chapter 4 Aeronautical Information Publication (AIP) 43
1. Introduction 43
2. Content of the AIP 44
3. Compilation and Editing 47
4. Specifications for AIP Amendments 48
5. Specifications for AIP Supplements 48
6. Trigger NOTAM 53
7. Notification of Differences in AIP 54
Chapter 5 Aeronautical Information Circular (AIC) 56
1. Introduction 56
2. Annual Review and Checklist 57
3. Distribution 57
Chapter 6 Aeronautical Information Regulation and Control(AIRAC) 61

此为试读,需要完整PDF请访问: www.ertongbook.com

1. Information to be Notified by AIRAC 61
2. Regulated System 62
3. Schedule of AIRAC Effective Dates 63
Chapter 7 Pre-flight and Post-flight Information 65
1. Provision of Pre-flight Information Service 65
2. Physical Location and Layout of an AIS Unit 66
3. Detailed Information for Each Coverage Zone 66
4. Wall Displays 67
5. Self-briefing and Pre-flight Information Bulletins (PIB) 68
6. Post-flight Information 69
7. Telecommunication Requirements 69
Chapter 8 Aerodrome 76
1. General 76
2. Aeronautical Data 77
3. Physical Characteristics 83
4. Obstacle Restriction and Removal 91
5. Visual Aids for Navigation 99
6. Visual Aids for Denoting Obstacles 128
7. Visual Aids for Denoting Restricted Use Areas 132
Chapter 9 Glossary 135
1. Definitions 135
2. Abbreviations 143
3. Location Indicators for Domestic Aerodromes 158
4. Airlines Two-Letter, Three-Letter Designators 162
Appendix I NOTAM Code in the NOTAM Qualifier Column 167
Appendix II A Survey of China AIS 175
Appendix III ICAO 182
Appendix IV The Integrated Information Package 195
References 200

Chapter 1

Introduction

1. Purpose of an Aeronautical Information Service (AIS)

The basic purpose of an AIS is to provide information needed to ensure the safety, regularity and efficiency of civil aviation, and its ability to perform this important function will be very dependent on the adequacy, accuracy and timely provision of the required raw information by each of the State services associated with aircraft operations. The operator of any type of aircraft, be it a small private aircraft or a large transport, must have available a variety of information concerning the air navigation facilities and services which may be expected to be used. For example, he must know the regulations concerning entry into and transit of the airspace of each country in which operations will be carried out; and must know what aerodromes, heliports, navigational aids, meteorological services, communication services and air traffic services are available and the procedures and regulations associated with them. The operator must also be informed, often on very short notice, of any change affecting the operation of these facilities and services and must know of any airspace restrictions or hazards likely to affect flights.

The purposes of AIS are simply described as follows:

(1) to ensure the flow of information necessary for the safety, regularity and efficiency of civil aviation;

(2) to maintain a high standard of air navigation, and information concerning the air navigation facilities and services must be readily available;

(3) information must be accurate and up-to-date;

(4) timely dissemination of information affecting navigation facilities and services is essential.

2. Responsibilities

1) Responsibility of a State

Each Contracting State is required to provide either independently or jointly an Aeronautical Information Service (AIS) responsible for the collection, collation, editing and publishing of aeronautical information concerning its own territory. The responsibilities of each Contracting State are as follows: Each Contracting State shall:

(1) provide an aeronautical information service;

(2) agree with one or more other Contracting State(s) for the provision of a joint service; or

(3) delegate the authority for the provision of the service to a non-governmental agency, provided the Standards and Recommended Practices of this Annex are adequately met.

2) Responsibility of the Aeronautical Information Service (AIS)

The collection and distribution of aeronautical information for use by all types of aircraft operation is the responsibility of the AIS of a State, as specified in Annex 15 to the Convention on International Civil Aviation. It is responsible for making available to civil aviation interests any and all information that is pertinent to and required for the operation of aircraft engaged in international civil aviation within its own territory, as well as in areas outside its territory in which the State has air traffic control or other responsibilities.

3) Responsibility of the pilot-in-command

It is the responsibility of the pilot-in-command to become familiar with all appropriate information concerning the regulations and procedures of each State he has to fly over. Certain specific types of information must be carried on board an aircraft, and no flight may be commenced unless there is reasonable assurance that the facilities and services required on the flight are available and operational.

3. Functions

(1) An aeronautical information service shall receive and/or originate, collate or assemble, edit, format, publish/store and distribute aeronautical information/data concerning the entire territory of the State as well as areas in which the State is responsible for air traffic services outside its territory. Aeronautical information shall be published as an Integrated Aeronautical Information Package, which includes Aeronautical Information Publication (AIP), AIP Supplement, AIP Amendment, NOTAM, Aeronautical Information Circulars (AIC), Pre-flight information bulletins (PIB), checklists and summaries.

(2) An aeronautical information service shall obtain information to enable it to provide pre-flight information service and to meet the need for in-flight information:

a) from the aeronautical information services of other States;

b) from other sources that may be available, such as Military Services or non-governmental organizations.

(3) An aeronautical information service shall make available to the aeronautical information

services of other States any information necessary for the safety, regularity and efficiency of air navigation, and such information shall be available in a form suitable for the operational requirements of:

a) flight operations personnel including flight crews, flight planning and flight simulator; and

b) the air traffic services unit responsible for flight information service and services responsible for pre-flight information.

* To provide and exchange information with the AIS of other States is one of the main functions of AIS.

(4) The effective functioning of an AIS is dependent upon the co-operative effort of all aeronautical services, such as communications, aerodromes, air traffic services, etc., since the raw information must be originated by such services. It is therefore incumbent upon the national aviation authority to ensure that all the required information is supplied to the AIS as promptly as possible.

4. Users of Aeronautical Information

(1) The most obvious user is the pilot.

(2) The second category of user represents:

a) those engaged in airline operational control;

b) chart and document-producing agencies;

c) air traffic services.

5. Scope of Information Handled by an AIS

1) Permanent information

Some types of information handled by an AIS are not subject to frequent change and can best be provided in the form of a manual entitled "Aeronautical Information Publication", which includes such information as the physical characteristics of an aerodrome and the facilities associated with it, the types and location of navigation aids along air routes, the air traffic, communications and meteorological services provided and the basic procedures associated with these facilities and services.

2) Temporary information

Some types of information frequently deal with changes to facilities and services that are of a temporary nature or of short duration. In addition, notification of operationally significant changes of a temporary or permanent nature is sometimes required at short notice. For example, construction at an aerodrome may necessitate the closing of a runway, or a radio navigation aid

may be removed from service for 24 to 48 hours for modification or maintenance, or a visual aid may be permanently removed from service. Such information is issued in the form of a notice known as a "NOTAM" (Notices to Airmen) and is distributed via the aeronautical fixed services (AFS). Furthermore, temporary changes of long duration (more than three months) or changes of operational significance requiring the issuance of extensive text and/or graphics that affect the contents of an AIP are published and distributed as AIP Supplements.

3) Information of an explanatory, advisory or administrative nature

Information that does not qualify for the inclusion in the AIP or NOTAM is issued in a form known as Aeronautical Information Circulars (AIC). These cover such matters as long-term advance notifications of major changes in procedures or facilities, information of an explanatory, advisory nature, or information concerning administrative matters.

6. Organization of an AIS

1) Status within the aviation administration

(1) The utility of the facilities provided and the effectiveness of the procedures introduced for civil aviation depend to a large extent on the availability and timely promulgation of accurate, relevant information to other services and operators. Thus, qualified staffs in sufficient number, suitable accommodation and the necessary equipment are a prerequisite to safe and expeditious provision of aeronautical information. As with any other aeronautical service, such as air traffic control and telecommunication, adequate resources are essential to AIS.

(2) The aeronautical information handled is mainly of technical nature. It will therefore greatly assist in the provision of an efficient service if the staff employed in the service is technically qualified. Such a qualified staff is more likely, as a result of its knowledge and experience, to be able to achieve a higher degree of accuracy, completeness and clarity in the information provided.

2) Arrangements with related services

The basic purpose of an AIS is to provide information needed to ensure the safety, regularity and efficiency of air navigation, and regardless of the efficiency of its organization, its ability to perform this important function will be very dependent upon the adequacy, accuracy and timely provision of the navigational information. To secure this, an easy and effective liaison needs to be established with other related services.

In order to fulfill efficiently the dual role of collecting and promulgating information from and to all concerned, an AIS should establish and maintain a direct and continuous liaison with other related services, as follows:

(1) the AIS of all other States from which it is necessary to receive information to meet operational requirements within the State for pre-flight information;

(2) technical services within the State which are directly concerned with the provision and maintenance of the various air navigation facilities, services and procedures-this, in turn, is necessary to ensure timely promulgation of all significant information both within the State and to other States as required;

(3) the military services within the State, as necessary, to receive and promulgate information concerning navigation warnings (exercises, etc.) or any special military facilities or procedures available to or affecting civil aviation;

(4) the air traffic services of the State, to ensure immediate transmission of all required information to those services for air traffic control and in-flight information purposes;

(5) all aircraft operating agencies conducting operations in or through the State to ensure that pre-flight information requirements are adequately met; and

(6) any other services which may either be a source of information of interest to civil aviation or which have a legitimate reason for requiring information about civil aviation.

3) Organizational arrangements

(1) The main factors to be taken into account in the organizational arrangements are:

(a) Department arrangements

(b) Sources of information (domestic and foreign)

(c) Communication facilities

(d) Publications (copy preparation, reproduction and distribution)

(e) Supply of information to AIS units and operators

(f) Supply of information to cartographic unit

(g) International NOTAM Office (NOF)

(2) To maintain efficiency, the AIS headquarters should be in easy communication with the technical branches responsible for its administration and the supply of information for dissemination. Each of the services responsible for providing AIS with raw information should designate individuals who are responsible for maintaining direct and continuous liaison with AIS.

4) International NOTAM Office (NOF)

The International NOTAM Office is the focal point within a State for the issuance and receipt of NOTAM from and to other States and operates on a twenty-four-hour basis. The following minimum facilities and equipment should be provided for each international NOTAM office and aerodrome unit in addition to basic furnishings:

(1) adequate table/counter space for processing information;

(2) adequate filing /card index systems;

(3) full teletypewriter service (receive and transmit) linked to the AFS;

(4) typewriter and computer terminal;

(5) duplicator, for pre-flight bulletin production;

(6) telephone;

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(7) a reliable clock and a recording time-stamp clock, both showing UTC. Where appropriate, a second clock should be provided showing local time; and

(8) reference charts and documents modified as necessary for the international NOTAM office if direct access to AIS headquarters reference material is not available.

5) Personnel requirements

It is most desirable to have staff with technical background, preferably with aircrew experience in civil aviation, but a knowledge of air traffic control and radio aids may suffice if training is provided to enable the staff to get acquainted with the various aspects of civil aviation and the requirements of the operators. It is also important to note that personnel should be service-minded.

Staff should be adequately qualified and should be capable of working without supervision. Proficiency in the languages used in AIS is essential for assessing and interpreting AIS data, for processing AIS documents and for the fulfilling of AIS functions such as briefing.

The very nature of the service calls for initiative and enthusiasm at all levels, and in a very special way for good supervision and leadership. These are the qualities that cause a man to be continually seeking improvements in the work under his control and enable him to obtain the best results. The competent and conscientious performance of duty is directly related to the safety of life and property.

Chart 1 is location of AIS within the aviation administration.

Chart 2 are organization and information flow charts.

Questions for discussion:

1. What are the purposes of an AIS?
2. What are the responsibilities of each Contracting State, the AIS and the pilot-in-command?
3. What is an Integrated Aeronautical Information Package composed of?
4. Describe the functions of an AIS.
5. What are the three different kinds of information handled by an AIS?
6. State the function of the international NOTAM office and its basic facilities and equipment.
7. What are the requirements for personnel to be engaged in AIS work?

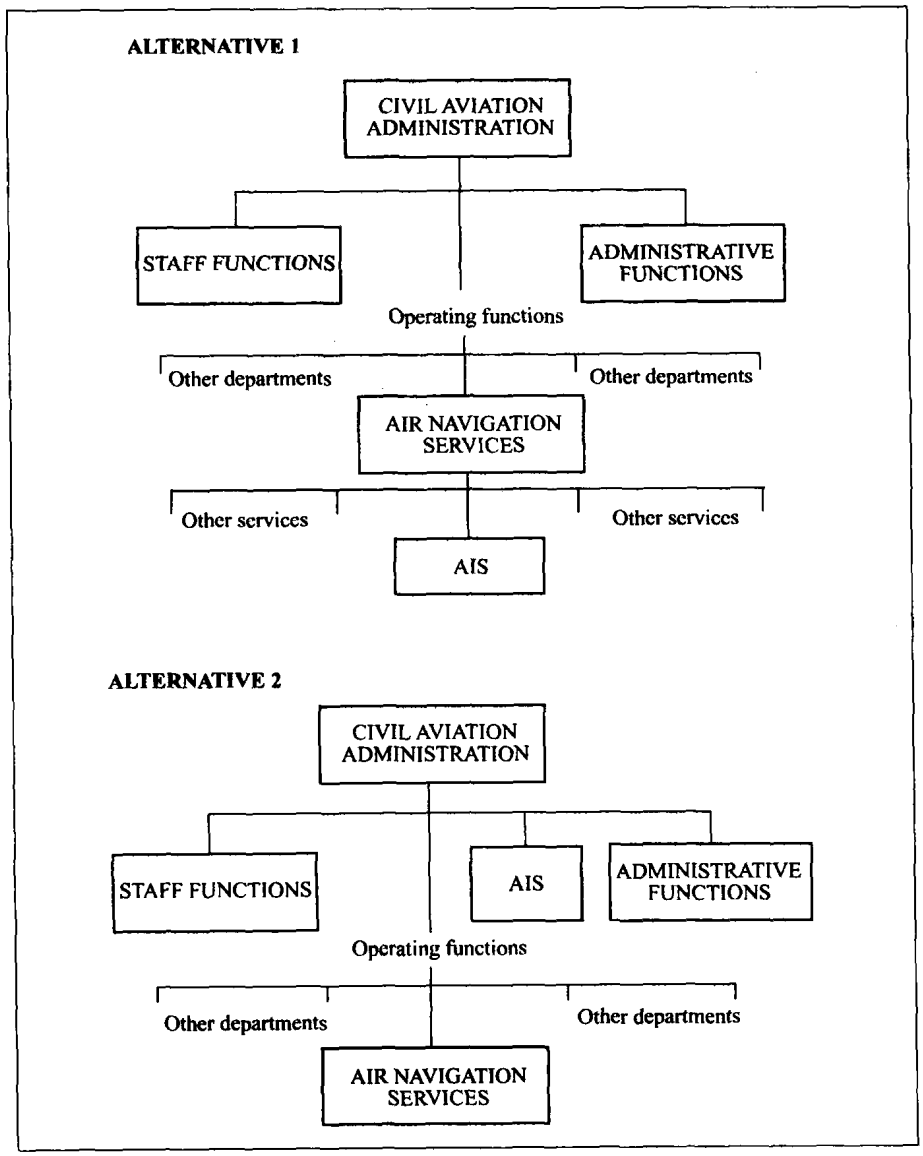

Chart 1 Location of AIS within the aviation administration

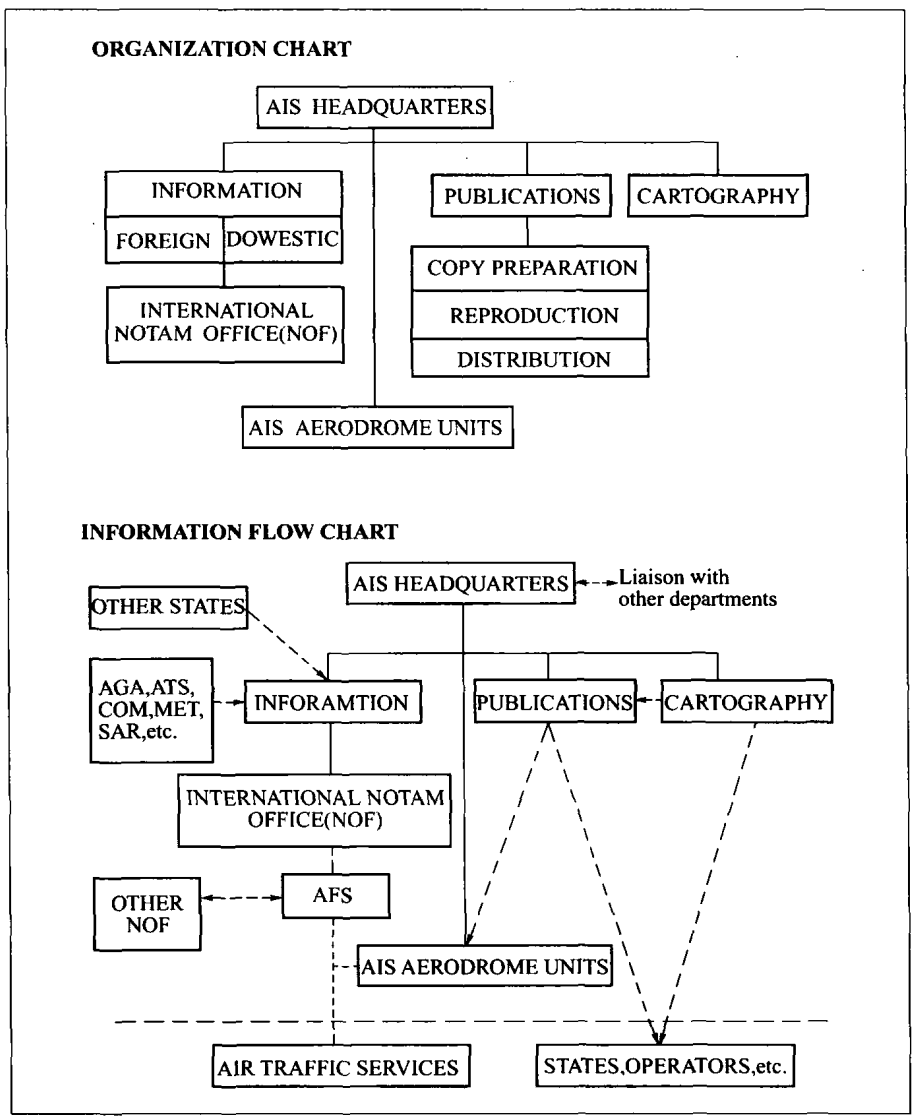

Chart 2 Organization and information flow charts

Chapter 2

Collection of Aeronautical Information

1. Domestic Information

(1) The State's aviation authority should assign to its technical branches at headquarters the responsibility of originating the raw data required to be promulgated by the AIS in the Aeronautical Information Publication (AIP), AIP Supplements, NOTAM, and Aeronautical Information Circulars (AIC). On receipt of the raw data, it is the responsibility of AIS to check, record and edit the data in order to promulgate the information in a standard format.

(2) Basic information usually covers the more permanent or static material for inclusion in the AIP and as such should preferably be authorized by the policy branches at headquarters level in order to ensure uniform format and compliance with present or future policy. All basic information should be supplied well in advance to AIS, to permit ample time for processing and promulgation, thus affording reasonable advance notice to operators.

(3) Ephemeral information deals with temporary changes made in basic information when special short-term procedures are produced or in the case of certain navigational warnings, etc. To ensure the fastest possible action in promulgation, the local authority responsible for the majority of ephemeral information covering, for example, work in progress at airports and radio installations, unserviceabilities, temporary withdrawal or re-instatement of operational facilities, should be given facilities to communicate directly with AIS.

2. Foreign Information

(1) Geographic coverage: The first problem to be solved by any national AIS is the limit of the geographic coverage to be maintained. This must be sufficient to cater for at least the first route stage requirements of not only the national carriers of a State but also for those of the foreign airlines which operate into or through its territory. This coverage must be capa-

ble of satisfying day-to-day requirements quickly and accurately while leaving sufficient margin to cater for new requirements without undue strain. Additionally, the possibility of charter flights to locations away from the routine coverage zone must be kept in mind. Generally the coverage zone of an aerodrome AIS unit should be limited to the flight information region (FIR) within which the aerodrome is located, the flight information regions adjacent thereto, and all air routes stages originating at the aerodrome and extending beyond the FIR mentioned.

(2) The depth of information required within the geographic area of coverage: The immediately adjacent areas will be those most used by short-range traffic, whether it is commercial or private flying. For these areas, it will be necessary to request the maximum amount of information relating to the country as a whole and in particular to every aerodrome which is available for use by international traffic. Quite frequently it may be necessary to request similar information in respect of aerodromes which, though not designated as airports of entry, may be used by charter or private aircraft which have previously cleared customs elsewhere.

Where information is required from States which have not yet produced an AIP, it is necessary to find a substitute. Quite a lot can be achieved by the intelligent use of NOTAM. If nothing is published by the civil aviation administration, useful information can often be obtained from military handbooks or manuals produced by private aeronautical service agencies or by airlines. However such information should be treated with reserve as it may often be abbreviated and intended only for certain types of operations, and furthermore, the information is likely to contain little or nothing relating to formalities and procedures associated with international traffic.

3. Channels of Communication

The channels of communication required for submission of raw data to AIS should include:

(1) messenger service: in all cases where such a service exists and the time factor permits;

(2) postal service: in all cases where a messenger service is not available;

(3) aeronautical fixed service: in all cases where the messenger service or postal service would not meet the time factor (this should be following by a completed aeronautical information promulgation advice form);

(4) telefax;

(5) telephonic: to be used only in an emergency and must be confirmed by a completed aeronautical information promulgation advice form;

(6) computer network; and

(7) electronic mail.

4. Screening and Distribution of Information

The aim of this practice is for the AIS headquarters of a State to be in possession of all information, regularly amended, required or likely to be required by national operators flying from that State and international operators flying through that State, with due allowance for occasional flights by charter operators.

A careful analysis of the traffic emanating from each aerodrome/heliport is essential. This must be supplemented by close liaison with the representatives of the operators using the aerodrome/heliport. By this means, any changes in the route plans of any operator will be known by the AIS unit and it will then be possible to organize the adjustment, supply or additional information called for by such changes. Where the State is large enough to require AIS units at two or more aerodrome/heliport within its territory, then the information held at each individual unit should be designed to meet the needs of the traffic normally emanating from each aerodrome/heliport.

Aeronautical information is generally presented and distributed in the form of a NOTAM, AIC or AIP with its subsequent supplements and amendments.

Normally, the AIS headquarters should be responsible for the distribution of relevant information to all AIS units to enable them to maintain and have available up-to-date information. It is imperative that all incoming NOTAM be checked for accuracy since it is possible for figures or groups to be transposed or accidentally corrupted during transmission. Therefore, when a NOTAM is received, a check should be made against the AIP of the Provider State to ensure that the NOTAM is consistent with published information. The outgoing repromulgation should also be checked after transmission to ensure that similar errors have not occurred during this process.

5. Basic Reference Material

Since national rules, regulations and procedures, and the characteristics of facilities and services are based on ICAO regulatory and guidance material, it is advisable to maintain certain ICAO documents for reference purposes, both at the AIS headquarters and at aerodrome/heliport information units. Annexes to the Convention concerned with the provision of facilities or services, together with any related procedures for air navigation services, are a minimum requirement, i. e. :

(1) Standards and Recommended Practices

Annex 1—*Personal Licensing*

Annex 2—*Rules of the Air*

Annex 3—*Meteorological Service for International Air Navigation*

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