Discussion Paper
on COMNAP's Antarctic Flight Information Manual (AFIM)

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Introduction

What is the purpose of this discussion paper?

This discussion paper presents the results of the review of the AFIM which began in 2007-2008 and one of COMNAP's 2008-2009 Strategic Projects.

The purpose of the review and of this discussion paper is to:

- review what the AFIM is, in particular in relation to international aeronautical information circulated under the auspices of the International Civil Aviation Organisation (ICAO);
- outline what information it contains;
- review the suitability of this information for use of the AFIM by pilots;
- discuss and clarify the structure of the AFIM – for input into the development of a suitable data model for the future electronic version;
- confirm our needs and requirements for the AFIM and its future development; and
- propose a way forward.

What are our ultimate objective and guiding principles?

Our ultimate objective is to produce an AFIM that effectively supports safety of air operations in Antarctica.

We want an AFIM that is:

- easy to maintain and manage;
- as usable as possible for pilots;
- safe - which means being reliably
  - complete (we need to include all facilities and their operators);
  - consistent (the same formats and standards must be used throughout);
  - accurate (the information must be correct and up-to-date).

Why do we need to review and improve the AFIM?

In addition to it being probably a good idea to review an AFIM that is now 15 years old, a number of current developments warrant an evolution and improvement of the AFIM. These include:

- **Development of a central, master database: the COMNAP InfoX**
  A range of information included in the AFIM is also included in other publications and processes for exchange of information. The best way of maintaining this information in an efficient and reliable manner is to do it through a single, master database. This database is under active development as the web-based COMNAP Information Exchange (InfoX) system, interconnected with and complementary to the Antarctic Treaty's Electronic Information Exchange System (EIES). Maintaining through the InfoX the information used in the AFIM will require a clearer, more consistent and more structured data model for the

AFIM information.

- **The AFIM is required to follow ICAO formats and standards and these have changed**
  ATCM Recommendation XV-20 specifies that information on runways, skiways and helipads, on communications and on meteorology included in the AFIM should be provided in the formats and standards specified in Appendix I to Annex 15 of the Convention on International Civil Aviation, as a guideline. These have changed since the AFIM was created.
- **The AFIM is not as clear and concise as it should be**
  The AFIM has grown somewhat "organically" and is not as clear and concise as it should be. It now contains too much information not necessarily needed by those it is intended for, namely, pilots. It also remains designed primarily for operations by single nations and is not necessarily well-adapted to joint operations at regional levels.
- **The AFIM is not subject to the quality controls expected of such a publication**
  Under ICAO, aeronautical information publications have to strictly adhere to minimum quality management procedures at all stages of the publication process. The AFIM does not adhere to these procedures.

What aspects of air safety are not covered by this review?

This review does not cover *per se* other aspects of air safety such as

- advance exchange of information on planned air operations, as required by a number of Antarctic Treaty provisions;
- exchange of information between National Programs during the season on flight operations they know of, including flights by non-government operators, as required by ATCM Recommendation XV-20;
- designation of primary and secondary air information stations (PAIS and SEAIS), as required by ATCM Recommendation XV-20;
- Traffic Information By Aircraft (TIBA) procedures, as required by ATCM Recommendation XV-20;
- Improvement of meteorological services available in Antarctica to meet aviation requirements, as required by ATCM Recommendation XV-20;
- Designation of points of contact which are to be the addressees of emergency location messages relating to air operations in Antarctica generated by the COSPAS-SARSAT system, as required by ATCM Recommendation XV-20;
- Studies aimed at making use of satellite communication and navigation systems developed within the framework of ICAO, as required by ATCM Recommendation XV-20;
- Coordination between operators and Rescue Coordination Centres (RCCs) of the 5 nations with responsibilities under ICAO in parts of the Antarctic region for coordination of search and rescue when an aircraft issues a distress call, as currently discussed and improved through work led by COMNAP and the SAR authorities of these 5 nations.

We need to keep these aspects in mind, however, while reviewing the AFIM, and consider how the AFIM can complement and support work done to address these important aspects of air safety.

Background – the AFIM

What is the AFIM?

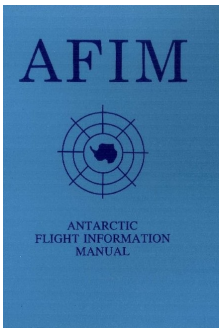
The Antarctic Flight Information Manual (AFIM) is a handbook of aeronautical information published by COMNAP as a tool towards safe air operations in Antarctica as recommended by ATCM XV (1989) in Recommendation XV-20 "Air safety in Antarctica" (provided in full at Appendix 1).

Recommendation XV-20 contained a number of specific recommendations including:
For the purpose of improving air safety in Antarctica, national Antarctic programmes operating aircraft in Antarctica and their aircrews should be provided with a continuously updated compendium ('Handbook') describing ground facilities, aircraft and aircraft operating procedures (including helicopters) and associated communications facilities operated by each national Antarctic programme (out of the use of which questions of liability will not arise) and, therefore, they should:

(a) prepare such a Handbook as a matter of urgency;
(b) facilitate the preparation of such a Handbook by their national Antarctic programme operators by collective action through the medium of the Council of Managers of National Antarctic Programmes (COMNAP) federated to SCAR;
(c) adopt a loose-leaf format in which information provided by each national operator is kept separate (unless facilities are jointly operated) so as to facilitate updating of information;
(d) request their national Antarctic operators to provide information for the purpose of compiling the Handbook in accordance with Annex 2 to this Recommendation.

Annex 2 to Recommendation XV-20 specifies that information on runways, skiways and helipads, on communications and on meteorology included in the AFIM should be provided in the formats and standards specified in Appendix I to Annex 15 of the Convention on International Civil Aviation, as a guideline.

What does the manual look like?



The AFIM manual comes in a blue, plastic, 7-ring binder to allow for independent pages and easy revisions. The manual is 232 mm high by 182 mm wide and 40 mm thick.

It is arranged in successive sections separated by tabbed dividers. The first section contains an introduction, general information about the AFIM and relevant Antarctic Treaty instruments, and a log of current pages. It is followed by one section for each operator with an airfield in the Antarctic.

How many copies of the manual are in use?

As at 01 July 2009, it is estimated that 200 copies of the manual are in use and maintained up-to-date by their owners. This corresponds to the number of revision sets distributed. The largest proportion, 167 or 83.5%, is owned and used by National Antarctic Programs and associated organisations, including Search and Rescue Authorities and ICAO. The remaining 33 manuals are owned by private organisations and individuals, including some contractors working for National Antarctic Programs.

However, we can note that:

- the majority of revision sets are distributed to National Antarctic Programs, and these are given rights to free revisions *ad-vitam eternam* – some may continue receiving revision sets for manuals that they no longer hold; and
- a number of private organisations or individuals purchase manuals without the revision service and may continue using them when out-of-date – though hopefully not for actual flying operations.

Between 15 and 30 new manuals are printed and sold every year. Most of those are either replacement manuals or manuals purchased as a one-off with no revision service.

How much does the manual cost?

The current annual cost for COMNAP of maintaining the manual is around €10 000.

Annual income from sales to private organisations and individuals has varied in the last few years between about € 2 000 and € 5 000.

The conditions of sale of the AFIM at June 2009, as shown on the COMNAP web site at www.comnap.aq/afim, are shown below. Prices are given in Australian Dollars (AUD). AUD 175.00 and 350.00 correspond to about € 100 and € 200 respectively.

Non-Members:

External (non COMNAP members) organisations or individuals can purchase AFIM copies and subscribe to the revision service as follows:

- *Purchase of a new AFIM manual, in binder (per copy, payable in advance):*
  - *if sent by standard mail: AUD 350.00*
  - *if you require shipment by trackable priority air service (eg Express Post International, UPS, Fedex, DHL..): AUD 450.00*
- *Revision Service (per manual, including postage of revision sets, payable in advance):*
  - *revisions for five calendar years: AUD 350.00*

Note that COMNAP is not making any profit from these sales, and we will in no circumstances sell manuals at a reduced price. 1-year revision services are no longer available.

COMNAP Members:

Each National Antarctic Program member of COMNAP can obtain AFIM and receive revisions as follows:

- *Three manuals free of charge.*
- *Any additional or replacement manual at the price of AUD 175.00 each (including delivery).*
- *All future revisions, for any number of manuals still held and maintained, free of charge.*

Who has copyright on the manual?

The manual includes a number of plates or charts that were put together by Jeppesen on the basis of information provided to them by individual National Antarctic Programs via COMNAP. These have a Jeppesen copyright, which only apply to that exact graphical representation of the plate or chart.

The rest of the manual has no clear indication or formalisation of a copyright, but under normal international law and principles, the copyright of the manual rests with COMNAP (for the manual as a compilation and for most general material contained in the introduction) and with individual contributors for the rest. Any new publishing arrangement will need to confirm and spell this out.

How is the manual managed and updated?

The manual is usually updated on an annual basis. National Antarctic Programs send changes to their information to the COMNAP Secretariat by 31 July each year. The Secretariat does a basic review of the information (mostly of an editorial nature) and asks clarifications if needed. The information is then sent to Jeppesen which takes 4 to 6 weeks to incorporate this information and publish revision sets.

A typical annual revision includes between 40 and 100 updated pages. About 250 copies of each revision set are produced, with 200 distributed to those keeping their manuals up-to-date and the rest kept back as spare copies for those that lose their revisions and decide to restore old manuals.

The quality control is limited to basic checking that the information seems to make sense.

The revision sets are sent out directly by Jeppesen to subscribers, using the up-to-date distribution list provided by the COMNAP Secretariat. A small stock of revision sets is also sent to the COMNAP Secretariat for back-orders.

Small batches of complete manuals are produced by Jeppesen and sent to the COMNAP Secretariat as and when needed to maintain a small stock of manuals at the COMNAP Secretariat.

Orders and sales of new manuals and subscriptions to the revision service are handled directly by the COMNAP Secretariat. New manuals and old revision sets (needed from time-to-time by subscribers who misplaced their sets or did not receive them) are shipped out of the COMNAP Secretariat.

Is the AFIM a certified manual prepared to ICAO standards?

No.

ICAO-standard international information on airfields and flight procedures is based on national Aeronautical Information Publications (AIPs).

Each State is responsible for publishing and maintaining an AIP containing information related to operation of aircraft within its territory. It is a certified publication that has legal standing, prepared by specialist national agencies to strict standards. Agreed formats are strictly adhered to, and quality management procedures are in place at all stages (receiving and/or originating, collating or assembling, editing, formatting, publishing, storing and distributing) of the aeronautical information/data process.

Some electronic versions of AIPs are in use around the world, but are usually not certified and are meant to be used for preview of the information only – everything must be checked against the paper version.

AIPs have a standard 3-part structure:

1) 'GEN' (General): contact details, structure of the AIP, general national information, etc...
2) 'ENR' (Enroute): flight rules, airspace, corridors, danger areas, overflight restrictions, etc...
3) 'AD' (Aerodomes): info on airfields – access, runways, infrastructure, etc...

More information on AIPs can be found in Appendix 4: Note of information from ICAO on Annex 15 to the Convention on International Civil Aviation “Aeronautical Information Services”. ICAO maintains a number of complementary technical documents on how the information can/should be provided - eg Doc 8126 “Aeronautical Information Services Manual” (on the structure of AIPs) or

Doc 8697 “Aeronautical Chart Manual”.

There is now an agreed Aeronautical Information Exchange Model (AIXM) that is designed to enable the management and distribution of Aeronautical Information Services (AIS) data in digital format. Details on AIXM can be found at www.aixm.aero.

Work is underway on a global standard for electronic Aeronautical Information Services (eAIS) that will be compatible with AIXM. This could be finalised by the end of 2010.

AIPs are detailed, voluminous publications, and are not usually used directly by pilots in their aircraft. Specialised publishers prepare for airlines or other organisations smaller “Flight Manuals” limited to information directly relevant to their flight operations, and based on information contained in one or more AIPs.

The AFIM sits outside of this system. In terms of format and scope of the information, it sits somewhere in-between an AIP and a flight manual. Some National Antarctic Programs may involve their national authority in preparing and/or checking their information before inclusion in the AFIM. But the AFIM overall does not follow the rigorous standards and procedures, in particular in relation to quality control, that apply to national AIPs and to flight manuals.

Given that the AFIM resembles an official national AIP, a manual based on such an AIP or something in between the two, there is a risk that some pilots assume that the AFIM is prepared to the same standards, and trust it to much. The increase in aircraft activity makes it more difficult to ensure that every pilot is well aware that the AFIM is not prepared to the same standards. It must be noted also that the AFIM is made available to anyone outside the National Antarctic Programs that do request it, and that we have even less control on how to convey this to pilots operating outside National Antarctic Programs.

What is the format specified for the AFIM?

Annex 2 to ATCM Recommendation XV-20 includes one page that briefly outlines the content of this “Antarctic Aeronautical Information Handbook”, noting that information should be provided using Appendix I to Annex 15 to the Convention on International Civil Aviation “*as a guideline”*.

SCALOP Notice 18 of 16 October 1990, established a format for information for the AFIM. This can be assumed to be in agreement with Appendix I to Annex 15 to the Convention on International Civil Aviation, although it may be worth checking to what extent it follows this Appendix I, and if Appendix I has evolved since.

As far as we know, the format specification included in Notice 18 of 16 October 1990 has not been superseded and remains in force. It is provided here at Appendix 2 and can also found in the AFIM itself, at Appendix 4.

Is this format clear, and is it followed?

The wording used to describe each field of information is reasonably clear, although it could be adjusted:

- for a more consistent and rigorous use of terminology
  - for example, define what is considered an 'airfield' then use the word throughout in the same context; and
- to reflect technical evolutions
  - for example, change the description of the section for direct contact phone numbers from '*INMARSAT telephone numbers*' to '*Direct telephone numbers (such as INMARSAT or Iridium)*'.

Possible adjustments are shown inline in the *AFIM Information Template* provided here at Appendix 3.

Somewhat less clear is the structure of the information, which actually changed between the formats specified in Recommendation XV-20 and in Notice 18.

Recommendation XV-20 proposed the following structure:

- For each “Country”, provide:
  - General Information about “the National Antarctic Operator”
  - For each “Station”, provide information on its “Ground Facilities”:
    - Runways, skiways and helipads
    - Communications
    - Meteorology
    - Aircraft operating procedures
    - Alerting and search and rescue procedures

Notice 18 established the following structure:

- For each “Country”, provide:
  - 1. General Information about “*the National Antarctic Operator*”
  - 2. '*for each station served by a runway, helipad, skiway (hereafter referred to a an air “facility”) or a surface suitable to be used as a helipad or skiway*', provide information on its “Ground Facilities” - Runways, skiways and helipads
    It also specifies to '*list each Antarctic station in alphabetic order; include all stations and field camps that operate for more than one summer season*'
  - 3. for *'each station'*, provide information on its Radio Communications and Navigation Facilities
  - 4. '*for each Air Operating Facility listed [in section 2]*', provide information on meteorological services provided.
  - 5. [for each “Station” or for each “Country”?] provide information on Provisions for air traffic services and procedures
  - 6. [for each “Station” or for each “Country”?] provide information on Alerting and search and rescue Procedures

This structure is adapted to, and was probably based on, the following general principles/assumptions:

- one country - one National Antarctic Operator
- one 'station' - one National Antarctic Operator
- each 'station' is serviced by one single 'air facility'
- no 'air facility' exists separately from a 'station'.

It can be noted that there is no definition in Notice 18 of what constitutes a 'station'. A distinction is made in one place between 'station' and 'field camp', but neither is defined and in another place is stipulated that '[all] stations' should include both 'stations' and 'field camps'.

The structure of section 2 seems to assume that if a 'station' is served by several runways, skiways or helipads, these are considered to constitute one single air facility, although it calls for detailed information such as the exact position of the facility relative to the station.

There is a lack of clarity in what is meant to constitute an 'air facility'. In some places it seems to refer to the station itself, while in some other places is seems to refer to the runway(s), skiway(s), helipad(s) or group thereof serving the same station.

Only the presence of formal runways, skiways or helipads seems to justify the existence of an 'air facility' while it is specified that information should also be included when a 'station' is served by a '*surface suitable to be used as a helipad or skiway*'. - which essentially would include about every 'station', 'field camp', 'refuge', 'depot', etc., operated in Antarctica.

The actual content of the AFIM shows that most operators have provided information as follows:

- sections 1, 5 and 6: for each 'operator';
- sections 2, 3 and 4: for each:
  - station or camp served by at least one runway, skiway or helipad;
  - runway/skiway maintained as diversion landing site; and
  - runway/skiway used as a staging/refuelling point.

In summary, information is generally provided as follows:

Number	Section Title	Provided for each
1	General	Operator
2	Ground facilities	Station; diversion landing site; staging/refuelling airfield
3	Radio communications and navigational facilities	Station; diversion landing site; staging/refuelling airfield
4	Meteorology	Station; diversion landing site; staging/refuelling airfield
5	Provisions for air traffic services and procedures	Operator
6	Alerting and search and rescue procedures	Operator

Let's define an 'airfield' as one or more runways, skiways or helipads situated next to each other (say within a few hundred meters) and all served by the same access road, vehicles, shelters and safety equipment. Using that definition, it appears that:

- a number of stations are served by several airfields;
- information of section 2 'Ground facilities' should be provided at least for each airfield, if not for each runway, skiway of helipad constituting the airfield;
- information of section 3 'Radio communications and navigational facilities' should usually be provided for each airfield, sometimes only for each station;
- information of section 4 'Meteorology' usually needs to be provided for each station only, sometimes even for a group of stations.

But in the current AFIM, only one station shows such a structure with four airfields serving the station having each their own 'Ground facilities' information but all sharing the 'Radio communications and navigational facilities' and 'Meteorology' information of the station. Three of these four airfields correspond each to one single runway or skiway, with the fourth airfield corresponding to a group of three helipads close to each other.

From the numbering system used in Notice 18, it appears the intention was to present for each operator a continuous set of information structured as follows:

1 General
2 Ground facilities
  2.1 station or air facility 1
  2.2 station or air facility 2
  etc...
3 Radio communications and navigational facilities
  3.1 station or air facility 1
  3.2 station or air facility 2
4 Meteorology
  4.1 station or air facility 1
  4.2 station or air facility 2
5 Provisions for air traffic services and procedures
6 Alerting and search and rescue procedures

However, not one single operator with more than one facility has adopted such structure. Most have shown first their operator 'general' information followed by one section for each station, sticking with 2.1, 3.1 and 4.1. numbering, eg:

- operator – section 1 'General'
- station A
  - 2.1 Ground facilities
  - 3.1 Radio communications and navigational facilities
  - 4.1 Meteorology
- station B

    - 2.1 Ground facilities
    - 3.1 Radio communications and navigational facilities
    - 4.1 Meteorology
- station C
    - 2.1 Ground facilities
    - 3.1 Radio communications and navigational facilities
    - 4.1 Meteorology

Depending on their needs, some have included sections 5 'Provisions for air traffic services and procedures' and 6 'Alerting and search and rescue procedures' within station information or have appended it to their operator information.

How could we make the current AFIM format clearer and more structured?

We need a clearer and more structured data model of the current AFIM information if we want to develop a suitable data model for an electronic version that can complement and support the traditional paper version, without duplicating other sets of information such as the Antarctic Telecommunications Officers Manual (ATOM).

The AFIM Information Template presented at Appendix 3 constituted a first attempt at designing such a clearer and more structured model, without departing from the actual nature of the information presented in the AFIM since 1990. It was designed in view of the observations noted in this document and intended as a basis for discussions and development of a suitable data model.

There is now an internationally agreed Aeronautical Information Exchange Model (AIXM) that is designed to enable the management and distribution of Aeronautical Information Services (AIS) data in digital formats (details on AIXM can be found at www.aixm.aero) and work is under way on a global standard for electronic Aeronautical Information Services (eAIS) that will be compatible with AIXM. This means that a number of tools will be available to generate both electronic and paper aeronautical information publications from data in the AIXM format.

The final data model chosen for the information maintained by COMNAP for use in the AFIM will **absolutely** need to be, at the same time:

- compliant with AIXM; and
- compatible with the data model of the COMNAP electronic Information Exchange (InfoX), through which the information will be maintained.

Discussion

This incorporates the result of discussions held in 2008-2009, in particular through two special meetings on the subject held as follows:

- 09-11 February 2009 in Monaco (Giuseppe de Rossi and Antoine Guichard); and

- 24-25 April 2009 in Cambridge (Giuseppe de Rossi, John Hall, Kazuyuki Shiraishi and Antoine Guichard).

Nature and structure of the information

Question (A): How does the AFIM format, and the way in which National Programs have provided their information in that format, relate to Rec XV-20, to Appendix I to Annex 15 to the Convention on International Civil Aviation, and to any other relevant International Civil Aviation Organisation (ICAO) requirements?

Rec XV-20 specifies that the AFIM should include information on aircraft. This information is not included in the AFIM at present. While this information is useful, it should probably be included in the online COMNAP Information Exchange rather than in the AFIM itself. This could include basic information on each aircraft type used including information on refuelling systems, floor height, stair access, door dimensions, heating needs, turning radius, wing tip height, clearance of propeller to ground, etc. We probably cannot rely on standard information from manufacturers or "Jane's"-type publications as many Antarctic aircraft will have custom configurations, for example, wide doors on some twin otters to load skidoos. ICAO Annex 15 does not cover information on aircraft, so we have flexibility in how to present this information. We can assess what level of detail we need when we finalise the InfoX.

ICAO formats and standards, which the AFIM has to comply with, have changed since ATCM Recommendation XV-20 was published in 1989 and since the AFIM was designed.

There is a need to check the AFIM against current ICAO formats and standards. This should be done by checking the AFIM against the AIXM model. ,

We will later need to alert the Antarctic Treaty Consultative Meeting and, if needed, initiate an update of Rec XV-20.

AFIM does not conform to the required level of quality, accuracy, resolution and integrity of data, as specified in ICAO Annex 15 (2nd page). This will need to be addressed.

Question (B): We must follow a standard format as "minimum". But, what latitude and options, if any, do we have to incorporate variations?

ICAO Standards are minimum standards only. We have an opportunity to progress faster and use new technologies to present information differently. We could even test advanced procedures with ICAO. This could, for example, include the integration of GoogleEarth and GoogleMap or some open source software in a user interface to the electronic version of the AFIM.

Question (C): Is the AFIM information structured in a way that is well-adapted to the reality of Antarctic air operations? - eg to what physically constitutes an airfield, to how an airfield relates to other facilities and services, to the growing number of international/multi-operator Antarctic operations.

The information template dated 13 May 2008 and provided at Appendix 3 seems a good basis for a well structured, flexible data model. We will need to:

- check the new terminology proposed for facilities (see Appendix 0) against ICAO terminology and adjust, as appropriate, to ensure compliance with ICAO, in particular with AIXM;
- develop additional, relevant terminology as needed; and
- incorporate the terminology in the AFIM template.

To reduce the volume of AFIM, we may want to simplify the information requested for helipads and basic skiways. Only "runways" and major skiways really need a lot of information.

Annex 15 deals only with facilities but includes reference to the class of aircraft that an aerodrome can accommodate. These classes (A, B, C...) depend on approach speed, tonnage, etc. For the Antarctic, it is believed to be simpler, better and safer to restrict information on airfields to their characteristics, and leave it to the aircraft operators to assess if this is suitable for their operation.

Information on helipads from ships is not included in the AFIM. There is in Section 1.4 a question about "which" ships of this operator are "carrying helicopters or [ ] have designated on-board facilities for operating helicopters". Some information on these ships would be useful, eg does it have a hangar, how wide, can a helicopter be protected in the hold, etc... but is probably not needed in the AFIM itself. It can be included in the online COMNAP InfoX.

We will develop a simple template format and standard, short and synthetic, and post these on the COMNAP InfoX

Some stations such as Mario Zucchelli or McMurdo have two distinct telecommunications facilities, one for general operations and one for aircraft operations. The information for a telecommunications facility will need to include a 'type' field to specify what it is for and who can/should contact it. We will need to develop a list of appropriate types with clear terminology and definition.

We will need to make it clear what needs to be included in the AFIM, for example prepared or unprepared helipads at any station.

We will also need to clarify that, if the spirit of Rec XV-20 is to support air safety in Antarctica, we need to include information for all facilities and all operators operating a facility.

We will need to establish a clear process for collecting and checking information on facilities that are jointly operated. We shall create only a single information object per facility and let its operators decide who maintains it.

We also need to confirm how we want to manage the information from those National Antarctic Programs that are composed of several distinct operators. To remain consistent with the constitution and spirit of COMNAP, we shall not distinguish between these operators and consider that each facility is operated by the "National Antarctic Program". However, we should provide for each National Antarctic Program to specify several operational contacts and specify for each facility which is the appropriate operational contact.

We will need to develop examples of information provided as per the new template, to help operators assess what kind of information and level of details are required.

The templates need to be compact, with short titles. The additional information and descriptions should only appear in the electronic version as pop-up help, and in the binder in an appendix that explains the format.

We need to identify and indicate where optional attachments are useful (eg procedures plates such as the Non-Directional Beacon (NDB) procedure of page Rothera-17). These are standard plates that operators can provide for inclusion in the AFIM but that are not required.

We will develop detailed templates in 2009-2010.

Question (D): What information included in the AFIM is already present in other "manuals" (eg the ATOM) or exchanges of information? How can we manage it without duplicating entry and update of the information?

We need to restrict the AFIM itself (the binder) to what is needed for air operations, and in particular for pilots, and DO NOT try to merge AFIM and other bodies of information such as ATOM. These serve different purposes. The ATOM, for example, contains many contact details that are not relevant to air operations. Some station information could be useful for planning air operations (eg station capacity) but this can be accessed online during the planning process on the COMNAP InfoX.

It is essential that the information in the AFIM and other information such as that of the ATOM all comes from a single master database. This will help to avoid duplication in terms of data entry and information updating. We need to integrate the information needed in the AFIM in the general COMNAP InfoX electronic exchange of information systems.

In the InfoX, the information needed for the AFIM will need to be clearly identified as such. We will need to figure out how this can be best done. In some cases it would need to be implicit (eg include relevant details of any 'station' facility that has been linked to any 'airfield' facility) and in other cases explicit (eg tick a box if you want this communication or meteorological facility to be included in the AFIM).

The InfoX content to be included in the AFIM will need to be consistent with the AIXM schema,

and it will have to be possible to automatically export this information into an AIXM-compliant XML file.

We will need to incorporate in the InfoX the capability to provide for each operator a number of operational 'contacts', including for air operations. We need to define categories of contacts (eg general operations, ship operations, air operations, SAR) and how we need them to work. The paper copy of the AFIM would show the contact as at the time of printing plus provide a link to where latest information can be found online.

Question (E): Is there any information not currently available in the AFIM that pilots would find useful?

We need to circulate this discussion paper to pilots and request feedback.

Information not currently included and that may be useful includes:

- undulation
- roughness
- steps
- side slopes
- refueling capabilities
- power supplies

In case of emergency or medevac, it may be necessary to fly in a type of aircraft not normally used at a particular airfield and which may be more sensitive to these aspects.

If requesting such additional information, we will need to provide examples and guidance, including on format and units.

Question (F): Is there information currently available in the AFIM that pilots do not need, or would need in a different, more compact/synthetic and readable format?

See other sections. We need to confirm this with pilots and major air operators.

Question (G): Could we, and should we, include in the AFIM some essential environmental information such as concentrations of wildlife in the proximity of airfields or helicopter transit routes? If so, how could this be inserted in the AFIM usefully and efficiently ?

Yes. We should include in the template the mention of a need to provide for each airfield a map showing the facility and, as applicable, coastline, main concentrations of birds, seals and vegetation, approach routes, zones to avoid, etc. Such information is only needed for airfields and their immediate surroundings. This is not needed for transit routes. While in transit, aircraft need to fly at an altitude that guarantees that they comply with the Guidelines for the Operation of Aircraft Near Concentrations of Birds in Antarctica adopted through ATCM Resolution 2 (2004).

The wildlife awareness manual produced by the UK Foreign Office for the Antarctic Peninsula region can provide examples and ideas.

Question (H): Could we, and should we, include links to relevant information (eg on accommodation on station, contact details of field parties, schedules of ships and land-based expeditions)? Should we liaise with pilots but also staff on Antarctic stations and ships or Aeronautical Rescue Coordination Centres (ARCCs) about this?

Very basic station information such as accommodation capacity or medical capability could possibly be included in the AFIM itself as long as it is of a reasonably permanent nature and we can keep it compact. We need to figure out what exactly would be useful.

Most of this additional information often changes from season to season and can also change during the season. Also, it is probably more useful to those planning the flight in advance or to those managing a crisis if needed. This is better managed through the online COMNAP InfoX, and made easily available to operators and RCCs.

We should, however, include in the AFIM, a list of links to relevant dynamic information (eg season schedules, ship positions) as can be found on the COMNAP InfoX or the Antarctic Treaty Secretariat's web site.

Presentation of the information

Question (I): What latitude do we have in the formatting of the information, in particular in terms of vocabulary, units and number formatting? Are there standard units that should be used, eg for slopes, distances, latitude/longitude, elevation, timezone?

We need to check the agreed AIXM format and vocabulary and adhere to it. When/if AIXM offers several options, we should agree on one to use for display in the AFIM. It is essential to, at the minimum, use the same notations, units and standards throughout, eg for timezone, latitude, longitude, distances and altitudes. Once we have agreed on which to use, the quality control can ensure it is adhered to.

A clear description of the format and vocabulary, preferably including some practical examples, should be included in the AFIM itself and made available in electronic form to all those that need to provide information for inclusion in the AFIM.

We should also take advantage of the implementation of InfoX to make it as easy and error-proof as possible for National Antarctic Programs to enter their data. One should, for example, be able to enter latitude or elevation in any commonly used unit, and the system could then display it on the

COMNAP InfoX and export it for use in the AFIM in several units. We should also incorporate a minimum amount of validation, enough to be useful but no too strict as to make it unflexible.

Question (J): Could there be a more modern, simple, synthetic and easy to read format suitable for the AFIM that would still comply with ATCM recommendation XV-20 and with ICAO Annex 15?

Yes, there are a number of ways information can be shown on diagram plates. We will try to move as much text information as we can (eg threshold, lengths...) in a diagram plate/page provided as graphic. We will, however, still need to maintain some of this information in InfoX in separate fields so that we can validate it and use it in searches or in tabular lists. Plates can be produced once a year as part of the annual AFIM revision, and an image of it uploaded.

We can note that we need to comply strictly with ICAO Annex 15, but only with the “spirit” of Rec XV-20, as we will need to propose a new, different instrument to replace Rec XV-20.

We need to better understand the current ICAO Annex 15, then we can design and propose some standard plate formats for the AFIM.

We need to investigate if there are some standard plate formats for GPS approach.

Question (K): Has ICAO been involved in parts of the process of developing the AFIM? Do we have any 'exception' with ICAO about how AFIM should be?

This is not entirely clear and we are investigating this. A number of discussions held in the late 1980s, in particular, at the 1989 Antarctic Treaty Meeting of Experts on Air Safety contributed to the decision to task COMNAP to publish the AFIM. These discussions involved ICAO as well as government delegations of Antarctic Treaty Consultative Parties, including the 5 nations that have responsibility over Flight Information Regions covering the Antarctic (Argentina, Australia, Chile, New Zealand and South Africa). Our current understanding is that applying the usual ICAO and national processes to the Antarctic was deemed to present a number of “political” and “diplomatic” problems, and that the easy way out was to task COMNAP to publish the AFIM.

It should be noted that Antarctic airfields are, in general, classified as private airfields, but that some may be included in national AIPS. For example, a number of Antarctic airfields are included in the Chilean AIP (available online at www.aipchile.cl)

Quality standards and control

Question (L): How could we make it clear what parts of the AFIM are, or are not, certified or checked by relevant national authorities?

We need to ask each operator, via appropriate fields in the templates:

- which airfields and/or towers ('aerodromes'?) are certified, and by who;
- what information provided in the AFIM has been prepared with and/or certified by a relevant national authority.

In particular, we need to specify which plates are certified. We need to capture, whenever information is updated, who provided, controlled and authorised the new information. We should then indicate this in the AFIM on every plate and set of text information.

If we were using a contractor to produce the annual binder copy, then the contractor could check this and request clarifications as needed, and add comments about the validity and quality of the information.

Question (M): What different levels of certification and quality checking are commonly accepted? Are there different corresponding "warnings" or "disclaimers"?

We need to discuss this further with ICAO or other appropriate specialists. We have to do our best and make the AFIM as good as we can, but realise we will always have limitations.

Once we have decided on a process and put it in place, we will need to make it clear what the AFIM is and what its limits are.

The disclaimer at the front of the AFIM needs to include that COMNAP is not liable for any use made of the information contained in the manual. This is already the case and should be kept as is.

We need a concerted effort to market the AFIM and explain its importance to all National Antarctic Programs that have air operations.

Question (N): Do national civil aviation authorities have the capability or the authority to quality assure or sign-off information provided in the AFIM for airfields that they do not certify themselves?

This is yet to be clarified.

Question (O): Are some Antarctic airfields and some En-route information actually included in relevant national AIPs? If so, could these be simply included in the AFIM "as is"?

We could try to find out, but we would probably not want to add them "as is" as it would not be compatible with maintaining our structured online AFIM version. If it existed, it could however be used for quality control. A number of Antarctic airfields are included in the Chilean AIP, but if the version available online (www.aipchile.cl) represents the full version available, then there is actually much more information about these airfields in the AFIM than in the AIP.

Question (P): Could we organise for each National Program to have their airfield included in their National AIPs, or at least have their information prepared in collaboration with, and checked by, their national civil aviation authority? (note that ICAO's note provided in Appendix 4 states that "each State is responsible for making available to civil aviation interests any and all information which is pertinent to and required for the operation of aircraft engaged in international civil aviation within its territory, as well as in areas outside its territory in which the State has air traffic control or other responsibilities" - some national agencies may consider that 'other responsibilities' could cover national Antarctic operations?)

We should encourage National Antarctic Programs to liaise, as practical and appropriate, with their (or another) relevant national civil aviation authority when preparing their information for the AFIM, even if only for a routine informal review and check.

We need to prepare some text to encourage this that includes the quote from Appendix 4.

Question (Q): Alternatively, could we find an appropriately qualified/certified contractor that individual National Programs could contract to prepare and check their information to an agreed standard?

This would be useful and we will reconsider this once we have developed an updated format and process for the AFIM.

Question (R): Could we publish the AFIM in collaboration with (or at least in close liaison with and guidance from) ICAO?

In view of what we understand happened in the international discussions on air safety in the Antarctic held in the late 1980s, and of some of the difficulties encountered in improving SAR coordination in the Antarctic, involving ICAO officially could be complicated.

We will maintain an informal link between the COMNAP and ICAO Secretariats and use it as and when needed. We will need to convey to the ICAO Secretariat the need for these discussions to remain at the level of the Secretariats. Moving discussions to the level of national ICAO delegates could complicate matters significantly for some National Programs.

Access to the AFIM

Question (S): Do we want to continue making the AFIM available to anyone willing to purchase a copy?

If we continue to publish paper copies in binders for the National Programs, then there is no reason not to make it available to others who want to purchase a copy. Not making it available might give the impression we are hiding information. Selling it can contribute to recovering some of the cost of producing it, though we need to keep the price high for that. Keeping the price high also ensures that not too many people will request one, which could be inconvenient and time-consuming.

This also allows us to know who has the information and how to contact them.

It would be useful to find a simpler process to sell AFIM copies, and at least something that does not require the COMNAP Secretariat to stop more strategic work whenever someone requests a copy. We could consider contracting this out.

If we sell paper copies, then it would make sense to make the online version available to National Programs only. We would only make available to the public a limited set of information, for example, the information that needs to be provided under the Treaty, hence is already public. The relevant information available online will need to be clearly separated into 'public' information and 'members only' information.

We should review the criteria and process for deciding who can have access to member pricing (which includes free revisions).

Paper and electronic versions

To be useful inside an aircraft, electronic information must be more synthetised, as it is more difficult to scroll pages on screen than turning pages in a binder.

Question (T1): Should we encourage the creation of certified synthetised “plates” of information for use electronically on aircraft Flight Management Systems (FMSs)?

We should reconsider this in view of AIXM and of the agreed standard for eAIPs once published. This should be added as a task for 2009-2010.

Question (T2): Is there a standard format for synthetic plates for both runways and helipads that comply with Annex 15?

Yes. We need to discuss this further with ICAO or other appropriate specialists to develop a recommended format for the AFIM.

There are two main kinds of plates: Approach plates and Location plates. Approach plates are coded and follow give formats and standards. Location plates are not coded and can, for example, include

information on wildlife concentrations.

Question (T3): Can such a plate be enough to comply with Annex 15 without the need for additional pages of text information?

Yes. We need to discuss this further with ICAO or other appropriate specialists to develop a recommended format for the AFIM.

Question (U): Once we had enough airfields with such synthetic "plates", could we try to restrict the paper version of the AFIM mostly to these plates? It could help solveing some of the problems associated with a continuous increase in the volume of the AFIM. It could also make it easier to read (in particular for non-native speakers) and easier to update (hence safer).

We will compact the text information, plus encourage Programs to produce plates that contain most of the information.

We need to produce some example of such plates to show National Antarctic Programs.

When these plates include information that is also provided in individual fields in the electronic version, we will need a process to check that they match.

Question (V): If the information could be updated continuously online, does that mean we should have a continuously evolving paper version for pilots, which they can generate online and print at any time?

This could be confusing and also make it difficult to know what has and has not been quality checked.

We should continue the usual practice of an annual revision of the binder version, to be delivered to all subscribers by 01 October. This would be based on the information provided online up to, say either 31 July or the time of the COMNAP annual meeting, whichever is earlier.

One "COMNAP AFIM Officer" would be clearly designated as responsible for the publication of the AFIM, for example COMNAP's designated Principal Contact for air operations (currently Giuseppe de Rossi) assisted by the Executive Secretary.

We would ask each National Program with air facilities or operations to nominate a "National AFIM Officer" in charge of AFIM information for that program.

We could then have someone (a contractor?) checking that information over a couple of weeks, liaising with National Programs as needed when clarification is needed. This would increase the chance of having consistent and accurate information. This information would then be checked against the previous year's binder version so as to develop and issue a revision. The contractor could

do both the quality check and the publishing of the revision (design, print and ship). It could add comments about the validity and quality of the information, and work with Programs to move progressively towards a more uniform and consistent AFIM in terms of level of details, quality, accuracy, etc... This would make it better but also easier to read and less prone to errors of interpretation.

The same contractor could also be available for contracting by individual Programs to produce procedures, plates, etc. on demand.

Information could be printed at any time from the web site for general purpose viewing. It would be in a different format and appearance, to avoid confusion. We could include a clear indication of the fields that have been updated since the last quality check.

Weather, aircraft tracking and SAR

Question (W): The AFIM does not include common, coordinated procedures for requesting weather forecast. What is the status of weather forecasting?

We need a better interaction and coordination between operational weather forecast centres and operators. This needs to be discussed between forecasters and operators. We will need some clear procedures for requesting forecasts, including providing advance notice that forecasts may be needed during the next season, and when and where. Procedures will need to also include communication between weather forecast centres, and principles of assistance (eg a nation that will need many forecasts in the coming season from a centre operated by another Program may contribute a forecaster to the centre for the season).

While we need to incorporate some basic description of these procedures into the COMNAP InfoX, this is probably not needed in the paper AFIM. The maximum to include in the AFIM would be, for an airfield or station: (1) if forecast services are available either (a) 24x7 for the period X to Yand/or (b) by prior arrangement, and (2) where more information on services available can be obtained (contact details or a web address – inside or outside the COMNAP InfoX).

In the AFIM, we probably only need for each airfield or station indication of where to find information,

collect the information on how this is done now, and promote the development of uniform procedures.

Question (X): The AFIM includes very little 'en-route' information. Should we consider adding more, for example on aircraft tracking and SAR procedures?

In Antarctica, we have independent air control and tracking systems and procedures over the same territory, which is unusual and problematic, even though ICAO's Flight Information Regions (FIRs) do extend to the Pole. Tracking systems do not interface. Some commonly used contractors (eg Ken

Borek) may have their own tracking system which extends over several National Programs, and a National Program may use two contractors with separate systems.

This has SAR implications. We should discuss this at the next COMNAP SAR workshop in Buenos Aires.

Some tracking systems in use in Antarctica are not and cannot be certified as they use internet for part of their transmission chain and quick/instant delivery cannot be guaranteed.

We need to include in the AFIM the contact details of relevant RCCs.

More en-route (ENR) information would be useful, in particular in view of increased joint activities and flying across National Program "boundaries". ENR information should be organised in a separate section organised by region. This could include a number of maps showing all airfields and stations for which further information is available in the AFIM, with pointers on where and how to find it.

Conclusions

What are our needs and requirements?

- Continue to publish a "paper AFIM" in the form of an loose leaf binder, with revisions published usually once a year for delivery by 01 October, and more often if absolutely needed;
- Publish a paper AFIM that is simpler and more focused, and appropriately quality controlled;
- Make the extra information, required mostly for advance planning purposes, available online through the COMNAP InfoX;
- Probably include full information for runways and major skiways only, and reduce information for basic skiways and for helipads to limited, concise information – eg just one plate;
- Revise the structure of the AFIM so as to include:
    - an ENR (en route) section organised by region – with details for each main intercontinental link (out of each gateway) and for each intracontinental flying region (eg Antarctic Peninsula, Weddell Sea, Droning Maud Land, Mawson to Casey, Dumont d'Urville – Concordia – Mario Zucchelli, Ross Sea);
    - a GEN (general) section organised by operator and including for each operator: emergency contact details, PAIS, SAIS then headquarter contacts;
    - an AD (aerodromes) section organised alphabetically, either in one single section or in three successive section for (1) runways and major skiways, (2) other skiways and (3)

prepared helipads and any stations/camps not mentioned elsewhere.

- Add basic details of the very few commercial routes that cross or can cross the Antarctic circle (eg Qantas SYD-EZE and SYD-JNB, LAN AKL-SCL, Aerolineas AKL-EZE): routes and schedules, how to reach these aircraft if we need help with trying to radio field parties missing in the areas they overfly.
- Manage and maintain the information for use in the paper AFIM through the COMNAP InfoX system, interconnected with and complementary to the Antarctic Treaty's Electronic Information Exchange System (EIES), that will act as the authoritative master database;
- Provide the capability to export from the InfoX the information to be included in the paper AFIM (a) in an AIXM-compliant form and (b) in a way that clearly identifies what has been updated when;
- Revise the paper AFIM on the basis of what has been updated in the InfoX;
- Identify the "primary contributors" of AFIM information and encourage them to put in place a quality control for their information before they input it into the COMNAP systems, eg through working with their national authority;
- Develop an update process for the paper AFIM whereby a contractor:
  - performs appropriate quality controls over the new and updated information provided since the last revision,
  - liaises with COMNAP and individual contributors to adjust the information, develop additional representations of that information as needed,
  - ensures consistency throughout the manual,
  - publishes the revision.
- Sales could either continue to be handled by the COMNAP Secretariat as done now, or handled on behalf of COMNAP by the same or another contractor, with the COMNAP Secretariat authorising each sale and confirming if the purchaser is entitled, or not, to member pricing.

What should we do next?

- Approach a small number of suitable contractors that could help us with finalising an updated data model for the AFIM, and could possibly later manage the publication and revision of the paper AFIM for COMNAP, to get feedback on this document and assess what service they could provide;
- Seek feedback on this discussion paper from all National Antarctic Programs, and in particular from air operations contact points for those National Programs identified as "primary contributors" or main users of the AFIM;

- confirm at the 2009 COMNAP Annual General Meeting (3-5 August 2009) a way forward, which should include:
    - developing an updated format and data model for the AFIM as recommended in this document, with assistance from a contractor;
    - incorporating the data model into the COMNAP InfoX;
    - developing an updated management process for the AFIM incorporating appropriate quality control procedures;
    - reporting back to the 2010 COMNAP Annual General Meeting with a proposed course of action and corresponding costing.

Appendices:

(Appendices 1 to 4 are the original appendices included in the June 2008 version of the paper)

- Appendix 0:
  Terminology for facilities

- Appendix 1:
  ATCM Recommendation XV-20 (Paris, 1989) "Air safety in Antarctica"

- Appendix 2:
  SCALOP Notice 18 "Air safety in Antarctica" of 16-October-1990

- Appendix 3:
  AFIM Information Template of 13-May-2008

- Appendix 4:
  Note of information from the International Civil Aviation Organisation (ICAO) – Annex 15 to the Convention on International Civil Aviation "Aeronautical Information Services"

Appendix 0: Terminology for facilities

Facility Type - Options and Definitions (see Note 1)		
Type:	Definition:	Notes:
-A- 'Living/Working' facilities in decreasing order of size/footprint (see Note 2)		
Station	An established facility/installation with fixed, permanent buildings and mechanical services – reticulated power, water and sewage, etc...;	Do we want to avoid using 'Base' as a facility type as it relates more to a function ('the base for something') than to a size or physical characteristics? We may want to use 'Base' interchangeably with 'Station' – this would be more consistent with the customary use of the word in Antarctic circles?
Camp	A more basic and less permanent facility/installation, such as a group of tents or shelters, often used only for a small number of seasons;	
Refuge	Usually a small and very basic facility/installation, sometimes only one small hut, but usually of a permanent nature;	
-B- Special purpose subsidiary facilities (see Note 3)		
Depot	a depot of food, fuel or other supply.	
Airfield	A group of one or more runways, skiways and/or helipads that are all: • situated next to each other; • served by the same access road, vehicles, safety equipment and communication facility; and • attached to the same station, camp, refuge or depot	

Facility Type - Options and Definitions (see Note 1)		
Type:	Definition:	Notes:
Port	The ensemble of facilities used to anchor, unload and load a ship. Can include a wharf, a craft landing site, a boat ramp, an anchorage and fixed lifting/moving equipment. Does not include mobile equipment, such as cranes or forklifts, that may be used in port operations.	
Telecommunications facility	Facility that is used or is capable of being used for telecommunications (transmitting messages, as by telegraph, cable, telephone, radio, etc...), and includes a transmission facility.	In AFIM, currently included along with Air Navigation Facilities in a single section titled “Radio Communications and navigational facilities”
Air navigation facility	A facility used, available for use, or designed for use as a an air navigation aid (NAVAID) including landing areas, lights, any apparatus or equipment for disseminating weather information, for signalling, for radio-directional finding, or for radio or other electrical communication, and any other structure or mechanism having a similar purpose for guiding or controlling flight in the air or the landing and takeoff of aircraft.	In AFIM, currently included along with Telecommunications Facilities in a single section titled “Radio Communications and navigational facilities”
Meteorological services facility	A facility providing various weather information and forecasts in support of Antarctic activities – in particular air operations.	

Notes:

1. Use 'Facility' and 'Installation' interchangeably? Facility has the advantage of expressing a 'purpose' (there is an implication that a facility has been installed to serve a purpose), while 'Installation' just expresses that it is there. But in some languages, 'Installation' may be easier to translate than 'Facility'.
2. Each Living/Working facility can be the 'parentFacility' of any number of special purpose facilities (depot, airfield, port...) and any number of other (usually smaller) Living/Working facilities

Each Living/Working facility can be the 'subsidiaryFacility' of a maximum of one other Living/Working facility (but cannot be the subsidiary of a special purpose subsidiary facility)

3. Each special purpose subsidiary facility can have a maximum of one Living/Working facility as its 'parentFacility'. Each Station or Camp normally has a Telecommunications Facility. Each Airfield normally relies on both a Telecommunications Facility and a Meteorological Services Facility but either or both can be located at a significant distance from the Airfield.

Facility Status – Options and Definitions

Status:	Definition:	Notes:
Year-round	opened and used all year round – winter and summer	This generally corresponds to what many called 'winter'
Seasonal	opened seasonally only, every year or most years – in Antarctica this typically means opened every summer or most summers	This generally corresponds to what many called 'summer'
Temporarily Closed	closed temporarily and ready to be re-opened as and when required; Maintained or checked regularly	This option should avoid past confusion about the status of some facilities used very occasionally but that were identified as 'summer' - because that was the only option available.
Closed	closed indefinitely – but at least part of the facility still exists and could be renovated and/or re-used if needed	
No Longer Exists	the facility no longer exists;	
Under Construction	under construction – on-site construction work has commenced	
Under Consideration	construction of the facility is under consideration – on-site construction work has not commenced	

Facility Annual Cycle Parameters – Options and Definitions		
Parameter:	Definition:	Notes:
Summer Start Date	Typical Start Date (day-month) of the Summer Season for the facility	Typical date of first arrival of personnel at the station after the winter – eg 25 October
Summer End Date	Typical End Date (day-month) of the Summer Season for the facility	Typical date of last departure of personnel from the station before the winter – eg 20 March
Summer Duration	Typical duration of the Summer Season for the facility	If Summer Start and End Date have been provided, then the Duration should be calculated automatically
Winter Duration	Typical duration of the Winter Season for the facility	To be calculated automatically from Summer Duration

Facility Population Parameters – Options and Definitions		
Parameter:	Definition:	Notes:
Nominal Capacity	The maximum number of persons the facility is designed for, and can accommodate 'comfortably'	as consistent with the number of beds and the size/capacity of catering, ablution and waste processing facilities.
Peak	The maximum number of persons present at the facility at any one time.	This will typically be the number of persons present on site at the busiest time of the summer, over a short period of time. This can be higher than the Nominal Capacity of the facility.
Winter Average	The average number of persons living in the facility over the winter period	
Summer Average	The average number of persons living in the facility over the summer period	This should as far as practicable correspond to a weighted average - eg if you have 20 persons for 3 months and 40 persons for 1 months then the summer average would be: (20*3+40*1)/(3+1)=25 persons

Facility Population Parameters – Options and Definitions		
Parameter:	Definition:	Notes:
Annual Average	The average number of persons living in the facility over the entire year	If the winter and summer average population and the duration of the summer season have been provided, then the Annual Average should be calculated automatically from these.
Annual Turnover	The total number of person movements in and out of the station over a 12 months period	For simplicity, calculate the number of movements 'in', ie the cumulative total of passengers that have arrived at the station. The same person coming twice in a year is counted twice.

Discussion Paper on the AFIM
22-June-2008

Appendix 1:

ATCM Recommendation XV-20 (Paris, 1989)
"Air safety in Antarctica"

Recommendation XV-20 (Paris, 1989)

Subject	Air safety measures
Status	Effective 29/01/2004
Category	Operational matters
Topics	- Air Safety - Air Transport - Information exchange - general - Meeting of Experts
Attachments	- Advance notice (information on planned air operations)

Approval Details

Argentina*	23/10/1991
Australia*	04/09/1991
Belgium*	29/01/2004
Brazil*	01/09/1998
Bulgaria	
Chile*	14/08/1992
China*	26/01/1995
Ecuador	
Finland	18/06/1997
France*	26/04/1995
Germany*	13/06/1991
India*	23/01/2004
Italy*	11/02/1998
Japan*	15/12/1997
Korea ROK*	10/05/1995
Netherlands	10/10/2003
New Zealand*	28/10/1991
Norway*	13/10/1993
Peru*	05/11/2003
Poland*	18/10/1991
Russian Federation*	19/06/2001
South Africa*	14/06/1995
Spain*	03/02/2003
Sweden*	07/04/1994
Ukraine	
United Kingdom*	27/04/1995
United States*	09/05/1995
Uruguay*	15/05/1995

AIR SAFETY IN ANTARCTICA

The Representatives,

Recalling Recommendations I-X and XIV-9;

Recognising the importance of ensuring safe air operations in the Antarctic, and:

(a) that there is a wide range of problems in air operations which are becoming more urgent with increasing activity;
(b) that the principal body of knowledge and experience of Antarctic air operations, and its current problems, lies with the operators of national Antarctic programmes;

Noting, with appreciation, the Report of the Meeting of Experts on Air Safety in Antarctica, held in Paris from 2 to 5 May 1989;

Recommend to their Governments that:

1. For the purpose of ensuring that measures for improved air safety apply to all flights in Antarctica, measures to improve air safety set out in paragraphs 2-10 below should be elaborated on the basis of ICAO criteria, taking due account of the specific features of Antarctica as well as of existing practices and services.

2. For the purpose of ensuring the safety of air operations in the Antarctic Treaty area, they exchange, preferably by 1 September and no later than 1 November each year, information about their planned air operations in accordance with the standardized format at Annex 1 to this Recommendation.

3. For the purpose of improving air safety in Antarctica, national Antarctic programmes operating aircraft in Antarctica and their aircrews should be provided with a continuously updated compendium (‘Handbook’) describing ground facilities, aircraft and aircraft operating procedures (including helicopters) and associated communications facilities operated by each national Antarctic programme (out of the use of which questions of liability will not arise) and, therefore, they should:
(a) prepare such a Handbook as a matter of urgency;
(b) facilitate the preparation of such a Handbook by their national Antarctic programme operators by collective action through the medium of the Council of Managers of National Antarctic Programmes (COMNAP) federated to SCAR;
(c) adopt a loose-leaf format in which information provided by each national operator is kept separate (unless facilities are jointly operated) so as to facilitate updating of information;
(d) request their national Antarctic operators to provide information for the purpose of compiling the Handbook in accordance with Annex 2 to this Recommendation.

4. For the purpose of ensuring mutual awareness of current air operations and exchanging information about them, they should designate:
(a) Primary Air Information Stations (PAIS) which coordinate their own air information and information from their Secondary Air Information Stations (if any) for the purpose of notifying current air operations to other PAIS. These PAIS should have adequate communication facilities able to transmit "hard copy" information by means of an agreed HF data mode and/or INMARSAT; and
(b) Secondary Air Information Stations (SAIS) which comprise stations/bases

(including field bases and ships) which provide air information to their parent coordinating PAIS.

5. For the purpose of avoiding air incidents in areas beyond the range of VHF radio coverage of primary and secondary stations, aircraft outside the areas covered by primary and secondary stations should use a specific radio frequency to apply the "TIBA" procedure laid down in Annex 11 to the Convention on International Civil Aviation.

6. So as to ensure compliance with Article VII, paragraph 5 of the Antarctic Treaty and also Recommendation X-8, Part IV, they should keep one another informed about non-governmental flights and a reminder of the above provisions should be given to all pilots filing a flight plan for flights to Antarctica.

7. So as to provide for the improved collection from, and exchange within Antarctica of meteorological data and information of significance to the safety of Antarctic air operations, they should:
(a) encourage the World Meteorological Organisation in their work towards this end; and
(b) take steps to improve meteorological services available in Antarctica, specifically to meet aviation requirements.

8. For the purpose of ensuring effective communications between Primary Air Information Stations (PAIS), they ensure that their PAIS have adequate facilities for communicating with other PAIS, and that, in this connection, they bear in mind the INMARSAT system.

9. For the purpose of locating aircraft in distress in Antarctica, and noting the possibilities offered by the COSPAS-SARSAT system for the location of Emergency-Locator-Beacons-Aircraft transmitting on 406 Mhz, they designate points of contact which are to be the addressees of emergency location messages relating to air operations in Antarctica generated by the COSPAS-SARSAT system.

10. For the purpose of enhancing the safety of operation of aircraft in the longer term, studies should be undertaken, at a suitable time, aimed at making use of a satellite communication and navigation system being developed within the

framework of ICAO. Source: Antarctic Treaty Secretariat (www.ats.aq)

ANNEX TO RECOMMENDATION XV-20

ADVANCE NOTICE

INFORMATION ON PLANNED AIR OPERATIONS IN ANTARCTICA FOR PERIOD COMMENCING 1 OCTOBER 19 TO 30 SEPTEMBER 19

Part A

Country:	Operations/Logistics Contact Officers	Position	Office Telephone No
Address for Correspondance: Facsimile:			

Part B

* Please tick (✓) appropriate box

* ☐ No. it is not intended to conduct air operations in Antarctica during the forthcoming summer season

* ☐ Yes. it is intended to conduct air operations in Antarctica during the forthcoming summer season for which the following information sheets are attached:

(* Debate as appropriate)

Sheet 1	Intercontinental Operations	Yes/No*
Sheet 2	Continental Operations	Yes/No*
Sheet 3	Ship Based Operations	Yes/No*
Sheet 4	Other Air borne Operations (e.g. Balloons or Rockets)	Yes/No*
Sheet 5	Aircraft Description	Yes/No*

Signed..... Date.....

Part C

	Station	Lat. Long	INMARSAT Nce.
Primary Air Information Stations			
Secondary Air Information Stations			

INFORMATION ON PLANNED AIR OPERATIONS IN ANTARCTICA: Intercontinental Flights Sheet 1

Route	No. of Flights	* Flight Level or Altitude (ft/m)	Appropriate Dates or Period	Number and Type of Aircraft per flight

* Refer to Explanatory Notes, Item (3)

INFORMATION ON PLANNED AIR OPERATIONS IN ANTARCTICA: Continental Operations

Route/Location	No. of Flights	* Flight Level or Altitude (ft/m)	Appropriate Dates or Period	Number and Type of Aircraft per flight

* Refer to explanatory Notes, Item (3)

INFORMATION ON PLANNED AIR OPERATIONS IN ANTARCTICA: Ship Based Operations Sheet 3

Vessel/Route/Location	Planned Schedule		Number and Type Of Aircraft
	Arrive	Depart	

INFORMATION ON PLANNED AIR OPERATIONS IN ANTARCTICA: Other Airborne Operations (e.g. Balloons or Rockets)

Location	Latitude	Longitude	Type of Device	Maximum Altitude (ft/m)	Appropriate Times/Dates/Period	Other Information

INFORMATION ON PLANNED AIR OPERATIONS IN ANTARCTICA: Aircraft Description

Short Name	Full Name	(a) F/R	(b) W/S	No of Aircraft	(c) Flight Level or Altitude (ft/m)	Pax Capacity	Radio Equipment	Navigation Equipment	(d) Max Range (nim)	Type of Fuel Used	(e) SAR Equip-ment
Postenotes:											

(a) fined (F) or Rotary (R) Wing
(b) Wheeled (W) or Ski (S) Equipped
(c) Refer to Explanatory Notes, Item (3)
(d) For helicopters, also indicate maximum range over water, in brackets ( )
(e) Refer to Footnotes

EXPLANATORY NOTES on the Procedure for the

Exchange of Information on Planned Air Operations in Antarctica

In accordance with discussions at the 1988 Hobart Meeting of MNAP's and SCAR Working Group on Logistics, and Proposal 2 of the 1989 Paris Meeting of Experts on Air Safety, it was agreed that Antarctic Operators would exchange information on their planned air operations in a standardised format by 1 September each year.

The format for presenting the information is given in the attachments to this document.

Please note:

1. All Operators are to complete the "Advance Notice" cover sheet whether or not they plan to undertake air operations in the forthcoming summer season.

2. Operators who do plan to conduct air operations during the forthcoming summer season are to complete the "Advance Notice" cover sheet and the applicable information sheets as follows:

- Intercontinental Operations (Sheet 1);
- Continental Operations (Sheet 2);
- Ship Based Operations (Sheet 3);
- Other Airborne Operations (Sheet 4); and
- Aircraft Description (Sheet 5).

3. Flight Level or Altitude information is to be provided as follows:

- For inter or intra continental flights, and flights remote from stations, specify the normal operating Flight Level for the aircraft (which would be based on the Standard Pressure altimeter setting of 1013.2 hPa).

- For flights operating within the vicinity of stations (up to 50 nm radius), specify normal operating Altitude or altitude range for the aircraft (which would be based on the local QNH altimeter setting).

Notes:

(a) A transition altitude and level for Antarctic flights has not yet been agreed.

(b) A table of standard en route cruising levels for vertical separation based on direction of track (true or grid) has not yet been agreed.

(c) The ICAO standard altitude in both metres and feet for each flight level will apply.

4. All flight times (for example, for balloon launches) are to be given in Coordinated Universal Time (UTC).

5. The "Exchange of Information Sheets" should preferably be completed in the English language.

ANTARCTIC AERONAUTICAL INFORMATION HANDBOOK

CONTENTS

1. GENERAL (arranged by the name of countries in their internationally accepted order in the language of the document).

1.1 The postal address of the National Antarctic Operator including telephone, telex and telefax numbers;

1.2 An indicative description of the parts of the Antarctic Treaty Area in which the operators' aircraft operates;

1.2.1 frequently

1.2.2 infrequently
(Maps may be used where this would facilitate understanding of the description).

1.3 The primary station (PAIS) or stations from which the national operator co-ordinates his aircraft operations;

1.3.1 the role played by the operators' secondary stations (PAIS).

1.4 Ships carrying helicopters or which have designated on board facilities for operating helicopters.

2. GROUND FACILITIES (arranged by the alphabetical order of the name of each station. All stations and field camps are to be included which operate for more than one Antarctic summer season).

2.1 Runways, skiways and helipads (Information to be provided using paragraphs 2-43 of section 2.2. of Appendix I to Annex 15 to the Convention on International Civil Aviation as a guideline).

2.2 Communications
(Information to be provided using paragraphs 2-14 of section 3.2 and paragraphs 2-10 of section 3.3 of Appendix I to Annex 15 as a guideline).

2.3 Meteorology
Information to be provided using paragraphs 2-11 of section 4.2. of the Appendix I to Annex 15 as a guideline).

2.4 Aircraft operating procedures.

2.5 Alerting and search and rescue procedures.

Discussion Paper on the AFIM
22-June-2008

Appendix 2:

SCALOP Notice 18 “Air safety in Antarctica” of 16-October-1990

Council of
Managers of National Antarctic Programs

STANDING COMMITTEE ON ANTARCTIC LOGISTICS AND OPERATIONS

16 October 1990

SCALOP Notice No. 18

Subject: Air Safety in Antarctica

The purpose of this notice is to establish the format and to initiate the collection of information from each national Antarctic program for the initial compilation of an Antarctic aeronautical information handbook.

Following its meeting in Sao Paulo, the first task of the SCALOP air safety sub-group was to produce a format for the collection of information with which to assemble the first edition of the handbook. The handbook is to be named "The Antarctic Flight Information Manual."

ATCM Recommendation XV-20 emphasized that measures for improved air safety in Antarctica should be elaborated on the basis of ICAO criteria taking due account of specific features of the Antarctic and of existing practices and services. XV-20 further recommended that Treaty governments through their national program operators prepare the handbook as a matter of urgency.

Applicable ICAO criteria are found in ICAO Annex 15, Aeronautical Information Services, where the contents and arrangement of aeronautical information publications are described. ATCM Rec. XV-20 includes an annex with an outline of basic information to be collected, referring in part to ICAO Annex 15.

Accordingly, in compliance with the ATCM Recommendation and with reference to the ICAO publications, the SCALOP sub-group has developed the format, enclosed.

ACTION 4-90: Each member of SCALOP on behalf of the respective national program is requested to provide the information indicated by the enclosed outline. Preserve the outline numbering scheme, eliminating or leaving blank those items not applicable. With due regard for the urgency that has been assigned, and for the complexity and importance of the information, a target date of January 1991 is set for return of the information to the secretary. The assembly by the sub-group of the first edition of the AFIM will follow and its distribution expedited.

Enclosure

A. N. Fowler
Executive Secretary

Distribution: SCALOP members
Copy to: COMNAP members

Contents

(In English, arranged alphabetically by name of country)

1. **GENERAL**

1.1 The postal address and organization of the National Antarctic Operator including: telephone, telex, telefax and INMARSAT numbers, and electronic mail address where applicable;

1.2 An indicative description of the parts of the Antarctic Treaty area in which the operator's aircraft operate:

1.2.1 Frequently;

1.2.2 Infrequently (maps may be used to illustrate);

1.3 The primary air information station (PAIS) or the station(s) from which the national operator coordinates his aircraft operations;

1.3.1 The secondary air information station(s) and the role played by the operator's secondary station(s);

1.4 Ships carrying helicopters or which have designated on-board facilities for operating helicopters.

2. **GROUND FACILITIES** (List each Antarctic station in alphabetical order; include all stations and field camps that operate for more than one summer season.)

2.1 For each station served by a runway, helipad, skiway (hereafter referred to as an air "facility") or a surface suitable to be used as a helipad or skiway, show the following additional information:

1) Name of the station which the facility serves and the name of the facility.
2) Site and geographical coordinates of the facility reference point.
3) Distance and direction (true or grid) of facility from center of station.
4) Facility elevation.
5) Facility reference temperature (the monthly mean of the daily maximum temperature for the warmest month - degrees Celsius).
6) Magnetic variation to the nearest degree including date of information.
7) Where appropriate, the transition altitude.
8) Operational dates and hours of the facility; local time zone.
9) Facility operator or administrative authority.
10) Postal address.
11) Telex address.
12) INMARSAT telephone number.
13) Capacity for overnight food and lodging for visiting aircrews and passengers.
14) Medical facilities.
15) Transportation available at the facility or station.
16) Cargo handling capability at the facility.
17) Types and/or grades of fuel.
18) Types and/or grades of oil.
19) Oxygen and related aircraft servicing media.
20) Fueling facilities, fittings, and limitations on fueling services and quantities available.
21) Hangar space normally available for visiting aircraft.
22) Repair facilities normally available for visiting aircraft.
23) Rescue and fire fighting services and equipment.
24) Availability of snow removal and surface preparation services.
25) Local flying restrictions.
26) a) Position and elevation of designated preflight altimeter check location.
    b) Location of VOR facility check points.
    c) Geographical coordinates, to an accuracy of at least one tenth of a minute, of each aircraft stand or location at which aircraft equipped with inertial navigation systems may align and program their equipment before departure.

Note - A facility chart may be used to show these items.

Contents

27) Slopes of each runway or skiway and associated stopways, clearways and strips, and elevations of thresholds and/or significant points on each runway or skiway.
28) Designations, true bearings, dimensions, strength and surface of each runway or skiway and associated stopways, dimensions of clearways and strips, type of runway, runway surface friction calibration number(s) for each runway, and geographical coordinates of each threshold to an accuracy of the nearest second (latitude) or minute (longitude).
29) Strength and surface of facility movement areas other than runways and skiways and width of taxiways.
30) Taxiing guidance system.
31) Visual aids to location (e.g., describe the skiway/runway markers, wind direction or landing direction indicators, etc.).
32) Ground signalling devices.
33) Lighting aids.
34) Emergency lighting.
35) Obstacle marking and lighting.
36) Obstacles in approach and takeoff areas and declared distances for each direction of each runway/skiway, i.e.,
    a) Takeoff run available.
    b) Accelerate stop distance available.
    c) Takeoff distance available.
    d) Landing distance available.
37) Where established, standard routes for taxiing aircraft, with their designators.

3. RADIO COMMUNICATIONS AND NAVIGATION FACILITIES

3.1 Give a brief description of radio communications and aids to air navigation at each station, including:

1) Name of the station.
2) Types of service available.
3) Call signs and identifications.
4) Type of emission for each frequency.
5) Frequencies used for ground-to-air and air-to-ground transmissions.
6) Normal calendar dates and hours of operation for each service.
7) Latitude and longitude to at least one tenth of a minute of the transmitting antenna (receiving antenna for direction finding stations).
8) In the case of DME associated with ILS and/or MLS, when the zero range indication is other than at the DME antenna:
    a) The position of the zero range indication point on the approach path.
    b) The distance that the zero range indication is displaced from the DME antenna.
9) Magnetic bearing and distance in kilometers and tenths (nautical miles and tenths) of the radio facility from a known or established reference point.
10) Language(s) used.
11) Radiated power at the antenna, if applicable - in the case of a NDB, the average radius of rated coverage.
12) Full details of a non-visual aid to final approach and landing that is not an ILS, but which may be used in whole or in part with aircraft equipment designed for use with the ILS.
13) Name of operating authority of facility.

Contents

4. METEOROLOGY

4.1 For each air operating facility listed under 2.1 give the details of the meteorological services provided and an indication of which meteorological office is responsible for the service enumerated, including:

1) Name of the facility (station) and of the associated meteorological office.
2) Normal calendar dates and hours of service and, where applicable, the designation of the responsible meteorological office outside these dates or hours.
3) Office responsible for preparation of air facility forecasts and periods of validity of the forecasts.
4) Type of landing forecasts available for the air facility.
5) Information on how briefing and/or consultation is provided.
6) Type of flight documentation supplied and language(s) used.
7) Charts and other information displayed or available for briefing or consultation.
8) Supplementary equipment (e.g., weather radar) available for providing information on meteorological conditions.
9) The primary and secondary air information station(s) provided with meteorological information.
10) INMARSAT telephone numbers of meteorological office(s).
11) Additional information (e.g., concerning any limitation of service, etc.).

5. PROVISIONS FOR AIR TRAFFIC SERVICES, AND PROCEDURES

5.1 Routes and position reporting points that have been established and/or are used in the Antarctic Treaty area.
5.2 GRID or other polar navigation system or directional reference (true or magnetic) used.
5.3 Altimeter setting procedures.

(NOTE: It is intended that future editions of this manual include detailed information on communications flight guard, safety of flight monitor and air traffic control procedures as practiced by various national operators, with a view to future measures for improved cooperation and coordination among national operators in Antarctica.)

6. ALERTING AND SEARCH AND RESCUE PROCEDURES

Provide a summary description of the search and rescue capabilities available in Antarctica and the alerting procedures used by the national operator.

Appendix 3:

AFIM Information Template of 13-May-2008

AFIM - Antarctic Flight Information Manual

INFORMATION TEMPLATE - 13-May-2008

This template has been designed to:

- collect information in full conformity with the format of the AFIM as used since 1990;
- clarify and structure this information for a clearer, more generic and more uniform AFIM – including possible adjustments, shown inline, to the original wording; and
- facilitate the development of an electronic version of the AFIM that can complement and support the traditional paper version, without duplicating other sets of information such as the Antarctic Telecommunications Officers Manual (ATOM).

This template includes 6 sections - repeat each section as many times as needed.

Nb	Title	Complete this section for:
1	General	Each '*operator*' Proposed definition: an 'operator' is defined as an organisation that operates one or more airfields in the Antarctic – it will typically be a National Antarctic Program member of COMNAP)
2	Ground facilities	Each '*airfield*' Proposed definition: an 'airfield' is defined as one or more adjacent runways/skiways/helipads considered to be in a same location, refered to by the same placename, sharing a number of buildings, vehicles or access roads and necessarily sharing the same r*adio communications and navigational facility*, the same *meteorological services facility,* the same p*rovisions for air traffic services and procedures* and the same *alerting and search and rescue procedures*. A station or camp is not considered part of the 'airfield'. If a camp exists exclusively to support the airfield, it will be considered an 'airfield camp' attached to (but separate from) the airfield itself.
3	Radio communications and navigational facilities	Each '*radio communications and navigational facility*' serving at least one airfield: a distinct, physical radio communications and navigational facility with its own contact details/numbers and personnel. It can serve one or more airfields (for example it can be attached to a 'station' and server all airfields attached to that station).
4	Meteorology	Each '*meteorological services facility*' serving at least one airfield: a distinct, physical meteorological facility with its own contact details/numbers and personnel. It can serve one or more airfields
5	Provisions for air traffic services and procedures	Each set of '*Provisions for air traffic services and procedures*' – whether they apply to all air operations for the operator, a subset of its stations or a subset of its airfields
6	Alerting and search and rescue procedures	Each set of '*Alerting and search and rescue procedures*' – whether they apply to all air operations for the operator, a subset of its stations or a subset of its airfields

SECTION 1: GENERAL

Operator this applies to:	[in an electronic version: pick from operator list]
Information updated on (day-month-year):	[in an electronic version: auto]
by (name and email address):	[in an electronic version: auto]

Information to appear in AFIM manual:

1. GENERAL	
1.1 The name and contact details ~~postal address and organization~~ of the ~~National~~ Antarctic Operator including: – postal address; – telephone, telex, telefax including direct satellite numbers (eg ~~and~~ INMARSAT or Iridium numbers);~~;~~ and – electronic mail address ~~where applicable~~.	
1.2 An indicative description of the parts of the Antarctic Treaty area in which the operator's aircraft operate:	
1.2.1 Frequently	
1.2.2 Infrequently	
1.3 The primary air information station (PAIS) or the station(s) from which the national operator coordinates his aircraft operations:	
1.3.1 The secondary air information station(s) and the role played by the operator's secondary station(s).	
1.4 Ships carrying helicopters or which have designated on-board facilities for operating helicopters.	

SECTION 2: GROUND FACILITIES

(repeat section as many times as necessary)

Operator(s) this applies to:	[in an electronic version: pick from operator list]
Name of airfield:	
Information updated on (day-month-year):	[in an electronic version: auto]
by (name and email address):	[in an electronic version: auto]

2. GROUND FACILITIES **Provide information for each "airfield"**	
2.~~1 For each station served by a runway, helipad, skiway (hereafter referred to as an~~ "Name of ~~air~~airfield ~~facility") or a surface suitable to be used as a helipad or skiway, show the following additional information~~:	
1) Name of the station which the airfield~~facility~~ serves, if applicable ~~name of the facilitytheand~~ .	[in an electronic version: pick from station list]
2) Site and geographic coordinates of the airfield~~facility~~ reference point.	
3) Distance and direction (true or grid) of airfield~~facility~~ from centre of station.	
4) airfield~~Facility~~ elevation.	
5) airfield~~Facility~~ reference temperature (the monthly mean of the daily maximum temperature for the warmest month - degrees Celsius).	
6) Magnetic variation to the nearest degree including date of information.	
7) Where appropriate, the transition altitude.	
8) Operational dates and hours of the airfield~~facility~~; local time zone.	
9) airfield~~Facility~~ operator or administrative authority.	
10) Postal address.	

11) Email address.	
12) ~~INMARSAT~~Direct t~~T~~elephone numbers (eg INMARSAT or Iridium).	
13) Capacity for overnight food and lodging for visiting aircrews and passengers.	
14) Medical facilities.	
15) Transportation available at the airfield~~facility~~ or station.	
16) Cargo handling capability at the airfield~~facility~~.	
17) Types and/or grades of fuel.	
18) Types and/or grades of oil.	
19) Oxygen and related aircraft servicing media.	
20) Fuelling facilities, fittings, and limitations on fuelling services and quantities available.	
21) Hangar space normally available for visiting aircraft.	
22) Repair facilities normally available for visiting aircraft.	
23) Rescue and fire fighting services and equipment.	
24) Availability of snow removal and surface preparation services.	
25) Local flying restrictions	
26) (a) Position and elevation of designated pre-flight altimeter check location.	
(b) Location of VOR facility check points.	
(c) Geographical coordinates, to an accuracy of at least one tenth of a minute, of each aircraft stand or location at which aircraft equipped with inertial navigation systems may align and program their equipment before departure. Note – An airfield ~~facility~~ chart may be used to show these items.	

27) Slopes of each runway or ski-way and associated stop ways, clearways and strips, and elevations of thresholds and/or significant points on each runway or skiway.	
28) Designations, true bearings, dimensions, strength and surface of each runway or skiway and associated stopways, dimensions of clearways and strips, type of runway, runway surface friction calibration number(s) for each runway, and geographical coordinates of each threshold to an accuracy of the nearest second (latitude) or minute (longitude).	
29) Strength and surface of airfield~~facility~~ movement areas other than runways and skiways and width of taxiways.	
30) Taxiing guidance system.	
31) Visual aids to location (for example, describe the skiway/runway markers, wind direction or landing direction indicators, etc.).	
32) Ground signalling devices.	
33) Lighting aids.	
34) Emergency lighting.	
35) Obstacle marking and lighting.	
36) Obstacles in approach and take-off areas and declared distances for each direction of each runway/skiway, i.e., a) Take-off run available. b) Accelerate stop distance available. c) Take-off distance available. d) Landing distance available.	
37) Where established, standard routes for taxiing aircraft, with their designator.	

SECTION 3: RADIO COMMUNICATIONS AND NAVIGATIONAL FACILITIES

(repeat section as many times as necessary)

Operator this applies to:	[in an electronic version: pick from operator list]
Information updated on (day-month-year):	[in an electronic version: auto]
by (name and email address):	[in an electronic version: auto]

Information to appear in AFIM manual:

3. RADIO COMMUNICATIONS AND NAVIGATIONAL FACILITIES **Provide information for each "radio communications and air navigation facility" serving one or more airfields**	
3. Name of radio communications and air navigation facility~~1 Give a brief description of radio communications and aids to air navigation at this station, including:~~	
1) Name of the station(s) and/or airfields which this radio communications and air navigation facility serves	[in an electronic version: pick from airfield and station lists]
2) Types of service available.	
3) Call signs and identifications.	
4) Type of emission for each frequency.	
5) Frequencies used for ground-to-air and air-to-ground transmissions.	
6) Normal calendar dates and hours of operation for each service.	
7) Latitude and longitude to at least one tenth of a minute of the transmitting antenna (receiving antenna for direction finding stations).	
8) In the case of DME associated with ILS and/or MLS, when the zero range indication is other than at the DME antenna.	
(a) The position of the zero range indication point on the approach path.	
(b) The distance that the zero range indication is displaced from the AME antenna.	

9) Magnetic bearing and distance in kilometres and tenths (nautical miles and tenths) of the radio facility from a known or established reference point.	
10) Language(s) used.	
11) Radiated power at the antenna, if applicable, in the case of an NDB, the average radius of rated coverage.	
12) Full details of a non visual aid to final approach and landing that is not an ILS, but which may be used in whole or in part with aircraft equipment designed for use with the ILS.	
13) Name of the operating authority of facility.	

SECTION 4: METEOROLOGY

(repeat section as many times as necessary)

Operator this applies to:	[in an electronic version: pick from operator list]
Information updated on (day-month-year):	[in an electronic version: auto]
by (name and email address):	[in an electronic version: auto]

Information to appear in AFIM manual:

4. METEOROLOGY **Provide information for each "Meteorological Services Facility" serving one or more airfields**	
4.~~1 For each air operating facility listed under 2.1, give the details of the meteorological services provided and an indication of which meteorological office is responsible for the service enumerated, including:~~ Name of Meteorological Services Facility	
1) Name of the station(s) and/or airfields which this meteorological services facility serves.~~facility (station) and of the associated meteorological office~~	[in an electronic version: pick from airfield and station lists]
2) Normal calendar dates and hours of service and, where applicable, the designation of the responsible meteorological office outside these dates or hours.	
3) Office responsible for preparation of airfield ~~facility~~ forecasts and periods of validity of the forecasts.	
4) Type of landing forecast available for the airfield ~~facility~~.	
5) Information on how briefing and/or consultation is provided	
6) Types of flight documentation supplied and language(s) used.	
7) Charts and other information displayed or available for briefing or consultation.	

8) Supplementary equipment (for example, weather radar) available for providing information on meteorological conditions	
9) The primary and secondary air information station(s) provided with meteorological information.	
10) ~~INMARSAT~~ Direct telephone numbers of meteorological services facility and any other responsible meteorological office(s) - eg INMARSAT or Iridium	
11) Additional information (for example, concerning any limitation of service, etc.).	

SECTION 5: PROVISIONS FOR AIR TRAFFIC SERVICES AND PROCEDURES

(repeat section as many times as necessary)

Operator this applies to:	[in an electronic version: pick from operator list]
Stations and/or airfields this applies to:	[in an electronic version: pick from airfield and station lists]
Information updated on (day-month-year):	[in an electronic version: auto]
by (name and email address):	[in an electronic version: auto]

Information to appear in AFIM manual:

5. PROVISIONS FOR AIR TRAFFIC SERVICES AND PROCEDURES	
5.1 Routes and position reporting points that have been established and/or are used in the Antarctic Treaty area.	
5.2 GRID or other polar navigation system or directional reference (true or magnetic) used.	
5.3 Altimeter setting procedures.	

SECTION 6: ALERTING AND SEARCH AND RESCUE PROCEDURES

(repeat section as many times as necessary)

Operator this applies to:	[in an electronic version: pick from operator list]
Stations and/or airfields this applies to:	[in an electronic version: pick from airfield and station lists]
Information updated on (day-month-year):	[in an electronic version: auto]
by (name and email address):	[in an electronic version: auto]

Information to appear in AFIM manual:

6. ALERTING AND SEARCH AND RESCUE PROCEDURES	
Provide a summary description of the Search and Rescue capabilities available in Antarctica and the alerting procedures used by the ~~national~~ operator	

Appendix 4:

Note of information from the International Civil Aviation Organisation (ICAO) - Annex 15 to the Convention on Internation Civil Aviation "Aeronautical Information Services"

(source: http://www.icao.int/icaonet/anx/info/an15_info_en.pdf, 22-June-2008)

ANNEX 15
to the Convention on
International Civil Aviation

Aeronautical Information Services

One of the least known and most vital roles in support of international civil aviation is filled by the aeronautical information service (AIS). The object of the aeronautical information service is to ensure the flow of information necessary for the safety, regularity and efficiency of international air navigation.

Annex 15 defines how an aeronautical information service shall receive and/or originate, collate or assemble, edit, format, publish/store and distribute specified aeronautical information/data. The goal is to satisfy the need for uniformity and consistency in the provision of aeronautical information/data that is required for the operational use by international civil aviation.

The ICAO Council first adopted the original Standards and Recommended Practices in 1953. Annex 15 has its origins in Article 37 of the Chicago Convention. The first requirements for the Annex were developed by the ICAO Air Navigation Committee (now the Air Navigation Commission), following recommendations from regional air navigation meetings, and were published by the authority of the Council as *Procedures for International Notices to Airmen* back in 1947.

"International notices to airmen" is a phrase which led to the birth of an early aeronautical acronym: NOTAM. In 1949, a special NOTAM meeting reviewed and proposed amendments to these procedures, which were later issued as *Procedures for Air Navigation Services* that became applicable in 1951. A total of 33 amendments updated Annex 15 over the years to meet the rapid changes brought about by air travel and associated information technology. In recent years, Annex 15 amendments have reflected the increased need for the timely provision of quality aeronautical information/data and terrain data as they have become critical components of data-dependant on-board navigation systems. The Annex now contains many provisions aimed at preventing corrupt or erroneous aeronautical information/data which can potentially affect the safety of air navigation.

The operator of any type of aircraft, be it small private aircraft or large transport aircraft, must have available a variety of information concerning the air navigation facilities and services that may be expected to be used. For example, the operator must know the regulations concerning entry into and transit of the airspace of each State in which operations will be carried out, as well as what aerodromes, heliports, navigation 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. While this information can nearly always be provided before take-off, it must, in some instances, be provided during flight.

The philosophy underlying Annex 15, which stems from Article 28 of the Convention on International Civil Aviation, is that each State is responsible for making available to civil aviation interests any and all information which is pertinent to and required for the operation of aircraft engaged in international civil aviation within its territory, as well as in areas outside its territory in which the State has air traffic control or other responsibilities.

The information handled by an AIS may vary widely in terms of the duration of its applicability. For example, information related to airports and its facilities may remain valid for many years while changes in the availability of those facilities (for instance, due to construction or repair) will only be valid for a relatively short period of time. Information may be valid for as short a time as days or hours.

The urgency attached to information may also vary, as well as the extent of its applicability in terms of the number of operators or types of operations affected. Information may be lengthy or concise or include graphics.

Therefore, aeronautical information is handled differently depending on its urgency, operational significance, scope, volume and the length of time it will remain valid and relevant to users. Annex 15 specifies that aeronautical information be published as an integrated aeronautical information package. It is composed of the following elements: the *Aeronautical Information Publication* (AIP), including amendment service, AIP supplements, NOTAM, pre-flight information bulletins (PIB), aeronautical information circulars (AIC), checklists and lists of valid NOTAM. Each

element is used to distribute specific types of aeronautical information.

Information concerning changes in facilities, services or procedures, in most cases, requires amendments to be made to airline operations manuals or other documents and databases produced by various aviation agencies. The organizations responsible for maintaining these publications usually work to a pre-arranged production programme. If aeronautical information were published indiscriminately with a variety of effective dates, it would be impossible to keep the manuals and other documents and databases up to date. Since many of the changes to facilities, services and procedures can be anticipated, Annex 15 provides for the use of a regulated system, termed AIRAC (aeronautical information regulation and control), which requires significant changes to become effective and information to be distributed in accordance with a predetermined schedule of effective dates, unless operational considerations make it impracticable.

Annex 15 also specifies that pre-flight information must be made available at each aerodrome/heliport normally used for international operations and sets the content of aeronautical information provided for pre-flight planning purposes as well as requirements for the provision of that information through automated aeronautical information systems. Additionally, there are requirements to ensure that important post-flight information provided by aircrews (for example, the presence of a bird hazard) are relayed to the AIS for distribution as the circumstances necessitate.

The need, role and importance of aeronautical information/data have changed significantly with the evolution of the Communications, Navigation and Surveillance/Air Traffic Management (CNS/ATM) systems. The implementation of area navigation (RNAV), required navigation performance (RNP) and airborne computer-based navigation systems has brought about exacting requirements for the quality (accuracy, resolution and integrity) of aeronautical information/data and terrain data .

The users' dependence on the quality of certain aeronautical information/data is evident from Annex 15, paragraph 3.2.8 a) which, when describing critical data, states: "There is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe".

Since corrupt or erroneous aeronautical information/data can potentially affect the safety of air navigation because of the direct dependence upon it by both airborne and ground-based systems, it is imperative that each State ensure that users (aviation industry, air traffic services, etc.) receive timely and quality aeronautical information/data for the period of its intended use.

To achieve this, and to demonstrate to users the required information/data quality, Annex 15 provides that States must establish a quality system and put in place quality management procedures at all stages (receiving and/or originating, collating or assembling, editing, formatting, publishing, storing and distributing) of the aeronautical information/data process. The quality system must be documented and demonstrable for each function stage, ensuring that the organizational structure, procedures, processes and resources are in place in order to detect and remedy any information/data anomalies during the phases of production, maintenance and operational use. Explicit in such a quality management regime is the ability to trace all information/data from any point, back through the proceeding processes, to its origin.

Of all the activities in international civil aviation, the provision and sustaining of aeronautical information services may not rank among the most glamourous and indeed the complexity of AIS information supplying data-dependant on-board navigation systems may be transparent to the user, but without this service a pilot would be flying into the unknown.