

AIP GOES ELECTRONIC

The Aeronautical Information Publication as we know it – a bulky paper document – is bound to evolve and adapt to new technologies as ANSPs evolve from service to management

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The Aeronautical Information Publication (AIP) is the only official document offering all permanent aeronautical information related to a country. It is defined by ICAO Annex 15 and is the largest component of the Integrated Aeronautical Information Package (IAIP), along with AIP Supplements (SUP), NOTAMs and Circulars (AIC).

'Integrated' is quicker said than done; made of paper documents, these components of the IAIP are quite simply not integrated at all. Pilots are supposed to read the AIP, SUPs and AICs but they all come as separate documents. Add NOTAMs and an international flight to the mix and it becomes clear that pilots need to do the integration work themselves. Flight manuals do respond to the integration need for flights over

several countries, but not to the integration of AIP and NOTAMs, for instance.

The new generation of the AIP, which enhances the paper AIP with new technologies, already exists: it is the electronic AIP (eAIP), as specified by Eurocontrol (1). Even better, ICAO is in the process of including the Eurocontrol eAIP Specification in a future amendment of Annex 15 (2).

What is the eAIP?

The electronic AIP (Figure 1) is a specification of the look and feel of an AIP, SUPs and AICs on screen. It defines an international, standard way to display these documents in the form of an aeronautical information web site. This site integrates

The screenshot shows the eAIP interface for the Netherlands. The top left features the eAIP logo and navigation options like PDF, Help, and About. A sidebar on the left lists various AIP sections, with 'Effective 27 AUG 2009' highlighted. The main content area displays 'EHDR AD 2.18 ATS COMMUNICATION FACILITIES' and a table with the following data:

Service designation	Call sign	Frequency	Hours of operation	Remarks
1	2	3	4	5
Aerodrome information	Drachten Radio	120.600 MHz 119.650 MHz	See EHDR AD 2.3	NIL

Below the table, there is a section for 'EHDR AD 2.22 VFR FLIGHT PROCEDURES AND REGULATIONS' and a sub-section '1 VFR FLIGHT PROCEDURES AND REGULATIONS'. A note states: 'Note: for visual approach chart see [AD 2.EHDR-VAC](#).' The first sub-section is '1.1 VFR traffic circuit area and traffic circuit', which includes a list of six items:

1. The minimum approach altitude for the aerodrome is 1014 ft AMSL (1000 ft AAL).
2. The circuit altitude is 714 ft AMSL (700 ft AAL).
3. The visual traffic circuit must be carried out within the lateral limits of the circuit area.
4. Built-up areas shall be avoided as much as possible.
5. Marked areas shall be avoided.
6. The circuit area may not be overflown below an altitude of 1014 ft AMSL (1000 ft AAL).

Figure 1: Extract from the eAIP The Netherlands published by LVNL. Text highlighted in pink is part of an amendment

the three types of AIS documents in an easy-to-use and easy-to-learn interface. An electronic AIP brings flexibility in the diffusion and access format. It can be distributed on CD-ROM, published on a public website, or published on an electronic library such as PAMS on the European AIS Database (EAD).

All stakeholders will find benefits in having an international, standard eAIP specification. Readers will find it easier to get used to the eAIP interface if all eAIPs in the world follow the same guidelines and producers will use COTS products to decrease their development costs and increase their return on investment.

Advantages for AIP readers

User friendly. An eAIP offers a number of interactive features that make AIP browsing much easier compared with paper. An electronic document can also be searched using search engines – something that is not possible with paper.

Changes are precisely highlighted. The use of colour codes to highlight changes in an AIP Amendment makes it clear for readers what exactly has changed. In comparison, the traditional change bars in the margin of a paper AIP can often leave the reader wondering what the amendment brings, especially when the previous version of the page is no longer available.

Virtually no maintenance.

An eAIP amendment is in fact a complete AIP with highlighted changes. With paper AIPs, readers need to insert, delete or replace pages for every amendment. This manual process is tedious and error-prone, even more so with a large amendment of more than a dozen pages. Consequently some readers simply do not update their AIPs on a regular basis, only to be faced with a huge stack of amendments to incorporate when they actually need to consult an AIP. The eAIP makes this process obsolete, as readers can simply consult the latest eAIP amendment to find both the changes and the rest of the document. As a bonus this makes an eAIP easy to archive, being a self-contained electronic document.

Easy access and distribution. With paper AIPs, readers have to walk to the AIP library in their organisation in order to access the documents. The eAIP offers remote access through the intranet or internet, so that all members of staff can access the documents from their workstation.

Advantages for AIP editors

Improved AIS products. Implementing the eAIP specification is

a means for AIS offices to improve their products by the use of modern document production systems. They improve consistency, integrity and usability of the documents. Consistency is achieved by using a professional document management system as opposed to 'free-style' word processing software. Higher integrity is obtained by combining the eAIP production and publication rules with the use of an aeronautical information database. Usability is offered by the means of modern, web-based technologies and by following the Eurocontrol eAIP interface specification.

Enabler for derived AIS products. By using professional document production software, AIS offices can combine information from different sources, including the AIP, and reuse information in other AIS products. For example common information can be shared between a VFR guide and the AIP. In

the future one can imagine several countries (functional airspace blocks or even entire continents) grouping together and producing a common AIP-like document, made by joining their national eAIPs in a semi-automated manner.

Cost reduction.

Publishing an electronic document cuts down production costs. Recent experience with States that have already migrated to the eAIP shows that a vast majority of AIP subscribers do not require paper copies any more. This reduces printing and posting costs. It is especially true for internal copies within ANSPs, which can easily be distributed via an intranet. Moreover new readers join in for the electronic AIP, which increases turnover.

No development cost. Why reinvent the wheel? The electronic AIP specification is there, offered by Eurocontrol as open standard. As such the specification opens up the COTS software market for AIP production and promotes a sane, competitive environment. Using the eAIP saves organisations from development costs and risks.

State of the art eAIP Production

It is possible to produce a paper AIP using a word processor or page-layout application, but such paper-orientated software will not bring the benefits of an electronic AIP. When it comes to reusing aeronautical information for derived products, or publishing interactive, electronic documents on a website, these software tools quickly show their limits. It is time to migrate to professional tools.

What more can AIS offices expect from an advanced, professional eAIP production system, compared with old-generation, paper-based tools?

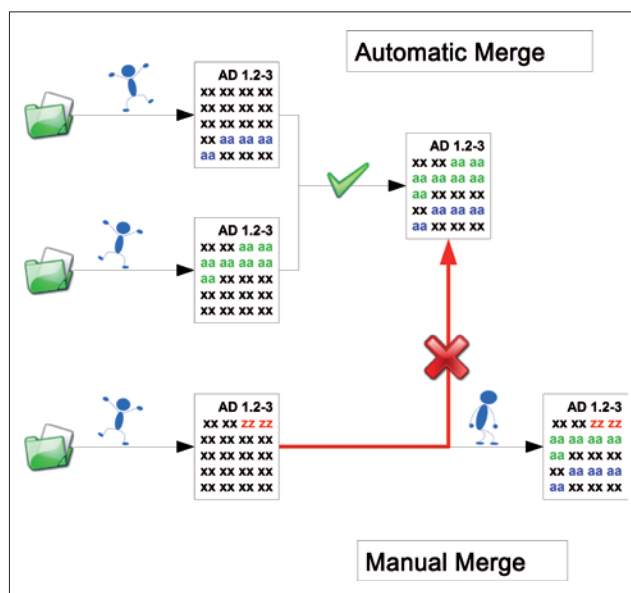


Figure 2: Professional document management systems automatically merge concurrent changes, or detect the unlikely conflict and assist editors in solving it

Collaboration. The advanced solution must be collaborative, enabling a team of AIP editors, cartographers, coordinators and quality controllers to work together efficiently.

Concurrent editing. An important aspect of collaboration is enabling AIP editors to edit the same page, for the same amendment, at the same time. The system must automatically merge concurrent changes when possible (Figure 2). It must detect the occasional conflict (i.e. when two changes occur exactly on the same text) and assist the user in resolving it.

Data referencing. The advanced solution must ease the creation of data references from text documents to an AIXM database, by assisting AIP editors in generating certain AIP sections and tables. It should offer ready-made templates from which editors can pick the document elements they need. It should also assist editors in creating references to individual data items, to use in a paragraph, for instance. These data references must be updated automatically upon database changes.

Automation. It should automate as much as possible the production of the AIP: page numbering, headers and footers, table of contents (sections GEN 0.6, ENR 0.6 and AD 0.6), check list of pages (section GEN 0.4), paper amendment, cover pages including the list of changed pages (pages to replace, insert or delete) must all be generated with minimal user intervention.

Change detection. It should automatically detect changes in text, data, charts and other images and mark up the changes according to ICAO SARPs (change bars and deletion arrows in paper documents) and to the Eurocontrol eAIP Specification (precise highlighting and appropriate colours in electronic documents).

Eurocontrol eAIP compliance. It should be fully compliant with the eAIP specification. This must be verifiable: if one imports the sample eAIP from Eurocontrol and then exports it again, no information should be lost.

Eurocontrol SDP compliance. It should follow procedures and user roles described in Eurocontrol's Static Data Procedures (SDP) specification.

AIRAC adherence. It must assist AIP editors and coordinators in adhering to the AIRAC standard, notably when preparing parallel amendments – publishing a regular amendment while an AIRAC amendment has already been published but is not yet effective. Publishing a parallel amendment often requires the production of a correction of the previous AIRAC amendment, which should be completely automated.

Work unit management. Users should be able to split the work to be done on a given amendment into one or more work units. One work unit is defined to group a set of related changes. This concept, issued from the document management domain, enables editors to focus on one set of changes at a time. It also

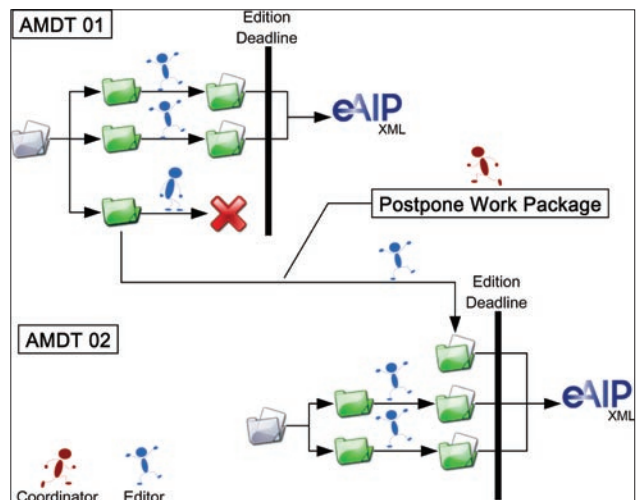


Figure 3: Work unit management: a delayed work unit is postponed until the next eAIP amendment with a single click

enables coordinators to postpone a work unit that happens to be late (Figure 3) without compromising the timeliness of the rest of the amendment.

The above list is not comprehensive but is a good check list of items to look for in a modern AIP production system.

Synclude has developed such a system, called GroupVerve AIS, which covers all the above features and more. It is one component of a complete AIM system, perfectly integrated with Comsoft's CADAS suite, which includes an AIXM 5 database, a NOTAM office system, a flight plan management system and pre-flight information bulletin (PIB) system.

This brings us back to the (non-)integrated AIP. The near future of the eAIP is to incorporate a live NOTAM feed into the interactive eAIP web site. This feature is technically possible today and at Synclude we have researched and developed this path. Until the advent of AIXM 5 databases, however, linking AIP and NOTAM information remained a manual process. With an AIXM 5 database it is now possible to automate this process and offer an interactive, dynamic, truly integrated AIP. This is the first concrete result of the migration from AIS to AIM. ❖

References

1. <http://www.eurocontrol.int/eaip>
2. http://www.icao.int/wacaf/apirg/sg/2009/AIS_MAP_TF5/docs/attachment%20to%20wp-8.pdf, section 5.3

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