

AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL

Working Group Two

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**Progress Report on the Preparation of an ATN
Requirements Database**

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SUMMARY

Eurocontrol's work on preparing a database of ATN Requirements was reported to the first meeting of the ATN Panel. This work has now progressed to the point where it is believed that the database has captured all ATN Requirements and Recommendations contained in the 2nd Edition of the ATN Manual. The database contents and categorisation of requirements has also been reviewed by the EurATN consortium. It is therefore believed that the database is in a fit state to be used as a control tool during the production of validated SARPs and Guidance Material by the ATN Panel. This paper provides a status report of the preparation of the ATN Requirements Database. Attached to this report is a User Manual and an example report. Recommendations are also made as to future work on and use of the database.

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1. Background

1.1 Objectives

Earlier this year, Eurocontrol decided to develop an ATN Requirements Database with the following objectives:

1. To create an itemised list, giving a unique reference number to all
 - Requirements,
 - Recommendations,
 - Notes,
 - APRL Entries
 - MORTS Entries
2. To identify perceived User Requirements
3. To provide a basis for categorising and consolidating the Requirements and Recommendations
4. To track Defect Reports and Resolutions
5. To Provide Traceability of all Changes to ATN Requirements
6. To provide input to the Validation Process i.e. by providing a defined list of Requirements that relate to a specific subject
7. To provide a record of the validation progress.
8. To Provide a general purpose tool for permitting analysis of the ATN Provisions.

This work has now been completed.

1.2 Source Text

The text of the ATN Manual was handed over to the ICAO Secretariat at the conclusion of the 5th meeting of the SICAS Panel. Subsequently, the editor made available a copy of this text in Word for Windows format. This version of the text was taken as input to the production of the requirements database. It was assumed to be identical to the ICAO published text.

1.3 Choice of Tools

Word for Windows was the natural choice for the wordprocessor, given that the ATN Manual was available only in this format.

Microsoft Access version 1.1 was chosen as the database engine. The main reason for the choice of Access is that it is readily available within Eurocontrol and experience in its use can be called upon.

1.4 Production Strategy

The production plan for the ATN Requirements Database included a total of seven steps. i.e.

1. Markup of Text
2. Identification of Implied Requirements
3. Database Design
4. DBMS Generation
5. Analysis and Categorisation
6. Consolidation
7. Reporting.

Finally, the work done in marking up the ATN Manual and the production of the actual database was subject to a thorough review by the EurATN consortium. This has resulted in a number of corrections to the original work and has validated the consistency of the database with the ATN Manual 2nd edition and the appropriateness of the requirements analysis.

2. Status Report

Jean-Pierre Briand of Eurocontrol Brétigny has been responsible for preparing the database and has task managed the EurATN review.

At the time of the ATN Panel meeting in June, the work on analysing the ATN Manual had been completed, and an initial version of the database prepared. Since then, the work on categorising the requirements has been completed, and a database application has been developed to aid the use of the database. This application may be used to search for related requirements and to prepare reports. A sample report produced using this application is attached to this paper. A User Manual for this application has been prepared and this is also attached.

The EurATN review is now complete and, at the time of writing, the database is being updated to incorporate changes that have resulted from the review. The EurATN reviews have also prepared a number of defect reports on the ATN Manual resulting from their own review, and the original analysis of the ATN Manual during the preparation of the database.

It is also hoped to have prepared, by the time the working group meets, a Microsoft Windows Help File derived from the database. This will provide access to the requirements contained in the database, through indexes derived from the categories assigned during the analysis work. Hypertext links will enable ready access to related requirements.

Future work is concerned with developing the procedures to enable the database to be used as a control for the validation of the ATN draft SARPs. A number of outstanding issues have also to be resolved.

3. Outstanding Issues

3.1 Guidance material

The current version of the ATN Database does not contain all the guidance material from ATN Manual. Only a limited number of database entries (of type GUID) were defined

during database generation when identifying User Requirements and missing Requirements in chapters.¹

We need to decide whether to:

- a) perform a complete annotation of all the guidance material as done for the draft SARPs text, and generate the corresponding database table, or
- b) remove existing guidance from the database entirely and consider it as out of the scope of the database.

The main advantage of a guidance database is the ability to relate guidance text to a subset of requirements that it is meant to cover. During maintenance of the SARPs, changes may then 'propagate' to the guidance if this link is properly managed.

The drawbacks of a guidance database are:

- i. guidance material is less formal in format and content, hence deciding at which level guidance should be itemised is very difficult and often arbitrary. For the same reason, establishing the link to associated SARPs may be difficult.
- ii. handling guidance in a database will impose the same change control formality as for the SARPs database. Text must be mature enough, so that change control is manageable.

This issue has to be decided in the light of ATNP plans for the development of ATN Guidance.

3.2 Chapter 6 analysis

Chapter 6 is considered to be one of the most important guidance chapters. For that reason, it was annotated in detail. The large number of resulting database entries have not been analysed in detail for User Requirements, or, indeed, any other requirement category. A provisional type 'tba' (to be assigned) has been given to these entries.

3.3 Extension of database relationships

The model used for ATN database relationships is a 'one-to-many' model. This is too limiting when expressing e.g. the 'noteof' relation. An enhancement of the database may need to be introduced in a future version, in order to implement a 'many-to-many' model.

A need for a new relationship has been identified, and needs to be introduced. Its provisional name is "*in context of*". This new relationship is meant to be used to reflect a dependency between requirements that is not otherwise specified as *sonof*, *itemof* or *if*. These latter relations have very restricted meanings.

3.4 Use of the database for draft SARPs validation

Initial analysis information contained in the database may be used as a starting point for some defect reports. The following list is not exhaustive.

¹ All potential sources for User Requirements and missing requirements were tagged in one step. During a later analysis step, the correct type was assigned, i.e. User Requirement, Requirement or Recommendation. When none of those was found applicable, guidance type was assigned.

- entries of type “REQ”, “REC” or “OPT” in chapters have been considered as missing from draft SARPs. They should be reviewed and if agreed, amendment of draft SARPs should be proposed.
- *aliasof* relationships reflect duplication of requirements. They should be reviewed and if agreed, removal of redundant text may be proposed.
- *sonof* relationships reflect implication. In some way it indicates a redundancy because satisfying the father requirement implies that the sons are also satisfied. They should be reviewed and if agreed, removal of redundant text may be proposed.

4. Recommendations

The working group is recommended to:

1. Make use of the ATN Requirements Database as a tool to help control the validation of the ATN draft SARPs.
2. Consider the outstanding issues identified above.
3. Determine procedures for ensuring alignment of the database and future versions of the draft SARPs and Guidance Material, and for handling defect reports that are specific to the database itself.

Attachments:

1. Guide to the ATN Requirements Database.
2. Sample Report