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Issues on ATN RDB work

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SUMMARY

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1. Introduction

The ATN Requirements Database last release is version 1.1, dated 11 February 95. It was not upgraded after version 3.0 of the draft ATN SARPs was issued.

A brief scan through the new SARPs text confirms that the amount of work required to perform the alignment is important, assuming that we maintain the current database concept.

At the same time, past experience has shown that the current database concept and its tight relationship to the SARPs text does not correspond fully to the user's expectations.

Since plans are now being made to upgrade the RDB, this document gives a summary of the issues that must be considered.

2. Issues related to RDB upgrade

2.1 Use of RDB for SARPs maintenance

The first objective of the RDB was to help the SARPs maintenance process. The SARPs and Database editors were responsible for maintaining the necessary alignment. The role of the database in this process was to provide the means for automating some consistency checks and keep track of the modifications.

The RDB work has shown that these consistency checks are difficult to perform because of informal/imprecise formulations and redundancy between plain text and PICS/APRL information. At some point in time, it was proposed that the database become the reference source of requirements from were the SARPs text would then be derived. Until such a decision is taken, it seems inevitable that the database will have the same informal/imprecise quality as the SARPs text.

In addition to that, alignment is currently maintained by manual procedures agreed between editors. As shown by last events, large modifications to the SARPs make this impractical, or even impossible. Therefore, we have no guarantee that the same alignment problem will not happen again in the future.

2.2 Use of RDB for ATN validation

The current RDB concept does not give any hierarchy to the database content. Hence when using the database to establish a relationship between a validation exercise and a set of SARPs requirements, the user is overwhelmed by the number of low-level requirements he has to consider. It is not uncommon that one validation exercise points to 500 entries. Note that this is based on real life experience.

The situation that arises is very similar to the PICS definition problem: how to define the right level of PICS information so that all major features/options are referenced, but without itemising individual requirements.

The current RDB does not provide an answer to this problem. Introducing some hierarchy requires that a preliminary work is done on the SARPs text itself to derive PICS-like tables for all textual sections. This is a possible intermediate steps towards a new database concept to be defined. At a second stage, when all SARPs are mapped on PICS/APRL tables, low-level relationships can be established between PICS/APRL entries and individual low-level requirements.

2.3 Use of RDB by implementors

The current database concept has value for implementors because it provides a hook for development tools, traceability tools, etc. However, this assumes that categorisation information is properly maintained. In particular, it is important that requirements are clearly sorted by types of systems (ES, BIS, ABIS, etc.) and whether they apply to systems developers (how systems are built) or to network administration (how systems are used).

Current SARPs text does not reflect such a clear categorisation, although it has improved since version 2.0. The once proposed SARPs restructuring work has been put on hold until end of Package 1. If a complete database has to be re-generated it would be more beneficial to wait until the text is restructured.

3. Conclusion an recommendations

If work to update the RDB is planned it should take into account the preceding issues. Because of the current context and tight planning for package 1 validation, the emphasis should be given to the help this database could provide in contribution to ATN validation (see issue on ATN validation).

It is recommended that RDB work is planned in two phases:

- Phase 1: modification of the database concept and of its future relationship with the SARPs and Guidance text. This phase should also deliver a comprehensive set of PICS/APRL tables that reflect the complete SARPs. This set of PICS/APRL can be viewed as the high-level part of the database. It is believed that this high-level database is sufficient for the ATN validation work. See appendix 1.

- Phase 2: construction of the low-level part of the database by indexing individual text requirements and establishment of relations with high-level requirements defined in phase 1. See appendix 2.

It is recommended that phase 2 work does not start until we have guarantees that no future SARPs text restructuring will endanger the database work. This may imply that either all text restructuring is performed before the database work, or that text restructuring is performed under control from the database. When the database is complete, it should become the primary source of SARPs.

Appendix 1: Proposal for Phase 1 work

The proposal is to create a consistent set of PICS/APRL tables that represent the full SARPs material, more or less like a PICS proforma represent a base standard. Obviously these tables will not contain exaustive references to individual requirements/recommendations but rather references to sub-sections of the text. This exercise has the following advantages:

- tables are very easy to process with database tools, and easier to bring to a consistent level.
- it provides the high-level view of the SARPs material we miss at present.
- they can be easily organised per category of systems.

SARPs text needs to be reviewed so as to be create new ATN-specific PICS proformas which exhaustively refer to the relevant sections of the SARPs and define the appropriate status. The level of details of these new tables will directly impact the cost of the solution. They should itemise at least the recommendations.

The set foreseen is as follows:

1) SARPs on ATN topology and ATN operators/administrators
   - (new) PICS proforma from section 2.5 and 3.
   - (new) PICS proforma on addressing (can be very short)
2) SARPs on ATN systems and ATN system implementers
   - 2a) End Systems
     - (new) Transport specific PICS proforma
     - Transport APRL
     - (new) Network specific PICS proforma
     - Network APRL (ES part)
   - 2b) Ground-Ground BIS
     - (new) Network specific PICS proforma
     - Network APRL (IS part)
     - IDRP APRL (8.3.3)
   - 2c) Air/Ground BIS
     - (new) Network/Routing specific PICS proforma
     - Network APRL (IS part)
     - ES-IS APRL (8.2.2)
     - IDRP APRL (8.3.3)
     - Mobile SNDCF APRL (7.11)
     - Routing initiation APRL (7.12)
   - 2d) Airborne BIS
     - (new) Network/Routing specific PICS proforma
     - Network APRL (IS part)
     - ES-IS APRL (8.2.2)
     - IDRP APRL (8.3.3)
     - Mobile SNDCF APRL (7.11)
     - Routing initiation APRL (7.12)

Appendix 2: Changes needed on current database concept

Requirement tagging/colouring was defined as an ad-hoc procedure for importing information from SARPs into the database. It was conceived as a one-off procedure. Once the database was constructed, manual procedures were defined to maintain alignment. Another linkage concept may be required if we want to avoid this situation again in the future.

MORT tables are obsolete.

User Requirements as currently defined no longer exist. This work is not completed and it is likely that package 1 SARPs will not contain any reference to them.

Without SARPs text outline information, the database appears as a (very long) flat list of requirements. Since outline has been largely modified and renumbered, this information must be regenerated.

Currently, a database PICS/APRL entry is either a requirement, a recommendation or an option depending on the ATN status column. This has to change because multiple columns have been introduced in version 3.0. This means that a PICS entry may be, say, a requirement for ground BISs and an option for Airborne BISs.

Most of the relationship information will be lost in the alignment process. It is not clear whether these relationships should be re-generated in the same manner. Alternate solution is to put more style constraints on the way SARPs text is written to reduce the need for relationships.