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AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL
SECOND MEETING

Montreal 4th - 15th November 1996

Agenda Item 5: Preparation for future CNS/ATM Packages (SARPs and guidance material) and other related documents for the ATN

Proposed Strategy and Approach for the Future Development of SARPs and guidance material for the Internet Communications Service

(Presented by ATNP WG2 Rapporteur)

WORKING PAPER

SUMMARY

This Working Paper proposes the basis of a future work programme for the WG responsible for the further development of the SARPs and guidance material for the Internet Communications Service. The Paper proposes a high level future work programme strategy that consists of two main areas of work. The first area is related to supporting operational implementations of the Package 1 SARPs compliant Internet Communications Service. The second area of work is related to the development of additional SARPs and guidance material for additional functionality that may be required by the Users of the service.

REFERENCES

1. Introduction

1.1 Working Group 2 agreed, at its ninth meeting, on the principles for a overall strategy for the future work programme for the WG responsible for the further development of the Internet Communications Service SARPs and guidance material. This strategy essentially comprises two key areas:

- Firstly the WG must review and resolve feed-back from States/Organisations developing Package 1 compliant implementations planned for use in operational environments and modify existing SARPs and guidance material only where defects are detected; and
- Secondly the development of additional SARPs and guidance material for the Internet Communications Service for "Package 2" must be based upon agreed "User Requirements".

1.2 With respect to the second part of the strategy the WG agreed on a "top-down" approach to be adopted for the development of additional SARPs and guidance material for the "Package 2" Internet Communications Service definition. In addition the WG identified a number of key areas of potential functionality that may be necessary for the Package 2 definition, these being subject to endorsement by the appropriate "User".

2. Background

2.1 Since the first meeting of the ATN Panel (ATNP/1, June 1994), the activities of Working Group 2 have been focused on the development and validation of the draft SARPs for the Internet Communications Service. As a basis for the development of these draft SARPs the WG adopted the proposed Second Edition of the ATN Manual. That document in turn had been developed by the SICAS Panel who had based its development upon implicit and assumed User Requirements, this being inevitable at the beginning of the standardisation process, where no explicit User Requirements had been expressed.

2.2 In the absence of such explicit User Requirements the Working Group initially adopted the principle that the Internet Communications Service definition should allow for flexibility and growth potential whilst taking into account various implementation constraints. This resulted in the definition of the "Package1" definition which was originally envisaged at ATNP/1 to be the "minimum functionality" solution.

2.3 Approximately one year after ATNP/1 the reported capacity constraints of the airborne platforms disappeared and various explicit User Requirements were received from several sources. This gradually resulted in the Package 1 as defined today which includes more functionality than was originally envisaged for a "minimum functionality" solution.

2.4 The approach for future work which may include the development of additional draft Internet Communications Service SARPs should be based on the analysis of the development process that has resulted in the current Package 1 definition. Furthermore, the future work of the Panel on further SARPs development must clearly, as a high priority objective, support the development of operational implementations.

3. Discussion

3.1 As stated in the introduction the strategy proposed for the future work programme related to the Internet Communications Service comprises two main threads:

- Resolution of feed-back resulting from the development of systems to be deployed in Operational environments;
- Development of additional SARPs and guidance material for the Internet Communications Service for "Package 2" based upon agreed "User Requirements".

3.2 Feed-Back from and support of Package 1 compliant Implementations

3.2.1 The draft ATN SARPs will constitute a significant amount of material with which systems are required to comply. In spite of the enormous validation of the material that has taken place the Panel should be prepared to expect input resulting from States/Organisations developing implementations of SARPs compliant systems planned for use in operational environments. Such input/feed-back is expected to comprise:

- defects/inconsistencies in the technical requirements defined in the SARPs;
- functional areas for which additional SARPs are required to ensure inter-operability;
- functional areas for which SARPs have been defined but are considered over-specification;
- editorial defects in the SARPs;
- additional and/or incorrect guidance material.

3.2.2 The appropriate WG to which such input is submitted should be tasked with developing resolutions to the problems indicated and disseminate such input and proposed resolutions to the aeronautical industry for comment prior to any recommendation proposing amendments to the SARPs. Since ATNP/1 Working Group 2 has maintained the operation of a "Change Control Board" (CCB) that has comprised members of the Working Group. The CCB has reviewed the majority of defects and proposed defect resolutions prior to any final submission to the WG. The operation of the CCB has, to date, worked well. It is recommended that the CCB continue to operate post ATNP/2 under the management of the appropriate WG. Its procedures, function, membership and role, however, should be enhanced to meet the requirements related to supporting operational implementations of the SARPs. To date the operation of the CCB has covered only the draft SARPs material and not the guidance due to its relative immaturity. However, the guidance material is now considered to be stable and it is recommended that it also be covered by the CCB post ATNP/2.

3.3 Development of draft SARPs for Package 2

3.3.1 The proposed principle for the development of additional SARPs and associated guidance material for Package 2 is that it should be based on and support agreed operational concept(s), implementation plans and User Requirements. In order to follow this principle, priority should be given to capturing and interpretation of operational concepts and User Requirements.

3.3.2 The term User Requirement is a general term representing all requirements including direct and derived operational/implementation requirements which (may) have to be fulfilled by the ATN internet.

The captured User Requirements and operational concepts should be translated to functional requirements for the ATN internet. During this phase there is a need for an intensive interaction with the "providers" of the User Requirements and operational concepts to ensure that the provided information is of relevance and is correctly interpreted.

3.3.3 Before initiating any development of additional SARPs and guidance material for the Internet Communications Service, presented in the ATNP/2-WP for the Internet Communications Service draft SARPs, all ATN SARPs should be assessed against the derived functional requirements. In general the result of such an assessment can be that one or more functional requirements can be met through modifications of the current SARPs or require the development of additional SARPs.

3.3.4 The described approach is known as a "top-down" approach. In addition it is important to make the known sources of User Requirements and operational concepts aware of the potential capabilities of the Internet Communications Service. The approach is based on providing maximum support to the implementation and the operation of the ATN by timely adaptation of the SARPs based on identified defects and/or User Requirements and Operational Concepts.

3.4 Potential Functionality to be Standardised in "Package 2"

3.4.1 Based upon a number of inputs to the WG2 on potential Internet Communications Service functionality that may potentially require standardisation in Package 2 the following list has been compiled:

The WG has agreed the following list of functional areas that may require standardisation in Package 2 to meet future agreed User requirements placed on the Internet Communications Service:

- integration of Asynchronous Transfer Mode and Frame Relay type subnetworks within the ATN architecture for ground/ground communications;
- integration of the HF subnetwork within the ATN architecture for air/ground communications;
- potential broadcast/multi-cast communications requirements;
- potential air-to-air communications requirements
- incorporation of the Network and Transport Layer Fast Byte Protocols (ISO DIS 14699 and ISO DIS 14700);
- Broadband Transport;
- Systems Management requirements;
- Security requirements ;
- Quality of Service Management requirements;
- financial accounting mechanisms.

3.4.2 In developing any SARPs to support any of the areas identified above it is recommended that the Panel agree on a principle that any system compliant with Package 2 and beyond shall be required to inter-work and inter-operate with a Package 1 compliant system. Any other situation is considered to be unacceptable unless well justified and is acceptable to States, Organisations and Aircraft Operators.

4. Recommendation

The panel is invited to:

a) endorse the strategy proposed by WG2 for the future work programme related to the

development of draft SARPs and guidance material for the Internet Communications Service i.e. that the responsible WG:

(i) Within the Panels overall terms of reference, support the implementation of Package 1 compliant operational systems and that this activity be treated with the highest priority;

(ii) develop additional SARPs and guidance material in line with the principle that any additional functionality be based upon agreed User Requirements i.e. a "top down" approach .

b) In support of a) (i) recommend that States/Organisations developing operational implementations of Package 1 compliant systems provide feed-back on any issues related implementation of the Package 1 SARPs which may include the need for additional SARPs where defects have been identified;

c) In support of a) (i) that the responsible WG continue to monitor and co-ordinate, to the extent possible, the on-going validation of the Package 1 SARPs;

d) In support of a) (i) agree on the need for a Change Control Board (CCB) to be under the management of the responsible WG and whose objectives, procedures, membership are determined by that WG;

e) In support of a) (ii) agree on the principle that notwithstanding b) above that the need and development of any additional SARPs and guidance material be based upon the following phases:

(i) Capture and interpret User Requirements and operational concepts;
(ii) Derive functional requirements for the Internet Communications Service;
(iii) Assess the suitability of the Package-1 Internet Communications Service SARPs to meet the functional requirements;
(iv) Where agreed User Requirements cannot be met with the Package 1 definition even with modifications, develop additional draft SARPs and associated guidance material for the Internet Communications Service;

f) In support of a) (ii) recommend that "providers" of User Requirements and operational concepts are informed about the potential capabilities of the Internet Communications Service with the objective to direct and correctly formulate their requirements and operational concepts;

g) Seek endorsement from appropriate Users on the need for the functionality (or not) of any of the functions listed in section 3.4, and for those functions for which the need is confirmed, initiate the development of appropriate SARPs and guidance material;

h) Re-affirm the objective that any equivalent Package 2 SARPs compliant system shall be capable of successfully inter-operating with a Package 1 compliant system i.e. the Package 2 definition shall be backwards compatible.