

**AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL**

**WORKING GROUP 3 MEETING**

**Munich, 24-28 June 1996**

**Agenda Item 6: Air-Ground Applications SARPs**

**REPORT OF SUBGROUP 2 ACTIVITIES**

(Presented by M J A Asbury)

**SUMMARY**

This paper reports on the latest two meetings of Subgroup 2, at Toulouse and Vancouver, held since the last WG 3 meeting.

**1. INTRODUCTION**

1.1 On departure from the 6th Meeting of Working Group 3 (WG 3/6) in Brussels, Subgroup 2 was tasked, in addition to carrying on with its current work programme, with a specific set of instructions resulting from discussion of the application of ground/ground forwarding as an additional functionality within the draft material for Standards and Recommended Practices for the air/ground data link applications. These instructions are at Appendix A to this paper.

1.2 In addition, WG 3 had approved the draft SARPs material as suitable for baselining as version 3.0, subject to the changes recommended in the instructions being put in place. The decision whether or not to submit the SARPs as baselined would be made by the Subgroup during their next meeting. If baselined, the SARPs would be put on the CENA server.

1.3 The Subgroup has had two meetings since WG 3/6: its eighth meeting was held in Toulouse from 29th April - 3rd May, and its ninth in Vancouver from 10 - 14 June. The closeness of these meetings reflects the tight schedule and high workload of the Subgroup.

1.4 This paper reports on the activities of the Subgroup particularly in relation to the specific actions passed to it by WG 3/6, and the effect this has had on the rest of the programme.

## 2. SPECIFIC ACTIONS

### Toulouse

2.1 The meeting in Toulouse was almost entirely preoccupied with discussing how to fulfill the specific actions, given the constraints of no additional applications, minimal changes to the SARPs material as presented to WG 3/6. It was generally agreed that the cleanest way of providing air/ground and ground functionality would be through the use of two or more discrete Application Service Elements per application. But this was tantamount to developing new applications, and was not acceptable, although technically this is the way that the Automatic Dependent Surveillance application currently differentiates between air/ground and ground functionality.

2.2 The Subgroup ultimately agreed that the optimum way to proceed was to minimise changes to the SARPs material as presented, develop the necessary validation objectives along the lines indicated by WG3/5 Flimsy 12, and to initiate development of subsetting rules, which would allow acceptable combinations of validated functionalities to remain as interoperable sets, provided that the functional units were themselves validated.

2.3 One set of Validation Objectives covering all four applications was developed - these are outlined in Appendix B, and discussed further in a paper (7-29) prepared under Agenda Item 7.

2.4 The need to develop formal subsets arose from discussion as to whether air/ground and ground/ground (and, to complicate matters, Downstream Clearance) functionalities were different modes, and how one could list relevant applicable paragraphs, when to a great extent, paragraphs were not clear stand-alone elements, but in many cases were conditional on some previous set of circumstances. The Subgroup noted that subsetting proposals had been made at an earlier WG 3 meeting, but had been ruled out, in order to keep options limited, implementation relatively simple and the SARPs as straightforward as possible. However, there seemed to be no acceptable alternative solution, and the concept of subsets, and the need to accept formal subsetting rules, was duly accepted.

2.5 The remainder of the Toulouse meeting was taken up with making corrections to the SARPs based on input to and from WG 3/6. To the extent possible, therefore, the Subgroup considered that it had met the majority of the actions requested, if not in specific detail, then at least in planning and concept, leaving the details to be worked out at the next meeting (Vancouver).

2.6 However, based on the need for a significant change in concept, and hence an additional chapter in the SARPs for each application, the Subgroup did not feel that the SARPs were suitable for baselining as version 3.0, since it was felt that the WG should review and approve the change in concept and content.

2.7 Nevertheless, the members felt that some updated material should be put on the server, to provide guidance for those organizations who were developing SARPs validation programmes. At that time, the latest version available was version 1.0, arising from the WG3/5 meeting.- it was decided to add version 2.1, as corrected at WG 3/6, but not including the proposed updates for the WG 3/7 meeting.

### Vancouver

2.8 At the next meeting in Vancouver, the main tasks were to clear up the subsetting rules, and match the VOs to the 'shall' statements.

2.9 With regard to the subsetting, it was decided that it would be better to follow the OSI method of operation, and develop every technically permissible subset, regardless of whether the combination of functionalities was operationally acceptable. It would be up to the ADSP to decide on a minimum functionality for each application. This would allow the variability required by the WG 3/6 meeting, although not allowing a paragraph by paragraph identification.

2.10 A new Chapter eight was developed for each application, again to a standardised format, indicating, for both air and ground, which combination of functionalities were technically permissible.

### **3. ADDITIONAL TASKS**

3.1 Scrutiny of the SARPs by both the editors and user groups had identified a number of defects, which had to be reviewed by the Subgroup in its role as Configuration Control Board. Although many were trivial, other identified defects had a significant impact on particular SARPs. Defects will be reported on an application by application basis within the relevant Working Papers.

3.2 The SG reviewed the mechanism for dealing with defect reports, particularly during the period when the SARPs themselves will be frozen by the need for ICAO stability prior to the ATNP/2. The concern of the Subgroup was that several organisations are reviewing the SARPs prior to starting the necessary validation or implementation work, and defects and misunderstandings are being identified. These cannot be disregarded merely because ICAO cannot cope with short term amendments. A suitable path for processing defect reports was identified, and is demonstrated in the diagram in Appendix C.

3.3 The Eurocontrol developed 'shall statement' data base programme was demonstrated. The SG agreed that there was a use for the programme, particularly the 'shalls' listing and identification. It saw the possible first use on the material in the approved Version 3.0. Eurocontrol would be consulted on the possibility of tailoring the programme to suite the air/ground SARPs.

3.4 A paper had been prepared for the SG outlining future development of Guidance Material, using ADS as an example. At present the highest level of GM is the ADSP Manual, but this is not specific enough for individual applications. SG 2 is aware of potential implementation strategies being considered - for example the idea of a single CM server for a whole State or Continent. GM should contain at least some sample scenarios for reference. However, the SG members also cautioned about becoming too specific - it was not in the business of telling the world how to implement data link.

### **4. FUTURE WORK**

4.1 The Subgroup plans to have one more meeting, in Washington, from 26-30 August, in order to develop the validation work in time for the October meeting of WG 3. The need to develop the subsetting plans has reduced the time available for this work. In addition, the SG will update the work on Defect rectification, with a view to preparing an update paper for submission through WG3 to ATNP/2.

### **5. CONCLUSION**

5.1 The SG have a continuing programme, particularly on the development of validation work, and the detailed preparation of Guidance Material. In addition, there is a need to act, particularly in the relatively short term, as a focal point for defect monitoring, reporting, correction and dissemination.

5.2 There is still outstanding technical work relating to functionalities and operational requirements identified in the ADSP Manual and by the ADSP and needing to be incorporated into a full ATS data link operating environment. Whether some of these become upgrades to the initial version of the SARPs, or become a part of a whole new Package 2 has yet to be decided, but the work of the SG will continue to be required.

End

**SPECIFIC ACTIONS FOR SG 2 FOR ITS NEXT MEETING IN TOULOUSE**

1. Arising from discussion at the WG 3 meeting, SG 2 was tasked at its Toulouse meeting (29/4 - 3/5) to review the SARPs and:

a. Develop validation objectives and provide traceability for air/ground, ground/ground and DSC functionality separately

b. Provide guidance material indicating which paragraphs apply to -

- i. the air/ground,
- ii. ground/ground forwarding and
- iii. DSC,

thus indicating which do not need to be implemented depending on which functionality is being validated,

c. Review the SARPs Material, taking account of the following technical considerations

- in a single ASE implementation only part of the ASE may be validated,
- what the impact will be on the other aspects of the ASE.
- how much effort will have to be put in by the SG on developing the additional material, vice putting in another ASE.

d. Review technical flexibility and possible future evolution

e. Investigate and implement if necessary DSC as an independently validatable functionality

f. Review the possibility of having state tables etc. for each mode, or other means of subsetting modes (by ATNP/2)

g. Consider whether the subset for air/ground is in fact truly separable in terms of functionality, such that the addition of DSC and ground/ground forwarding would not change its functionality.

Finally the SG will have to deal with a number of defects and will have to consider which takes the most time - correcting the errors or taking it out, or separating this out.

## AIR GROUND SARPS - VALIDATION OBJECTIVES

### System

- SV01: To determine which ORs within ICAO draft manual of ATS data link applications (ref) are satisfied by the functional descriptions in combination with the user requirements of the XXX SARPs.
- SV02: To determine if the CM, ADS, CPDLC and FIS applications are mutually consistent e.g. version numbers are assigned so they can be carried by CM.

### Functional (Specific)

- FV01: To determine if the functional descriptions of the XXX SARPs are satisfied by the technical requirements identified in the XXX SARPs.
- FV02: To determine if the user requirements and recommended practices are consistent with the technical requirements.

### Functional (General)

- FV03: To determine if the XXX SARPs are complete.
- FV04: To determine if the XXX SARPs are unambiguous.
- FV05: To determine if the XXX SARPs are consistent.
- FV06: To determine if there are any requirements in the SARPs which would have no effect if removed.
- FV07: To determine if provision has been made to ensure that SARPs are implementation independent.

### Technical

- TV01: To determine if the protocol description supports the end-to-end services.
- TV02: To determine if the protocol description has any unacceptable behaviour (e.g. deadlocks, livelocks, invalid states, etc.).
- TV03: To determine if ASI parameters are mapped appropriately to PDU fields and/or DSI parameters and vice versa.
- TV04: To determine if protocol errors in the peer AE are correctly handled.
- TV05: To determine if the SARPs are consistent with the ULA, e.g. use of the dialogue service, application control function, etc.
- TV06: To determine if the APDUs are correctly specified.
- TV07: To determine if provision for QOS management has been addressed.
- TV08: To determine if provision for future migration has been addressed.
- TV09: To determine if efficiency requirements have been addressed, e.g. minimise size of data transfer, appropriate maintenance of dialogue.

**DEFECT REPORT PROCESSING PATH**

