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3rd November 1995

To: ATNP WG2 Members & Interested Parties

Report of the ATN Panel 6th WG2 Meeting
Banff, Canada, 16th - 20th October 1995

Please find attached the First Issue of the Report of the Sixth ATNP WG2 meeting. Any comments by those who attended the meeting would be greatly appreciated by the 17th November so that they may be included in a revision of the report if appropriate. Any clarification relating to the proceedings of the meeting by those who have an interest but did not participate should be sent to me ideally addressed to the above internet e-mail address.

As agreed the next WG2 meeting will take place in South Brisbane, Australia in the period 5th - 9th February. It is essential that all agreed actions are completely within the agreed time-scales in order to make that meeting a success. As identified in Banff that , due to lack of available resource, there is significant risk in the WG not being able to complete the guidance material to the level and depth envisaged. Should your State/Organisation be in a position to offer additional resource over the coming months to work on this activity it would be greatly appreciated and I look forward to receiving positive responses to this effect.

Version 3.1 of the Draft Internet SARPs ("Sub-Volume V") is planned to be made available on the atn-internet mailing list by 31st December 1995. As agreed this Version will be provided with a summary of changes along with revision marks visibly indicating all changes that have been incorporated from the Version 3.0 agreed at the 5th meeting (Rome).

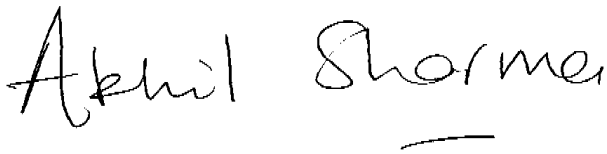
No major changes to technical requirements or additional requirements to Version 3.0 were agreed in the Banff meeting. There is, however, one outstanding area that relates to the inclusion of appropriate Congestion Management provisions for CNS/ATM-1. It has been agreed that such provisions would be incorporated at the 7th WG2 (February 1996) pending demonstrable benefits resulting from on-going EUROCONTROL and US simulation studies.

An agenda for the next WG2 meeting will be sent out in due course. In the mean time I would request that only WPs relevant to the agreed actions are developed for presentation at that meeting unless otherwise considered essential.

As advised in Banff the ATNP WG Rapporteurs will be providing the ANC with a brief presentation (1/12/95) on the ATN in general and the progress of the ATNP WGs. Should you wish any particular issues to be addressed please inform either myself, Ron Jones or Tom Calow so that they may be taken into account.

As a final point in order to avoid unnecessary photocopying costs please bring a copy of this report and any Working Papers made available prior to the next meeting with you if you plan to attend.

Yours Sincerely



Akhil Sharma
(Rapporteur ICAO ATNP WG2 (ATN Internet WG)

ATNP/WG2/6/Report
3rd November , 1995

AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL
Banff, Alberta, Canada
16.10.95-20.10.95

Issue 1.0

ATN Internet Working Group 2 (WG2)

Sixth Meeting Report

1. Agenda Item 0 - Meeting Organisational Issues

At the initial ATNP-1 meeting held in Montreal 8-21 June 94, three working groups were created in order to further the work of the Panel. This is a report of the sixth meeting of Working Group 2 (WG2) of the ATNP which took place in Banff, Alberta, Canada in the period 16th - 20th October 1995.

Twenty three experts from seven States (Brazil, Australia, Japan, Germany, USA, France, UK) and four International Organisations (ARINC, INMARSAT, IATA, EUROCONTROL) attended the meeting. The list of attendees is at Appendix A. A total of thirty three Working Papers were submitted to the meeting, the list is at Appendix B.

2. Agenda Item 1 - Approval of Agenda and Objectives

2.1 Mr. Sharma, Rapporteur of WG2, opened the meeting and drew the participants attention to the Working Papers that had been prepared for the meeting and, in particular, to WP/157 comprising the agenda, a list of all known working papers, their assignment to agenda items, a list of meeting objectives, and a proposed schedule for the meeting. This had been prepared by Mr. Sharma in advance of the meeting.

2.2 The meeting agreed the objectives for the meeting as proposed in WP/157 and reproduced below:

- To resolve issues arising out of the Rome WG2 meeting
- To review relevant issues arising out of other related WGs (WG1, JWG) & Panels
- To review progress on assigned WG2 actions
- To review report of the CCB
- To endorse/reject CCB Recommendations as appropriate
- To review outstanding VRCIs (i.e. those not yet reviewed by CCB)
- To agree on NSAP Registration Procedures
- To review Sub-Volume V of the CNS/ATM-1 SARPs & Guidance Material (Internet Communications Service)
- To review Role of ATN Internet Requirements Database
- To initiate development of CNS/ATM-1 Sub-Volume V Validation Report.
- To identify potential CNS/ATM-2 Internet Requirements
- To develop and agree detailed work plan up to ATNP/2
- To review and resolve any issues brought to the attention of the WG by the Panel Secretary.

2.3 The agenda was adopted as proposed in WP/157 and reproduced in Appendix C.

2.4 The current WG2 action list, as reproduced in WP/157, was reviewed and the following was reported:

- **Action 2/8** - On-going - It was agreed that the resulting User Requirements Document would be a separate deliverable to ATNP/2 following discussion of whether it would be appropriate to merge the results of the action in either the draft SARPs, guidance material or the validation report. Mr. Hof explained that no progress on the task was due to lack of available resource. He would
- **Action 2/29** - Closed
- **Action 2/37** -Closed
- **Action 2/59** - Closed
- **Action 3/2** - Closed
- **Action 3/4** - Closed - It was agreed that this action should be merged with action 2/8. It was further agreed to therefore amend the title of action 2/8 to include the term "Operational Requirement".
- **Action 3/6** - Closed - It was agreed to merge the results of this action with action 2/8.

- **Action 3/12** - Closed.
- **Action 4/1** - On-going
- **Action 4/2** - Closed
- **Action 4/5** - Closed
- **Action 5/1** - Closed
- **Action 5/2** - Closed
- **Action 5/3** - Closed
- **Action 5/4** - Closed
- **Action 5/5** - Closed
- **Action 5/6** - Closed
- **Action 5/7** - On-going - Mr. Hof stated that initial co-ordination on Congestion Management had taken place recently with the FAA within the context of a MOC between EUROCONTROL and the FAA.
- **Action 5/8** - Closed
- **Action 5/9** - Closed
- **Action 5/10** - Closed - Refer to WP/183
- **Action 5/11** - Closed
- **Action 5/12** - Closed
- **Action 5/13** - On-going

3. Agenda Item 2- Issues arising out of WG1/3 and JWG/3 WG Meetings

3.1 Mr. Calow, Rapporteur of WG1 provided a verbal report of the proceedings of WG1/3 and the JWG/3 that had taken place in the previous week. WP/175 and 176, the reports of these two meetings would be made available towards the end of the meeting since they were currently under review.

3.2 With respect to WG1 Mr. Calow reported:

- that as a result of the need to determine Post CNS/ATM-1 requirements that the WG recommended that a joint meeting of ATNP WG Rapporteurs and ADSP Rapporteurs take place. Mr. Calow reported that since the ADSP was meeting in December and the ATNP Rapporteurs will be presenting ATNP progress to the ANC in December the proposed joint meeting would most likely take place in that timeframe;

- that WG1 had assessed the current total number of draft **SARPs** for CNS/ATM-1 to be in the region of 1000 pages and that this fact would be presented to the ANC;

- that the dates for ATNP/2 had been confirmed for a two week period from 6th November 1996, this being, subject to completion of the new ICAO HQ building in Montreal;

- that WG1 had established a drafting group to further develop Sub-Volume 1 of the CNS/ATM-1 SARPs and guidance material based on the draft WG2 input which proposed an initial version as a result of the Fairfax WG2/WG3 meetings;

- that WG1 had some considerable discussions on the use of CIDIN as an ATN subnetwork and the validation of the CIDIN SNDCF draft SARPs that were contained in Version 3.0. He reported that WG1 had developed a Flimsy encouraging States/Organisations to validate the material.

- WG1 had discussions on CNS/ATM-2 Package security requirements and would be forwarded the resulting WG2 related flimsy to WG2.

3.3 With respect to the Joint Working Group Mr. Calow reported that:

- the meeting discussed and agreed the high level structure for the CNS/ATM-1 Package SARPs and guidance material;

- the ATNP WG's were encouraged by the Panel Secretary that all stable draft material be forwarded to ICAO in WordPerfect 5.1 format although this was not essential since ICAO would otherwise perform the conversion;

- stable draft CNS/ATM-1 SARPS and guidance material be forwarded to ICAO no later than June 1996 in order to allow sufficient time for translation for ATNP/2;

- the next series of WG meetings would take place in Australia, South Brisbane as follows:
  - WG1 29th January - 1st February
  - JWG 2nd February
  - WG2/WG3 6th February - 10th February (WG3 may extend to 1.5 weeks)

3.4 Mr. Sharma stated that he had made a statement to the JWG that the Sub-Volume V draft SARPs (i.e. the Internet SARPs , formerly Part V) could be sent to ICAO following the February 1996 meetings and that WG2 should confirm this fact at the end of this meeting.

4. Agenda Item 3 - Approval of the Rome WG2 Meeting

4.1 Before discussing the Rome report Mr. Sharma asked which members were not subscribed to the "atn-internet-technical" mailing list since the Rome meeting report was only made available issued via this channel. The Australian, Brazilian and INMARSAT representatives indicated that they were not as yet subscribed to this list and would therefore require hard copies of future WG2 reports.

4.2 Mr. Colliver stated that there had been a number of problems with respect to e-mail distribution via the mailing list particularly with respect to messages addressed to the FAA and lengthy e-mails addressed to Japan. Mr. Colliver undertook to develop a Flimsy (#1, Appendix D) indicating the precise nature of the problems including the addresses with which there were problems.

4.3 With respect to the Report of the Rome meeting Mr. Whyman noted that the report had not actioned anyone to ensure that the ACA compression algorithm in the Version 3.0 SARPs was correctly aligned with the Rome revisions to the NSAP address. Mr. Crenais informed the meeting that he had received appropriate material following the Rome meeting from Mr. Ron Jones and that this had been incorporated in Version 3.0.

4.4 The report of the Rome WG2 meeting was approved without amendment.

5. Agenda Item 4 - CNS/ATM-1 Registration Authority

5.1 Mr. VanTrees joined the meeting to present WP/179 concerned with the establishment of a Registration Authority for CNS/ATM-1 Package addresses. The WP was a slightly modified version of a WP that had been presented to the JWG meeting and proposed that a registration authority be established comprising two parts, the first part relating to the NSAP addresses and the second part relating to application names. With respect to the first part the WP proposed that in order to ensure efficient routing in the global internet that WG2 be the responsible body for administering the ARS field since this field defined the routing domain and as such assignment of such values needs to be co-ordinated. With respect to the second part the WP proposed that WG3/SG3 be the responsible body for administering application names. The WP further proposed that the current list be maintained on the CENA internet server.

5.2 Mr. Hennig proposed that the term FMS be replaced with LRU on page 1 paragraph 3. This was agreed. Mr. Hennig questioned whether the proposal in the WP with respect to allocation of the ARS field was

applicable to both mobile and fixed systems. It was clarified that the proposal was only related to ground Addresses and recognised that mobile ARS fields were 24 bit addresses allocated by ICAO.

5.3 Mr. Whyman opposed the proposal in WP/179 with respect to ARS allocation on the grounds that it would be in conflict with the current draft SARPs which required administrations to allocate these ARS values. This was agreed. (**Rapporteurs Note:** - Having reviewed Version 3.0 of the draft SARPs following conclusion of the meeting it appears that there is an anomaly between the WGs understanding of what is currently stated in the SARPs and what is actually stated, i.e.:

"4.5.6.2 Administration
ARS field values shall be administered by the authority given in 4.5.6.2.1, 4.5.6.2.2, or 4.5.6.2.3, based on the value of the VER field.
4.5.6.2.1 ATSC-Fixed Administration
ATSC ARS values shall be assigned and administered by ICAO.
Note.— Authority may be further delegated to State authorities as required.
4.5.6.2.2 AINSC-Fixed Administration
AINSC ARS values shall be assigned and administered by IATA.
Note.— Authority may be further delegated to aeronautical industry authorities as required."

It is proposed to re-address this issue at the next WG meeting).

5.4 Mr. Hof suggested that the WG recommend ICAO to send out a State Letter advising States to establish appropriate State address registration authorities. Mr. Colliver believed that SICASP/IV may have recommended such action and suggested that this be confirmed. Mr. Hof undertook to develop an appropriate Flimsy (#2) which would document a WG2 recommendation on this point.

5.5 It was agreed that a current list of all assigned CNS/ATM-1 NSAP addresses will be maintained on the CENA Server as a service offered to the ATN community based on the understanding that the information contained in the list would comprise the latest provided information and would have no legal and/or definitive status. This was agreed. Mr. Colliver agreed to develop a Flimsy (#3) that would document the various services offered by the CENA Server including the known NSAP address list.

6. Agenda Item 5 - Review of Sub-Volume V of the CNS/ATM-1 SARPs (Version 3.0)

6.1 Two WPs (158 and 169) under this Agenda Item (note further papers were presented under agenda items 5.x).

6.2 WP/158 presented Version 3.0 of the Internet SARPs. Mr. Sharma thanked Mr. Crenais for having incorporated all changes agreed at the previous WG2 meeting and making the document available in early August as had been planned. Mr. Sharma reiterated the Rome agreement that Version 3.0 should be regarded as the validation baseline draft and that any changes to the technical requirements contained in this draft would only be accepted as the results of validation work. However, he did point out that this did not preclude the WG from agreeing changes of an editorial nature and those which were required to make the document consistent and unambiguous. Mr. Sharma stated that the current draft would need to be aligned with the JWG agreements with respect to replacing "Sections" with "Chapters" and replacing references to "Parts" with "Sub-Volumes".

ACTION 6/1 - MR. CRENAIS - TO REFLECT JWG/3 AGREEMENTS WITH RESPECT TO SUB-VOLUME NOMENCLATURE, REPLACING SECTIONS WITH CHAPTERS IN ORDER TO BE CONSISTENT WITH OTHER CNS/ATM-1 SARPS

6.3 Mr. Sharma then requested high level comments from the WG on the current draft. Mr. Cossa stated that a number of issues from Flimsy #6 of the Rome meeting remain unresolved and had not therefore been included in the draft, he pointed out that these were addressed in WP/187. This WP had been assigned to Agenda Item 5.1 and it was agreed to address these issues under that item. Mr. Whyman raised concerns with respect to Section 2 and in particular with the need to review the structure of that section and the need to align the definitions contained therein with the remainder of the document. He was subsequently tasked to develop a

Flimsy (#4, Appendix G) to propose changes in line with his comments noting that no changes to existing requirements or new requirements would be accepted by the WG.

6.4 Mr. Sharma aired his concerns over the inconsistent use of terminology with respect to traffic type, traffic category, communications class etc. and undertook to develop a Flimsy (#5, Appendix H).

6.5 Mr. Colliver proposed that the next version of the SARPs be based on change pages rather than having to re-issue the entire document. Whilst this approach was considered to be desirable it was believed to be impractical due to the different paper sizes used in various parts of the world. It was agreed to discuss this issue later in the meeting once the total number of agreed changes would be known.

6.6 WP/169 was presented by Mr. Whyman as an Information Paper. This WP highlighted the significant "ATN specific" changes that had been implemented in the Internet SARPs over the past year and the reasons for their incorporation. Mr. Hennig stated that the development of RTCA MOPS for the Router and Upper Layers questioned whether the APRLs in the current version 3.0 of the SARPs contained "all" requirements including those that had been specified in text. The answers was that this is not the case since some requirements do not lend themselves to be expressed in APRL format.

7. Agenda Item 5.1 Report of the CCB/Review of CCB Recommendations

7.1 Three WPs were to be presented under this Agenda Item, WPs 189, 188, 187.

7.2 Mr. Cossa (CCB Chair) presented WP/189. The WP summarised details of current CCB procedures based on WP/66. Mr. Cossa reported that the CCB had not been active since the Rome WG meeting and he had consequently developed WPs 188 and 187 to resolve issues that he considered to be outstanding. Consequently it was agreed that WPs 188 and 187 would be discussed under agenda item 5.2 since they did not reflect the consolidated views of the CCB.

8. Agenda Item 5.2 Review of Proposed Changes

8.1 WP/187 was presented by Mr. Cossa. The WP addressed the issues outstanding from Flimsy #6 of the previous WG2 meeting related to mobile routing initiation, robustness of connectivity, routing domain route propagation, back-off procedures, and clearing causes/leave events.

8.2 Issue 1 of WP/187 addressed the subject of Mobile Route initiation. The WP proposed a change to the current draft SARPs by mandating that ground Routers servicing ground initiated subnetworks (e.g. Mode S) establish a virtual circuit with each and every aircraft of which they are notified based on receipt of a join event from the ground based subnetwork processor (e.g. GDLP in the case of Mode S). This proposal had been rejected at the previous WG2 meeting on the grounds that it should be considered a local issue and that mandating circuit establishment for each aircraft may result in unnecessary overhead on the Mode S link. As a result of the previous WG2 decision two further WPs (180 & 162) had been developed which were presented next.

8.3 WP/180 was presented by Mr. Snively. This WP provides an airline perspective to the rationale of multiple subnetwork availability and their usage. The WP assumed that proposals had been made to limit the air/ground subnetwork usage to one in CNS/ATM-1 and recommended that CNS/ATM-1 must not restrict the use of or selection of air/ground subnetworks for ATSC applications as long as the requirements are met. Mr. Sharma stated that the current definition of the CNS/ATM-1 SARPs (Version 3.0) do not in any way restrict the number of air/ground subnetworks to one and furthermore the current definition is in fact in line with WP/180 which requires that air/ground subnetworks be established based on the need to exchange data. Mr. Hof supported this view and stated that there had been no discussion in WG2 with respect to imposing such a restriction for CNS/ATM-1. Mr. Snively stated that the WP was based upon rumours that he had heard following the Rome WG2 meeting and that WP/180 was presented as a "just in case" paper.

8.4 WP/162 was presented by Mr. Herber. This WP addressed the consequences on the Mode S subnetwork of adopting the proposal addressed in WP/187 Issue 1 and recommended that the WG confirm its

previous decision and reject the proposal. Mr. Herber stated that, whilst he did not support the proposal in question, if User Requirements warranted the establishment of a Mode S subnetwork connection then he would comply but believed that this decision should be left with the ground operator based on local policy.

8.5 The meeting recognised that that was a risk that air/ground data communications could be denied based upon the current provisions and agreed that a modification to note 3 of 3.5.2.3 be developed which would provide additional guidance to ground operators with respect to selecting Option "b" of 3.5.2.3. The revised wording would be presented as Flimsy #7 (Appendix J).

8.6 Issue 2 of WP/187 related to "Robustness of Connectivity" . It was agreed that the current wording in 3.3.1.4 should be more explicit in the need for airborne routers to support multiple concurrent air-ground adjacencies. Mr. Whyman was tasked to develop appropriate wording and present the results in Flimsy #7.

8.7 Issue 3 of WP/187 related to "Route Propagation to RDs more than one hop away from a backbone RDC". It was noted that the Rome WG2 had agreed this point as an issue and had tasked Mr. Whyman to develop an appropriate change proposal (Action 5/12) which was documented in WP/170. The meeting consequently reviewed the appropriate section of WP/170 and agreed the proposed text in "d" of 3.7.3.2.

8.8 Issue 4 of WP/187 related to "Back-off Procedures". The proposed resolution in WP/187 was rejected since Mr. Whyman believed that it still left implementors to work out the applicable causes and was additionally unsure whether the clearing cause code list was complete. Mr. Whyman undertook to review ISO 8208 and to develop a flimsy based on th results of that review (Flimsy #10).

8.9 Issue 5 of WP/187 related to "Clearing Causes and Leave Events". It was agreed that Flimsy #10 take this issue into account.

9. **Agenda Item 5.1** Report of the CCB/Review of CCB Recommendations **(Continued)**

9.1 Mr. Cossa confirmed that WP/66 was still up-to-date and documented currently applicable CCB procedures. He proposed that the CCB should continue to function and undertook to encourage active participation. Mr. Graf also supported that the CCB should continue to function and needed to take a more pro-active role. Mr. Hof also gave his full support to the CCB concept and recommended that it continued to function as originally envisaged. Mr. Sharma requested that any CCB results to be presented to the next WG meeting be available two weeks prior to that meeting. This was agreed. Miss Cosgrove was welcomed as a new member to the CCB. Mr. Hennig undertook to investigate whether IATA and/or the ICCAIA would be in a position to join the CCB and to report back later in the meeting.

10. WG1 Flimsy 1 - Proposed Change to ATNP WG Meeting Dates for Jan/Feb '96

10.1 WG1 Flimsy #1 was presented by Mr. Sharma on behalf of WG3. The flimsy proposed a modification to the meeting dates agreed at the JWG/3 meeting for the next series of ATNP WG1, WG3 & JWG meetings as follows and requested WG2 to comment:

- 30 Jan - 1 Feb. '96 WG1 (Tuesday through Friday)
- 5. Feb. '96 JWG (Monday)
- 6 Feb - 14 Feb. '96 WG3 Tuesday through Wednesday of following week)

10.2 WG2 concluded that:

- it required a 5 day meeting and that this take place Monday through Friday;
- that it did not perceive a need for a JWG meeting;
- that if a JWG meeting was desired by WG3 & WG1 then it take place outside the above referenced 5 day period;
- it would develop a Flimsy (#8) documenting the above addressed to WG3.

11. Update on CCB Ad-Hoc Progress

11.1 Mr. Cossa provided a progress report on the CCB meeting that had taken place earlier in the day:

- he had received a WP (this was allocated WP/190) from JP Briand (EUROCONTROL CCB member) which contained an additional analysis of outstanding VRCIs and proposed that this WP be addressed by the CCB following conclusion of the WG meeting;
- the CCB had started to review WP/188 as requested by the WG which is now superseded by WP/190;
- proposed that by mid-November VRCI(s) will be submitted to the CCB for resolution within the following 2 week period.

11.2 Mr. Sharma questioned whether any of the VRCIs identified in WP/188 or WP/190 contained any major technical changes to version 3.0 of Sub-Volume V. Mr. Cossa believed there to be none such changes but was not prepared to provide a firm commitment until they had been studied further.

11.3 Mr. Hof questioned why the CCB Ad-Hoc could not continue during the week in order to resolve the issues raised in WPs 188 & 190. He also questioned if it was possible to assess whether proposed changes were major based on the originators submission. Ms. Cosgrove proposed that the CCB Ad-Hoc should continue to work through the applicable WPs this week as far as was possible. Mr. Crenais opined that there were just 7 or 8 issues which required resolution and believed that they could be resolved this during the week.

11.4 Mr. Sharma questioned why the outstanding issues in WPs 188 & 190 had not been resolved prior to the WG and hoped that the CCB would take a pro-active role following the meeting. It was agreed that the CCB continue its ad-hoc meeting in order to resolve as many of the outstanding issues as possible and report back to the WG (Flimsy # 6).

11.5 Mr. Bochkarev questioned how he may initiate changes without being a member of the CCB. Mr. Sharma stated that any changes/defects identified by non-CCB members could be forwarded to him in the first instance for onward submission to the CCB.

12. **Agenda Item 5.2** Review of Proposed Changes **(Continued)**

12.1 WP/168 was presented by Mr. Whyman. The paper noted three defects in ISO 10747 identified as a result of on-going EUROCONTROL validation activities. The first of these defects related to an ambiguity in the ISO standard with respect to the "Specification of the Type 1 Authentication algorithm". The second defect related to "Persistent False Routes" ad the third defect related to "Applicability of the MinRouteAdvertisementInterval". The WP recommended revisions to the Version 3.0 SARPs to resolve the first two of these defects which were accepted by the WG with some amendments. In particular the Note under recommendation 1 and "a)" under recommendation 2 were amended to read as follows:

> *"Note. The interpretation of MD4 give in annex B of ISO 10747 is open to ambiguous interpretation and may lead to interoperability problems."*
>
> *"a) The route contains the receiving RD's RDI in its path, or"*

ACTION 6/2 - MR. WHYMAN - TO SUBMIT DR & DRAFT CP BASED ON WP/168 RECOMMENDATIONS TO CCB AS WG2 APPROVED WITH INSTRUCTIONS TO CCB MEMBERS TO VOTE ACCEPTANCE.

12.2 WP/170 was presented by Mr. Whyman in response to actions 5/11 and 5/12 assigned at WG2/5 (Rome '95). The proposed revisions to the section 3 text were approved by the WG.

ACTION 6/3 - MR. WHYMAN - TO SUBMIT DR & DRAFT CP BASED ON WP/170 TO CCB AS WG2 APPROVED WITH INSTRUCTIONS TO CCB MEMBERS TO VOTE ACCEPTANCE.

12.3 WP/171 was presented by Mr. Whyman in response to action 5/6 assigned at WG2/5 (Rome '95). It was proposed to delete the current section 7.12 of the Version 3.0 of the draft SARPs and to introduce the material contained in WP/171 into section 3. It was agreed that due to the significant amount of detail in WP/171 it was appropriate to submit the material to the CCB for further consideration. Mr. Brangier requested that the material submitted to the CCB be modified to make consistent use of the logical negation notation.

ACTION 6/4 - MR. WHYMAN - TO SUBMIT DR & DRAFT CP BASED ON WP/170 TO CCB.

12.4 WP/173 was presented by Mr. Whyman in response to action 5/4 assigned at WG2/5 (Rome '95). The proposed change was accepted by the WG with a modification to the third paragraph as below:

"ES-IS (ISO 9542) PDUs shall be implicitly assumed to have priority 14 and shall be forwarded as if they were CLNP NPDUs of priority 14."

ACTION 6/5 - MR. WHYMAN - TO SUBMIT DR & DRAFT CP BASED ON WP/173 TO CCB AS WG2 APPROVED WITH INSTRUCTIONS TO CCB MEMBERS TO VOTE ACCEPTANCE.

12.5 WP/174 was presented by Mr. Whyman. The WP proposed text on priority to replace the entire provisions currently contained in section 2.6 of Version 3.0 of the draft SARPs. Mr. Sharma reminded the meeting that the previous WG2 meeting had conducted a detailed review of the current material and therefore requested views on whether it was appropriate to adopt such a "wholesale" replacement. Mr. Colliver stated that the material contained in WP/174 was far superior to the current text in terms of clarity and readability and consequently supported the proposal in WP/174. He did, however, express concern over the relationship with the AMSS subnetwork. Mr. Sharma stated that this concern was valid irrespective of whether WP/174 was adopted or not and should therefore be the subject of a separate WP. Mr. Graf believed that the WP adopted a good approach but questioned the proposed removal of the application priority from the table which concerned him since it did not now, in his opinion, illustrate the link between transport layer priorities and application priorities. Following deliberations with WG3 colleagues over the lunch period Mr. Hennig reported that WG3 was not planning to discuss any issues related to application priority. It was agreed to forward WP/174 with an appropriate cover sheet in the form of a Flimsy indicating to WG3 that WP/174 was likely to form the basis of the internet priority provisions and that comments by WG3 participants should be forwarded to WG2.

ACTION 6/6 - MR. WHYMAN - TO SUBMIT DR & DRAFT CP BASED ON WP/174 TO CCB TAKING INTO ACCOUNT EDITORIAL CHANGES AGREED AT WG2

12.6 WP/177 was presented by Mr. Akimoto. The paper proposed that the guidance material should provide guidance on means to avoid unnecessary route advertisement. Mr. Whyman stated that the WP addressed issues that have till now been neglected and agreed guidance on the subject should be included targeted at network administrators. Mr. Sharma summed up by stating the editor of the applicable section of the guidance material should take the issues raised in WP/177 into account.

12.7 WP/191 was presented by Mr. Crenais. Mr. Crenais reported that he had received the WP from a SITA colleague attending the WG3 meeting. Mr. Whyman stated the WP would add complexity to the Mobile SNDCF by requiring more than a one bit change. Mr. Roy believed the background to the WP was based on the fact that an aircraft flying in VDL coverage would typically be required to change VDL station every 10 minutes and the requirement to establish a local reference table each time would prove to be inefficient. Mr. Colliver asked whether the indicated change was applicable in general i.e. to both Mode S and SATCOM. He also pointed out that there may be problems with respect to the ground/ground transmission of that the data in a

transparent manner via X.75 gateways based on experience with the ADS Europe trial. Mr. Hof questioned whether the proposal would result in a separate VDL SNDCF, he also believed that the WP did not contain sufficient background material for WG2 to take any positive action at this point. It was agreed that Mr. Roy would investigate the background of the WP in order to present a comprehensive proposal to the next WG2 meeting.

ACTION 6/7 - MR. ROY - TO INVESTIGATE THE BACKGROUND TO WP/191 AND PROVIDE DETAILED PROPOSALS TO NEXT WG2 MEETING.

13. Agenda Item 6 - Review of Sub-Volume V of the CNS/ATM-1 guidance Material

13.1 WP/172 was presented by Mr. Whyman. The paper contained a first draft of the guidance material based on the outline agreed at the previous WG2 meeting. Mr. Whyman reported that he had copied existing guidance material from version 2.1 of the draft SARPs into the new structure as well as including other material that had been previously been presented to the WG as proposed guidance. The meeting reviewed and agreed the high level structure and agreed to add sections on:

- Guidance to Aircraft Operators (Section 7)
- Guidance to Subnetwork Implementors (Section 8)

13.2 Mr. Sharma asked for volunteers to draft various sections of the guidance and the following was agreed:

- Section 1 (Introduction) Editor - Mr. Pellingro
- Section 2 - (The ATN Concept) - No volunteer
- Section 3 - (Guidance for ATN Administrators) - Mr. Sharma
- Section 4 - (Guidance for ATN System Implementors) - Mr. Whyman
- Section 5 - (Guidance for ATN Service Providers) - Mr. Roy
- Section 6 - (Guidance for ATM Application Designers) - Mr. VanTrees
- Section 7 - (Guidance to Aircraft Operators) - Mr. Hennig
- Section 8 - (Guidance to Subnetwork Implementors) - No volunteer - Mr. Bochkarev will supply relevant AMSS related information.

13.3 Mr. Sharma noted that given the significant amount of work required to complete the guidance there was a risk that it may not be completed as planned due to a lack of volunteers. Mr. Pellegrino agreed to act as the chief editor and would propose a schedule to complete the next draft - Flimsy #11.

13.4 WP/184 was presented by Mr. VanTrees. The paper proposed that the solid line in table 2-2 be moved up one level in order to indicate message categories associated with CLNP priority 6 and above related to the safety and regularity of flight. This was agreed and Mr. Whyman undertook to implement the change in Flimsy # 9. WP/184 also requested modifications to the table that was in Chapter 10 of the version 2.0 draft SARPs and guidance material related to priority mapping into the mobile subnetworks. Since the guidance material had been restructured the editor for Section 8 will be asked to ensure that the proposed changes are implemented in the next draft.

13.5 WP/167 was presented by Mr. VanTrees. The WP proposed US agreed values to be assigned to the ATSC communications classes "A" through "H" in support of known US end-to-end transit delay requirements. The WP further proposed that these routing classes could also point to related tables of Transport Layer TP4 timers.

13.6 Mr. Whyman questioned how the second proposal related to possible congestion management algorithms. Mr. Colliver believed that, with respect to the second proposal, dynamic allocation of transport timers would prove to be difficult from the implementors perspective and that it was non-COTS.

13.7 Mr. Whyman recalled that Class "H" was previously defined at the FairFax meetings to mean " no maximum expected transit delay" and that this was a requirement in a current EUROCONTROL development.

Mr. Whyman then questioned how implementors would be expected to implement "reserved values" being proposed for classes "A", "F", "G" and "H".

13.8 Mr. Sharma noted that the Fairfax joint meeting with WG3 had in fact agreed that the values for each of the communications classes should be defined by WG3 and that WP/167 only represented a US position. It was agreed to remind WG3 of this expectation and to re-visit WP/167 once WG3 had considered it.

14. Further update of Ad-Hoc CCB

14.1 Mr. Cossa reported that the on-going ad-hoc CCB meeting had resolved a number of the outstanding issues. He required clarification a number of issues that had been originated by Mr. Whyman. He also stated that the CCB planned to schedule a one day meeting on the Friday of the week preceding the next WG2 meeting.

15. Agenda Item 6 Review of Sub-Volume V of the CNS/ATM-1 Guidance Material **(Continued)**

15.1 Mr. Cossa volunteered to develop the Section 2 guidance material.

ACTION - 6/30 - MR. COSSA TO COMPLETE DRAFT SECTION 2 OF THE GUIDANCE MATERIAL.

15.2 Mr. Bochkarev presented WP/181 for information. It was agreed that applicable material contained in WP/181 should be used where appropriate in the guidance material. Mr. Bochkarev undertook to provide a copy of table 17. He also stated that additional detailed material could be made available to interested parties.

16. Agenda Item 7 - Development of Part V of the CNS/ATM-1 SARPs Validation Report

16.1 Mr. Kraft joined the meeting to provide input to the subject of validation from a certification perspective.

16.2 Mr. Hof presented WP/161 which resulted in closure of action 4/2. The WP proposed an approach toward the development of the WG2 internet validation report. Mr. Cossa stated that the US would present a paper on its ATN Validation Programme at the next WG2 meeting. Mr. Graf questioned whether the development of validation reports by other Panels had been consulted in support of the development of WP/161. This had not been the case. Mr. Brangier agreed to make the AMSS SARPs validation report available to the next WG2 meeting.

ACTION 6/8 - MR. BRANGIER - TO MAKE THE AMSS SARPS VALIDATION REPORT AVAILABLE AT WG2/7.

16.3 Mr. Sharma pointed out that there was a potential risk that the validation report may be out of sync with the draft SARPs presented at ATNP/2 if ICAO re-numbered and/or reformatted the draft material once received. Mr. Whyman stressed that this should be avoided if at all possible. Mr. Colliver proposed that the WG continue on the development of the validation report based on the SARPs references as currently defined.

16.4 Prior to discussing the detailed proposals in WP/161 Mr. Sharma proposed that it would be appropriate to have WP/183 presented. This was agreed. Mr. Hof presented WP/183 which proposed a revised approach towards the development of an Internet Requirements Database. In his presentation Mr. Hof stated that EUROCONTROL have resource available to undertake the proposed development of the revised database. He also stated that due to the significant amount of effort required to update the old requirements database and having had practical experience with having used it he did not see any benefits in attempting to update it to align with the current version of the draft SARPs. Mr. Hof expressed his disappointment at not having

received any response to an e-mail that had been sent out to the atn-technical mailing list a few months ago which laid the foundation of the proposals in WP/183.

16.5 Mr. Hiltz questioned whether the proposed validation database was intended to address all CNS/ATM-1 Package draft SARPs. Mr., Hof stated that WG3 are currently considering a detailed approach along the lines of the old WG2 database where each "shall" would be individually referenced in their database. He also stated that such an approach maybe more suitable to the WG3 material since it was believed to be structured in a hierarchical way having had less editors working on it to date.

16.6 Mr. Kraft proposed that the approach to validation/validation database/validation report should, if possible, be such that it facilitates and supports the certification activity. He also stressed that the draft SARPs should not contain redundant requirements since he perceived that the APRLs and text in the draft SARPs was resulting in requirements being specified twice. Mr. Sharma stated that this was not in fact the case and if there were any redundant requirements then these should be removed via the CCB process. Mr. Colliver stated that certain requirements in the SARPs were suited to be specified in the from of an APRL whilst other requirements were suited to be specified in the text.

16.7 Mr. Hennig supported the "Phase 1" activity as proposed in WP/183 since it would result in a set of PRLs and a tabularised format for all textual specified requirements. Mr. Kraft observed that if the Phase 1 activity referenced sets of requirements at section/sub-section level then the onus to check and report on individual requirements was being passed to the validators.

16.8 Mr. Kraft then questioned how the "higher level requirements" were being validated in order to satisfy the operational concept. Mr. Hof agreed that the validation needs to take place within an assumed operational concept but this has not as yet been defined. He did however, make reference to a recent FAA/EUROCONTROL meeting where the need was agreed for a jointly agreed scenario for the NAT within which FAA/EUROCONTROL validation initiatives could take place. Mr. Sharma stated that the requirements included in Sub-Volume 1 of the CNS/ATM-1 SARPs should be included in the WG2 database and validated against. This was agreed.

16.9 Mr. Hiltz again questioned whether it is intended to develop validation database for the entire CNS/ATM-1 Package. This was not the current intention. Mr. Kraft suggested that interested members of WG2 meet with WG3 colleagues to establish whether or not it would be possible and beneficial to adopt a common ATNP approach. This was agreed and Mr. Hof agreed to lead the sub-group with support from Mr. Kraft, Mr. Crenais, Mr. Colliver and Mr. Brangier and to report back in Flimsy # 12.

16.10 WP/175 Appendix J was presented by Mr. Hiltz. The WP documented the conclusions of WG1 on the use of CIDIN within the ATN architecture and the validation of the CIDIN SNDCF SARPs in Version 3.0. It was noted that, at present, no participating ATNP State/Organisation planned to contribute toward the validation of this material. Mr. Herber stated that whilst this is correct at present he regarded the validation of the referenced SARPs to be essential and would be seeking ways to initiate appropriate action.

17. Review of Flimsy # 8 Proposed Meeting Dates for Jan./Feb. 1996

17.1 Miss Cosgrove presented Flimsy #8 regarding the WG2 position on the dates for the next series of WG2 meetings. Two amendments to the proposed text were accepted and Miss Cosgrove undertook to present a revised version. The final version of the Flimsy is at Appendix K.

18. Review of Flimsy #11 - SCHEDULE OF EDITING GUIDANCE MATERIAL FOR ATN INTERNET SARPs

18.1 Flimsy #11 which proposed a schedule for the development of the next version of the guidance material was presented by Mr. Pellegrino in the capacity of his new role as chief editor. The proposed schedule was accepted and Mr. Pellegrino requested that contributors adopt the format and style of the material presented in WP/172. Mr. Sharma stated that he would be assigning individual actions to each of the contributors of the guidance material. Mr. Hennig stated that he may only be able to supply his contributions in ASCII text. This was acceptable though not encouraged. Mr. Hennig also stated that he would circulate his

draft contribution to the atn-technical mailing list for comment prior to formal submission to Mr. Pellingro. This was noted.

19. WP/91 re-visited

19.1 Mr. Roy reported that the material contained in WP/91 was AMCP approved and that the material had now been "frozen". He stated that this would effectively result in a VDL specific mobile SNDCF and that the WG should respond to AMCP indicating any concerns that it may have. Mr. Sharma stated that following review of the detailed background (Action 6/7) at the next WG2 meeting that WG2 should develop an appropriate flimsy for transmittal to the appropriate AMCP WG.

20. Agenda Item 7 Development of Part V of the CNS/ATM-1 SARPs Validation Report (Continued)

20.1 WP/159 was presented by Mr. Whyman as an IP. The WP documented the results of an analysis of the current Mobile IP specification under development by the Internet Engineering Task Force (IETF). The WP concluded that while Mobile IP meets requirements drawn up by the IETF for adding support for mobility to the Internet, it does not meet the ATN requirements for high availability and strong routing policies.

20.2 WP/160 was presented by Mr. Whyman. The WP describes additional simulation exercises necessary in order to investigate any adverse interactions between the Transport Backoff algorithm proposed for ATN Congestion Management and ATN System Mobility. The WP also investigates a proposed mechanism for avoiding such problems. Mr. Whyman reported that the companion WP (185) which was to have reported the results of executing the described simulations had to be withdrawn due to unforeseen problems with the simulation environment and that EUROCONTROL would be presenting the results of the activity at the next WG2 meeting.

20.3 Mr. Sharma reminded the meeting of the conclusions of the previous WG2 meeting on the subject of Congestion Management where it had been agreed to insert the following text into the Version 3.0 of the draft SARPs:

Note: *ATNP/WG2 recognises the need for congestion management in the ATN. Specific algorithms for transport layer congestion management are not at present defined for the CNS/ATM Package-1, therefore no requirement has been placed in these SARPs. However, specific requirements may be added at the sixth WG2 meeting (October 1995) based on the validation results presented at that meeting. This will not preclude the use of explicit flow control for congestion avoidance which is a required element of COTP.*

20.4 Mr. Roy indicated that feedback based on the ER PDU would result in a non-COTS solution. Mr. Whyman agreed and stated that if the results of the simulation demonstrate tangible gains then the cost of non-COTS may be worth investment. Mr. Roy supported that EUROCONTROL continue with their planned simulation work and that if the results of the work demonstrate benefits then the next WG2 meeting should consider inclusion of the necessary provisions in the internet draft SARPs. Mr. Hennig suggested and hoped that the need for the inclusion for Congestion Management provisions could be excluded for CNS/ATM-1 if the ground network was appropriately dimensioned but agreed that any final decision should await the final results from the EUROCONTROL work. Mr. Herber agreed that if the validation results prove benefits then the supporting provisions should be included in the draft SARPs. Mr. Sharma added that the final decision as to whether or not to include Congestion Management provisions in the draft SARPs should be made no later than the end of the next WG meeting whilst recognising that subsequent validation work may result in the issue being raised again irrespective of the final decision. This was agreed.

20.5 WP/163 was presented by Ms. Cosgrove as an IP. The WP provides an outline for the identification of billable bits per message for the exchange of ATN data. Ms. Cosgrove requested guidance and input to support the further development of the material. Mr. Hof stated that the area of costing is an institutional issue and that it had been addressed at a high level in the FANS Committee. Mr. Whyman stated that what this material be the basis of a "charging model" for the ATN based on previous experience that he had had in work related to the X.400 charging model. He considered that it was extremely important that work on such a model be initiated as soon as possible. At the detailed level Mr. Whyman suggested that the WP take into account the

use of the Mobile SNDCF. Mr. Hennig stated that he would like to see billable bits split into those associated with "overhead", "user data", "connection setup" and "connection maintenance". Mr. Sharma considered the work as a useful input toward the definition of a charging model and stated that the WP was addressing an institutional issue and as such the next revision should be presented to WG1. This was agreed.

20.6 WP/164 was presented by Mr. Cossa as an Information Paper. This WP documented the results of a US simulation study into the percentage protocol overhead on an air/ground subnetwork. Mr. Whyman was extremely surprised at the reported transport protocol overhead and questioned the assumptions made in the simulation. In particular he questioned the size of the assumed credit window and postulated that a size of 1 had probably been assumed, which in practice would not be used. He also questioned whether the simulation had assumed the use of TP4 concatenation, this being equivalent to TCP/IP piggybacking. Mr. Hof stressed that any simulation results reported to the WG must document all assumptions without which any results could not be taken into account by the WG in the development of SARPs and guidance. This was agreed.

20.7 WP/165 was presented by Mr. Cossa as an Information Paper. This WP documented the results of a US simulation study to estimate Router initiation time using Mode S. with and without use of the IDRP protocol over the air/ground link. Mr. Whyman questioned why the ISH had not been assumed to be concatenated with the call request/call accept packets. Mr. Sharma suggested that Information Papers should not include recommendations. This was agreed.

20.8 WP/182 was presented by Mr. Hennig. This WP documented the ATN Systems Inc. (ASI) position on the use of IDRP for CNS/ATM-1 over the air/ground link (Recommendation #1) and also stressed the need for complete and stable requirements resulting from this meeting (recommendation #2). Mr. Hennig also provided an update on ASI developments since the Toulouse WG meetings. He reported that ASI was officially incorporated on 5th July 1995 and is owned by eleven US carriers and has a co-operative agreement with the FAA and an approximate budget of $22M. Its primary objective is to acquire ATN compliant avionics systems and, at a lower priority, ATN compliant ground based systems. He also reported that combined number of carriers supporting the CAIG and ASI now numbered 19. Mr. Hennig undertook to make the ASI Program Plan available to the atn-internet-technical mailing list.

20.9 Recommendation #1 of WP/182 recommended that the ICAO ATNP focuses on the "use" of IDRP in its validation efforts. Should it transpire that use of IDRP cannot be validated within the required time-scale and/or results in recommendations that IDRP cannot meet appropriate operational requirements then non-use could be supported in the ground by the use of service providers. Mr. Hof questioned whether the airlines considered IDRP to be beneficial i.e. what are the perceived benefits.

ACTION - 6/9 - MR. HENNIG - TO PRESENT IATA POSITION ON USE/NON-USE OF IDRP IN AVIONICS FOR CNS/ATM-1 AT NEXT WG2 MEETING.

20.10 Mr. Sharma reported that the UK was currently considering validating the use of IDRP over the air-ground link within the context of its national ADS/SATCOM trial. He also reported that the ADS Europe trial would be implementing the procedures to support the non-use of IDRP.

20.11 With respect to Recommendation #2 of WP/182 the meeting agreed that no new requirements were being introduced but noted that the area of Congestion Management remained an outstanding issue to be resolved at the next WG2 meeting.

21. Agenda Item 8 - CNS/ATM-2 Internet Requirements

21.1 Mr. Sharma presented WP/175, Appendix L. The WP documented revised WG1 recommendations in respect of the WG1 Overall Security Concept deliverable relating to WG2 in the context of the CNS/ATM-2 definition. Mr. Sharma stated that this WP was not formally submitted to WG2 as yet and therefore no action was required at this point in time. Recommendation #2 related to the protection of the Routing Information Base through unauthorised use of IDRP by application of the "Digital Signature Standard" . Recommendation #6 related to the protection of Systems Management messages against modification, masquerade and replay through the application of the Message Authentication Check (MAC) mechanism.

22. Review of Flimsy # 9 Proposed replacement text for ATN Internet draft SARPs on use of Priority in the ATN

22.1 Flimsy #9 was presented by Mr. Whyman. It had been agreed during the discussion of WP/174 that the proposed material contained therein be forwarded to WG3 for comment. The Flimsy essentially provided a covering note to WG3 soliciting comments. Additionally the priority table had been modified to take into account the recommendation in WP/184 regarding the delineation of "safety & regularity of flight" related message categories. The final agreed version of the Flimsy is at Appendix L.

23. Review of Flimsy #10 Air/Ground Route Initiation - Proposed Defect Resolution

23.1 Flimsy #10 was presented by Mr. Whyman following earlier consideration of WP/187 Issue 4 (Back-Off Procedures) and Issue 5 (Clearing Causes and Leave Events). No comments were made on the material and it was agreed to forward it to the CCB.

ACTION 6/10 - MR. WHYMAN - TO SUBMIT DR AND DRAFT CP BASED ON FLIMSY #10 TO CCB

24. Review of Flimsy # 7 Proposed Changes to the Draft ATN SARPs resulting from WP187 Issues 1 and 2

24.1 Mr. Whyman presented Flimsy #7 which was actioned following discussion of WP/187 Issues 1 & 2. The WG agreed a number of detailed changes and agreed to forward to the CCB with instructions to accept proposed amendments.

ACTION 6/11 - MR. WHYMAN - TO SUBMIT DR AND DRAFT CP TO CCB BASED ON ISSUE 1 OF FLIMSY # 7 AS WG2 APPROVED WITH INSTRUCTIONS TO CCB MEMBERS TO VOTE ACCEPTANCE

ACTION 6/12 - MR. WHYMAN - TO SUBMIT DR AND DRAFT CP TO CCB BASED ON ISSUE 2 OF FLIMSY # 7 AS WG2 APPROVED WITH INSTRUCTIONS TO CCB MEMBERS TO VOTE ACCEPTANCE

25. Review of WG3, Flimsy #2

25.1 Mr. Jones presented WG3, Flimsy #2 (Appendix Q). The flimsy was developed as a result of the WG2/WG3 joint meetings that had taken place in May where it was agreed that WG3 would provide WG2 with transit delay values for each of the ATSC communications classes. In his presentation Mr. Jones stated that WG3 was not imposing any internal requirements on the internet (e.g. optimal use of TP timers) since this was considered by WG3 to be a WG2 issue. He also pointed out that at this point the values stated in the Flimsy related to air/ground application requirements and that ground/ground requirements may be imposed at some time in the future and hence the reserved status for classes A and B. Mr. Jones stated that WP/167 which had expressed US requirements that had been presented earlier in the meeting should now be treated as an Information Paper.

25.2 Mr. Whyman noted that WG3 Flimsy #2 required class H to be reserved for future use and that this was in conflict with the previous joint WG2/WG3 agreement where it had been agreed that class H would imply "no maximum expected transit delay". His proposal to reinstate this on the grounds that EUROCONTROL validation work was based on this previous requirement was rejected. Mr. Whyman further stated that whilst no dynamic QoS had been specified for the CNS/ATM-1 internet application requirements such as transit delay, availability and throughput would also be accomplished through appropriate network design/capacity planning by each administration. He also noted that the benefit of the ATSC class based approach was that it did not require the entire ground portion of the ATN to be dimensioned to support the stringent requirements of safety related applications but only those parts of the network that would be used by such applications.

25.3 Mr. Colliver noted that each ground Router operator would consequently be required to define a policy module to determine whether the connectivity of the Router satisfied the ATSC class requirement. Mr. Jones responded by stating the real WG3 concern in the frame of CNS/ATM-1 was related to the selection of the air/ground subnetwork. Mr. Pearce noted that the in addition to the internet providing mechanisms to support the transit delay requirements administrations will need to ensure appropriate network dimensioning and/or impose appropriate requirements in service providers to ensure that end-to-end requirements may be met. It was noted that the values in Flimsy #2 did not address ground/ground requirements at this point. Mr. Pearce also reminded the meeting that failure of the internet to be able to provide the requested communications class should result in a higher class being offered and that the unavailability of any higher classes should then result in the message not being transmitted and this fact reported to the originator. He also pointed out that in the event of more than one route offering the requested class of service that the decision should then be based on cost i.e. the cheapest route should be selected.

ACTION- 6/36 - MR. COLLIVER TO SUBMIT DR AND DRAFT CP TO CCB BASED ON WG3, FLIMSY #2 REGARDING VALUES FOR ATSC COMMUNICATIONS CLASSES.

26. Review of Flimsy #12 - ATN Draft SARPs Validation Approach

26.1 Mr. Hof presented Flimsy #12 which was actioned following discussion of Agenda Item 7 (Validation) and had been developed by Mr. Hof, Mr. Kraft and Mr. Van Roosbroek. The Flimsy proposed a common Validation Strategy to be followed by WGs 1, 2 and 3. The WG agreed with the proposed strategy. Mr. Graf noted an inconsistency in the text which firstly proposed that a common validation approach be adopted and then suggested that WG1 determine a validation approach. It was agreed to revise the wording in order to remove the inconsistency. It was noted that the Flimsy would also be presented to WG3 and should be forwarded to WG1 for their consideration.

27. CCB Membership Update

27.1 Mr. Hennig reported that IATA will join the CCB with immediate effect. The actual member would be Mr. Van De Boogard with support from Mr. Hennig and Mr. Snively. He also reported that the ICCAIA were unable at this point in time to join the CCB.

28. Flimsy #2 - Recommendation related to NSAP Registration Authorities

28.1 Mr. Hof reported that he had not developed the Flimsy and proposed to undertake the task related to address registration as an action. This was agreed.

ACTION - 6/13 - MR. HOF TO CONFIRM WHETHER AS A RESULT OF SICASP V ICAO SENT OUT A STATE LETTER RECOMMENDING ESTABLISHMENT OF ADDRESS REGISTRATION AUTHORITIES.

29. Flimsy #5 - Traffic Type Terminology Alignment

29.1 Mr. Sharma reported that he had investigated the inconsistent use of traffic type related terminology in the SARPs but had been unable to develop appropriate recommending changes since the amount of changes required were considerable. He proposed to undertake the task as an assigned action. This was agreed.

ACTION - 6/14 - MR. SHARMA TO SUBMIT DR AND DRAFT CP TO CCB PROPOSING CORRECTIONS AND CONSISTENT USE OF TRAFFIC TYPE TERMINOLOGY.

30. Agenda Item 7 Development of the CNS/ATM-1 Internet SARPs Validation Report **(Continued)**

30.1 Having agreed the Validation Strategy as proposed in Flimsy #12 the WG returned to WP/183 which had proposed a revised requirements database to be developed given problems experienced with the "old" database which was only aligned with Version 2.1 of the draft SARPs. The WG agreed with the proposal in WP/183 to develop a new simplified database. Mr. Hof stated that EUROCONTROL would be investing a considerable amount of effort in the development of the new database and wanted to be assured that it would be used by participants of the WG. This was agreed. Mr. Herber questioned how WG1 requirements could be accommodated in the new database. Mr. Sharma stated that WG1 had established a DG to develop Sub-Volume 1 (Introduction and System Level Requirements for CNS/ATM-1) and that given that both he and Mr. Herber were members of that DG they could ensure co-ordination. Mr. Hof noted that as WG1 requirements are known they may, if appropriate, be linked into the WG2 database dependent upon how they are expressed. He also noted that they may result in additional validation objectives.

30.2 Mr. Hiltz questioned how the mechanisms by which the database could be accessed. Mr. Hof confirmed that the same approach as per the previous database would be adopted, i.e. there would be a database editor (Jean Pierre Briand) responsible for maintenance of the database and that this database would be made available on the CENA server and available to all interested parties via FTP. Mr. Hiltz was advised to contact Jean Pierre Briand for further detailed information.

ACTION - 6/15 - MR. HOF - TO DEVELOP VALIDATION DATABASE IN ACCORDANCE WITH WP/183 RECOMMENDATIONS.

30.3 The meeting then returned to WP/161 which had proposed a detailed approach to the development of the WG2 Validation Report. It was agreed that it was not necessary at this point in time to formally agree the proposed outline of the Validation Report which was presented at Attachment A to WP/161. It was agreed that an additional section entitled "Validation Results" needed to be included in the main body of the outline. It was noted that Appendix B, "Consolidated Validation Results", would most probably be extracted from the Validation Database. Mr. Sharma reminded the meeting that the Validation Report needed to be no more than 6 to 7 pages in length (excluding Appendices) and that it needed to be sent to ICAO following the June 1996 meeting. It was agreed that relevant material from the first WG2 meeting (San Diego, Flimsy #12) should be included in the Validation Report.

30.4 Mr. Herber agreed with the proposed approach in WP/161 but did not see the need for an additional WG2 meeting in the May time-frame. It was agreed to revisit the need for an additional meeting under Agenda Item 9. Mr. Graf noted that the proposed approach was focused on the development of the validation report and that it should not be forgotten that the main objective is to find bugs in the draft SARPs that would retrospectively need to be corrected and the corrections validated.

30.5 Mr. Sharma asked each represented State/Organisation whether they would be conducting any Validation of the draft SARPs and the following was noted:

- DFS (Germany) - Validation based on two BISs planned for early next year in addition to some simulation activities;
- US - Plans to execute Validation Programme, details of which will be made available at next WG2 meeting;
- ARINC - Will make available results of on-going validation results and would make extensive use of the proposed Validation database;
- France - Conducting validation activities in the framework of EURATN, ADS Europe and simulations activities;
- IATA - Will provide input to validation report based on current Airline validation initiatives;
- Canada - Not currently planning any validation of internet SARPs;
- Brazil - Not currently planning any validation of internet SARPs;
- Japan - Not currently planning any validation of internet SARPs;
- Australia - Have planned development of Validation platform but doubted if any results would be available prior to ATNP/2;
- INMARSAT - Would provide relevant information based on ADS Europe trial;
- UK - ADS Europe, IDRP development, Experimental ATN, National SATCOM & ADS Trial
- EUROCONTROL - Conducting European co-ordinated Validation Programme

30.6 Mr. Whitfield agreed to develop the first draft of the Validation Report based on the attachment in WP/161 for presentation to th next WG2 meeting.

ACTION - 6/16 - MR. WHITFIELD TO PRODUCE DRAFT OF VALIDATION REPORT BASED ON ATTACHMENT A TO WP/161.

30.7 With respect to the format in which the details of validation tools being developed by participating States/Organisations would be documented Mr. Hof agreed to provide a template with an example to the atn-internet-technical mailing list.

ACTION - 6/17 - TO PROVIDE GUIDANCE ON FORMAT IN WHICH TOOL SPECIFICATION INFORMATION SHOULD BE PROVIDED IN A COMMON FORMAT WITH AN EXAMPLE TO THE ATN-INTERNET-TECHNICAL MAILING LIST.

30.8 Following receipt of the above template it was agreed that Mr. Herber (action 6/18), Mr. Cossa (Action 6/19), Mr. Roy (Action 6/20), Mr. Crenais (Action 6/21), Mr. Hennig (Action 6/22), Mr. Sharma (Action 6/23), Mr. Hof (Action 6/24) and Ms. Thulin (in her absence Action 6/25) would provide information regarding their validation tools in accordance with this template. Mr. Hof undertook to provide proposals on detailed validation objectives as proposed in WP/161.

31. Final Review of Flimsy #7 - Proposed Changes to the Draft ATN SARPs resulting from WP187 Issues 1 and 2

31.1 The proposed text was accepted without comment. The final version is in Appendix J.

32. Review of Flimsy #6 - Analysis of WP 188 and Review of Open VRCIs

32.1 Flimsy #6, presented by Mr. Cossa (CCB Chair) documented the results of the ad-hoc CCB meeting that had taken place over the week. The WP reported on the CCB conclusions of the review of WP/188 and WP/190. Mr. Crenais reported that he would be making a template available to facilitate the submission of VRCIs. This was considered to be a very useful contribution. Mr. Cossa reported that resolution of the items to date did not result in any major technical changes being agreed by the CCB. Mr. Cossa also reported that he planned to schedule a CCB 1 or 2 day meeting to take place concurrently with the WG1 meeting in the period 29/1/96 - 2/2/96. Mr. Sharma hoped that such a meeting did not result in any major changes and that the majority of the CCB input for the next WG2 meeting must be made available 2 weeks prior to the meeting. This was agreed and Mr. Cossa stated the intent of the CCB meeting would be to tidy up loose ends.

32.2 With respect to the next version of the Internet SARPs it was agreed that they would be available on 31st December at the latest incorporating all WG2 agreed changes as version 3.1. Following discussion on the merits of issuing changes pages to version 3.0 it was agreed that the logistics involved would be too burdensome and that the only logical manner to present version 3.1 would be as a complete draft. It was agreed that version 3.1 would be made available with revision marks indicating all changes made to version 3.0 and that a summary of proposed changes from version 3.0 be included at the front of the document. Mr. Hennig expressed reservations at re-issuing the document completely since version 3.0 was being used as the basis for the RTCA MOPS development. He did, however, concur with the WG decision which had been based on much discussion. Mr. Sharma proposed that the next WG2 meeting would review the changes in version 3.1 SARPs in detail and submit the resulting draft (i.e. Version 4) to ICAO for translation. This was agreed as the current intention of the WG with the final decision being deferred to the next WG meeting. Mr. Crenais was confirmed as SARPs editor. It was agreed that the CCB would plan its activities to ensure that the 31st December date for version 3.1 availability could be accomplished.

33. Review of Flimsy #1 - Summary of Problems Experienced using ATN Validation EMAIL Distribution Lists

33.1 This Flimsy, presented by Mr. Colliver, summarised e-mail problems that had been experienced by CENA following nearly two years of operation of the e-mail distribution lists. The Flimsy notified the WG of Mr. Collivers intention to conduct a survey of existing members of the atn-internet-technical distribution list to determine a number of characteristics. This was noted. On behalf of the WG Mr. Sharma thanked CENA for making the service available over the past two years and noted the significant benefits that it had brought to the WG in terms of progressing its work Programme. He also encouraged all members of the WG to subscribe to the atn-internet-technical mailing list.

34. Review of Flimsy #3 - Documentation of Expanded Functionality for the DGAC ATN Validation Archive/Server

34.1 This Flimsy, presented by Mr. Colliver, noted that the services offered by the CENA Validation Archive to the ATN Community had expanded considerably over the last two years in terms of a variety of open and protected mailing lists. In order to resolve any potential confusion over the various services offered and associated access techniques the Flimsy proposed that DGAC would develop a Paper to be presented to the next series of WG meetings detailing the services offered and the required access techniques for each of these where applicable. The WG viewed such a document as being valuable and encouraged its development. Mr. Hennig requested Mitre to develop a similar document for the services offered by the Mitre server. Mr. Cossa undertook to develop such a document.

35. Review of Flimsy #4 - Proposed Editorial Changes to chapter 2 of the ATN Draft Internet SARPs

35. Flimsy #4 was presented by Mr. Whyman as a result of comments he had made under Agenda Item 5 with respect to the current structure of section 2. Mr. Colliver questioned why the it was proposed to replace the term "BIS" with "ATN Router". Mr. Whyman wished to align the terminology with the remainder of the SARPs. After discussion it was agreed to **additionally include the term "BIS" in parentheses in Table 2-1**.

ACTION - 6/38 - MR. WHYMAN - TO SUBMIT DR AND DRAFT CP BASED ON FLIMSY #4 TO CCB.

36. Birthday

36.1 The meeting congratulated Miss Cosgrove on her ??? birthday.

37. Agenda Item 9 - Future Work Plan up to ATNP/2

37.1 Mr. Sharma presented Flimsy #13 which documented all actions agreed to date. Each action was reviewed for accuracy and a completion date assigned. In general it was agreed that all submissions to the CCB must be available no later than 3rd November in order to allow the CCB sufficient time to resolve and implement prior to 31st December. It was also agreed that material relating to description of validation tools should be made available by 19th January 1996 and that all contributions to the guidance material be made available no later than 31st December.

37.2 The meeting did not see the need for an additional WG2 meeting in the April '96 time-frame but considered that a sub-group meeting may be required. If this took place then it would be in the same time-frame as the WG3 April meeting, i.e. 15th April to 19th April. It was agreed to review this at the next WG2 meeting.

38. Agenda Item 10 - Any Other Business

38.1 Mr. Sharma mentioned that he along with Ron Jones and Tom Calow he would be giving the ANC a briefing on the ATN and progress of the ATNP WGs on 1/12/95. He also noted that IATA were arranging a seminar "Gateway to the ATN" which will take place in the period 5th - 7th December in Chicago.

39. Agenda Item 11 - Conclusions and Action List

39.1 Mr. Sharma concluded the meeting by stating that the meeting had been a success in meeting its objectives as agreed at the beginning and noted that the WG believed that it would be in a position to submit the draft SARPs to ICAO following the next meeting in February. With respect to the guidance material he noted a risk in the material not being developed to the depth envisaged due to the lack of resources available from participants and strongly encouraged participants to investigate whether additional resource could be available. With respect to the Validation report he noted that the meeting had agreed a comprehensive approach and aggressive schedule and hoped that the WG could comply with the agreed schedule.

39.2 On behalf of the WG, Mr. Sharma thanked Transport Canada, for hosting the meeting and the excellent facilities including the administrative support that had been provided throughout. He thanked all participants for their contributions and wished them a safe journey home. The meeting was then closed.

39.3 The next WG2 meeting will be hosted by Australia in the period 5th - 9th February 1996.

40. Appendix A - WG2 ATTENDANCE LIST

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41. Appendix B - List Of Working Papers

No.	Title	Presented By	Agenda Item
157	Proposed Objectives, Schedule & Planning	A Sharma	1
158	CNS/ATM-1 SARPS & Guidance Material - Part V:Internet Communications Service (Version 3.0, August 7th 1995)	J Crenais	5
159*	Analysis of the Mobile IP Proposal and Comparison with ATN Mobile Routing	H Hof	7
160	Validation of Congestion Management Proposal	H Hof	7
161	Proposed Format of the CNS/ATM-1 SARPs (Part V) Validation Report	A Sharma H Hof	7
162	Policy-controlled Route Initiation over the Mode S Subnetwork.	A Herber	5.3
163*	Message Costing	T Calow	7
164*	Protocol Overhead in the Aeronautical Telecommunication Network (ATN)	R Jones	7
165*	IDRP Router Initiation Times with Mode S	R Jones	7
166*	End-to-End Data Link Delays using Mode S	R Jones	7
167	The Use of ATSC Traffic Types for CNS/ATM-1 Package	R Jones	5.3
168	Defects found in IDRP and Consequential Changes Required to the draft ATN Internet SARPs	H Hof	5.2
169*	Review of Recent Changes to the draft ATN Internet SARPs	H Hof	5
170	ATNP/WG2 Actions 5/11 and 5/12	H Hof	5.2
171	Review of Routing Initiation APRLs (ATNP/WG2 Action 5/6)	H Hof	5.2
172	Proposed Initial Guidance Material for ATN Internet SARPs	H Hof	6
173	ISH PDU Priority (Action 5/4)	H Hof	5.2
174	Change Proposal for Improved Text on the ATN Priority Architecture	H Hof	5.2
175*	Draft Minutes of ATNP/WG1/3	T Calow	2,7,8
176*	Draft Minutes of ATNP/JWG/3	T Calow	2
177	Avoiding unnecessary route advertisement	M Akimoto	5.3
178	ATNP/WG3/SG2, Canberra Flimsy 4	S VanTrees	5.3
179	CNS/ATM-1 Package Registration Authority	A Sharma	4
180	Subnetwork Usage	A Snively	5.3
181	Data Communications Services	V Bochkarev	6
182*	ATN Systems Inc. Position on CNS/ATM-1 Package	R Jones	7
183	Issues on ATN RDB Work	H Hof	7
184	Priority Definitions within Annex 10 and the Relationship to ATN SARPs	R Jones	5.2
185	Paper Withdrawn		
186*	AEEC ATN Newsletter, October 1995, Vol 2, No. 3	A Roy	N/A
187	Proposed Resolution of Open CCB Issues Arising from Presentation of Flimsy #6 - Routing Architecture	R Cossa	5.2
188	Proposed Resolution of Open CCB VRCIs	R Cossa	5.2
189	CCB Procedures & Requirements for Defect Reports, Change Requests, Change Proposals, 8th August 1995	R Cossa	5.1
190	VRCI Status	H Hof	5.2
191	Proposed Change i n the Mobile SNDCF to support VDL	J Crenais	5.3
192*	ATN SARPs & Guidance Material - Fax from Secretary	M Paydar	9

*** Denotes Information Paper**

42. Appendix C - Meeting Agenda

		WPs
0.	**Meeting Organisational Issues**	
1.	**Approval of Agenda and Objectives**	**157**
2.	**Issues Arising out of WG1/3 and JWG/3 October Meetings**	**175, 176**
3.	**Approval of the Rome WG2 Meeting Report**	
4.	**CNS/ATM-1 Registration Authority**	**179**
5.	**Review of Sub-Volume V of the CNS/ATM-1 SARPs (Version 3.0)**	**158, 169**
5.1	**Report of the CCB/Review of CCB Recommendations**	**189**
5.2	**Review of Proposed Changes**	**188, 187, 180, 162, 168, 170, 171, 173, 174, 184, 190**
5.3	**General**	**167, 177, 178, 191**
6.	**Review of Sub-Volume V of the CNS/ATM-1 Guidance Material**	**172, 181**
7.	**Development of the CNS/ATM-1 Internet SARPs Validation Report**	**161, 183, 175-ApJ, 159, 160, 163, 164, 165, 166, 182**
8.	**CNS/ATM-2 Internet Requirements**	**175-ApL**
9.	**Future Work Plan up to ATNP/2**	**192**
10.	**Any Other Business**	
11.	**Conclusions and Action List**	

43. Appendix D - (Flimsy #1) Summary of Problems Experienced using ATN Validation EMAIL Distribution Lists

Discussion

During the nearly two years of operation of the ATN Validation Internet EMAIL distribution lists by the French DGAC in Toulouse, frequent problems have been observed in certain address regions of the world, and with certain mailing tools and practices. The problems experienced can be described by grouping them into the following classes:

1. It has been observed that the further (in Internet topology terms) an addressee's domain is located from the US Internet backbone, the lower the overall email reachability of that domain has been found to be, on an ongoing basis. While there is very little that can be done about this problem in today's TCP/IP Internet, the relatively low delivery success rate to certain regions of the Internet does pose a problem where the "silence is assent" protocol for message response is used. Also, the repeated resend operations, followed in general by repeated failures, is costly for the DGAC administrators of these mailing lists. The result of this problem is that certain recipients are frequently "out of touch" with the ATN activities conducted via EMAIL.

2. It has been observed that various destinations exhibit different message size rejection limits, perhaps due to intervening mail gateways, or perhaps due to the destination mail software/hardware itself. In any case, the result is the same as in the problem class described above, i.e. non-delivery of EMAIL messages.

3. It has been observed that certain non-Internet-native mailers (i.e. those that do not operate SMTP as a native protocol, e.g. X.400 based systems, CCMAIL and other PC based systems, etc.) have a tendency in some cases to be a little too intelligent. This results in unexpected and undesired parsing and processing of message contents, unexpected and undesired modification of message contents, and occasionally in outright message rejection for no apparent reason. Again, non-delivery of mail and pointless consumption of administrative resources are the two main results.

4. Finally, there have been a number of interoperability problems observed concerning the processing of binary files transferred in ASCII EMAIL messages. These problems primarily relate to the apparently unambiguous specification of UUENCODE and UUDECODE software, as well as to the receipt of unintended "help" from certain "too-smart" mailers (e.g. X.400 based systems, CCMAIL and other PC based systems, etc.). File compression software (i.e. PKZIP and ZIP, based on prevalent use) is sometimes subject to interoperability problems.

While it is clear that the Internet mailing lists have made possible progress in communication among the ATN community that would have been otherwise difficult, it is also clear that solutions to the problems above must be found.

Proposal

To resolve the problems above, the DGAC proposes to conduct a survey of the existing members of the "atn-internet-technical" mailing list, to determine:

a) Ability to receive Internet EMAIL.

b) Applicable message size limits, if any.

c) Embedded binary data processing restrictions, if any.

d) Tools used for binary file extraction and data compression, if any.

Based on the responses to this survey, the DGAC will prepare a report on the results, and will prepare a proposed methodology guideline set for the use of the ATN Validation Internet EMAIL distribution lists based on the results.

This document will be distributed via the "atn-internet-technical" mailing list, and is proposed to be provided as an input to the next meeting of ATNP Working Groups 1, 2 and 3.

44. Appendix E (Flimsy #2) - Recommendation related to NSAP Registration Authorities

Refer to Action 6/13 & par. 28 of the Report

45. Appendix F (Flimsy #3) Documentation of Expanded Functionality for the DGAC ATN Validation Archive/Server

Discussion

During the past two years, DGAC/Toulouse has provided and supported an FTP and EMAIL distribution Internet server for the use of the ATN community. This server was initially put into service in 1993, primarily to handle "email exploder" service for the "atn-internet-general" and "atn-internet-technical" mailing lists. In the two following years, this server was expanded to support a variety of both open and protected mailing lists related to the global ATN community, as well as a variety of both open and protected file archives. Each element of service provided by the server was generally documented in a single purpose manner, focused on the particular user group being supported.

Proposal

It has recently been observed that due to the proliferation of services supported by the DGAC ATN Validation Archive/Server, some confusion now exists in the ATN community as to the high level view of access methodologies required and services offered. Additionally, the assumption that a given service is focused only on a particular interest group is no longer viewed to be valid.

Thus, DGAC proposes to provide to the ATN community, via the ICAO ATN Panel, a comprehensive document describing the overall service set provided by the DGAC/Toulouse ATN Validation Archive/Server, and the associated access techniques.

This document will be distributed via the "atn-internet-general" mailing list, and is proposed to be provided as an input to the next meeting of ATNP Working Groups 1, 2 and 3.

46. Appendix G - (Flimsy #4) - Proposed Editorial Changes to chapter 2 of the ATN Draft Internet SARPs

Introduction

This flimsy results from comments made verbally during the WG2 meeting and comprises a list of editorial concerns about the structure of chapter 2 of the ATN Internet draft SARPs, and a proposal for their resolution.

Comments on Chapter 2

1. The chapter title does not really describe the scope of its contents. The chapter also contains a number of important definitions and concepts (e.g. the ATN Island), which are well beyond the scope of ES and IS provisions. It is believed that a more appropriate title is "Definitions and Concepts".
2. Why are there separate sections for ATN Routers and Intermediate Systems? There is considerable overlap in their subject matter, and readers may well be confused as to the difference between (e.g.) an ATN Airborne BIS and an Airborne Router. It is certainly not clear whether it is possible to have a BIS without IDRP as is suggested by 2.3.2.2.
3. If it is appropriate to specify the use of priority in this section, then why is not also correct to specify the use of QoS and Security? Neither is properly introduced at present, and SARPs should be generated for these subjects.
4. The functional components of the ATN are End Systems, Routers and subnetworks. Chapter 2 specifies the End System and Router requirements, while the assumptions and dependencies on subnetworks are in 7.2. A definitions and concepts section should also include this text. Chapter 7 may then be more clearly focused on SNDCFs.
5. Chapter 7 also contains requirements on how subnetwork QoS is used. This text is considerably out of date and does not reference ATC Class. It is proposed that this text is replaced by text in chapter 2 covering this subject as part of the Security Concept.
6. In 7.4.2 a requirement on ATN Subnetworks in respect of minimum SNSDU size is specified. This should be included in the section on requirements on ATN Subnetworks.

Proposals

It is proposed that chapter 2 is renamed to "Definitions and Concepts", with the following outline:

2. Definitions and Concepts
2.1 Objectives and Goals
2.2 Definitions
2.3 ATN End Systems
2.4 ATN Routers
2.5 ATN Subnetworks
2.6 Quality of Service Concept
2.7 Security Concept
2.8 Priority Concept

It is proposed that chapter 7 is renamed to "Specification of Subnetwork Dependent Convergence Functions", with the following outline:

7. Specification of Subnetwork Dependent Convergence Functions
7.1 Scope and Applicability
7.2 Subnetwork Service Primitives
7.3 Convergence Provisions for ISO 8208 Subnetworks
7.3.1 Service Coordination between the SNDCF and SN-Service-Users
7.3.2 Service Coordination between the SNDCF and ISO 8208 Subnetwork Providers
7.3.3 Convergence Provisions for ISO 8208 General Topology Subnetworks
7.3.4 Convergence Provisions for ISO 8208 Mobile Subnetworks
7.3.5 ATN Requirements for mobile SNDCFs
7.3.6 ATN NSAP Compression Algorithm (ACA)
7.4 Convergence Provisions for ISO 8802-2 Broadcast Subnetworks
7.5 Convergence Provisions for Common ICAO Data Interchange Network (CIDIN)

A draft re-organisation of chapter 2 is attached.

Definitions and Concepts

Objectives and Goals

Note 1.— In computer data networking terminology, the infrastructure required to support the interconnection of automated ATM systems is referred to as an internet. Simply stated, an internet comprises the interconnection of computers with gateways or routers via real subnetworks. This allows the construction of a homogeneous virtual data network in an environment of administrative and technical diversity. Given the desire to interconnect an evolving and ever wider variety of aircraft- and ground-based computers to accomplish this ATM automation, it is clear that the civil aviation community needs a global data internet. The internetworking infrastructure developed by ICAO for this purpose is the ATN.

Note 2.— The ATN design allows communication services for different user groups, i.e. air traffic services (ATS), aeronautical operational control (AOC), aeronautical administrative communications (AAC) and aeronautical passenger communications (APC). The design provides for the incorporation of different air-ground subnetworks (e.g. SSR Mode S, AMSS, VDL) and different ground-ground subnetworks, resulting in a common data transfer service. These two aspects are the basis for interoperability of the ATN and will provide a reliable data transfer service for all users. Furthermore, the design is such that user communications services can be introduced in an evolutionary manner.

Note 3.— The ATN is capable of operating in a multinational environment with different data communication service providers. The ATN is capable of supporting ATSC as well as AINSC.

Note 4.— The ATN is capable of supporting the interconnection of End Systems (ES) and Intermediate Systems (IS) using a variety of subnetwork types.

Definitions

Note. This specification makes extensive use of the definitions, concepts and terminology derived from the OSI Reference Model (ISO 7498 parts 1-4) and the OSI Routing Framework (ISO TR 9575).

The ATN Internet

The ATN shall consist of a set of interconnected Routing Domains (RDs), within the global OSI Environment (OSIE). Each such RD shall contain *Air Traffic Service Communication* (ATSC) and/or *Aeronautical Industry Service Communication* (AINSC) related Intermediate and End Systems. A Routing Domain that declares itself to be a Transit Routing Domain (TRD) shall implement a Routing Policy that supports the relaying of NPDUs received from at least one other Routing Domain to destinations in another Routing Domain. Otherwise, the Routing Domain shall be defined as an End Routing Domain (ERD).

ATN RDs

An ATN RD is a Routing Domain that includes one or more ATN Routers.

Every ATN RD shall have a unique Routing Domain Identifier (RDI).

Note.— An RDI is a generic Network Entity Title (NET), and has the same syntax as an ATN NSAP Address; alias RDIs are permitted.

Administration RDs

Each Administration participating in the ATN shall operate one or more ATN RDs, comprising Air/Ground and Ground-Ground Routers as required to interconnect with Mobile RDs and other ground based ATN RDs, respectively.

Note.— Adjacent Administrations may alternatively combine their RDs into a single RD.

Aeronautical Industry RDs

Each aeronautical industry member participating in the ATN shall operate one or more Routing Domains (RDs), comprising Air/Ground and Ground-Ground Routers as required to interconnect with Mobile RDs and other ground based ATN RDs, respectively.

Note.— Adjacent aeronautical industry domains may alternatively combine their RDs into a single RD.

Mobile RDs

Each ATN equipped mobile platform (e.g. an aircraft), shall operate at least one ATN RD. This shall be an End Routing Domain. This ERD shall include ATSC and AINSC related Intermediate and End Systems contained within this mobile platform, and at least one Airborne Router (Router Class 6 or 7).
Note 1.— An ATN mobile platform may operate multiple ERDs.

Note 2.— When more than one Airborne Router is installed on board an aircraft, then each must be in a separate Routing Domain.

Recommendation.— *ATSC and AINSC End-Systems and Intermediate Systems located within a mobile platform should form a single Routing Domain, within the appropriate Administrative Domain.*
Note 3.— A single routing domain minimizes the transfer of routing information over low-bandwidth air-ground subnetworks.
Note 4.— It is anticipated that other classes of mobile platforms (e.g. airport surface vehicles, etc.) may be operated as ATN routing domains in the future.

The Ground ATN Internet

The Ground ATN Internet shall consist of one or more ATN Islands.

ATN Island

Each ATN Island shall comprise one or more ATN RDs forming a single ATN Island RDC.
An ATN Island shall not contain any ATN mobile RD.

The Fixed ATN RDC

The Fixed ATN RDC shall comprise all ATN RDs other than Mobile RDs.
Note.— The Fixed ATN RDC enables a ground ATN Router to advertise a route to a mobile, the destination of which is the entire fixed ATN, without having to enumerate the RDIs of all ATN RDs in the RD_Path Attribute.

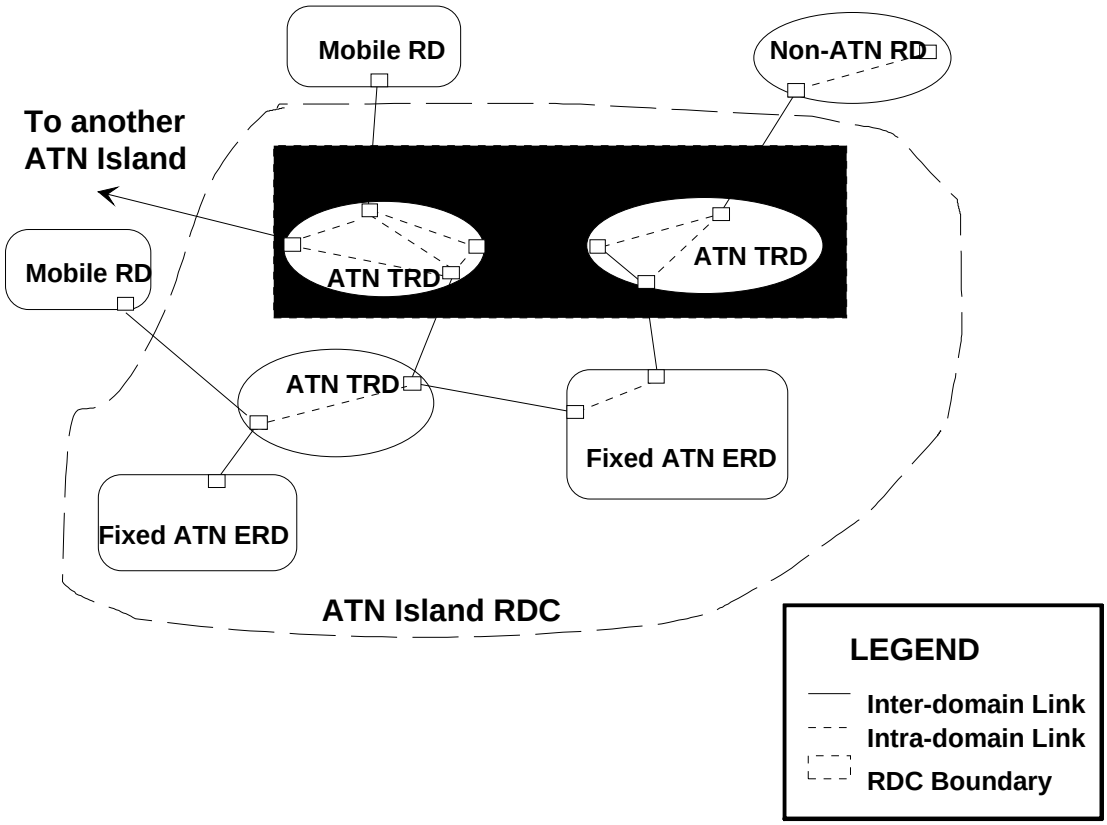


Figure 2-1 Example ATN Island Routing Domain Confederation Structure

The Global ATN Backbone

The Global ATN Backbone shall comprise at least one ATN RD from each ATN Island, interconnected either directly or indirectly via other members of the Global ATN Backbone.
Note.— The purpose of the Global ATN Backbone is to provide a high availability core network of ATN Routers supporting ATN Mobile Routing.

ATN Island Backbone RDCs

Recommendation.— *Within each ATN Island, those ATN RDs that are members of the Global ATN Backbone should form a single RDC, the ATN Backbone RDC.*
An ATN Backbone RDC, when present, shall be nested within an ATN Island RDC.
Note 1 .— The purpose of the Backbone RDC is to permit more than one ATN RD to act as the default route provider for an ATN Island. It also provides a containment boundary to limit the impact of changes in routes to mobile RDs, to only the members of the Backbone RDC and not to the rest of the ATN Island.

Note 2.— This is only a recommended practice as in some regions, simpler, or other alternative structures may be more appropriate for an ATN Island.

The "Home" Domain

Aircraft for which inter-Island communications are required shall have a "Home" domain, which is a Routing Domain in an ATN Island.
Note 1.— This "home" needs not be in either the ATN Island through which the aircraft is currently reachable, or in the ATN Island with which communication is required.

Note 2.— The role of the "Home" domain is to advertise a default route to all the aircraft belonging to an airline, or the General Aviation aircraft of a given country of registration. This default route is advertised to the ATN Global Backbone in line with the routing policies specified in 3.7.

Administrative Domains and the ATN

The Administrative Domain of each administration, and aeronautical industry member that operates one or more ATN RDs shall comprise both their ATN RDs, and any non-ATN RDs that they operate.

Note.— The Routing Policies for communication between ATN and non-ATN RDs within the same Administrative Domain is a local matter.

ATN End Systems

Note 1.— ATN End Systems are capable of communicating with other ATN End Systems, either directly or indirectly, to provide end-to-end communication service for both air/ground and ground/ground applications.

Note 2. An ATN End System is a realisation of the OSI End System architectural entity.

Physical and Data Link Layer

ATN End Systems shall implement the appropriate Physical and Data Link Layer functions for access to the ATN subnetwork to which they are attached.

Network Layer

ATN End Systems shall implement:

a) The End System provisions of ISO 8473 - *Protocol for Providing the Connectionless Mode Network Service* - as the Subnetwork Independent Convergence Function (SNICF) as specified in Section 6.
b) a Subnetwork Access Protocol (SNAcP) suitable for each underlying subnetwork.
c) a Subnetwork Dependent Convergence Facility (SNDCF) providing byte and code independent service to the SNICF (i.e ISO 8473) via the selected Subnetwork Access Protocol, as specified in Section 7.

Recommendation.— *ATN End systems should implement:*

d) The End System provisions of ISO 9542 - End-System to Intermediate System Routing Exchange Protocol for use in conjunction with the Protocol for the Provision of the Connectionless-mode Network Service- to facilitate the exchange of routing information between the ES and any locally attached IS(s).

Transport Layer

Depending on the requirements of the application and its supporting upper-layer protocols, ATN End Systems shall implement either one or both of the following:

a) ISO 8073 - *Connection-Oriented Transport Protocol (Class 4)* - as specified in Section 5.
b) ISO 8602 - *Connectionless Transport Protocol* - as specified in Section 5.

Upper Layers

Note 1.— The requirements for session, presentation and application layer protocols to support end-user applications on ATN End-Systems are defined in Part 4 of the CNS/ATM-1 SARPs.

Applications

Note 1. - The requirements for CNS/ATM-1 air/ground and ground/ground applications are contained in Parts 2 and 3 of the CNS/ATM-1 SARPs respectively.

ATN Routers

Note 1.— ATN Routers~~Intermediate Systems~~ are capable of the relaying and routing of Network Layer protocol data units with other ATN Routers~~Intermediate Systems~~ and with directly connected ATN End Systems.

Note 2. An ATN Router is a realisation of the OSI Intermediate System architectural entity. ATN Routers that additionally implement ISO 10747 are also known as Boundary Intermediate Systems (BISs).

ATN Router Classes

The classes of ATN Router and the Routing Protocols supported, that are recognised by this specification, are listed below in Table 2-1:

Class	Name	Routing Protocols Supported
1.	Static Router	ISO 9542 (optional)
2.	Level 1 Router	ISO 9542 (optional) ISO/IEC 10589 Level 1 only
3.	Level 2 Router	ISO 9542 (optional) ISO/IEC 10589 Level 1 and Level 2
4.	Ground-Ground Router	ISO 9542 (optional) ISO/IEC 10589 (optional) ISO/IEC 10747
5.	Air/Ground-Router (ground based)	ISO 9542 ISO/IEC 10589 (optional) ISO/IEC 10747 Route Initiation Procedures (see 3.5.2)
6.	Airborne Router with IDRP	ISO 9542 ISO/IEC 10747 Route Initiation Procedures (see 3.5.2)
7.	Airborne Router without IDRP	ISO 9542 Route Initiation Procedures (see 3.5.2)

Table 0-1 ATN Router Classes

Note 1.— Classes 1, 2 and 3 are only for use within an ATN Routing Domain and their specification is a local matter.

Note 2.— The intra-domain parts of Router Classes 4 and 5 are also a local matter.

Note 3. — The intra-domain part of Router Class 6 and 7 are concerned with the interconnection of avionics to the airborne router and are the subject of aeronautical industry standards.

Note 4.— Router Classes 5, 6 and 7 describe routers that support at least one ATN Mobile Subnetwork.

All ATN Inter-Domain Routers (i.e. Router Classes 4 to 7 inclusive) shall support:

a) the ISO 8473 Connectionless Network Protocol (CLNP) as specified in Section 6, including the use of the CLNP options security parameter, and shall interpret and obey the Routing Policy Requirements expressed therein, whilst routing the packet in accordance with any restrictions placed on the traffic types that may be carried over a given ATN Subnetwork, by forwarding CLNP NPDUs according to 3.8.

b) the ISO 10747 Inter-Domain Routing Protocol (IDRP) as specified in Section 8 for the exchange of inter-domain routing information according to 3.6 and 3.7.

An Airborne (Router Classes 6 or 7) or Air/Ground Router (Router Class 5) shall support the Mobile SNDCF specified in Section 7 for the use of CLNP over an ATN Mobile Subnetwork, and the ISO 9542 ES-IS routing information exchange protocol, as specified in Section 8 for support of the route initiation procedures specified in 3.5.2.

Physical and Data Link Layers

ATN RoutersIntermediate Systems shall implement the appropriate Physical and Data Link Layer functions for access to the ATN subnetwork(s) to which they are attached..

Network Layer

Ground Boundary Intermediate Systems

An ATN RouterGround BIS shall implementsupport:

a) the Intermediate System provisions of ISO 8473 - *Protocol for Providing the Connectionless Mode Network Service* - as the Subnetwork Independent Convergence Function (SNICF) as specified in Section 6.

b) a Subnetwork Access Protocol (SNAcP)suitable for each underlying subnetwork.

c) a Subnetwork Dependent Convergence Facility (SNDCF)providing byte and code independent service to the SNICF (i.e. ISO 8473) via the selected Subnetwork Access Protocol., as specified in Section 7.

d) The routing protocols specified in Table 0-1 for the Router's Router Class,ISO 10747 - *Protocol for the Exchange of Inter Domain Routing information among Intermediate Systems to Support Forwarding of ISO 8473 PDUs* - to facilitate the exchange of routing information with peer ground BIS(s) as specified in Section 8.;

e) The Route Initiation procedures appropriate to the Router Class, as specified in section 3.

In addition, an ATN Ground BIS which is directly connected to a mobile subnetwork (i.e. a so-called ATN Air/Ground BIS) shall support:

f)ISO 10747 - *Protocol for the Exchange of Inter Domain Routing information among Intermediate Systems to Support Forwarding of ISO 8473 PDUs* to facilitate the exchange of routing information with peer airborne BIS(s) that support ISO 10747 as specified in Section 8;

b)The mechanisms necessary to support the "optional non-use of ISO 10747" where the airborne IS does not support ISO 10747 as specified in Section 3;

Note 1. - Item 'f' above will not be required to be supported once all airborne BIS(s) implement ISO 10747.

Note 2. - Some States may require that aircraft operating in their airspace, after July 1999, and desiring ATSC services via the ATN support the use of ISO 10747, as specified in Section 8.

f) Where an ATN Routera BIS is directly connected to one or more mobile subnetworks, it shall implement a sub-set of the ISO 9542 - End-System to Intermediate System Routing Exchange Protocol for use in conjunction with the Protocol for the Provision of the Connectionless-mode Network Service - for operation over those subnetworks to facilitate the exchange of addressing (BIS Network Entity Title) information between the RouterBIS and its peer as specified in Section 3 (see 3.5.2) and in Section 8.

Airborne Boundary Intermediate Systems

An ATN Airborne BIS shall support:

a) The Intermediate System provisions of ISO 8473 - *Protocol for Providing the Connectionless Mode Network Service* as the SNICF as specified in Section 6.

b) a Subnetwork Access Protocol suitable for each underlying subnetwork.

c) a Subnetwork Dependent Convergence Facility providing byte and code independent service to the SNICF (i.e. ISO 8473) via the selected Subnetwork Access Protocol., as specified in Section 7. This SNDCF is called the ATN Mobile SNDCF.

d) A sub-set of the ISO 9542 - *End-System to Intermediate System Routing Exchange Protocol for use in conjunction with the Protocol for the Provision of the Connectionless-mode Network Service* for operation over the mobile subnetwork(s) to which it is attached in order to facilitate the exchange of addressing (BIS

~~Network Entity Title) information between the airborne BIS and its peer as specified in Section 3 (see 3.5.2) and in Section 8.~~

~~e) In addition, an ATN Airborne BIS shall support either:~~

~~1. ISO 10747 - *Protocol for the Exchange of Inter Domain Routing information among Intermediate Systems to Support Forwarding of ISO 8473 PDUs* to facilitate the exchange of routing information with peer ground BIS(s) as profiled in Section 8,~~

~~OR~~

~~2.~~ ATN Routers of class 5 (Air/Ground Routers) and of class 7 (Airborne Routers without IDRP) shall also implement the mechanisms necessary to support the "optional non-use of ISO 10747" where the ~~airborne IS does not support ISO 10747~~ as specified in Section 3;

Recommendation.— *All ATN Airborne Routers~~BIS's~~ should support the use of ISO 10747. (i.e. Class 6 is the preferred Airborne Router Class).*

Note.— Some States may require that aircraft operating in their airspace, after July 1999, and desiring ATSC services via the ATN must support the use of ISO 10747, as specified in Section 8.

ATN Subnetworks

Note. An ATN Subnetwork is any fixed or mobile data communications network that fulfils the following requirements.

Requirements for All ATN Subnetworks

Both fixed and mobile~~An~~ ATN subnetworks shall conform to the following requirements :

Byte and Code Independence

Data shall be transferred through ATN Subnetworks in a byte and code independent manner.

Note. — If necessary, this byte and code independence may be ensured through the services of the SNDCF.

Subnetwork QOS

Subnetwork QOS shall either be constant and known, or must be capable of being determined on a dynamic basis, in order to support the internetwork routing decision process.

Note. — The service referred to is the quality of the SN-Service, which may differ from the inherent subnetwork QOS where an SNDCF is employed.

Subnetwork Addressing

An ATN subnetwork shall provide a mechanism for uniquely and unambiguously identifying each ATN router attached to that subnetwork.

Internal subnetwork routing

Routing between specified SNPA addresses on a local subnetwork shall be carried out by mechanisms internal to the subnetwork, based solely on the subnetwork addressing information given to the SN-Service provider when the SN-Service is invoked.

Minimum SNSDU Size

An ATN subnetwork shall support an SNSDU size of a minimum of 1068 octets.

Requirements for Mobile ATN Subnetworks

An ATN mobile subnetwork shall conform to the following requirements

Invocation of Subnetwork Priority

When priority is implemented within that subnetwork, an ATN subnetwork shall provide a SNAcP mechanism for invocation of subnetwork priority.

Invocation of Subnetwork Quality of Service for Mobile Subnetworks

Recommendation.— *Mobile ATN Subnetworks should provide a mechanism for invocation of subnetwork QOS. Subnetwork QOS parameters include transit delay, protection against unauthorized access, cost determination and residual error probability.*
Note.— ATN subnetworks may allocate subnetwork resources on a per user or per subnetwork connection basis in order to make available a different QOS.

Connection-Mode Subnetwork Service

An ATN mobile subnetwork shall provide a connection-mode service between SNPAs, with a well-defined start and end to a connection, and with reliable, sequenced SNSDU transfer over that connection. When QOS is available on a per subnetwork connection basis, the SNAcP shall provide mechanisms for selecting a specific QOS when the subnetwork connection is established.
Note 1.— A mobile subnetwork implementing ISO 8208 to provide a connection-mode service between SNPAs meets this requirement; however, where appropriate, an alternative protocol providing the same service may be used.

Note 2.— This requirement does not imply the need for a single mobile SNAcP.

Connectivity Status Changes

Note 1. Mobile ATN subnetworks may provide a mechanism for detection of change in media connectivity and for the conveyance of this information to connected ATN routers.

If a mobile subnetwork provides subnetwork connectivity information, the subnetwork shall convey this information to connected subnetwork service users (i.e. connected ATN routers), in order to initiate operation of the internetwork routing protocols as specified in Section 3.
Note 2. It is desirable for the IS-SME to be notified as soon as possible by the SN-SME when communication is possible with a newly attached BIS and for an immediate decision to be made as regards bringing up the link.

Segmentation/Reassembly Mechanism

Recommendation.— *An ATN subnetwork should provide a mechanism that allows the conveyance of large SNSDUs greater than the subnetwork's internal packet size between subnetwork points of attachment.*
Note.— It is the responsibility of the subnetwork to ensure that this data is efficiently segmented and/or concatenated for efficient transfer over the physical medium. If this capability is not present within a Mobile ATN Subnetwork, ISO 8473 can support segmentation of NPDUs for transit over subnetworks with small maximum SNSDU sizes.

Quality of Service Concept

Note 1. In the ATN, the Quality of Service provided to applications is maintained using Capacity Planning techniques that are outside of the scope of this specification. Network Administrators are responsible for designing and implementing a network that will meet the QoS rerquirements of the CNS/ATM applications that use it.

Note 2. Network Administrators may take advantage of the strong QoS requirements signalled by the ATC Class (see Security Concept), in order to ensure that only those parts of the ATN that support the high QoS requirements of ATSC applications, need be designed to meet those requirements.

Security Concept

Priority Concept
- see flimsy #9.

47. Appendix H - (Flimsy #5) - Traffic Type Terminology Alignment

Refer to Action 6/14 and par. 29.

48. Appendix I - (Flimsy #6) Analysis of WP 188 and Review of Open VRCIs

Introduction

The CCB was tasked to review **WP 188** proposing resolution of open or pending Defect Reports and to evaluate the newly received VRCI Status Report received from CCB member J.P. Briand and identified as **WP 190**.

Discussion

CCB members met for two sessions on 17 and 18, 1995 to formally review open VRCIs.
It was agreed to use **WP 190** as the latest CCB status document, superceding the information in **WP188**. Due to schedule constraints, it was decided to evaluate the list of DIs identified **as Still Open or Pending** in the listing presented in **WP 190** and any other items for which background material was available.
Results of this analysis follow:

DI 95010**17**.DR	22-11-94	**Accepted** with wording proposed by Chair.
DI 95010**18**.DR	11-01-95	**Accepted** as guidance material being rewritten.
DI 95010**27**.DR	12-01-95	**Rejected**.
DI 95010**28**.DR	12-01-95	**Remains Open**. CP with add'l explanation needed..
DI 95010**29**.DR	12-01-95	**Remains Open**. CP with add'l explanation needed.
DI 95010**38**.DR	12-01-95	**Remains Open**. Further CCB analysis needed.
DI 95010**39**.DR	12-01-95	**Accepted** in concept. CP needed for closure.
DI 95010**46**.DR	12-01-95	**Remains Open**. CP with add'l explanation needed.
DI 95010**47**.DR	12-01-95	**Resolved**.
DI 95010**48**.DR	12-01-95	**Remains Open**. CP with add'l explanation needed.
DI 95010**49**.DR	12-01-95	**Remains Open**. CP with further analysis needed.
DI 95010**44**.DR	12-01-95	**Remains Open**. CP with add'l explanation needed.

The CCB intends to actively pursue resolution of any DR remaining open. Those DRs resolved or accepted will be closed with a CCB-developed CP document.

Upcoming CCB Activities

- A review will be undertaken during the next three weeks to finalise the status of all DRs listed in **WP 190** which are identified as "**Resolved**" , "**Implemented**" or "**Superseded**".
- A **DR Submission Template** will be developed and posted to the Technical List to simplify the preparation and submission of future DRs.
- Banff meeting actions resulting in DR or CP submissions to the CCB will be processed, reviewed and acted upon with the goal of resolution by the next WG2 meeting.

49. Appendix J - (Flimsy #7) - Proposed Changes to the Draft ATN SARPs resulting from WP187 Issues 1 and 2

Issue 1

In discussion of issue 1 and taking into account WP162, it was agreed that note 3 of 3.5.2.3 should be amended such that it would caution against option (b) of 3.5.2.3 except when it was explicitly required by the subnetwork provider and was compatible with the demands of air safety. The proposed modification to note 3 is:

Note 3.—Option (b) above permits an administration or organisation operating a ground initiated mobile subnetwork to implement procedures, according to its local policy, whereby an ~~The~~ Air/Ground Router may validate~~s~~ the DTE that is the subject of the Join Event and hence determine~~s~~ the acceptability of a subnetwork connection with the so identified Airborne~~ATN~~ Router.~~, using procedures outside of the scope of this specification~~. The purpose of this facility is to enable efficient management of the available subnetwork resources in areas of overlapping coverage. This facility is not appropriate when its use may result in an aircraft being denied air-ground data communications.

Issue 2

In discussion of issue 2 and WP180, it was agreed that the text of 3.3.1.4 should be more explicit in the need for Airborne Routers to support mutiple concurrent air-ground adjacencies. However, it was also recognised that it was impractical for the SARPs to specify minimum capabilities without knowledge of ATN topology. The following is the proposed new text of 3.3.1.4:

Note 1.— A Mobile RD may interconnect concurrently with multiple~~any~~ ATN RDs which are attached to the mobile subnetworks and which are accessible to the Mobile RD at any given time. The purpose of such interconnections is to provide data link communications services when required by CNS/ATM applications and other aeronautical or airline industry applications..

In order to meet the availability requirements of CNS/ATM applications, Airborne and Air/Ground Routers shall be capable of supporting multiple concurrent adjacencies with other Routers; these adjacencies are supported by multiple subnetwork connections at the same or different priorities, using the same or different air/ground subnetworks.

Note 2. Dynamically, such adjacencies may be established and released in a "make before break" fashion permittng continuous communications availability, and for the suitability of a newly available adjacency to be determined before a no longer needed adjacency is released.

Note 3. It is not within the scope of this specification to set minimum requirements in respect of the number of adjacencies and subnetwork connections that an Airborne or Air/Ground Router must support. Such requirements are dependent on the published coverage and number of air-ground subnetworks, application availability requirements and additionally, in the case of Airborne Routers, on Airline operating policies. Implementors are advised to interpret "multiple" as, in the context of the above requirement, implying at least two adjacencies or connections, and, in practice, a larger number is anticipated as being the likely minimum requirement.

50. Appendix K - (Flimsy #8) Proposed Meeting Dates for Jan./Feb. 1996

WG 2 was invited to comment on Flimsy #1 of WG 3 ("**Proposed Change to ATNP Working Group Meeting Dates for Jan./Feb. 1996**"). After a discussion on the WG 3 proposed changes for the Jan./Feb. meeting, WG 2 decided on the following:

1. WG 2 will require 5 working days Monday to Friday (5 Feb - 9 Feb, 1996); and

2. A Joint Working Group may take place outside of this 5 day window (5 Feb - 9 Feb, 1996). However at this time, WG2 does not anticipate a need to schedule a Joint Working Group meeting (JWG/4).

These proposals are to be submitted to WG 3 in response to Flimsy #1.

51. Appendix L - (Flimsy #9)Proposed replacement text for ATN Internet draft SARPs on use of Priority in the ATN

Introduction

WG2/WP174 comprises a review of the ATN Internet draft SARPs provisions on priority and proposed replacement text provided in order to fix the identified problems. This working paper has been acccepted in principle by WG2 and the proposed replacement text has now entered the CCB process. During this period of review, WG2 solicits WG3's comments on the proposed new text, and, in particular, on the proposed text on "Application Priority". Comments should be passed to the WG2 rapporteur.
The proposed replacement text is attached to this flimsy.

Proposed Replacement SARPs for section 2.6 “ATN Use of Priority”

ATN Use of Priority

Note 1. The purpose of priority is to signal the relative importance and/or precedence of data, such that when a decision has to be made as to which data to action first, or when contention for access to shared resources has to be resolved, the decision or outcome can be determined unambiguously and in line with user requirements both within and between applications.

Note 2. In the ATN, priority is signalled separately by the application in the transport layer and network layer, and in ATN subnetworks. In each case, the semantics and use of priority may differ. Figure 1 illustrates where priority is applied in the ATN, and where it is necessary to map the semantics and syntax of ATN priorities

Application Priority

Note 1. Priority in ATN Application Protocols is used to distinguish the relative importance and urgency of application messages within the context of that application alone.

For the purpose of
a) distinguishing the relative importance and urgency of messages exchanged by different ATN Applications, and
b) distinguishing the relative importance and urgency of messages of the same application during their transit through the ATN,

application messages shall be grouped into one or more categories listed in Table 0-1.
Note 2. An ATN Application may include messages from more than one category.

When a message is sent between ATN Application Entities, the message shall be sent using either:
a) a transport connection established using the Transport Connection Priority listed in Table 0-1 for the message's message category, or
b) the connectionless transport service, signalling the Connectionless Transport Service Priority listed in Table 0-1 for the message's message category.

Note 3. The priority of an individual transport connection cannot be changed during the lifetime of the connection. Therefore, if an application exchanges messages belonging to more than one message category using the connection mode transport service, then a separate transport connection needs to be established for each message category.

Transport Connection Priority

Note 1. Transport priority is concerned with the relationship between transport connections and determines the relative importance of a transport connection with respect to (a) the order in which TCs are to have their QoS

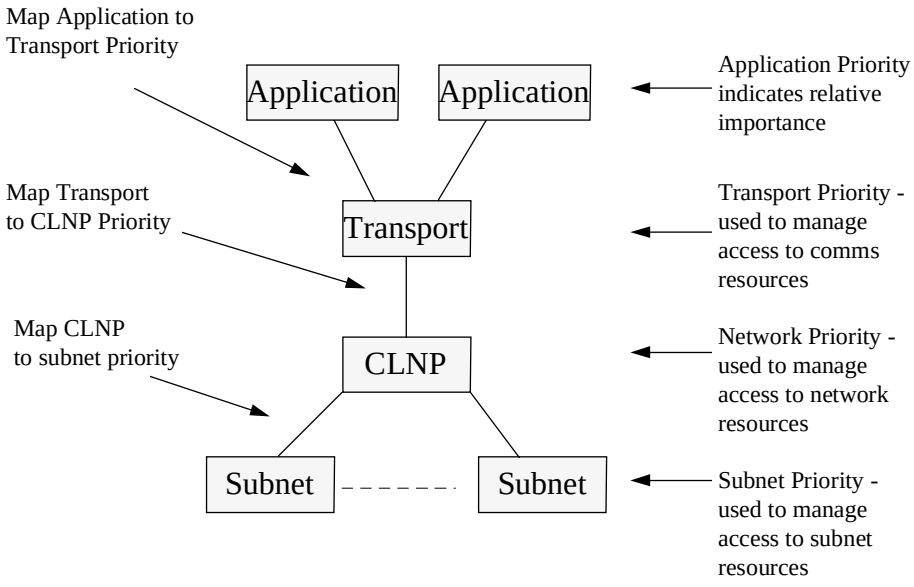


Figure 1 Use of Priority in the ATN

degraded, if necessary, and (b) the order in which TCs are to be broken in order to recover resources.

Note 2. The transport connection priority is specified by the transport user either explicitly or implicitly, when the transport connection is established.

When an ATN Transport Layer entity is unable to satisfy a request for a transport connection from either a local or remote TSAP, and which is due to insufficient local resources available to the transport layer entity, then it shall terminate a lower priority transport connection, if any, in order to permit the establishment of a new higher priority transport connection.
Note 3. Implementation may also use transport priority to arbitrate access to other resources (e.g. buffers). For example, this may be achieved by flow control applied to local users, by discarding received but unacknowledged TPDUs, by reducing credit windows, etc.

All TPDUs sent by an ATN Transport Layer Entity shall be transferred by the ATN Internet Layer, using the Network Protocol Priority that corresponds to the transport connection's priority according to Table 0-1.
Connectionless Transport Service Priority
Note 1. There are no procedures required of the ATN Connectionless Transport Entity in respect of priority, except for mapping the TSDU priority supplied by the service user (i.e. an ATN Application), to the corresponding Network Layer Priority, and vice versa.

All UD TPDUs sent by an ATN Transport Layer Entity shall be transferred by the ATN Internet Layer using the Network Protocol Priority that corresponds to the TSDU priority provided by the service user according to Table 0-1
ATN Internet Priority
Note 1. In the ATN Internet Layer, an NPDU of a higher priority is given preferred access to resources. During periods of higher network utilisation, higher priority NPDUs may therefore be expected to be more likely to reach their destination (i.e. are less likely to be discarded by a congested router) and to have a lower transit delay (i.e. be more likely to be selected for transmission from an outgoing queue) than are lower priority packets.

ATN Internet Entities shall maintain their queues of outgoing NPDUs in strict priority order, such that a higher priority NPDU in an outgoing queue will always be selected for transmission in preference to a lower priority NPDU.
Note 2. priority zero is the lowest priority.

During periods of congestion, or when any other need arises to discard NPDUs currently held by an ATN Internet Entity, lower priority NPDUs shall always be discarded before higher priority NPDUs.
Note 3. In addition to NPDUs containing user (i.e. transport layer) data, the Internet Layer also forwards routing information contained in CLNP Data PDUs (e.g. IDRP) and as distinct NPDUs (e.g. ES-IS). These must all be handled at the highest priority if changes to network topology are to be quickly actioned and the optimal service provided to users.

BISPDUs exchanged by IDRP shall be considered as Network/Systems Management category messages, and sent using CLNP priority 14.
ES-IS (ISO 9542) PDUs shall be implicitly assumed to have priority 14.
Note 4. The priority encoded in an ISH PDU conveys the priority of the sending system, and not the priority of the PDU.

ATN Subnetwork Priority

Connection Mode Subnetworks

Note 1. In a connection mode ATN subnetwork, priority is used to distinguish the relative importance of different data streams (i.e. the data on a subnetworks connection), with respect to gaining access to communications resources and to maintaining the requested Quality of Service.

Note 2. On some subnetworks (e.g. public data networks), not all data streams will be carrying ATN messages. Therefore, subnetwork priority is also used to distinguish ATN and non-ATN data streams.

Note 3. So as not to incur the overhead and cost of maintaining too many simultaneous subnetwork connections, NPDUs of a range of Network Layer priorities may be sent over the same subnetwork connection.

When an ATN connection mode subnetwork does not support prioritisation of subnetwork connections, then the ATN Internet Entity shall not attempt to specify a subnetwork connection priority, and NPDUs of any priority may be sent over the same subnetwork connection.
Note 4. The following does not apply to AMSS and Mode S Subnetworks, which have specified their own priority mapping schemes.

When an ATN connection mode subnetwork does support prioritisation of subnetwork connections, then unless the relationship between ATN Internet Priority and subnetwork priority is explicitly specified by the subnetwork specification, the following shall apply:

a) Subnetwork connections shall be established as either "High" or "Low" priority connections.
b) For the "Low" priority connection type, the priority to gain a connection, keep a connection and for data on the connection shall be the defaults for routine use of the subnetwork.
c) For the "High" priority connection type, the priority to gain a connection, keep a connection and for data on the connection shall be appropriate for urgent and network management data in the context of the subnetwork, In the absence of guidance from the subnetwork provider, the value decimal 8 shall be used for each of the three priorities.
d) "High" priority connections shall be used to convey NPDUs of priority five and above. "Low" priority connections shall be used to convey all other NPDUs.

Message Categories	**Corresponding Protocol Priority**		
	Transport Layer Priority		**Internet Layer Priority**
	Transport Connection Priority	**TSDU Priority**	**CLNP Priority**
Network/Systems Management	0	0	14
Distress Communications	1	1	13
Urgent Communications	2	2	12
High Priority Flight Safety Messages	3	3	11
Normal Priority Flight Safety Messages	4	4	10
Meteorological Communications	5	5	9
Flight Regularity Communications	6	6	8
Aeronautical Information Service Messages	7	7	7
Network/Systems Administration	8	8	6
Aeronautical Administrative Messages	9	9	5
<unassigned>	10	10	4
Urgent Priority Administrative and U.N. Charter Communications	11	11	3
High Priority Administrative and State/Government Communications	12	12	2
Normal Priority Administrative	13	13	1
Low Priority Administrative	14	14	0

Table 0-1 Relationship of Communication priorities in the ATN

When a subnetwork connection is established between two ATN Internet Entities and no subnetwork connection between these two entities exists over any subnetwork, then that subnetwork connection shall always be established at a priority suitable for conveying priority 14 NPDUs (i.e. Network/Systems Management).
Note 5. This is to ensure that routing information can be exchanged at the appropriate priority.

Connectionless Subnetworks

Note 1. The purpose of priority on a connectionless subnetwork is to provide higher priority NPDUs with preferred access to subnetwork resources.

Note 2. The relationship between NPDU priority and subnetwork priority is subnetwork specific.

When an NPDU is sent over a connectionless ATN Subnetwork which supports data prioritisation, the subnetwork priority assigned to the transmitted packet shall be that specified by the subnetwork provider as corresponding to the NPDU priority.

52. Appendix M - (Flimsy #10)Air/Ground Route Initiation - Proposed Defect Resolution

Introduction

WG2/WP187 proposed replacement text for a defect in the polled mode Air Initiated Route Initiation procedures, that had been identified in flimsy #6 of the WG2 Rome meeting. The defect concerned possible ambiguity between the use by the Mobile SNDCF of the Call Request/Call Clearing mechanism for the negotiation of compression options (see 7.6.4.3.6 of the draft ATN SARPS), and the requirements for invoking the back-off procedure (see 3.5.2.2.1.1).

The proposed defect resolution was not accepted as it was believed that the text should explicitly identify the call clearing diagnostic codes that result in the suppression of the back-off procedures.

This flimsy is the result of a review of the ISO 8208 diagnostic codes and proposed a resolution of this defect that makes explicit reference to these diagnostic codes. A copy of the ISO 8208 table 25 - diagnostic codes - is attached to this flimsy.

Errors in 7.6.4.3.6 have also been noted during the preparation of this flimsy (see section 3).

Proposed Replacement Text for 3.5.2.1.1

The following replacement text is proposed for the first paragraph of 3.5.2.1.1. The existing note in this section becomes note 2 as a result of this change.

Whenever a Clear Indication is received in response to a Call Request that indicates rejection by the called DTE and includes a call clearing diagnostic code of 133, 160..163, or 240..249, then the Airborne Router shall implement a "back off" procedure. The back off procedure shall comprise the effective quarantining of the called subnetwork address for a period configurable on a per subnetwork basis from 5 minutes to 20 minutes. During this period, a Call Request shall not be issued to the subnetwork address.

Note 1. Certain call clearing diagnostic codes in the range 128..143 are used by the Mobile SNDCF specified in chapter 7. The semantics of these codes is described there.

Problems with 7.6.4.3.6

A review of section 7.6.4.3.6 - Call Rejection - identified the following problems:

1. In the first paragraph, no diagnostic code is specified for call rejection.
2. The last paragraph is not proper SARPs text. There is no “shall” or “should”, instead the verb is “are recommended”. It is believed that this should be a full requirement.
3. Diagnostic code 1000 0000 is identified in the penultimate paragraph as being a general call clearing diagnostic code, while table 7-6 identifies it as being version number not supported.
4. The list of call reject reasons in 7.6.4.3.6 is incomplete.
5. The requirement to report a call rejection to Systems Management is perhaps too strong. Generation of a notification is believed to be what was really intended, which permits the way in which it is actioned to be a local matter.
6. NPDUs do not need to be discarded on call rejection if the call is re-attempted with a different directory size. This should be made clear.
7. Item caMaxd in the Mobile SNDCF APRL (ref 7.11.3) has an invalid SARPs reference (i.e. 7.6.4.3.2). It is believed that the reference is to note 1 of 7.6.4.3.6. However, this is then compliancy to a note! A recommendation is more appropriate here.
8. A single diagnostic code (1000 0101) indicates either that the calling DTE Address, or received NET was not acceptable (i.e. a security problem), or that the NSEL is invalid (e.g. IDRP not supported). The semantics are too different to be combined, and separate diagnostic codes should be specified.

Proposed Replacement Text for 7.6.4.3.6

In addition to the text below, Item caMaxd in 7.11.3 should be changed to reference 7.6.4.3.6.

If the call is not permitted by the effective security policy of the called SNDCF, then the call shall be rejected with a diagnostic code of 1000 0101 (see table 7-6). This call shall also be rejected for the following reasons :

- The proposed ISO-8208 facility, priority or fast select is not available
- Fast Select not supported and a proposed compression algorithm is not supported
- The format of the call user data is invalid
- The version number is not supported
- The Local reference compression is supported and the called SNDCF does not support the proposed directory size.

Recommendation: If a call is rejected due to the proposed directory size being too large, the caller should re-attempt the call using the default directory size, thus ensuring that the call will not be rejected again due to the requested directory size.

If the calling SNDCF receives a Clear Indication indicating call rejection, other than as part of a call collision resolution or directory size negotiation, then ~~a~~this ~~shall be reported to local~~ Systems Management notification shall be generated, and any SN-UNITDATA queued for this call shall be discarded.

~~*Note 1. – If a call is rejected due to the proposed directory size being too large, the caller may re-attempt the call using the default directory size, thus ensuring that the call will not be rejected again due to the requested directory size.*~~

The Diagnostic code listed in Table 7-6~~ISO 8208 cause 1000 0000~~ shall be used when an SNDCF rejects an incoming Call Request.

~~The Diagnostic code listed in Table 7-6, section 7.6.4.10 are recommended .~~

Proposed Replacement Text for Table 7-6

Table 7-6 Diagnostics values for ATN call clearing

1	1111 1001	Connection Rejection - unrecognised protocol identifier in user data
2	1000 0000	Version number not supported
3	1000 0001	Length field invalid
4	1000 0010	Call Collision Resolution
5	1000 0011	Proposed Directory Size too large
6	1000 0100	Local Reference Cancellation Not Supported
7	1000 0101	Received DTE refused, or received NET refused~~ or invalid NET selector~~
8	1000 0110	Invalid SNCR field
9	1000 0111	ACA compression not supported
10	1000 1111	V42bis compression not supported
11	1111 0000	System lack of resources
12	0000 0000	Cleared by System Management
13	1001 0000	Idle Timer expiration
14	1001 0001	Need to re-use the circuit
15	1001 0010	By local means (to be used for system local error)
16	1001 0011	Invalid NSEL in received NET

53. Appendix N - (Flimsy #11) SCHEDULE OF EDITING GUIDANCE MATERIAL FOR ATN INTERNET SARPs

This is a proposal (table 1) for the schedule of merging all chapters of the new version of the Guidance Material for ATN Internet SARPs.

ITEM	ACTION	DATE	
		START	END
1	WRITE THE CHAPTER	23 OCT 95	31 DEC 95
2	SENT IT TO EDITOR	2 JAN 96	5 JAN 96
3	MERGE ALL FILES AND WRITE THE INTRODUCTION	6 JAN 96	22 JAN 96
4	REVIEW THE GUIDANCE MATERIAL(*)	5 FEB 96	9 FEB 96

Table 1 - Proposal schedule of the Guidance Material For ATN Internet SARPs
(*) 7th WG2 meeting

54. Appendix O - (Flimsy #12) ATN Draft SARPs Validation Approach

Henk Hof
Danny van Roosbroek
Tom Kraft

1.0 Introduction

This flimsy proposes to WG 1, 2, & 3 to use a common validation approach for all SARPs. The flimsy also proposes to WG 1 to identify SARPs at the system level and determine a validation approach.

2.0 Validation approach

The validation approach is depicted in the figure below. The following steps can be identified.

a. Create a validation database. The database is intented to facilitate an analysis to ensure an adequate level of validation coverage of the SARPs. Different from how the validation database was used on the ATN Manual Version 2, the validation database in this proposal will not trace requirements to the lowest possible level, i.e., "shall" level. From that experience we found that it did not provide an efficient means to ensure validation coverage. The database will only trace requirements to the level necessary to achieve the validation objectives. Therefore, the state/organizations performing the validation task need to ensure validation coverage of individual "shalls" within a group of requirements referenced by the database. Also, with this approach, the database can no longer be used as an effective tool for assessing the impact of changes to the SARPs during the validation process.

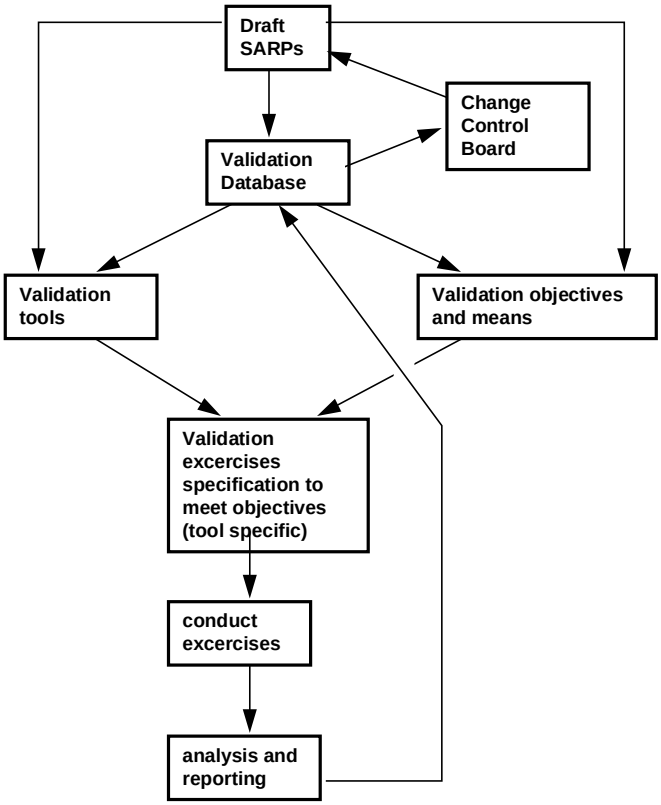
b. Validation objectives and means. Defines the functional areas of the system and identifies the means necessary to validate this area. Each of the validation objectives is associated with one or more of the database entries and can be fullfilled by one or more means of validation. (See table below).

c. Validation tools. This step derives from the validation database and the SARPs the requirements for the validation tools.

d. Validation excercise specification to meet objectives. The state/organizations performing validation need to document the validation procedures, including description of validation environment and assumptions made about the operating scenarios used. We propose that validation excercise specifications use consistent format and conventions to facilitate analysis of the results.

e. Conduct validation excercise.

f. Analysis and reporting. We propose that validation reports use a consistent format and conventions to facilitate analysis of the results.



	VO 1	2	3	...	Status
VDB entry 1	S	A	na	E	Valid
2	T		na		DR#x
3	J		P	P	
4	E	na	na	T	
...	na				

Validation means

S	simulation
P	prototyping
A	analysis
T	target environment testing
J	engineering judgment
E	service experience
na	Not applicable
	Not considered

3.0 Validation of System Level Requirement SARPs

Based on the operational requirements, documented in the ADS manual and the material from the former ASP panel, WG 1 has identified at its meeting in November 1994, an initial set of ATN applications and supporting ATN internet functionality. Based on an initial analysis of the operational requirements, WG 1 had tasked WGs 2 & 3 to develop the supporting SARPs sub-volumes 2 through 5. To adequately validate that the integration of WG 2 and WG 3 SARPs will meet those operational requirements, we recognize the need for high level system requrements that are traceable to lower-level requirements contained in sub-volumes 2-5. It is proposed that WG 1 document these system level requirements in sub-volume 1 and define the validation approach for these requirements. WGs 2 & 3 should identify the relationships of lower level SARPs to these high-level system requirements and validate those ralationships.

55. Appendix P - (Flimsy #13) - On-Going Action List

Ref	Deliverable	Status	By
WG2-8	Review and agree ATN User Requirements, submit Defect Reports and supporting draft Change Proposals **EUROCONTROL*/ GERMANY/JAPAN/US/ UK**	On-going Note it was agreed at WG2/6 to incorporate actions 3/4 and 3/6. The scope of 2-8 was therefore extended to include operational requirements.	--------
	MELBOURNE WG		
	TOULOUSE WG		
	Fair Oaks		
Action - 4/1	To develop high level proposals for CNS/ATM-2 internet requirements for presentation to the October ATNP WG meetings.	- US - On-going	19/1
	ROME		
5/7	Co-ordinate on future Congestion management Proposals to WG and present results of CM Validation activities .	USA/EUROCONTROL	19/1
5/13	Ms. Thulin to submit Defect Reports and CPs to CCB based on sections 5.1, 5.2 and 5.3 of Flimsy #6.	Ms. Thulin	3/11
	Banff		
6/1	To reflect JWG/3 agreements with respect to Sub-Volume nomenclature, replacing sections with chapters in order to be consistent with other CNS/ATM-1 SARPs.	Mr. Crenais	31/12
6/2	To submit DR & draft CP based on WP/168 recommendations to CCB as WG2 approved with instructions to CCB members to vote acceptance	Mr. Whyman	3/11
6/3	To submit DR & draft CP based on WP/170 to CCB as WG2 approved with instructions to CCB members to vote acceptance	Mr. Whyman	3/11
6/4	To submit DR & Draft CP based on WP/170 to CCB	Mr. Whyman	3/11
6/5	To submit DR & draft CP based on WP/173 to CCB as WG2 approved with instructions to CCB members to vote acceptance	Mr. Whyman	3/11
6/6	To submit DR & Draft CP based on WP/174 to CCB taking into account editorial changes agreed at WG2	Mr. Whyman	3/11
6/7	To investigate the background to WP/191 and submit DR and draft CP to CCB following circulation on atn-internet-technical list.	Mr. Roy	3/11
6/8	To make the AMSS SARPS Validation Report available at WG2/7	Mr. Brangier	WG2/7
6/9	To present IATA position on use/non-use of IDRP in avionics for CNS/ATM-1 at next WG2 meeting.	Mr. Hennig	19/1
6/10	To submit DR and Draft CP based on Flimsy #10 to CCB	Mr. Whyman	3/11
6/11	To submit DR and Draft CP to CCB based on Issue 1 of Flimsy # 7 as WG2 approved with instructions to CCB members to vote acceptance	Mr. Whyman	3/11

6/12	To submit DR and Draft CP to CCB based on Issue 2 of Flimsy # 7 as WG2 approved with instructions to CCB members to vote acceptance	Mr. Whyman	3/11
6/13	To confirm whether as the result of SICASP V ICAO sent out State Letter recommending establishment of Address Registration Authorities	Mr. Hof	24/11
6/14	To submit DR and Draft CP to CCB proposing corrections to traffic type terminology	Mr. Sharma	3/11
6/15	To develop Validation Database in accordance with WP/183	Mr. Hof	19/1
6/16	To produce draft of Validation Report based on Attachment A to WP/161	Mr. Whitfield	19/1
6/17	To provide guidance on format in which tool specification information should be provided in a common format with an example to the atn-internet-technical mailing list.	Mr. Hof	24/11
6/18	To provide German tool specification information based on guidance provided as a result of 6/16	Mr. Herber	19/1
6/19	To provide US tool specification information based on guidance provided as a result of 6/16	Mr. Cossa	19/1
6/20	To provide ARINC tool specification information based on guidance provided as a result of 6/16	Mr. Roy	19/1
6/21	To provide French tool specification information based on guidance provided as a result of 6/16	Mr. Crenais	19/1
6/22	To provide IATA tool specification information based on guidance provided as a result of 6/16	Mr. Hennig	19/1
6/23	To provide UK tool specification information based on guidance provided as a result of 6/16	Mr. Sharma	19/1
6/24	To provide Eurocontrol tool specification information based on guidance provided as a result of 6/16	Mr. Hof	19/1
6/25	To provide SITA tool specification information based on guidance provided as a result of 6/16	Ms. Thulin	19/1
6/26	To provide proposed detailed validation objectives	Mr. Hof	19/1
6/27	To make version 3.1 of Sub Volume V draft SARPs using strike out/revision marks available with summary of changes included .	Mr. Crenais	31/12
6/28	To provide consolidated draft guidance material to Rapporteur	Mr. Pellegrino	22/1
6/29	To complete draft Section 1 of Guidance Material	Mr.Pellegrino	22/1
6/30	To complete draft Section 2 of Guidance Material	Mr. Cossa	31/12
6/31	To complete draft Section 3 of Guidance Material	Mr. Sharma/Mr. Hennig	3/12
6/32	To complete draft Section 4 of Guidance Material	Mr. Whyman	31/12
6/33	To complete draft Section 5 of Guidance Material	Mr. Roy	31/12
6/34	To complete draft Section 6 of Guidance Material	Mr. VanTrees	31/12
6/35	To complete draft Section 7 of Guidance Material	Mr. Hennig	31/12
6/36	To issue DR and Draft CP to CCB based on WG3, Flimsy #2 regarding values for ATSC communications classes.	Mr. Colliver	3/11
6/37	To determine the ISO 10747 definition of a BIS	Mr. Sharma	Complete
6/38	To submit Flimsy #4 to CCB	Mr. Whyman	3/11

Appendix Q - WG3, Flimsy 2 - The use of ATSC Traffic Types

28 Oct. 1995

WG3 has considered the inputs received from WG2 resulting from the meeting in Fairfax, Virginia in May 1995 related to the definition of ATSC traffic types. WG3 endorses the definition of ATSC traffic types by relating each of the proposed types A through H to a desired maximum (95%) transit delay (end-to-end). For CNS/ATM-1 Package, the Internet SARPs will need to specify that a routing policy would be invoked consistent with the specified Traffic Type. The intent of the proposal to specific ATSC Traffic Types in terms of the desired maximum transit delay is not for a BIS to guarantee delivery within the specified deliver time. Rather the intent is to permit a BIS in apply a routing policy that will result in the selection of subnetworks (especially mobile subnetworks) that could be expected to support the desired performance. This would be determined a priori and not on a dynamic basis. In moving beyond package-1 perhaps more intelligent routing decisions could be made if the dynamic performance of the available subnetworks is know to the BIS.

The proposed definition of the ATSC traffic types is:

ATSC Traffic Type	Desired Maximum (95%) end-to-end Transit Delay (seconds)
A	Reserved
B	Reserved
C	13
D	18
E	Reserved
F	74
G	95
H	Reserved