Minutes
AERONAUTICAL TELECOMMUNICATION NETWORK PANEL(ATNP)
Working Group 3 -- Applications and Upper Layers
Second Meeting

(Toulouse, 13-17 March 1995)

I. Introduction

1.0 Meeting Information

1.1 The second meeting of ATNP Working Group 3 (WG3) took place on 13 to 17 March 1995 in Toulouse, France. The meeting was hosted by Direction Generale de l'Aviation Civile (DGAC). Special thanks are due to the French delegation, especially M. Bernard Gouvine and M. Jean-Yves Piram, for their hospitality.

1.2 The meeting was opened by Mr. Ron Jones, Rapporteur of Working Group 3. Mr Jones reminded the group of the urgent need for draft Standards and Recommended Practices (SARPs) for the Communications Navigation Surveillance / Air Traffic Management (CNS/ATM-1) Package by June 1995. This is critical for validated SARPs by ATNP/2 in November, 1996.

1.3 A list of participants is presented in Attachment 1.

II. Minutes of the Meeting

1. Approval of the Agenda

1. The proposed agenda is WP 2-1. The proposed agenda was approved with the comment that WG3/SG1 is the ground-ground applications group, and WG3/SG2 is the air-ground applications group. The final agenda and schedule are presented in Attachment 2.

1.1 Distribution of working papers

1. Working papers and information papers intended for the meeting were then distributed.

1.2 Assignment of working papers to agenda items

1. The list of papers with presenter and agenda item is presented in Attachment 3.

2. Review of the WG3/1 Report

2.1 Review of action items from WG3/1 and WG1/1 meetings

1. Action 3-1. The action was to provide a WG3/1 flimsy to the Automatic Dependent Surveillance Panel (ADSP). Mr. Tom Calow provided the ATNP flimsy combining WG1 and WG3 input to the ADSP. Mr. Don Maclean (Canadian ADSP member) reported that the ATN

material was provided for the November 1994 ADSP Toulouse meeting. Mr Jones asked if there was a response from the ADSP. Mr. Maclean indicated that ADSP is apprised of the June 1995 requirements freeze on CNS/ATM-1. Mr. Murphy reported that SG2 is working closely with ADSP and has received inputs from ADSP. ACTION CLOSED

2. Action 3-2. The action was to present results of a Eurocontrol study. Mr. van Roosbroek reported on a Eurocontrol study for transmission of radar data over wide area networks (WANs). Mr. van Roosbroek offered to provide documentation and performance statistics to interested WG3 members. ACTION CLOSED

3. Action 4-1. The action was to provide a list of ATNP/2 and post-ATP/2 products from each Study Group (SG). SG chairs will make this report under their agenda items. ACTION OPEN.

4. Action 5-1. The action was to present a data compression paper to the Joint Working Group(JWG). M. Picard reported that there has been no additional activity in data compression studies beyond that reported at WG3/1. ACTION CLOSED.

5. A list of action items from the meeting is presented in Attachment 4.

3. Development of SARPs and Guidance Material CNS/ATM-1 Package Air-Ground Applications

3.1 Review Air-Ground Application Subgroup (SG2) Terms of Reference

1. The group reviewed the terms of reference for SG2. The following working relationships were noted:

a. SG2 interfaces to WG2 for ATN internet requirements
b. SG2 interfaces to SG3 for potential transitional ULA requirements
c. SG2 interfaces to SG1 to pass ground-ground requirements

3.2 Report on Subgroup 2 Activities

3.2.1 Review SG2 Meeting Report

1. Mr. Mike Murphy presented IP 2-6, which presented status of SG2. He indicated that the group has had two meetings, in Brussels and Orlando. IP 2-6 reported that the draft Standards and Recommended Practices (SARPs) for CNS/ATM-1 Package are on schedule. Mr. Murphy indicated that draft requirements are mature for Controller Pilot Data Link Communication (CPDLC) and Context Management (CM). He reported that work is still ongoing in requirements for Automatic Dependent Surveillance (ADS). He indicated that Flight Information Service (FIS) operational requirements have only recently been received from ADSP.

2. Mr. Jones noted that it is important that minority viewpoints be represented in subgroup reports to WG3, since subgroups do not wholly represent WG3.

3. Mr. Murphy expressed the gratitude of SG2 for the fine cooperation of ADSP members, especially their willingness to recognize SG2 schedules.

3.2.2 Review inputs subsequent to WG3/1 received from other ICAO Panels or working groups (if any)

1. Mr. Murphy presented IP 2-9, which details ADSP requirements on the air-ground applications.

3.2.3 Review status of SARPs and Guidance Material for CNS/ATM-1 Package air-ground applications

3.2.3.1 ADS Contract Establishment and Position Reporting

1. Mr. Murphy presented status of the ADS SARPs. The SARPs are not ready for WG3 review. Mr. van Roosbroek presented WP 2-11, the ADS SARPs.

2. Operational requirements work is still required by ADSP. It was noted that North Atlantic Unified Trials (NUT) do not fully validate ADS.

3. The meeting agreed that the basis of ADS SARPs development is the ADSP/3 work, not RTCA DO-212, change 1. The meeting was informed by Mr. Hennig that there is no International Air Transport Association (IATA) requirement for backwards compatibility in CNS/ATM-1 applications.

4. The meeting agreed that the encoding technique for the ADS application is Abstract Syntax Notation One (ASN.1)/Packed Encoding Rules (PER).

5. The meeting held a detailed discussion on the format of the SARPs. Mr. Murphy proposed an Operational Requirement (OR) to Functional Description mapping. System Requirements would then be derived. Mr. Murphy proposed that ORs be detailed in the SARPs.

6. Mr. van Roosbroek then presented WP 2-24. WP 2-24 presented a SARPs format derived from the International Civil Aviation Organization (ICAO) Air Navigation Commission (ANC) approved format. The working paper presents a six-part format:
Part 1 (GM) Operational Requirements
Part 2 Abstract Service Definition (this is an addition to ICAO ANC work)
Part 3 Formal Definition of Messages
Part 4 Message Sequence Rules
Part 5 Communication Service Requirements
Part 6 Conformance and Subsetting Rules
Appendix A State Tables

7. Mr. Murphy questioned where the allocation of performance requirements to the Air, Ground, Communications Infrastructure occurred. Mr. van Roosbroek indicated that the performance requirements were incorporated by reference from the ADSP/3 report. The group agreed that performance requirements should be allocated in the SARPs.

8. Mr. Asbury presented the ICAO definitions from "Directives to Divisional-type Air Navigation Meetings and Rules of Procedure for their Conduct". To qualify as a Standard, the specification must be such that its uniform application by all Contracting States is necessary in the interests of safety or regularity of international air navigation. To qualify as a Recommended Practice, a specification must be such that its uniform application by all Contracting States is considered desirable, but not essential, in the interests of safety, regularity, or efficiency of international air navigation.

9. The meeting agreed on the format for SARPs derived from the ICAO ANC format as presented in WP 2-24. SARPs and Guidance Material (GM) will be developed in parallel.

10. The meeting agreed that the baseline for ADS requirements is the ADSP/3 report. Mr. Maclean reported that the ADSP document is stable for ADS and CPDLC. M. Jean-Francois Grout (rapporteur of ADSP WG B) indicated that FIS SARPs work should follow more recent ADSP work.

11. The meeting then discussed the ADSP/3 specific enhancements. There are two specific enhancements. These are more flexible event contracts, and the 20-waypoint extended projected profile block. After detailed discussion the meeting agreed that the flexible event contracts are to be included in the SARPs. Mr. Pearce pointed out that the event contracts can be multiply triggered, and that event contracts will be increasingly important in ADS operation. The meeting then agreed that the projected profile block be included in the SARPs. Mr. Asbury indicated that 20 waypoints were not mandatory, but multiple waypoints were. Mr. Valentine pointed out that Part 6 of the SARPs formatting allowed specification of subsetting.

3.2.3.2 Controller Pilot Communications

1. Mr. Murphy presented WP 2-8, the draft SARPs for CPDLC. Mr. Murphy indicated that requirements are mature, and that validation results are expected out of North Atlantic trials. Mr. Hennig pointed out that no airspace operator aircraft will do CPDLC. Mr. Murphy indicated that the FAA has one airplane doing CPDLC.

3.2.3.3 Context Management

1. Mr. Murphy presented WP 2-7, the CM SARPs. The CM Requirements are mature and based on DO-223. The Logon function will be validated in NUT.

2. Mr. Jones described recent United States (US) CM work. The flight plan does not have a truly unique ATN data address, since two aircraft may exist with same radio call sign. Newly added ASN.1 constructs serve to disambiguate aircraft for flight plan correlation.

3.2.3.4 Flight Information Services

1. WP 2-12 was withdrawn. M. Picard has agreed to be the editor of the FIS SARPs.

2. IP 2-27 and IP 2-28 contain recent ADSP work on FIS requirements. The papers concern Pre-Departure Clearance (PDC) and Automated Terminal Information System (ATIS).

3. There was general discussion of new ADSP work in FIS, including Frequency Management and Downstream Clearance. M. Grout indicated that ADSP does not specify applications, but rather data link services. These could be fulfilled by one or many applications.

3.2.3.5 Directory Functions (if any)

1. No Report.

3.2.3.6 Security Functions (if any)

1. Mr. Jones asked if the ADSP had a security requirement. M. Grout replied that it did not. Mr. Jones stated that security is not only a technical standards effort, but also potentially a tremendous administrative effort.

2. Mr. Ian Valentine then presented WP 2-14 on Package 1 (and beyond) security. The paper offers a summary of an ATN threat analysis. The conclusion of the WP was that modifications, replay, and masquerade are threats in Package 1. A solution to this is formulated in ISO 8731-2 (cryptographic checksum). There are no requirements foreseen for countermeasures against monitoring or traffic analysis.

3. The meeting agreed that the security framework of CNS/ATM-1 is a WG1 action, and that WG3 still awaits direction. There are no security measures currently specified for CNS/ATM-1. The meeting agreed that a full threat analysis is required before countermeasures are formulated, and questioned the ability to support other than procedural means for CNS/ATM-1. The meeting also agreed that security key distribution raises administrative concerns. Mr. Maclean suggested that the appropriate ICAO authority be addressed on this issue.

4. Mr. Murphy presented WP 2-10. The paper discussed the procedural approach methods for security in certain US applications.

3.2.3.7 Managed Objects (if any)

1. No report.

3.3 CNS/ATM-2 Package

3.4 Air-Ground Applications Validation Activities

1. Mr. Jones presented IP 2-17, "Data Link Benefits Study Team". The study addresses one specific capacity limitation. At transition from terminal to en route, controllers have to space aircraft further in trail than necessary , due to voice channel limitation. The Atlanta test scenario involved two days' live traffic recordings, en route and terminal Air Traffic Control (ATC) testbeds and cockpit simulators. The results indicated that at 140% of the current maximum traffic load, air traffic controllers could maintain separation at the minimum allowed in-trail separation standards. Cost savings are estimated at 350 million dollars (US) per year to the users of the system.

2. Mr Majima presented WP 2-18. The paper was originally prepared for Aeronautical Mobile Communications Panel (AMCP) to discuss Very High Frequency (VHF) Data Link (VDL) requirements. The Japanese Civil Aviation Bureau (JCAB) categorizes datalink for air traffic services (ATS) communication as follows: ATS services over datalink (PDC, ADS, strategic ATC, ATC information) and ATS services continuing to depend on voice (emergency and distress communications, tactical ATC). The paper suggests three considerations: some DO-219 messages might better be voice communications; necessity to monitor ATS communications for aircraft in close proximity; necessity to evaluate operational rationality of ADS requirements. Mr Jones suggested that the paper would be useful as a contribution to identifying operational requirements. The paper was referred to SG2.

3.5 Status of CNS/ATM-1 Package Related Implementation Activities

1. IATA then presented four papers. WP 2-26 presents requirements for Aeronautical Operational Control (AOC) in CNS/ATM-1. The paper supports use of priority to share ATC/AOC traffic.

2. Mr. Hennig then presented WP 2-13. The paper stressed that our target is not SARPs, it is operational implementation. To develop avionics for June 1997 certified NUT aircraft, SG2 must have stable draft SARPs by June 1995. The paper then discussed the CNS/ATM-1 Implementation Group (CAIG). The CAIG comprises 10 airlines and potentially 400 ATN-equipped aircraft.

3. Mr. Fred Mabe then presented WP 2-19. WP 2-19 presents an avionics vendor position on Application Service Object (ASO) Association Control Service Element (A2CSE) and Application Programming Interface (API). Mr. Mabe stressed his desire that an application be allomorphic; that an application can change the way it works based on services required.

4. Mr. Mabe then presented WP 2-31. WP 2-31 offers the standard X/OPEN API for ICAO consideration. Mr. Overgaauw indicated that APIs are not the subject of ICAO. Mr. Van Trees noted that the Airlines Electronic Engineering Committee (AEEC) 638 had several years ago rejected standardization of APIs. Mr. Day indicated he thought the API as presented actually was positioned in the middle of the application layer. The group agreed that the API was an implementation decision.

5. Mr Asbury then presented WP 2-30. Mr Asbury stressed that the United Kingdom (UK) is participating in trials (as previously discussed by Mr. Hennig). The UK agrees on the urgency, but not the exact dates of the trials

6. Mr. Jones then presented IP 2-2, the results of the US Data Link Operational Requirements Team (DLORT). The paper contains operational requirements for the Aeronautical Data Link System (ADLS) in the US. Tables in the document show data link performance and integrity requirements for each domain. The paper is also being offered to WG1 and ADSP.

3.6 Develop Revisions to the SG2 Terms of Reference, as necessary

1. This itemwas deferred to discussion under agenda item 7.

4. Development of SARPs and Guidance Material CNS/ATM-1 Package Ground Application

4.1 Review Ground Applications Subgroup (SG1) Terms of Reference

4.2 Report on Subgroup 1 Activities

4.2.1 Review SG1 Meeting Report

1. M. Jean-Yves Piram reported on the three meetings held by SG1, in San Diego, Paris, and Toulouse, as indicated in WP 2-3. SG1 intends four meetings per year, with one SG1 meeting before each WG3 meeting. There will be an SG1 meeting in June 1995, and also a meeting in Banff (immediately preceding the WG3/3 meeting).

2. The group's work was presented in five work items as follows:
WI 1: Message Handling Services
WI 2: Inter-Centre Communications
WI 3: Clarification of "Economic Issues" question with respect to Type A and Type B Gateways
WI 4: Validation Activities
WI 5: Framework and process for ATN applications SARPs development

M. Piram presented the list of SG1 deliverables which includes eleven documents fitting into these 5 work items. Editors have been designated for each delieverable and contributors have been identified. However, M. Piram also reported that the group is eager for volunteers for documents D7 (Economic Issues) and D3, D6 (MHS Validation Reports) for which editors have not yet been found.

3. M. Piram reported that the SARPs for Message Handling Services over the ATN will not be retrofitted to the The Upper Layer ICAO Profile (TULIP) SARPs format, because they are based on the Manual on ATS Message Handling over the ATN which already exists. He also mentioned that such a retrofit had been considered as requiring a lot of effort for little benefit. Piram reported that the important tasks before SG1 are:

AMHS organization (management domains issue) and addressing,
completion of the Type A protocol Stack,
completion of the use of profiles,
review of the gateway specification,
addition of a logging functions in the management provisions,
investigation of the possibility of harmonization of the ICAO and IATA gateway specifications.

4. M. Piram sought guidance from the Rapporteur on the deliverable product on Economic Issues of Type A and Type B Gateways. Type A is intended to be a simple protocol stack which links two Aeronautical Fixed Telecommunication Network (AFTN)/ATN gateways over the ATN internet, providing a "tunneling" effect for transitional purposes. Type B is an MHS protocol stack and links AFTN/ATN gateways and ATS Message Servers over ATN. Type B is intended to be the long-term architecture for ATS Message Handling over the ATN.

5. M. Piram reported on the work achieved in the domain of Inter-Centre Communications. The main decisions taken by SG1 deal with its detailed contents, as specified in section 4.2.3.2 hereafter. An outline of the standing document which is the basis for the draft SARPs andGM for Inter-Centre Communications (SG1 D8) will be produced by the end of April 1995.

4.2.2 Review inputs subsequent to WG3/1 received from other ICAO Panels or working groups (if any)

4.2.3 Review status of SARPs and Guidance Material for CNS/ATM-1 Package ground applications

4.2.3.1 Message Handling Service

1. M. Jean-Marc Vacher presented WP 2-4, the current MHS Standing Document (SD01). There are three deliverables, which he is the Editor for, which are in progress on the basis of SD01:
D1 Draft SARPs/GM for the Basic ATS Message Service (ATNP/2)
D4 Draft Manual for Message Handling Services over the ATN, including the specification of the Extended ATS Message Service (ATNP/2)
D5 Draft SARPs/GM for MHS over ATN (ATNP/3)

2. M. Vacher then discussed the Guidelines for future evolution of SD01. These are as follows:
a) Use of Formal Methods for expressing SARPs.
b) Check of references to Annex 10.
c) possible guidance on Aeronautical Message Handling Service (AMHS) User interface
d) Definition of Extended ATS Message Services
e) Interworking with public X.400 service and private X.400 networks in the Extended ATS Message Service
f) Non-critical ICAO performance requirements
g) Update for X.400 standards since 1988

3. M. Vacher then discussed the SG1 approach to standardization. SG1 for the Type B specification endorses the use of International Standardized Profiles (ISPs). The ISPs in use are ISO/IEC 10611 and ISO/IEC 12062. Both ISPs reference ISO/IEC 10021:1992.
The specification of the Basic ATS Message Service corresponds to the basic requirements of the ISPs.

4. M. Vacher then addressed further work. The salient items are:
AMHS organization (management domains) [needed by June 1995]
Addressing
Review of Gateway Specifications
IATA-ICAO Interworking
Character repertoires.

5. Mr. White then raised the question of the OR for extended ATS Message Service and public X.400 interworking. He noted that the original OR was limited to AFTN functionality. M. Vacher responded that SG1 had a clear sense of the potential benefit of MHS for the Extended ATS Message Service, but had no OR for this, and that no progress had been made yet on the specification of the extended service. M. Piram responded that SG1 mandated all existing AFTN-like MHS features and adopted the basic requirements of the profile for this purpose, for the Basic ATS Message Service.

6. Mr. White then commented that the non-time-critical requirement was not the only criterion for protocol architecture. Mr White indicated that the nature of the service was important; for example, a dialogue/interactive service, not provided by MHS. M. Piram responded that the Dialogue/Transactional issue was raised for the first time at WG3/1. M. Piram indicated that if dialogue were a requirement, that the International Organization for Standardization (ISO) Transaction Processing (TP) should be considered as a potential solution. M. Piram indicated that the dialogue requirement would form a separate document.

7. Mr. White then provided some recent details of work on transport management in the US. Mr. White asked that a common ULA of A2CSE/ Fast Byte (FB) be considered for an efficient stack M. Piram responded that this is a potential solution for the Type A gateway. M. Piram indicated that the challenge is to provide the service, not put the stack into discussion. Mr. Jones asked if SG3 should advise SG1 on ULA. The ULA proposal detailed later in this report indicates the standard ISO upper-layer stack for ground-ground communications. This is in agreement with current MHS standardization. Further discussion on the ULA for the Type A gateway was deferred to agenda item 7 to permit review of the SG3 activities.

8. The meeting then held a short discussion on documentation issues. Mr. Valentine commented that statements of Standards and Recommended Practices in SD01 should be checked for consistency in terminology. Mr. Jones indicated that, as the document is being translated by ICAO, they expect a change-bar document at ATNP/2. Mr Jones suggested that two working documents are necessary to reflect both recent changes and all changes since ATNP/1. M. Vacher indicated that SD01 had been distributed with a limited anticipation, so that approval would come only after the end of the comment period on 14 April 1995.

4.2.3.2 Inter-centre Coordination

1. M. Vacher presented WP 2-5 on inter-centre communications (ICC). He mentioned that M. Claude Leclerc has been designated Editor of the SARPs on this subject. The ICC work has just started from the Terms of Reference (TOR) in informal coordination with the ADSP. The following have been included in the scope of ICC:
Flight planning service
Notification service
Coordination service
Transfer of Control service
Transfer of surveillance data service
Airspace management service
General information service
Application management service
Context Management Application (CMA)

2. M. Vacher reiterated that ground-ground CMA is not the whole ICC for CNS/ATM-1. Mr. Jones questioned the status of the OR for ground-ground CMA. Mr. Murphy clarified that SG2 requires forwarding of CMA addresses. SG2 does not dictate whether the requirement is met by address forwarding or a directory service. Mr. Murphy indicated that SG2 would prefer to logon once and have seamless address forwarding thereafter.
Mr. White then asked that WP 2-5 be clarified to indicate that while completion of ground-ground ADS, and CMA in ICC in CNS/ATM-1 was not foreseen, that work was not precluded.

3. Mr. Esser then asked about the source of operational requirements outside of the ADS Panel. Mr. Esser asked about the process of receiving requirements from regional planning groups. Mr. Asbury indicated that the ANC has said that ORs for Data Link Applications (DLA) are through the ADSP. Mr. Pearce indicated that the ASPP was the source of MHS requirements. M. Piram indicated that the ADSP is concerned with SG1 message sources.

4. Mr. Murphy then presented WP 2-9. The paper presents ADSP requirements to SG1.

4.2.3.3 Directory Functions (if any)

1. No Report.

4.2.3.4 Security Functions (if any)

1. No Report**.**

4.2.3.5 Managed Objects (if any)

1. No Report.

4.3 CNS/ATM-2 Package

1. The meeting discussed CNS/ATM-2 for the ground-ground domain. Mr. White noted the requirement for Ground-ground AOC. Mr. Jones noted that Mr. Calow has discussed the need to support Traffic Flow Management (TFM) functions (at ATNP/1). Mr. Pearce indicated that

ADSP will work on Air Space Management and TFM. Mr. Maclean note that FIS requirements work is in progress.

4.4 Ground Applications Validation Activities

1. Mr. Majima presented WP 2-20 on JCAB MHS Validation Activities. The paper presented seven incremental stages for MHS validation in Japan. The validation uses commercial-off-the-shelf (COTS) MHS and routers for the initial configuration. Mr. Mizoguchi noted his concern about new requirements, and the next step after CNS/ATM-1.

4.5 Status of CNS/ATM-1 Package Related Implementation Activities

1. No Report.

4.6 Develop Revisions to the SG1 Terms of Reference, as necessary

1. This was deferred to agenda item 7.

5. Development of SARPs and Guidance Material for the ATN Upper Layers

5.1 Review ATN Upper Layers Architectural Framework Subgroup (SG3) Terms of Reference

5.2 Report on Subgroup 3 Activities

5.2.1 Review SG3 Meeting Report

1. Mr. Overgaauw presented the SG3 meeting report. The group has held two meetings, in Orlando and Toulouse.

2. Mr. Overgaauw then presented the ULA recommendation. The ULA proposal offers a ULA for CNS/ATM-1 and CNS/ATM-2, and common upper layers services and protocols for CNS/ATM-1. The proposal offers a clear transition path from CNS/ATM-1 to CNS/ATM-2. The proposed ATN ULA is the Open Systems Interconnection (OSI) ULA consisting of the OSI application layer structure (ALS) (ISO/IEC 9545), the presentation layer (ISO/IEC 8823), and the session layer (ISO/IEC 8327-1). The ALS offers a modular structure for building applications. The specific upper layers elements in the ULA proposal are the Association Control Service Element (ACSE) (ISO/IEC 8650); the OSI Presentation Layer Protocol, including the FB mode; and the OSI Session Layer Protocol, including the FB mode. ACSE is recommended because it provides an OSI logon function, graceful release of associations, and an authentication option. The FB recommendations for Presentation and Session layer are being standardized by the International Telecommunication Union Telecommunication Standardization Sector (ITU-T) in Geneva in June 1995. The FB recommendations meet the bandwidth requirements of air-ground applications. They require one octet in the connect phase, and zero octets in the data-transfer phase. For ground-ground communications, the standard session and presentation were identified,

based on SG3's understanding of what SG1 was recommending. This is recommended in terms of its advantages in OSI standardization, use of COTS, and certification credit for ALS. The commonality of ULA between the air-ground and ground-ground domains also eliminates the need for gateways. The proposal has zero impact on SG1. The proposal would require SG2 to define applications as ASOs. It would also require the use of the upper layer service instead of the transport layer service.

2. Mr. Mabe asked about the certification implications of ACSE. Mr. Van Trees replied that he saw certification advantages in ACSE, since its functions were already in the applications in proprietary software, which would have to be certified. Use of an ACSE solution implied that conformance statements, interoperability testing, and reusability could all give certification credit.

3. Mr. Murphy asked about the relation of CMA and ACSE. Mr. Van Trees replied that ACSE was the ISO logon. ACSE had been proposed for the ATN in 1991, but had been rejected since upper layer overhead was prohibitive for the air-ground link. As the upper-layer efficiency problem now has a solution, the use of ACSE to support the CMA logon function now seems prudent.

4. M. Grout indicated that he saw positive operational benefits in both the ACSE graceful release and authentication option.

5. Mr. Jones asked about the encoding of the ACSE. Mr. Overgaauw replied that PER was recommended. Mr. Jones then asked about the effect of the ULA on the CPDLC message set. Mr. Van Trees replied that there was no negative effect, since message decomposition was not contemplated. There may be positive effect, as graceful release is provided.

6. Mr. Murphy then asked about integrity and QOS provisions. Mr. Van Trees replied that integrity was provided by the transport layer. M. Camus then asked if this implied a one-platform solution since the upper layer protocol would have to be resident in the same platform. Mr. Van Trees replied that there was intensive discussion on this in the US, and that architectures across platforms were certainly in consideration. Mr. Overgaauw indicated that QOS was in the SG3 TOR, so that SG3 would work with SG2 and WG2 on this issue.

7. Mr Jones then asked about the use of the ACSE/FB ULA in the ground-ground domain. Mr. Overgaauw replied that this was an omission in his presentation; the ACSE/FB ULA is recommended for the low-bandwidth high-delay conditions of the air-ground domain, but is not limited to the air-ground domain.

8. WG3 endorsed the SG3 proposal for an ACSE/FB ULA for the air-ground applications, and standard full stack for the ground-ground in CNS/ATM-1.

5.2.2 Review Status of related ISO and ITU-T Upper Layer activities subsequent to WG3/1

1. Mr. Van Trees presented WP 2-21, the ITU-T Upper Layer Efficiency Recommendations. Mr. Van Trees reported that the final drafts of the Recommendations had been submitted to the ITU-T Rapporteur this week, and that final approval of the Recommendations is expected in Geneva in June 1995.

2. Mr. Van Trees presented WP 2-22, the ISO Common Application Service Element (CASE) Rapporteur's draft meeting report. Mr. Van Trees reported that as a result of the successful CASE Rapporteur's meeting in Paris, A2CSE is expected to progress to Committee Draft (CD) at the ISO/SC21 meeting in Ottawa in July 1995. Mr. Van Trees remarked that these two successes in standards work were on the schedule set forth at WG3/1 for ATN Manual, edition 3.0 ULA standards.

3. Mr. Van Trees presented WP 2-33, an SG3 flimsy from the Orlando meeting. The paper discusses the advantages of the ATN ULA over a application-over-transport solution and a full-stack solution. The WP proposes an ALS/A2CSE/FB ULA. Mr Overgaauw clarified that the A2CSE is profiled to ACSE in the CNS/ATM-1 ULA. Mr. Jones suggested that as A2CSE will be an element of the ULA in the ATNP/2 ULA Manual that it was wise to include GM in the ATNP/2 applications SARPs referring to the transition to A2CSE.

4. The meeting agreed that ALS/A2CSE/FB was the current CNS/ATM-2 ULA proposal.

5.2.3 Review inputs subsequent to WG3/1 received from other ICAO Panels or working groups (if any)

1. The only inputs that were received were from WG3/SG2.

5.2.4 Review status of SARPs and Guidance Material for CNS/ATM-1 Package Upper Layer Architecture

1. No draft material was available for review by WG3.

5.2.4.1 Requirements placed on underlying communications services (reference WG1/1 report, para. 4.6)

1. Material from SG2 was reviewed by SG3 and accounted for in the recommended ULA.

2. Mr. Jones asked Mr. Van Trees to explain the joint WG2-WG3 Quality of Service (QOS) meeting. The meeting basis was that WG2 offered weak QOS (requests are accepted, but results are not guaranteed), while WG3 had need for strong QOS (requests for service are honored, or results are made known). The joint meeting was held on 13 March 1995. The results are available in WP 2-32.

3. Mr. Valentine presented WP 2-32. WP 2-32 is notes from the WG2-WG3 QOS meeting. The proposal was that transport and network QOS would be met in CNS/ATM-1 by capacity planning. It was indicated that transport priority has end system influence, while network priority has

intermediate system influence. Thus, they are separate, and the mapping between transport and network priority in Table A5-1 of the ATN Manual, v2.0 should be removed. Mr. Day stated that partial ordering on priority must be preserved.

4. Mr. Whyman joined the group from WG2, and presented WG2 Flimsy 2. WG2 holds that transport priority has no meaning. WG3 is free to attach semantics to transport priority. WG2 has no plans to support the Connectionless mode Transport Protocol (CLTP) in CNS/ATM-1.

5. Mr. van Roosbroek presented IP 2-15, on Naming and Addressing. The paper is intended for WG1. Mr. Day stated that he found several problems with the paper, specifically that Application Process (AP)-titles were made location-dependent, and that network titles were not made topography-dependent. Mr. Hennig indicated that all airborne ATN applications should have IATA addresses.

6. Mr. Valentine presented WP 2-25 on QOS for CNS/ATM-1. The general comment from the group was that many requirements and constraints were expressed without a sense of their limitation to CNS/ATM-1. Mr. Maclean reminded WG3 that the ADSP figures were a small part of the ADSP/3 report, and were intended as goals. M. Grout indicated to WG3 that FIS QOS figures were still under development.

5.2.5 Review status of SARPs and Guidance Material for CNS/ATM-2 Package Upper Layer Architecture

5.2.5.1 Upper Layer Stacks

1. Material from SG2 was reviewed by SG3 and accounted for in the recommended ULA.

5.2.5.2 Security Functions

1. The discussion of the security paper (WP 2-14) is presented under 3.2.3.6.

5.2.5.3 Directory Functions

1. No report.

5.2.5.4 Upper Layer Managed Objects

1. No report.

5.2.6 Review status of SARPs and Guidance Material for System Management application and its supporting upper layer stack

1. Mr. Valentine presented WP 2-23, the Systems Management Concept for CNS/ATM-1 Package. The WP first considers the long-term institutional objectives and then considers CNS/ATM-1. The WP proceeds from the assumption that there will be no ICAO-standardized systems management exchanges between organizations in CNS/ATM-1.

5.3 Status of Validation Activities

1. Mr. Jones indicated the US intends to validate the full CNS/ATM-1 ULA and applications. The US has also developed an ATN simulator through the transport layer. The US also has ATN flight tests scheduled. The US intends that the ULA be included in those flight tests. The US intends validation to be complete by the Jamaica WG meeting in January 1995. The CPDLC is implemented in the US, building upon what was demonstrated at WG3/1.

2. M. Grout indicated that Europe planned to institute further ATN activity in 1996 dependent on funding.

5.5 Status of CNS/ATM-1 Package Related Implementation Activities

1. No report.

5.6 Develop Revisions to the SG3 Terms of Reference, as necessary

1. This item was deferred to agenda item 7.

6.0 Coordination with other ICAO Bodies

1. Mr. Esser presented WP 2-16, a Request for operational requirements for the CNS/ATM-2 package. CNS/ATM-2 is the advancement of ATM applications in the 2000 timeframe. The WP identifies the needed coordination between the ATNP and the ADSP required for CNS/ATM-2 ORs. The paper details the need for an ATM operational concept from which ADSP will extract ORs. The WP recommends the usage of the ICAO Data Link Applications Requirements Documents (DLARDs) and Data Link Communications Requirements Documents (DLCRDs).

2. The following flimsys are attached.

1. Ground-ground forwarding of Air/ground data link application addresses.

2. WG3 Comments on WG3/WP 2-25 and WG3/WP 2-14.
The flimsy concerns comments on the CNS/ATM-1 QOS Concept. It contains issues for ADSP.

3. CNS/ATM-1 QOS Requirements
This discussion paper was directed to WG2. The paper provided a list of potential QOS requirements from the application perspective. The paper was produced by a WG3 breakout group and was reviewed in detail by the full WG3.

7.0 Any other business

1. Mr. Jones presented IP 2-29. Mr. Tom Kraft (US) issued the invitation for his presentation next week at the Joint Working Group (JWG). Mr Kraft is interested in having ICAO SARPs used in the US certification process. His work derives relationships between operational benefits and CNS performance.

2. The group discussed the ULA for Type A Gateway. M. Piram indicated that the group was comfortable with the agreed WG3 position of full-stack ULA for ground communication. Mr. White indicated that he had a prototype A2CSE/FB implementation in the Type A gateway. Mr. White indicated that none of the A2CSE enhancements were being used in the Type A gateway. SG3 was asked to advise SG1 on Type A Gateway ULA..

3. The group then reviewed SG TORs. The new TORs are attached. Interactive data exchange is included in the ULA work of SG3.

4. The group then discussed economic tradeoffs in Type A/Type B gateways. The group agreed that no SG1 work on the economic tradeoff topic was required at this time.

5. Mr. Overgaauw announced that he will join the French delegation after WG3/2.

8.0 Arrangements for the next meeting

1. The next SG1 meetings are 7-9 June 1995 (probably in Brussels), and 10-12 October 1995 in Banff.

2. The next SG2 meeting is 8-12 May 1995 in Seattle.

3. The next SG3 meeting is 1-5 May 1995 in Seattle.

4. [Editor's Note] Subsequent to the conclusion of the WG3 meeting, a proposal has been put forward to convene concurrent meetings of WG2 and WG3 15-19 May 1995 in the USA. The meeting concerns issues related to the definition of operational / application requirements and their impact on the definition of the underlying communications services.

5. The next WG meeting is Banff, Alberta. WG1 will be held 9-12 October 1995, JWG will be held 13 October 1995, and WG2/WG3 will be held 16-20 October 1995.

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ATTACHMENT 2 AGENDA

AGENDA
ATNP Working Group 3
Applications and Upper Layers
Second Meeting
13 - 17 March, 1995

1. Approval of the Agenda
- **1.1 Distribution of working papers**
- **1.2 Assignment of working papers to agenda items**

2. Review of the WG3/1 Report
2.1 Review of action items from WG3/1 and WG1/1 meetings

3. Development of SARPs and Guidance Material CNS/ATM-1 Package Air-Ground Applications
3.1 Review Air-Ground Application Subgroup (SG2) Terms of Reference
3.2 Report on Subgroup 2 Activities
3.2.1 Review SG2 Meeting Report
3.2.2 Review inputs subsequent to WG3/1 received from other ICAO Panels or working groups (if any)
3.2.3 Review status of SARPs and Guidance Material for CNS/ATM-1 Package air-ground applications
3.2.3.1 ADS Contract Establishment and Position Reporting
3.2.3.2 Controller Pilot Communications
3.2.3.3 Context Management
3.2.3.4 Flight Information Services
3.2.3.5 Directory Functions (if any)
3.2.3.6 Security Functions (if any)
3.2.3.7 Managed Objects (if any)
3.3 CNS/ATM-2 Package
3.4 Air-Ground Applications Validation Activities
3.5 Status of CNS/ATM-1 Package Related Implementation Activities
3.6 Develop Revisions to the SG2 Terms of Reference, as necessary

4. Development of SARPs and Guidance Material CNS/ATM-1 Package Ground Application
4.1 Review Ground Applications Subgroup (SG1) Terms of Reference
4.2 Report on Subgroup 1 Activities
4.2.1 Review SG1 Meeting Report
4.2.2 Review inputs subsequent to WG3/1 received from other ICAO Panels or working groups (if any)

4.2.3 Review status of SARPs and Guidance Material for CNS/ATM-1 Package ground applications
4.2.3.1 Message Handling Service
4.2.3.2 Intre-centre Coordination
4.2.3.3 Directory Functions (if any)
4.2.3.4 Security Functions (if any)
4.2.3.5 Managed Objects (if any)
4.3 CNS/ATM-2 Package
4.4 Ground Applications Validation Activities
4.5 Status of CNS/ATM-1 Package Related Implementation Activities
4.6 Develop Revisions to the SG1 Terms of Reference, as necessary

5. Development of SARPs and Guidance Material for the ATN Upper Layers
5.1 Review ATN Upper Layers Architectural Framework Subgroup (SG3) Terms of Reference
5.2 Report on Subgroup 3 Activities
5.2.1 Review SG3 Meeting Report
5.2.2 Review Status of related ISO and ITU-T Upper Layer activities subsequent to WG3/1
5.2.3 Review inputs subsequent to WG3/1 received from other ICAO Panels or working groups (if any)
5.2.4 Review status of SARPs and Guidance Material for CNS/ATM-1 Package Upper Layer Architecture
5.2.4.1 Requirements placed on underlying communications services (reference WG1/1 report, para. 4.6)
5.2.5 Review status of SARPs and Guidance Material for CNS/ATM-2 Package Upper Layer Architecture
5.2.5.1 Upper Layer Stacks
5.2.5.2 Security Functions
5.2.5.3 Directory Functions
5.2.5.4 Upper Layer Managed Objects
5.2.6 Review status of SARPs and Guidance Material for System Management application and its supporting upper layer stack
5.3 Status of Validation Activities
5.5 Status of CNS/ATM-1 Package Related Implementation Activities
5.6 Develop Revisions to the SG3 Terms of Reference, as necessary

6.0 Coordination with other ICAO Bodies

7.0 Any other business

8.0 Arrangements for the next meeting

ATTACHMENT 3 LIST OF PAPERS

ATNP/WG3/2 Toulouse 13-17 March 1995

List of Working Papers (revision 2)

No	Agenda	Presenter	Title
2-0	2.1	R. Jones	ATNP/WG3/1 Report
2-1	1	R. Jones	ATNP/WG3/2 Agenda
2-2 (I)	3.5	R. Jones	Operational Requirements for the Aeronautical Data Link System in the U.S.
2-3	4.2.1	J-Y. Piram	Report of SG1 Chairman to WG3
2-4	4.2.1	J-Y. Piram	Current Status of the SG1 Standing Document on Message Handling Services over the ATN
2-5	4.2.3.2	J-Y. Piram	Current Status of the SG1 Standing Document on Inter-Centre Communications over the ATN
2-6	3.2.1	M. Murphy	Copy of Status/Issues Document from ATN Applications SARPs Drafting Group
2-7	3.2.3.3	M. Murphy	Working Draft of ATNP CNS/ATM-1 Context Management ATN Application SARPs
2-8	3.2.3.2	M. Murphy	Working Draft of ATNP CNS/ATM-1 Controller Pilot Data Link Communication ATN Application SARPs
2-9 (I)	3.2.3	M. Murphy	ADSP Ground-Ground Messaging Requirements in Support of Data Link Based ATC Environments
2-10	3.2.3.6	M. Murphy	CNS/ATM-1 Procedural Security Recommendations
2-11	3.2.3.1	D. van Roosbroek	Draft ADS SARPs and Guidance Material
~~2-12~~	~~3.2.3.4~~	~~F. Picard~~	~~FIS SARPs~~
2-13	3.5	P. Hennig	The Airlines Need for an early definition of the CNS/ATM-1 Package
2-14	3.2.3.6	D. van Roosbroek	Security Issues for CNS/ATM-1 Package and Beyond
2-15 (I)	5.2.4	D. van Roosbroek	ATN Naming, Addressing and Registration Concept
2-16	6.0	R. Esser	Request for operational requirements for the CNS/ATM-2 package
2-17 (I)	3.4	R. Jones	Data Link Benefits Study Team
2-18	3.4	T. Majima	Consideration on the ATS Operational Requirements on Datalink Network
2-19	3.5	F. Mabe	Rockwell Collins Position
2-20 (I)	4.4	T. Majima	AMHS system configuration and protocol architecture
2-21	5.2.2	S. Van Trees	ITU-T Efficiency Enhancements Recommendations
2-22	5.2.2	S. Van Trees	ISO CASE Rapporteur's Meeting Report
2-23	5.2.6	D. van Roosbroek	System Management Concept for CNS/ATM-1 Package
2-24	3.2.3	D. van Roosbroek	Structure of air/ground Application SARPs
2-25	5.2.4	D. van Roosbroek	QOS Management Concept for CNS-ATM/1 Package
2-26 (I)	5.5	P. Hennig	The Airlines Position on ATN for non-ATC Applications
2-27 (I)	3.2.3.2	J-F. Grout	Detailed Description of Pre-Departure Clearance Service (Draft)
2-28 (I)	3.2.3.2	J-F. Grout	Detailed Description of ATIS Service (Draft)

2-29 (I)	7.0	T. Majima	(T. Kraft) ICPNC Coordination
2-30	3.5	M. Asbury	Implementation of the CNS/ATM-1 Package
2-31	3.5	F. Mabe	Upper Layer API
2-32	7.0	I. Valentine	Notes from joint WG2/WG3 meeting on QOS, 13 March 1995
2-33	5.2.2	S. Van Trees	Upper Layer Architecture Transition

ATTACHMENT 4 ACTION ITEMS

ACTION WG3/2-1 -- Mr. Van Trees will contact US authorities on alternative means for certification of ACSE.

ACTION WG3/2-2 -- SG3 will meet with SG2 as soon as possible to agree QOS, upper layer service, and ACSE specification deliverable dates.

ACTION WG3/2-3 -- The WG3 rapporteur will contact WG1 to include ATNP schedule and deliverables in the ATNP flimsy.

ACTION WG3/2-4 -- The WG3 rapporteur will convey to WG1 the WG3 position on no security for CNS/ATM-1.

ACTION WG3/2-5 -- Mr. Overgaauw and Mr. Van Trees will convey the WG3 ULA agreement to WG1. .

ACTION WG3/2-6 -- SG3 will advise SG1 on the Type A Gateway ULA at its next meeting.

ATTACHMENT 5
Flimsy 1

ATNP Working Group 3

13th - 17th March, Toulouse, France

Ground/Ground Forwarding of Air/Ground Data Link Application Addresses

This flimsy presents the ATNP Working Group 3 Air Subgroup recommendation concerning the ground/ground forwarding of air/ground data link application addresses.

Background

The air/ground data link applications have been designed to support seamless operational transitions between ATC facilities. To facilitate this there is a requirement to forward the relevant data link application addresses between these facilities.

At present there is an air/ground mechanism in the Context Management application to forward air/ground data link application addresses. This mechanism is expected to be used in some cases.

However, states have recognised the need for and will implement local ground/ground forwarding of air/ground data link application addresses. International standardisation of the ground/ground message format and handling would provide for standard interfaces among CAAs.

Recommendation

It is recommended that the ATNP Working Group 3 Ground Subgroup define technical requirements for ground forwarding of air/ground data link application addresses.

It is recommended that the ATNP Working Group 3 Ground Subgroup consider the Context Management application ASN.1 representation of the LOGON message in the determination of the technical requirements addressed in Recommendation 2.1.

WG3 Comments on WG3-2/WP25 and WG3-2/WP23

This flimsy is passed to ATNP/WG1, and also to ADSP.

ATNP WG1 is asked to take the contents of this flimsy into account when reviewing the referenced working papers.

ADSP is asked to consider the operational impact of the answers given in this flimsy, and notify ATNP WG3 if any answers are incorrect.

1 WG3-3/WP25 - "QoS Management Concept for CNS/ATM-1 Package"

1.1 Major assumptions and constraints in sections 2 & 3

Constraint 1 Agreed
Assumption 1 OK, but should make clear that the problem is the non-specification of QoS mechanisms and the absence of the QoS Basis Framework that is referred to.
Constraint 2 Agreed
Constraint 3 Not agreed, dynamic resource pre-allocation takes place today in connectionless networks. The constraint confuses service and NL internal functionality.
Constraint 5 Agreed
Constraint 6 Not agreed (same reason as 3)
Constraint 7 Agreed

1.2 Application/Upper Layer Requirements

Constraint 8 Agreed
Assumption 2 Agreed
Constraint 9 Agreed
Assumption 3 Agreed
Assumption 4 Change to read "WG3 will specify a generic set of QoS..."

All the A/G QoS parameters (Covered by constraint 10 - Assumption 8) are under discussion in WG3 SG2 (Air), and therefore the views expressed below for A/G should be regarded only as the opinions of the subset of experts in WG3.

Constraint 10 Not agreed. Applications will be designed which will need better QoS to reach a greater potential than is achievable with the initial networks. Operational procedures will handle degradation of QoS, e.g. by increasing the reporting intervals. In some cases CNS/ATM-1 package applications are specified to choose fastest transfer over cost considerations, in effect only using premium services.
Assumption 5 Agreed
Requirement 6 Not agreed. These figures were intended to be 'end state' targets. Lower levels of QoS are acceptable, provided they are known, and again operational procedures can be developed to handle less ideal parameters. Also, they apply for ADS and CPDLC, but probably not to FIS

6.2 Assumes a connection is in place

6.4 Discussions with members of the ADS panel indicate that the 'system' being addressed here is the whole comms. infrastructure. Only avionics systems which are within airspace where ADS/ATC coverage are available contribute to this availability figure.

Requirement 7 The Transport priority should be that corresponding to "Safety of Flight". So should the Network Priority. It is expected to be acceptable that the only QoS preference available from the list is "transit delay over cost"

Assumption 6 Agreed
Requirement 8 The same Transport and Network priorities, and the same QoS choices as for ADS apply for CPDLC. It is possible (ADSP to advise) that a continuing emergency situation may warrant setting up a new connection at higher (Distress Communications) priority.
Assumption 7 Agreed
CM Requirements It should be assumed that these will be the same as for CPDLC and ADS
Assumption 8 Agreed, FIS figures are not yet available.
Requirement 9 The table caused some debate. It was not clear exactly what the "Comm Failure Notification" time is supposed to achieve, and whether mechanisms have to be built in to measure it. ADS panel is asked to clarify. It is assumed that the transfer time excludes local interface delays. (definition in Appendix B) Also, it is not clear whether these are the '99.9% targets', or have to be measured.
Assumption 9 Duly noted, although the significance is not clear.
Requirement 10 Again, AIDC priority is "Safety of Flight", and should be so handled in Transport and Network. We think the first occurrence of "authentication" in last bullet should be deleted. It is important that security "hooks" are provided to allow technical authentication to be introduced beyond package 1.
Assumption 10 Insert "it" after "work".
Assumption 11 Agreed
Assumption 12 Agreed
Requirement 11 It is noted that the manual currently maps five message priorities onto three priorities provided by the MTS or IPMS Nothing is stated however on how the MTA decides how many transport connections to open, and at what priority. This needs to be addressed in a manner consistent with the ICAO priority hierarchy by the appropriate WG3 subgroup.
Assumption 13 Agreed
Assumption 14 Agreed

2 WG3-2/WP23 - Systems Management Concept for CNS/ATM-1 Package.

2.1 The Long Term

WG3 has many reservations about the long term model for management described in section 2. A separate contribution is available on this subject. However, it is recognised that this is a first proposal, and will evolve in WG1 discussions.

2.2 Long term assumptions

Assumptions 1-4 are agreed
Assumption 5 Not agreed - the absence of ICAO specifications does not preclude tactical management strategies, and building a 'high reliability' network is unquantified and probably unachievable. In any case this assumption is an implementation issues, not an ICAO specification issue.
Assumption 6 Agreed
Assumptions 7 & 8 are a restatement, or natural consequence of 3
Assumption 9 Relates to implementation, ICAO takes no part in State internal matters.
Assumption 10 Out of ICAO jurisdiction.
Assumption 11 Another consequence of 3
Assumption 12 Out of ICAO jurisdiction
Assumption 13 Another consequence of 3

2.3 Transition Issues

WG3 have the view that it would be better to have stated first the long term (target) solution and then cover transition from today (Package 1) to the target.

Assumption 14 Agreed

Assumption 15 Agreed
Assumption 16 Not agreed - this seems to be confusing implementation with specification. CNS/ATM-1 package is a set of validated SARPs (specifications). It is not a set of products, or even product specifications.
Assumption 17 As 16

2.4 Requirements for CNS/ATM Package 1 communications

Assumptions 18-21 Agreed
Assumption 22 This has not been discussed or resolved in WG 3, and so can not be agreed at this time.
Assumptions 23-26 Agreed
Assumption 27 Wording should be the same as in 23-26, then agreed.
Assumption 28 Not agreed - it is intended to provide for the X.400 Logging function in package 1 Also, the heading of this section should be Message Handling Systems - there are other 'Messaging' services foreseen in Ground-ground communications.
Assumption 29 Agreed

ATTACHMENT 7

ATNP WG3, Flimsy 3, 17 Mar 95

1 Introduction

1.1 This Flimsy only applies to CNS/ATM-1 SARPS.

1.2 This Flimsy is provided in reference to WG2 Flimsy 2.

2 Requirements/Issues

2.1 QOS Metrics

2.1.1 *Transit Delay* shall be specified.

2.1.2 *Residual Error Rate* shall be specified.

2.1.3 *Service Loss Reporting* shall be specified.

2.1.4 *Throughput* requirements are still an issue concerning need and quantification of the metric.

2.1.5 The methodology to convey QOS metrice to the communication service is still an issue.

2.2 General Design Requirements

2.2.1 *Availability* shall be specified.

2.2.2 *Service Restoration Time* shall be specified.

2.3 Message Sequencing

2.3.1 WG3 recognised a potential need for two message delivery modes: 1) sequential delivery where succeeding message delivery is dependent on the successful delivery of preceding messages, and 2) independent delivery, where delivery of a succeeding message is not dependent on the successful delivery of a preceding message. Possible message sequence control could be provided through one of the following means:

1) Applications would indicate to the communications infrastructure selected message delivery mode.

2) Applications would take responsibility for sequential delivery. In this case, the communication infrastructure would operate in mode 2.

3) Selection for sequential delivery would be placed on application users. In this case, the application and the communication infrastructure would operate in mode 2.

2.3.2 WG3 needs to further discuss the advantages/disadvantages associated with message sequencing.

2.4 Communication Service Termination

2.4.1 There is a potential requirement that non-delivery, mis-delivery, or induced message errors should not cause termination of the communications services.

2.4.2 The communications service shall provide an orderly termination of service upon indication by the application (e,g, if messages have been passed to the communications service and than a termination of service is requested, the preceding messages are to be delivered as per normal operations before the service is terminated).

2.4.3 Upon failure of orderly termination an indication shall be provided to the application.

2.4.4 There is still an issue associated with the lifetime of messages. If delivery is unsuccessful, after some point in time message delivery attempts should cease.

2.5 QOS Monitoring

2.5.1 There is a potential requirement that the communication service should provide an indication which distinguishes between successful/unsuccessful QOS maintenance. It is accepted that only the transit delay is monitored for this indication.

2.5.2 There is still an issue related to a requirement for the communication service to provide an explicit indication of successful delivery for a given message.

2.6 Priority

2.6.1 It is not accepted that the ATN tranport service provider will not implement procedures related to transport priority . Namely, a mapping shall be provided between transport priority and network priority. WG3 will provide these mapping requirements at a future meeting.

2.6.2 The relationship between network priority and QOS will be decided at a future meeting.

2.7 Routing Policy

2.7.1 It is not a valid assumption that lowest practical cost is always required.

2.7.2 Applications shall not be required to manage specific subnetwork selection. If required by the communication service, a logical ordering of subnetwork selection may be able to be provided.

2.7.3 There is a potential requirement that an application should be able to set routing policy for best time path or lowest cost path. Other metrics may be required, as well.

2.8 Miscellaneous

2.8.1 A message delivered to the communications service shall not be delivered more than once to its peer entity.

2.8.2 It is recognised that there will be possible interface requirements for a QOS maintenance settings to potentially include security labels.

3 Conclusions

3.1 Requirements in this flimsy are not finalized. WG3 looks forward to working with WG2 to resolve communication service interface requirements.

ATTACHMENT 8

ATNP WG3/WG2 Adhoc, Flimsy AH-1, 17 Mar 95

1 Introduction

1.1 Thia Flimsy represents a consensus agreement among adhoc participants (list enclosed) concerning ATNP air/ground application requirements on a communication service.

1.2 This Flimsy only applies to CNS/ATM-1 Air/Ground Application SARPS.

1.2 This Flimsy is provided in reference to WG2 Flimsy 2.

2 Requirements/Issues

2.1 General Design Requirements

2.1.1 *Transit Delay* shall be specified for each application in the SARPS.

2.1.2 *Residual Error Rate* shall be specified for each application in the SARPS. All ATNP applications will have the same value. Other applications (e.g. AOC) may have different values.

2.1.3 *Service Loss Reporting* shall be specified for each application in the SARPS. All ATNP applications will have the same value.

2..1.4 *Availability* shall be specified for each application in the SARPS.

2.2.2 *Service Restoration Time* shall be specified for each application in the SARPS.

2.2 Message Sequencing

2.3.1 Sequential delivery, where succeeding message delivery is dependent on the successful delivery of preceding messages is required.

2.3 Communication Service Termination

2.3.1 The communications service shall provide an orderly termination of service upon indication by the application (e,g, if messages have been passed to the communications service and than a termination of service is requested, the preceding messages are to be delivered as per normal operations before the service is terminated). It is noted that the ATN Upper Layer Architecture will provide this service.

2.3.2 Upon failure of orderly termination an indication shall be provided to the application. It is noted that the ATN Upper Layer Architecture will provide this service.

2.4 Priority

2.4.1 Applications shall specify priority in accordance with ITU regulations.

2.4.2 There shall be a one-to-one relationship between application specified priority and any communication service priorities (e.g. transport layer, network layer, etc.).

2.4.3 Note that for the CNS/ATM-1 package, application specified priority will not necessarily result in a transport layer service, but will provide a queue handling service for the network layer.

2.5 Routing Policy

2.5.1 It is not a valid assumption that lowest practical cost is always required.

2.5.2 The application shall be able to set routing policy based upon best time path, lowest cost path, or no preference.

2.5.3 There is a potential requirement for application specific routing.

2.6 Message Duplication

2.8.1 A message delivered to the communications service shall not be delivered more than once to its peer entity.

3 Action Items

3.1 Provide general design requirement values. (WG3, Jun 95)

3.2 Develop draft application specific routing proposal (Mr. Hennig, 22 Mar 95)

3.3 Provide a range for likely lifetime values. (WG2, Jun 95)

3. Functional Interfaces

3.4.1 Provide draft functional interface description for ATN transport layer and below. (WG2, Jun 95)

3.4.2 Provide draft functional interface description for ATN Upper Layers. (WG3, SG3, Jun 95)

4 Participants

Asbury, Mike

Brangier, Francis

Colliver, Forrest

Crenais, Jean-Michel

Crocker, Ken

Day, John

Grout, Jean-Francois

Hennig, Paul

Link, Wes

Murphy, Mike

Overgaauw, Bo

Pearce, Stephen

Snively, Austin

Valentine, Ian

ATTACHMENT 9

TERMS OF REFERENCE FOR THE GROUND SUBGROUP (SG1)

ATNP Working Group 3 - Applications and Upper Layers
Second Meeting
Toulouse, 13-17 March 1995

TERMS OF REFERENCE

The following terms of reference have been endorsed by Working Group 3 for the subgroup for the definition of the ATN functionality required to support CNS/ATM-1 Package ground applications (hereafter simply called the ground subgroup):

(1) The ground subgroup is to produce the validated draft SARPs and Guidance Material for:

- the application's communications functions; and
- the upper layers stacks

on top of the ATN Internet, using stable international standards and profiles where available and consistent with ~~guidance~~ the recommendations provided by the architecture subgroup (SG3) for the ground data communications of the following CNS/ATM-1 Package applications as selected by ATNP Working Group 1, currently agreed as agreed upon at this meeting :

- Message Handling Services;
- Inter-centre coordination;

to satisfy their operational requirements as documented by the ICAO sources identified by Working Group 1. The SARPs and Guidance Material for Message Handling Services will be based on the Manual on "ATS Message Handling over the ATN", as endorsed by ATNP/1.

(2) The ground subgroup is to produce the validated draft SARPs and Guidance Material for any application which is required to perform the ground-ground information exchanges as identified by the air-ground subgroup in support of the air-ground applications for CNS/ATM-1 Package.

(3) The ground subgroup is to produce the validated draft SARPs and Guidance Material for:

- any additional directory functions which are required by the aforementioned ground applications;
- any security functions which are required by the aforementioned ground applications;
- any managed objects of the application's communication functions and upper layers stacks for the aforementioned ground applications.

(4) In case the ground subgroup produces draft SARPs and Guidance Material for the operations of the aforementioned ground applications in the context of CNS/ATM-2 Package, it is to document this material in a manner which is suitable for publication.

(5) The ground subgroup is to monitor, evaluate, and provide guidance for the on-going activities supporting the validation of the aforementioned draft SARPs and Guidance Material. As appropriate, the ground subgroup will serve as the focal point for the collection of deficiencies as identified by validation efforts, and will incorporate changes into the draft SARPs and Guidance Material.

(6) Where stable international standards and profiles do not exist for the aforementioned upper layers stacks, directory functions, security functions and managed objects in support of the requirements identified for ground

applications of CNS/ATM-1 Package, ~~guidance should be sought from~~ the recommendations of the architecture subgroup should be taken into account.

ATTACHMENT 10

TERMS OF REFERENCE FOR THE AIR SUBGROUP (SG2)

ATNP Working Group 3 - Applications and Upper Layers
Second Meeting
Toulouse, 13-17 March 1995

TERMS OF REFERENCE

The following terms of reference have been endorsed by Working Group 3 for the subgroup for the definition of the air-ground data communications service functionality required to support CNS/ATM-1 Package (hereafter simply called the air subgroup)

(1) The air subgroup is to produce the validated draft SARPs and Guidance Material for the air-ground data communications of the following CNS/ATM-1 Package applications in support of ADSP Operational Requirements, ~~using the ATN Internet, as selected by ATNP WG 1:~~consistent with CNS/ATM-1 package communications services provided by the upper layer architecture as defined by the ATNP/WG3/SG3 architecture subgroup.

- ADS Contract Establishment and Position Reporting
- Controller Pilot Communications
- Context Management
- Flight Information Services

The draft SARPs and Guidance Material will address:

- any additional directory functions which are required by the aforementioned air-ground applications;
- any security functions which are required by the aforementioned air-ground applications;
- any managed objects of the applications communication functions for the aforementioned air-ground applications.

(2) The air subgroup will coordinate efforts with ATNP WG2 concerning ~~CNS/ATM-1 Package application interface requirements with the lower layer ATN stacks~~ the services provided by the ATN internetwork and will coordinate efforts with the ATNP WG3 architecture subgroup concerning ~~all package~~ application interface requirements with the ATN upper layer ~~ATN stacks~~services.

(3) In case any air-ground applications require support by ground-ground information exchanges, the air subgroup is to express the requirements for these exchanges to the ground subgroup, in a time frame which allows the ground subgroup to develop validated draft SARPs and Guidance Material for the ground applications which will perform these exchanges.

(4) In case the air subgroup produces draft SARPs and Guidance Material for the operations of any air-ground applications in the context of CNS/ATM-2 Package and beyond which is not yet suitable for CNS/ATM-1 Package, it is to document this material in a manner which is suitable for publication as (part of) an ICAO Manual.

(5) The air subgroup is to monitor, evaluate, and provide guidance for the on-going activities supporting the validation of the aforementioned draft SARPs and Guidance Material. As appropriate, the air subgroup will serve as the focal point for the collection of deficiencies as identified by validation efforts, and will incorporate changes into the draft SARPs and Guidance Material.

(6) The air subgroup will keep a record of, and take into account, any directives, guidelines, or requests for resolution that are passed to it by WG3.

ATTACHMENT 11

TERMS OF REFERENCE FOR THE ARCHITECTURE SUBGROUP (SG3)

ATNP Working Group 3 - Applications and Upper Layers
Second Meeting
Toulouse, 13-17 March 1995

TERMS OF REFERENCE

The following terms of reference have been endorsed by Working Group 3 for the subgroup for the definition of the ATN Upper Layers Architecture (hereafter simply called the architecture subgroup):

(1) The architecture subgroup is to define the architectural framework for the ATN upper layers with a focus on the medium and long term (i.e. for CNS/ATM-2 Package and beyond) which satisfies the requirements expressed by the appropriate ICAO bodies for the medium and long term, to be documented in a manner which is suitable for publication as (part of) an ICAO Manual. In case such requirements have not yet been expressed by ICAO bodies, the present ideas of non-ICAO bodies concerning these requirements may be used as an initial basis. The architectural framework is to include the Quality Of Service (QOS) framework for the ATN upper layers.

(2) The architecture subgroup is to define the CNS/ATM-1 Package upper layers architecture, and is to produce any service definitions and protocol specifications required by this architecture (excluding consideration of the use of MHS to support ground applications for Package 1), which requires the minimum functionality necessary to provide a transition path to the aforementioned ATN upper layers architectural framework for CNS/ATM-2 Package and beyond.

(3) The architecture subgroup should ensure that the architectural solutions ~~chosen~~recommended by the air-ground and ground subgroups are compatible with the aforementioned CNS/ATM-1 Package upper layers architecture.

(4) The architecture subgroup is to produce draft SARPs and Guidance Material for:

- upper layers stacks for generic services;
- security functions (within the framework for security produced by WG 1);
- directory functions;
- efficient encodings and encoding rules;
- upper layers managed objects;

which satisfy the needs for the medium and long term (i.e. the needs of CNS/ATM-2 Package and beyond) for both air-ground and ground-ground data communications as expressed by the appropriate ICAO bodies for the medium and long term, to be documented in a manner which is suitable for publication as (part of) an ICAO Manual. In case such requirements have not yet been expressed by ICAO bodies, the present ideas of non-ICAO bodies concerning these requirements may be used as an initial basis.

(5) The architecture subgroup is to produce the draft SARPs and Guidance Material for the System Management application and its supporting upper layers stack, within the framework for System Management produced by Working Group 1, and in coordination with the work on System Management in Working Group 2.

(6) The architecture subgroup is to monitor, evaluate, and provide guidance for the on-going activities supporting the validation of the aforementioned draft SARPs and Guidance Material. As appropriate, the architecture subgroup will serve as the focal point for the collection of deficiencies as identified by validation efforts, and will incorporate changes into the draft SARPs and Guidance Material.