



International Civil Aviation Organization

**Fifth Meeting of Aeronautical Telecommunication Network (ATN)
Transition Task Force of APANPIRG**

Phuket, Thailand, 9 – 13 June, 2003

**Agenda Item 1: Review the latest developments in the ATN Panel and the Aeronautical
Mobile Communication Panel**

**Review Latest Development in the Aeronautical Telecommunication Network Panel (ATNP)
And in the Aeronautical Mobile Communications Panel (AMCP)**

(Presented by Australia)

Summary

This paper provides results of the eighth meeting of Aeronautical Mobile Communication Panel (AMCP/8) including its new name and structure established after the merger of the ATN Panel into AMCP. The AMCP has been renamed as Aeronautical Communication Panel (ACP).



Review Latest Developments in the Aeronautical Telecommunication Network Panel (ATNP) and in the Aeronautical Mobile Communications Panel (AMCP)

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Aeronautical Communications Panel

- **Aeronautical Communications Panel**
 - ➔ Structure will continue on from the AMCP
 - ➔ All AMCP Working Groups will flow into the ACP
 - ➔ Future ATN activities will be part of Working Group C and Working Group N

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Changes to Technical Panels

- Air Navigation Commission Decided on the 19th November 2002 to:
 - ➔ Merge remaining work of the ATNP into the ACMP.
 - ➔ Merge remaining work of the AVSSG (ATS Voice Switching and Signalling Study Group) into the AMCP.
 - ➔ Rename the AMCP to the Aeronautical Communications Panel (ACP) at the end of AMCP/8 meeting.
- ACP to become the main focal point on all technical aeronautical communication matters.

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ACP New Structure (1)

- ACP will have the following Working Groups:
 - ➔ Working Group B
 - ❖ Frequency Assignment Planning for VDL (modes 2, 3 and 4)
 - ➔ Working Group C – Rapporteur Mr Kors van den Boogard
 - ❖ Development of SARPs and guidance material for future systems.
 - ❖ Next WG meeting to be determined (20/24 Oct 03 in Europe).
 - ➔ Working Group F – Rapporteur Mr Steve Mitchell
 - ❖ Address spectrum management activities for International Telecommunication Union (ITU) conferences.
 - ❖ Next meeting scheduled for Aug 03 in Montreal and Feb 04 in Nairobi.

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ACP New Structure (2)

- Working Group M – Rapporteur Mr Loftur Jónasson
 - ❖ Address corrective maintenance of guidance material and SARPs for all air-ground, and ground-ground voice signalling communications.
 - ❖ Next meeting scheduled for 2nd week in April 2003 Iceland and Nov 03 in Bangkok .
- Working Group N – Rapporteur Mr Jean-Yves Piram
 - ❖ Address development of SARPs and guidance material for new features and develop provisions related to internet communications services, air-ground and ground-ground applications, systems management, security and directory services.
 - ❖ Next meeting to be advised.

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Remarks by ANC President

- AMCP/8 to develop proposals for the new ACP.
- ICAO standardisation activities should only be undertaken when new systems or technologies are mature and have demonstrated their ability to provide safety enhancements compared to existing standardised systems and/or they are cost beneficial to international civil aviation.
- Reduce the proliferation of Data Links.

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Outcomes from AMCP/8

Montreal, 4 to 13 February 2003
For further information please refer to
<http://www.icao.int/anb/Panels/AMCP/>

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AMCP/8 Agenda Item 1

- Agenda Item 1: Progress of implementation of air/ground digital links
 - Development of ADS-B Data Links
 - ❖ FAA informed the meeting that a decision has been made to use 1090 MHz Extended Squitter for major airline and private/commercial operators of high performance aircraft.
 - ❖ FAA also announced that ADS-B data link services for the general aviation will be provided by the Universal Access Transceiver (UAT) format.
 - ❖ Eurocontrol also indicated that 1090 MHz ES will also be used within the core of Europe during 2007 – 2012 time frame. Longer term requirements will look at other forms of ADS-B such as VDLm4
 - ❖ Both FAA/Eurocontrol/IATA confirmed that they have worked together to assess the performance of Mode S ES, VDLm4 and UAT which led to the decision to use Mode S ES as the initial link for ECAC States and large transport aircraft in the US..

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AMCP/8 Agenda Item 1

→ Development of ADS/B Data Links

- ❖ Russia stated that the RCAA has decided to use VDLm4 as their data link for ADS-B services
- ❖ Sweden provided an update on the implementation of VDLm4 in Kiruna and Stockholm's airport Arlanda.
- ❖ Mongolian CAA is working with the Swedish CAA to undertake combined simulation studies of ADS-C and ADS-B in Mongolian airspace. Studies so far have found the implementation of ADS-B will improve the safety and efficiency of the NAS.
- ❖ Other presentations included:
 - ❖ Update on the North European ADS-B Network (NEAN) Programme
 - ❖ ADS Mediterranean Upgrade Programmes (MEDUP)
 - ❖ Mediterranean Free Flight (MFF) Programmes

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AMCP/8 Agenda Item 2

➤ Agenda Item 2: Future air/ground data link systems.

- Draft Proposal change to Global Air Navigation Plan for CNS/ATM System (Doc 9750)
 - ❖ Deletion of Section: Required Communication Performance.
 - ❖ Other changes were mostly factual or editorial.
- Future Aeronautical Mobile Communication Scenarios
 - ❖ Working Group C developed a discussion paper on future communications scenarios as may develop over the next 20 years highlighting some of the issues that may need investigation.
 - ❖ Appendix A, B and C to Agenda Item 2 of the AMCP/8 report contains further information on these scenarios.

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AMCP/8 Agenda Item 1

→ Development of VDL Mode 3 Implementation

- ❖ FAA indicated that they have selected the VDLm3 system for its next generation VHF air/ground communications systems. This is part of the FAA's NEXCOM programme which its digital voice services are planned to be fully operational by 2009.
 - ❖ JCAB is studying the future implementation of VDLm3. Time scales match the plans of the USA to implement the new digital voice services by 2009/2010.
- Other Developments include:
- ❖ ARINC's HF DL global coverage is nearing completion with message traffic levels exceeding 300,000 per month.
 - ❖ ARINC's VDLm2 ground stations now number 110 in the US and will increase to 150 by end of 2003.

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AMCP/8 Agenda Item 2

→ Next-Generation Satellite Systems

- ❖ An initial technical description of a potential next-generation satellite system (NGSS) is currently under investigation in Europe to support the AMSS.
- ❖ The NGSS will re-use as much as possible the provisions of the current AMSS which would ease transition to the improved system.

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AMCP/8 Agenda Item 2

→ Interactive Digital Voice Transmission in the HF Band

- ❖ Aena (Spanish Airports and Air Navigation) in a joint effort with Polytechnic University of Madrid and University of Las Palmas de Gran Canaria are developing a design for an Orthogonal Frequency Division Multiplex (OFDM) – Code Division Multiple Access (CDMA) system for interactive digital voice transmission in the HF Band.
- ❖ The work shows favourable results for increasing the system robustness against channel fading when combining the advantages of OFDM schemes with CDMA spread spectrum techniques.
- ❖ Working Group M will monitor the progress in this area.



AMCP/8 Agenda Item 3

➤ Agenda Item 3: Development of SARPs for the Universal Access Transceiver (UAT).

→ Requirements and Desirable Features for the UAT

- ❖ The UAT SWG chaired by Dr. Ligler had developed draft requirements and desirable features for the UAT.
- ❖ Working Group C at its fifth meeting in Kobe, Japan, reviewed the draft material and agreed for its submission to the panel.
- ❖ The draft material was largely based on the RTCA DO-242A minimum aviation system performance standards and a section addressing UAT support of ground uplink services related to surveillance and situational awareness.
- ❖ Further information on the requirements and desirable features for the UAT is available from Appendix A of Agenda Item 3 of the AMCP/8 report.



AMCP/8 Agenda Item 2

➤ Main Conclusions on Future Air/Ground Data Link Systems:

- Assess when and in which regions VHF saturation will occur.
- Evaluate potential alternative technologies and measures to ensure that the required ATM capacity will not be constrained by a lack of communication capacity in the VHF Band.
- Investigate feasibility to introduce new AMSS technologies such as the next-generation satellite system
- Assessment of spectrum requirements for future terrestrial and satellite communications systems.
- Review current plans for future aeronautical communication infrastructure with the objective to converge present systems into a common global infrastructure.



AMCP/8 Agenda Item 3

→ Draft SARPs for the UAT

- ❖ The meeting was presented with the draft SARPs and guidance material for the UAT.
- ❖ The UAT SWG will continue the development of the draft SARPs so as to be in a position to initiate validation of the SARPs by June 2003, subject to ANC approval to continue the work.
- ❖ Further information on the Draft SARPs for the UAT is available from Appendix B of Agenda Item 3 of the AMCP/8 report.



AMCP/8 Agenda Item 4

- Agenda Item 4: Comparative analysis of ADS-B data links.
 - ➔ The meeting reviewed the draft comparative analysis for ADS-B data links which was developed by Working Group C.
 - ➔ There were some concerns that the analysis was based on emerging operational requirements and on document RTCA DO-242A which is subject to further revision and were not ICAO standards.
 - ➔ Information in regards to this item is attached as an appendix to Agenda Item 4 of the AMCP/8 report.
 - ➔ It was recommended that the document be circulated to appropriate ICAO bodies for information.

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AMCP/8 Agenda Item 5

- ➔ Radiotelephony Procedures
 - ❖ The Panel was advised that there are no immediate requirements to amend Annex 10 radiotelephony procedures and that the appropriate ICAO bodies will monitor the situation as potential requirements become available.
 - ❖ However the Manual of Radiotelephony (Doc 9432) would need to be reviewed and possibly updated with the assistance of ATM operational expertise.
- ➔ High Frequency Data Link (HFDL)
 - ❖ A number of editorials are being proposed to bring the HFDL SARPs in line with relevant provisions of the ITU Radio Regulations.
 - ❖ Amendments to the Manual on HFDL (Doc 9741) are being propose due to ongoing implementation of HFDL. A special section on the AMCP website will be available for industry.

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AMCP/8 Agenda Item 5

- Agenda Item 5: Review of existing ICAO material on air/ground communication systems.
 - ➔ Aeronautical Mobile Satellite Service
 - ❖ The Panel agreed to split the current AMSS SARPs (Annex10, Vol III, Part I, Chapter 4) into "Core" SARPs material and detailed technical specifications.
 - ❖ SARPs material will remain in Annex 10 while technical specifications will be placed in a Manual.
 - ❖ Other proposed amendments to the AMSS SARPs included:
 - ❖ Aircraft earth station receiver interference susceptibility.
 - ❖ Maximum harmonic, discrete spurious and noise density levels.*
 - ❖ Maximum intermodulation product levels.*
 - ❖ DTE effect on DCE restart rates and DTE effect on DCE flow control transfer rates.
- * Panel did not agree due to required protection of the GLONASS receivers

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AMCP/8 Agenda Item 5

- ➔ VDL Mode 2
 - ❖ Amendments to the Manual on VDL Mode 2 (Doc 9776) was agreed to by the Panel. Changes mainly reflect operational experience gained from implementation in Asia, Europe and North America.
 - ❖ Changes can be viewed in a special section on the AMCP website
- ➔ VDL Mode 3
 - ❖ Amendments to the Manual on VDL Mode 3 (Doc 9805) was agreed to by the Panel. Changes mainly reflect testing and implementation issues in the United States.
 - ❖ Changes can be viewed in a special section on the AMCP website

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AMCP/8 Agenda Item 5

→ VDL Mode 4

- ❖ Manual on VDL Mode 4 was agreed at AMCP/7 but has not yet been published by ICAO.
- ❖ Further information can be found in the Appendix to Agenda Item 5 of the AMCP/8 report.

→ Technical Issues Relating to 8.33 KHz Channel Spacing and VDL Mode 3

- ❖ The main issue discussed in the Panel was the "Listen before push to Talk" principle that is part of the VDL Mode 3 design. When an aircraft must establish an emergency or distress communication link, this will be accomplished through priority management by the ground system.
- ❖ There was also some inconsistent use of the words frequency and channel in the SARPs for VDLm3 and 8.33 kHz DSB-AM.

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AMCP/8 Agenda Item 6

➤ Agenda Item 6: ICAO position for ITU WRC-2003.

→ Proposed Changes to ICAO Position for ITU WRC-2003

- ❖ Working Group F reviewed the results of ICAO and ITU studies conducted in preparation to WRC-2003 and developed a number of proposals for additional material to complement the ICAO Position.
- ❖ The main points of the proposal agreed by the Panel are:
 - ❖ Estimated spectrum requirements for future expansion of the microwave landing system and other aeronautical radio navigation systems in the 5091 – 5150 MHz band.
 - ❖ Technical studies on the protection of DMEs and radar systems from interference from radio navigation satellite systems operating in the band 1164 – 1400 MHz.

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AMCP/8 Agenda Item 5

→ FM Broadcast Immunity for VDL Mode 4

- ❖ Panel agreed to amending Annex 10, Vol II, Part I, Chapter 6 to include FM immunity characteristics for VDLm4.
- ❖ The amendments confirm that introduction of VDLm4 will not place any additional constraints on the FM broadcasting service and are similar to the relevant provisions for GBAS.
- ❖ Working Group F will be responsible for conducting future work on the potential interference from VDLm4 on FM broadcasting.

→ Frequency Assignment Planning Criteria for VDL

- ❖ Panel agreed to the assignment planning criteria for VDLm2. Further information on the assignment planning criteria is in Appendix J to Agenda Item 5 of the AMCP/8 report. This information will be incorporated into the Manual on VDL Mode 2 (Doc 9776).
- ❖ Further work on frequency assignment planning criteria for VDLm3 and VDLm4 is ongoing.

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AMCP/8 Agenda Item 6

- ❖ Initial introduction of ground-based augmentation systems and VDL Mode 4 in the 108 – 117.975 MHz band.
- ❖ Proposed deletion from the draft WRC-2007 agenda of an item with potential negative impact on radar systems operating in the band 2700 – 2900 MHz band.
- ❖ Editorial changes from the 2001 Edition of the ITU Radio Regulations.
- ❖ The proposal would be reviewed by the Air Navigation Commission for submission to the Council for approval where if approved would then be included in the ICAO submission to the ITU WRC-2003.

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AMCP/8 Agenda Item 6

→ Ancillary Terrestrial Component for Certain Mobile Satellite Service System Providers in the AMSS SARPs Band.

- ❖ The meeting was advised on a proposed operation of a new generation multi-beam MSS system, operating in the bands 1525 – 1559 MHz and 1626.6 – 1660.5 MHz.
- ❖ The system will have an ancillary terrestrial component using a cellular type network of repeater stations to augment the coverage of the satellite spot beam.
- ❖ The meeting concluded that there was an urgent need for ICAO studies to be conducted on the impact of the introduction into the 1525 – 1559 MHz band and that this study would be carried out by Working Group F in consultation with the Spectrum Subgroup of GNSSP.