International Civil Aviation Organization

**NINTH MEETING OF THE
COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND
METEOROLOGY SUB-GROUP OF APANPIRG
(CNS/MET SG/9)**

Bangkok, Thailand, 11–15 July 2005

Agenda Item 4:   **Aeronautical Mobile Service:**

1) review report of Air-ground Data Link Study Task Force meeting

AIR-GROUND COMMUNICATIONS STRATEGY

(Presented by the Secretariat)

SUMMARY

This paper reviews the work accomplished by the CNS/MET air ground Data Link Study Task Force Meeting held in Bangkok, Thailand from 19 to 20 May 2005. The Task Force has developed   a draft Conclusion for consideration and adoption of the air- ground communications strategy and a Draft Decision for dissolution of the Task Force.

1.   INTRODUCTION

1.1   The CNS/MET air ground Data Link Study Task Force meeting was held from 19 to 20 May 2005 at the ICAO Regional Office, Bangkok, Thailand in accordance with Decision 8/13 of the Eighth Meeting of CNS/MET Sub-Group of APANPIRG.   The report of the Task Force is provided in Attachment to this paper for detailed review.

1.2   The Fifteenth Meeting of the ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG/15) held from 23 to 27 August 2004 in Bangkok noted the establishment of a Working Group on AMS data link study by the CNS/MET SG/8 meeting and renamed it from Working Group to a Task Force.

2.   DISCUSSION

2.2   The meeting reviewed its Title and TOR and considered it more appropriate to rename it as CNS/MET air-ground Data Link Study Task Force. The meeting reviewed existing data link applications and trial conducted by States and service providers. The meeting also reviewed relevant recommendations of AN-Conf/11 and status of implementation of data link in the others regions. The perspectives from the data links service provider, airspace users and vision of the industry were taken into consideration. The meeting developed a draft Strategy for Implementation of the Air-Ground Data Link in the ASIA/PAC region for consideration by this meeting and for adoption by APANPIRG/16.

2.3   Considering the task assigned to the it in the Terms of Reference of the Task Force had been completed, the meeting proposed to disband the CNS/MET air-ground Data Link Study Task Force and developed a draft Decision for consideration by the CNS/MET SG/9 meeting.

3.   ACTION BY THE MEETING

The meeting is expected to:

(a)   review the report the Task Force provided in the Attachment; and

(b)   endorse the draft Conclusion formulated by the Task Force for consideration by APANPIRG/16 and adopt the draft Decision.

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INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE

REPORT OF

THE MEETING OF CNS/MET AIR-GROUND
DATA LINK STUDY TASK FORCE (AG DATA LINK TF)

Bangkok, Thailand, 19-20 May 2005

Summary of Discussion of CNS/MET Air-ground Data Link Study Task Force Meeting

1.   Introduction

1.1   The CNS/MET air-ground Data Link Study Task Force meeting was held from 19 to 20 May 2005 at the ICAO Regional Office, Bangkok, Thailand in accordance with Decision 8/13 of the Eighth Meeting of CNS/MET Sub-Group of APANPIRG.

1.2   The meeting was attended by nine participants from seven members of the Task Force nominated by Australia, China, Hong Kong China, India, Japan, SITA and ARINC.   List of participants is at Attachment 1.

1.3   Mr. Jeffrey Bollard, Chief Engineer Airservices Australia was elected Chairman of the Task Force and chaired the meeting. Mr. K.P. Rimal and Mr. Li Peng, Regional Officers CNS acted as Secretaries of the meeting. The meeting was also assisted by Mr. Dimitar H. Ivanov, Regional Officer MET of the ICAO Asia and Pacific Regional Office.

1.4   The list of Working Papers and Information Papers presented at Meeting is at Attachment 2.

1.5   Adoption of Agenda

1.5.1   The agenda adopted by the meeting was as follows:

Agenda Item 1: Adoption of Agenda

Agenda Item 2: Review of the Terms of Reference (TOR) of the Task Force

Agenda Item 3: Review of the Existing Data Link Applications

Agenda Item 4: Development of a Strategy for Implementation of Air-Ground Data
                        Link in the ASIA/PAC Region

Agenda Item 5: Any other Business

2.   Review of the Terms of Reference (TOR) of the Task Force

2.1   The meeting noted that the Fifteenth Meeting of the ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG/15) held from 23 to 27 August 2004 in Bangkok had noted the establishment of a Working Group on AMS data link study by the CNS/MET SG/8 meeting and renamed it as the CNS/MET Air-ground Data Link Study Task Force.

2.2   It was recognized that there was a lack of guidance available for the deployment of data communications and that current implementations of data link did not conform to ICAO standards. Though it did provide satisfactory service for the current applications, the technology being used will face limitations in the future. A strategy for selection and implementation of communications data links was considered to be of value to States in planning and implementation.

2.3   It was noted that the Task Force was requested to conduct appropriate consultations, identify factual information and to develop a regional strategy for implementation of the data link in the ASIA/PAC region and would present its result to the Ninth Meeting of the CNS/MET Sub-Group in July 2005. The meeting reviewed the Term of Reference provided in Appendix A to this report.

2.4   The meeting discussed the definition of Near-Term and Long-Term as mentioned in the TOR. It was clarified that the Near-Term means implementations to occur within the next 5-10 years from now. It was also recognized that systems being implemented or to be implemented would have a life cycle of at least 10 to 15 years from the date of implementation. The Long-Term was considered to be a period beyond the Near-Term and it would be considered as 15 years and beyond.

3.   Review of the Existing Data Link Applications

3.1   The meeting reviewed the results of the Eleventh Air Navigation Conference (AN-CONF/11) as contained in its report under agenda item 7 regarding Communication Data Link and future evolution of air-ground communications. The Conference was presented with a variety of significantly divergent views, but was able to identify a number of elements that could form the basis for a broad consensus on an evolutionary approach for global interoperability, as laid out in Recommendation 7/3. The need to investigate future technology alternatives for air-ground communications was also recognized (Recommendation 7/4). The Conference endorsed a set of guidelines on standardization of new communication technologies (Recommendation 7/5). The meeting also noted the actions taken by the Air Navigation Commission (ANC) and Council on these Recommendations.

3.2   The meeting also reviewed the regional guidelines for air-ground communications developed by APANPIRG for consideration by States. APANPIRG/14 held in 2003 discussed the preparatory work for AN-Conf/11 and developed several guidelines for States in the preparation from the ASIA/PAC perspective for agenda item 7 dealing with Aeronautical Mobile Service which were as follows:

       a)   a channel spacing of 25 kHz will continue to be the operational specification in ASIA/PAC Region as it is expected to satisfy requirement for the foreseeable futures;

       b)   the VHF voice service, backed by CPDLC and HF will be the primary communication medium for transcontinental traffic; and a combination of CPDLC and HF voice will be the communication medium for oceanic traffic; and

       c)   the requirements for basic voice communications will continue, supplemented by data link Flight Information Services (DFIS) applications including D-VOLMET, D-ATIS and PDC, which would significantly release the pressure of VHF spectrum congestion.

3.3   The meeting reviewed the list of key priorities for the CNS/ATM implementation in the ASIA/PAC region updated by the CNS/MET SG/8 and the ATM/AIS/SAR SG/14 meetings. It was noted that ADS-C, CPDLC and Data Link Flight Information Services (DFIS) applications: D-ATIS, D-VOLMET and PDC have been listed as Key Priorities.

3.4   The meeting reviewed the requirement for the air-ground data link to be used to downlink and uplink relevant meteorological information from or to aircraft-in-flight.

3.4.1   It was noted that ADS messages contain a meteorological information data block that includes information on wind direction, wind speed, wind quality flag, temperature, turbulence and humidity. This information is intended for use by the ICAO World Area Forecast Centres (WAFC). The SARPs for automated air-reports were incorporated in Annex 3 by Amendment 72 in 2001. The only regions where ADS reports (including the MET information data block) were made available on a large-scale operational basis were the North Atlantic and the Pacific.

3.4.2   Hong Kong China raised the issue of the application of Mode S data link in automatic weather reporting as an alternative to the ADS reporting (APANPIRG Conclusion 14/44 refers). It was considered as a possible attractive option particularly for air-space covered by secondary surveillance radars. It was informed that based on the APANPIRG conclusion on the subject, the ANC tasked the METLINKSG to study the feasibility of using Mode-S for automatic air-reporting and to draft the necessary amendments to SARPs. The Task Force would also include the use of Mode S data link in the draft strategy for consideration by the CNS/MET SG/9.

3.4.3   The meeting noted that the important applications of data link for uplink of MET data to aircraft are ACARS based D-ATIS and D-VOLMET. The implementation of D-VOLMET was encouraged by APANPIRG (Conclusion 13/29 refers) since D-VOLMET solves a long-standing problem for the inclusion of SIGMET in VOLMET. Recent data from Hong Kong China showed that the number of uplink requests for VHHH D-ATIS messages continue to be on an increasing trend, reaching 20,455 (14,740 for arrival D-ATIS and 5,715 for departure D-ATIS) in March 2005. It is expected that in the near future D-ATIS and D-VOLMET will gradually replace their voice predecessors. The meeting identified a need to make a survey to ascertain requirement for uplink and downlink of MET information.

3.5   The meeting was informed that a seminar on ADS/CPDLC was conducted by ICAO Asia and Pacific Regional Office on 18-19 April 2005 in conjunction with a combined FIT-BOB and FIT-SEA meeting. The seminar was attended by 42 participants from Australia, Bangladesh, Hong Kong China, India, Indonesia, Japan, Lao PDR, Malaysia, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, United States, IATA, IFALPA and SITA. The seminar shared information provided by experienced operators and pilots, ATS providers and controllers and network system providers.

4.   Development of a Strategy for Implementation of Air-Ground Data Link in the ASIA/PAC Region.

4.1   The meeting noted that the European Air Navigation Planning Group (EANPG) and the North Atlantic Systems planning Group (NAT SPG) had identified the need for convergence of data link applications between the European (EUR) and North Atlantic (NAT) Regions and the First Meeting of the Data Link Steering Group (DLSG/1) was held in the European and North Atlantic Office of ICAO on 1 April 2005. The meeting identified the following work issues:

- Establish a baseline for the current situation;
- Establish an achievable baseline for 2015;
- Develop steps to arrest divergence; and
- The harmonization strategy.

4.2   The meeting also noted that the Data Link Harmonization Symposium was held from 30 to 31 March 2005 in ICAO EUR/NAT Office in Paris. The outcome of the symposium highlighted the divergent data link implementation in different homogenous airspace areas (high density oceanic in North Atlantic and high density continental in Europe). There was a clear message from the symposium which could be expressed as follows:

- FANS-1/A and ATN data link services are the current realities;

- there was a need for convergence and ICAO should play a lead role in the global coordination of this process;
- there was a need to further clarify certain operational and technical details; and

- there were a number of issues that were seen as key elements in the convergence process including safety, performance, both in terms of required communication performance (RCP) and required total system performance, operational capability, interoperability, seamlessness and cost/benefit aspect.

4.3 Australia emphasized that in developing regional strategies for the air-ground datalinks, it is important to maintain or ensure compatibility of existing data links to support all current ATM and meteorological applications.

4.4 China made a presentation regarding the current status of datalinks service and applications provided to the airspace users within China by Aviation Data Communication Corporation (ADCC) which was established in June 1996 and own by the Air Traffic Management Bureau and major airlines. In addition to AOC traffic, FANS1/A based ADS/CPDLC, D-ATIS, D-VOLMET, PDC and AMDAR are provided including ATS datalinks service to support continental CNS/ATM Route L888 and polar routes. It has more than 83 remote ground station (RGS) covering the most of upper air space throughout China.

4.5 India informed the meeting that India had purchased digital VHF radio and deployed at various airports in India which could be used to support VHF data links in the future. It was also informed that FANS 1/A based ADS/CPDLC will be introduced at Mumbai on 7 June 2005 in addition to the existing services provided at Kolkata and Chennai. The same service will be provided at New Delhi later this year using links service provided by SITA.

4.6 Japan made a presentation providing an overview of AMSS and AMS VHF/HF datalinks. Japan launched MTSAT 1R successfully at the end of February which is under various tests. Japan also conducted trials for VDL Mode 3. Recognizing the vast oceanic airspace in the Tokyo FIR, AMSS data communication is considered important for the ATS air/ground communications.

4.7 The meeting reviewed a presentation prepared by IATA. The meeting also noted the airlines requirement for data links as identified in the presentation. IATA's position on air ground communication was to maintain present voice system with 25 kHz spacing and extend the use of 8.33 kHz only if necessary. Encourage introduction of data communications for ATS with available capability including ACARS-FANS 1/A, Satcom/HF data, Mode S/ES and AoA. IATA supports development of one global common communication infrastructure VDL Mode 2 to relieve ACARS congestion and to reduce ATC voice requirement.

4.8 SITA made a presentation on the SITA perspective on Data Link Selection for ASIA/PAC Region. The presentation provided an overview of the current ACARS/FANS 1/A based ATM services provided by SITA. It also provided current status of ATN compliant VDL Mode 2 service from SITA. It was informed that the German and Spanish ANSPs have partnered with SITA whilst the Portuguese ANSP has decided to contract the ATN/VDL2 service from SITA. ANSPs have a choice to either contract ATN/VDL Service provision from a communications service provider or acquire their own ATN/VDL infrastructure and operate in partnership with a communications service provider.

4.8.1 SITA strongly recommended that, in line with global industry developments VDL Mode 2 technology be adopted as the air/ground technology to be used to enable the exchange of the ICAO defined applications in the ASIA/PAC region.

4.9 ARINC made a presentation on an overview the GLOBALink/VHF/HF/Satellite service which offers two VDL Mode 2 services today i.e. AoA: ACARS over AVLC (Aviation VHF Link Control) which became operational since November 2000 and Aeronautical Telecommunication Network (ATN) compliant CPDLC which has became operational since September 2002.

4.9.1　　　　　VDL Mode 2 Products/Services provided by ARINC included AoA and ATN-FAA CPDLC Build 1 Programme for North America and AoA and ATN-Eurocontrol Link 2000+ in Europe providing ATN/VDL Mode 2 service at FL245 and above for the Maastricht upper airspace. ARINC also provided VDL Mode 2 products to AVICOM Japan for AoA service.　The VDL Mode 2/AoA project in Japan includes 10 VDL ground stations operational since September 2003.　42 VDL mode 2 equipped aircraft at the end of 2005 would use the service.

4.9.2　　　　　ARINC recommended that VDL Mode 2 for ATN air/ground subnetwork be considered for use in the ASIA/PAC region as it is a proven technology and internationally accepted, adopted, and implemented.

4.10　　　　　The meeting also noted the Boeing data link strategy presented to the North Atlantic FIG11.

4.11　　　　　Based on the information made available, the meeting developed a draft strategy for implementation of the air-ground data link in the ASIA/PAC region which is provided at Appendix B to this report. Accordingly, the meeting formulated the following draft Conclusion:

Draft Conclusion 1/1 - Strategy for implementation of the air-Ground data link in the Asia and Pacific Regions

That, the Strategy for implementation of the air-ground data link in the ASIA/PAC region as provided in the Appendix B to the report of the Task Force meeting be adopted.

4.12　　　　　China raised an issue regarding the description of PDC in the ICAO Doc 9694 Part IV in a table of Chapter 6 on page IV-6-1 and IV-6-4. It is quite different than the PDC service implemented by States and air spaces users in the region.　Secretariat agreed to provide clarification on this issue off-line after studying the issue in detail.

4.13　　　　　The meeting also noted different communication protocols used by States in providing PDC service i.e. AEEC620 and AEEC623. Japan is providing the service using AEEC620. It was informed that avionics for AOC traffic are based on protocol AEEC620 while ATC type avionics are able to support the communication protocol AEEC623 which has functions of CRC error protection and ACK at the link level.

4.14　　　　　As regards some of the current data link implementations did not confirm to ICAO standards, it was clarified that as a near-term solution consideration should be given for implementation of D-VOLMET, D-ATIS and PDC through ACARS data link based on industry standards pending availability of ICAO standard telecommunication system.

5.　　　　　Any other business

5.1　　　　　The meeting considered that the task given by CNS/MET Sub-group and APANPIRG/15 had completed by the Task Force. It was considered that similar to other strategies adopted by APANPIRG, the strategy for Data Link should be kept dynamically as a living document and the CNS/MET Sub-Group of APANPIRG can revisit and update it from time to time. Therefore the meeting suggested that the Air-ground Data Link Study Task Force be dissolved. Accordingly the meeting formulated the following draft Decision for consideration by the CNS/MET SG/9 meeting to be held in July 2005.

Draft Decision 1/2 – Dissolution of the air-ground Data Link Study Task Force

That, the Air-ground Data Link Study Task Force Task Force be dissolved as the task specified in the TOR has been completed.

5.2   The meeting appreciated for information provided by the members of the Task Force and the Secretariat.

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CNS/MET AIR-GROUND DATA LINK STUDY TASK FORCE

Term of Reference:

Develop regional strategies for the provision of air-ground communications data links for the near-term and long-term for consideration by CNS/MET SG/9 meeting to be held on 11-15 July 2005.

Membership:

The Task Force will consist of members from Australia; China;
Hong Kong China; India, Japan; USA; SITA, ARINC and IATA.

Facilitator:

Member from Australia will act as facilitator until a Rapporteur is appointed by the Task Force

The Task Force will consult air navigation services providers, airlines, communications service providers, aircraft and avionics manufacturers.

Considerations:

- Statement of the operations requirement
- SARPs compliant technology
- Ability to meet the performance requirement
- Commonality with AOC data communications
- Market place availability of technology
- Existing and planned fitment
- Global interoperability
- Inclusive of all levels of operators
- Acquisition and operational costs
- The form and style of existing regional strategies

Working method:
by electronic correspondence initially between members.

Target date for completion:
31 May 2005

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STRATEGY FOR IMPLEMENTATION OF THE AIR-GROUND
DATA LINK IN THE ASIA/PAC REGION

Considering:

a)   the benefit of data communications to improve safety, efficiency and capacity through the reduction of voice communications and process automation to meet the operational requirement and consistent with the Air Traffic Management Operational Concept;

b)   current operation application of data link to support CPDLC, ADS-C, PDC and D-FIS, the need to maintain the functional service of these applications;

c)   current technology such as VHF ACARS, VDL-Mode 2 AoA (ACARS over Aviation VHF Link Control), VDL-Mode 2 ATN, Satellite datalink, HF data link being acceptable for operations and standardized in SARPs and/or industry standards;

d)   availability of standardized VDL-Mode 3, VDL-Mode 4, Mode S data links and future standardized technology such as Universal Access Transceiver (UAT);

e)   the future growth of data communications to improve operations and the exchange of information including graphical meteorological information; and

f)   the need to assure global interoperability and harmonization.

THE GENERAL STRATEGY FOR THE IMPLEMENTATION OF THE AIR-GROUND DATA LINK INFRASTRUCTURE AND ASSOCIATED APPLICATIONS IN THE ASIA/PAC REGION SHOULD BE AS FOLLOWS:

a)   maintain or ensure compatibility of existing data links to support all current ATM and meteorological applications without change to the application or application specific system.

b)   new installation of VHF datalink systems should be capable of supporting VDL-Mode 2 and as an interim step provide the bridging application of AoA.

c)   in the near term there is no intent to implement VDL-Mode 3, VDL-Mode 4 or Mode S.

d)   undertake and monitor research and development of communications technology for the future evolution of data link services.

e)   States should work co-operatively to assist each other on a multinational basis to implement the air-ground ATN compliant VDL-Mode 2 service and ensure system inter-operability.

Note:
Near-Term: now to 10 years
Long-Term 15+

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