



International Civil Aviation Organization

**SIXTEENTH MEETING OF THE
COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND
METEOROLOGY SUB-GROUP (CNS/MET SG/16) OF APANPIRG**

Bangkok, Thailand, 23 – 27 July 2012

Agenda Item 4: Aeronautical Mobile Service (AMS)

- 1) Discuss satellite data-link communication continuity issues

**REPORT ON THE OUTCOME OF SECOND
SATELLITE DATA-LINK OPERATIONAL CONTINUITY MEETING (SOCM/2)**

(Presented by the Secretariat)

SUMMARY

The Second Satellite data-link Operational Continuity Meeting (SOCM/2) and the Workshop on Satellite data-link Communication were held in Bangkok from 8 to 10 February, 2012. This paper discusses the significant outcome of the meeting and presents a number of draft Conclusions/Decisions for the consideration of the meeting.

This paper relates to –

Strategic Objectives:

A: **Safety**

C: **Environmental Protection and Sustainable Development of Air Transport**

Global Plan Initiatives:

GPI-17 Data link applications

GPI-22 Communication infrastructure

1. Introduction

1.1 APANPIRG, after reviewing the outcome of the First Satellite data-link Operational Continuity Meeting (SOCM/1) held from 26 to 28 August, 2009 adopted Conclusion 20/32 inviting ICAO to organize the second meeting of SOCM. The SOCM/2 meeting could not be held as per the schedule in November, 2011 because of the floods in Bangkok.

1.2 The rescheduled meeting and the workshop were held from 8 to 10 February, 2012. Forty two (42) participants from eleven (11) States/Administrations, IATA, ARINC, Aerconnex (Representing INMARSAT) and Boeing participated in the events. The SOCM/2 meeting considered 11 Working Papers, 7 Information Papers and developed a number of draft Conclusions/Decision for the consideration by APANPIRG. This paper discusses significant outcome of the meeting. Complete meeting report, however is available at ICAO APAC Office website and can be accessed on the following address:

http://www.bangkok.icao.int/cns/meeting.do?method=MeetingDetail&meeting_id=115

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2. Discussion

2.1 After reviewing the status of data-link communication in the region, meeting concluded that though the safety targets for RNP4 (navigation) were being met, but no measures were in place to determine if safety targets for communication and surveillance components of the separation standards e.g. 30 NM longitudinal were being met.

2.2 Meeting was reminded about the State Letter issued by ICAO APAC Office recommending the usage of two or more satellite data-link communication services provided by different autonomous service providers to enhance availability of the services. Regarding efficiency, meeting concluded that States/ANSPs and operators should investigate the means to:

- a) increase the size of the fleet that is eligible for operation of reduced separation; and
- b) to expand operational improvement such as the application of reduced separations to other airspace, such as South China Sea and Bay of Bengal.

Expecting an incentive for operators to equip their aircraft with the operational improvements, meeting formulated following draft Conclusion for consideration by APANPIRG:

Draft Conclusion 16/xx – Increase equipage of data-link

That, States be urged to implement CPDLC and ADS-C both on ground and on board the aircraft to enhance airspace capacity and safety of operations.

GOLD Implementation

2.3 Meeting recommended that States/ANSPs should prescribe performance specifications for Required Communication Performance (RCP) and Required Surveillance Performance (RSP) in the area of applicability.

2.4 SOCM/2 was informed that guidelines on service level notifications and communication service agreements are provided in the GOLD and it was agreed that these items should be progressed further by improving the GOLD material. It was also agreed that such requirements can be referred in the agreement/contracts between ANSPs/Operators and the CSPs. Meeting invited suggestions regarding common outage/maintenance report template etc. for incorporation into the GOLD 2nd Edition due for completion in the 1st quarter of 2013.

Future Plan of MTSAT System

2.5 While informing about the uninterrupted service provided by MTSAT during tsunami in March, 2011, Japan informed the meeting about the comprehensive study carried out by JCAB on its next generation satellite system. Study concluded that MTSAT-1R is going to leave its orbit in 2015 and MTSAT-2 alone would continue to provide AMSS until 2020. On the same subject, INMARSAT informed that Classic Aero safety service will be supported at least until the end of life of I-4 constellation (2023) and simultaneously move over to Swift Broad Band (SBB). In support of ICAO recommendation of using two or more autonomous satellite data-link communication systems, meeting developed following draft Conclusion:

Draft Conclusion 16/xx – Support of AMSS after the current MTSAT system

That, Japan be invited to consider the following in the further study for next generation of MTSAT in support of AMSS:

- a) the system to be compatible with one of existing and/or future AMSS systems such as INMARSAT to support AMSS data link interoperability;
- b) to establish an operational environment which will enable seamless AMSS operation for AESs, and architecting AMSS systems with appropriate reliability both in space and ground segments; and
- c) to include function of SATCOM Voice for safety services

Operational use of FANS 1/A over Iridium (FOI)

2.6 Providing FAA's response on 27 June 2011 Performance-based operations Aviation Rulemaking Committee (PARC) meeting regarding FANS 1/A over Iridium (FOI), USA informed that FOI is a significantly lower cost solution compared to other Aeronautical Mobile Satellite (R) Service (AMS(R)S) alternatives. It was informed that Iridium based equipment is easier to retrofit on aircraft, draws less power, is lighter in weight and provides global coverage including over the polar region. PARC found that Iridium was viable for CPDLC/RCP 240 and ADS-C type 180 operations. FAA has certified FANS 1/A aircraft that uses Iridium sub-network i.e. FOI in accordance with AC 20-140A, and has authorized operators to use these aircraft in accordance with AC 120-70B. According to ICAO SARPs, FOI is a viable means for conducting ATS communications and FOI aircraft are eligible for CPDLC and ADS-C operations in the Pacific Region. In view of foregoing, the meeting developed following draft Conclusion for consideration by APANPIRG:

Draft Conclusion 16/xx – FANS 1/A over Iridium (FOI) for ATS communication

That, considering that FOI is expected to be continued for CPDLC and ADS-C operations using Iridium Next beginning in 2015, FOI be accepted as one of the viable means for conducting ATS communications in the ASIA/PAC Region.

IATA was of the view that issues like cost impact and global seamless interoperability etc. should be taken into account and operational mandate should address regional performance requirements in accordance with the established ICAO procedures.

INMARSAT Updates

2.7 INMARSAT informed that the end of life of the I-3 constellation was expected in 2018 however Classic Aero H+ technology will be available through to the end of life of the I-4 constellation expected in 2023. INMARSAT claimed that a heavy investment had been made by them and their partners resulting in achieving acceptable level of message latency and stability of network and no further upgrade was foreseen till the end of life of I-3 constellation, when the remaining eligible aircraft will be expected to migrate to I-4 network. Swift Broad Band Oceanic Safety Services will target 99.99% availability for the systems using SBB with fallback to Classic Aero.

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Updates by ARINC

2.8 Template presented by ARINC was considered as a response to the action item developed by SOCM/1 regarding implementation of improvement plan by the stake holders to develop a common outage/maintenance reporting template and process by CSPs. The sample template presented by ARINC is provided in Appendix A to this paper. It was observed that SITA has a similar template in use for the purpose. The meeting considered that this template should be provided for consideration by the steering group for GOLD amendment.

Performance over New Zealand

2.9 New Zealand reported that performance against RSP 180 and RCP 240 is continuing to improve and that nearly all the fleets were meeting 95% normal operations requirements.

RCP and RSP Planning and Implementation

2.10 USA proposed that APANPIRG begin the planning and implementation of a performance based framework for communication and surveillance within the Asia-Pacific Regions. Specifications included in GOLD can be used for FANS 1/A CPDLC and ADS-C. A number of States in Asia/Pacific region have been providing reduced separation in air traffic services that are predicated on certain communication, surveillance and navigation requirements. The GOLD provides guidelines to States to help in qualifying components of the operational system to the criteria prescribed by the performance specifications, including ANSP post-implementation monitoring. It was noted that in June 2011, the North Atlantic Region System Planning Group (NATSPG) endorsed its RCP and ADS-C Surveillance Performance Based Operations Implementation Plan, which is consistent with GOLD. The plan provided in the Appendix B to this paper is being executed within NAT Region effective from February 2015. In March 2011, ISPACG agreed to develop a performance-based framework for communications and surveillance within the South Pacific sub-region. To implement a performance-based communications and surveillance framework, changes will be needed to:

- a) type design approval of aircraft, as necessary;
- b) Master Minimum Equipment List (MMEL) policies;
- c) related operational authorizations
- d) Regional SUPPs (ICAO Doc 7030 Amendments) and AIPs (or equivalent);
- e) Flight plan requirements; and
- f) ATC automation to act appropriately based on communication and surveillance equipment and capability indicators provided in the flight plan.

The meeting recommended APANPIRG sub-groups to include RCP and RSP in their work programme and to organize necessary workshops to raise awareness by States and Operators on the subject. Following draft Decisions, based on above was formulated:

Draft Decision 16/xx – Inclusion of RCP and RSP Framework in work programme

That, APANPIRG Sub-groups include in its work programme and implementation initiatives, an effective implementation of a performance based framework for RCP and RSP in the Asia/Pacific Region.

Draft Decision 16/xx – Workshop on RCP and RSP

That, ICAO be invited to organize a workshop on RCP and RSP

Performance Framework Form (PFF)

2.11 The meeting reviewed and updated the Performance Framework Form (PFF) for enhanced Communication and Surveillance capabilities and improved provision of satellite based communication and surveillance capabilities to enable FANS 1/A data link (ADS-C, CPDLC) to support RCP 240 and RSP 180 specifications in the oceanic and remote areas. Meeting is invited to review the updated PFF provided in Appendix C to this paper and recommend it for adoption by APANPIRG.

Draft Decision 16/xx – Performance Framework Form

That, the Performance Framework Form provided in Appendix C be adopted.

HF Data-link

2.12 New Zealand informed the meeting about performance of HF Data-link as observed in the Auckland (NZZO) FIR. It was observed that aircraft using HF DL in the tertiary VHF, SATCOM and HF mode meet 95% normal operation requirement for RSP 180. No aircraft however are using HF DL as a primary means for FANS 1/A communications.

3. Action by the Meeting

3.1 The meeting is invited to:

- a) note outcome of SOCM/2 meeting; and
- b) consider to endorse draft Conclusions/Decisions for consideration by APANPIRG

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Appendix A to the Report

SAMPLE REPORTING TEMPLATE FROM ARINC

AAM - ARINC Advisory Message

We would like to inform you that ARINC maintenance work needs to be carried out according to the following:

Service(s): ATC Gateway

Trouble Ticket 681614 /Change Order #:PCO 58632

Maintenance Location: Annapolis, MD

Maintenance Window: 02/09/2012, 1930z -2000z

Expected Outage Duration: None

Description of Maintenance: ATC Gateway switchover to be performed. The switchover is not expected to cause any disruption of service. This switchover is necessary in order for new ARINC configurations to take effect.

ARINC regrets any inconvenience that this may cause, but this activity is necessary to maintain the quality and reliability of our services.

Please ensure this message is forwarded to the appropriate technical support personnel within your organization.

If you have any further questions or concerns, please contact the ARINC:

Service Desk

ARINC SERVICE DESK

US & INT'L ACCESS (SPRINT) 1-800-633-6882, OPTION 1

NON TOLL FREE NUMBER - 703.637.6360

INTERNATIONAL ACCESS +05+1 800-633-6882

FAX 1-410-956-5465

HELPDESK@ARINC.COM

HDQHDXA

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Appendix B to the Report

**NAT RCP and ADS-C Surveillance Performance Based
Operations Implementation Plan**

Associated with the NAT data link services in support of RLongSM and RLatSM.¹

#	TASKS	COMPLETE BY	STATUS	LEAD	Remarks
	GENERAL PROJECT DEVELOPMENT & MANAGEMENT				
1	Prepare a draft <i>RCP and ADS-C Surveillance Performance-Based Operations Plan</i> outlining the way forward for consideration by the NAT IMG	NAT IMG/38 and NAT SPG/47	Approved by NAT SPG/47.	NAT CNSG	
2	Identify Key Target Dates on implementing RCP and ADS-C surveillance performance framework and prescribing specifications to support RLongSM, and RLatSM.	NAT IMG/38 and NAT SPG/47	Pending target dates for associated operations.	NAT IMG	NAT SPG Conclusion 44/11 targets 2015. Target dates for RCP/ADS-C performance specifications need to be in combination with the target dates for RLongSM and RLatSM operational implementation.

¹ Plans for prescribing RCP specifications associated with SATCOM voice will be addressed, as appropriate, pending completion of the SATCOM Voice Guidance Material by the Inter-Regional SATCOM Voice Task Force.

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#	TASKS	COMPLETE BY	STATUS	LEAD	Remarks
3	<p>Confirm applicable performance specifications that will be used for operational implementation of data link services in support of RLatSM and RLongSM.</p> <p>Detail and validate CRM assumptions against actual performance measurements in accordance with GOLD.</p>	NAT SPG/46 for RLatSM and RLongSM.	Approved by NAT SPG/47	NAT SARSIG	<p>During trials of RLongSM and RLatSM, specifications are not prescribed, but will provide guidelines against which the actual performance is measured. RCP 240 and surveillance performance 180 are the candidate's specifications to be prescribed for RLatSM and RLongSM operations. Note: When performance falls below specified levels, operational judgment may be a consideration in determining appropriate actions.</p>
4	<p>Update operational concepts for implementation of RLatSM, RLongSM supported by associated RCP and surveillance performance specifications.</p> <p>Develop operational concept (of use), including procedures, for data link services using CPDLC and ADS-C to reduce the number and exposure of operational errors and pilot deviations, regardless of whether or not reduced ADS-C based separations are applied. For example, concept of use should detail conformance monitoring, intervention and route re-clearances.</p> <p>Review and comment on material for incorporation in GOLD, NAT Doc 006 and Doc 007.</p>	NAT IMG/40 and NAT SPG/48	Draft and review through end 2012.	NAT ATMG in coordination with CNSG	<p>ADS-C and CPDLC operational concepts are complete.</p> <p>Review and propose text to be candidate for GOLD amendment.</p>

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#	TASKS	COMPLET E BY	STATUS	LEAD	Remarks
	DOCUMENTATION				
5	Development of the GOLD material in support of reduced longitudinal: -the provisions for data link service (AIC, guidance for AIPs, eligibility requirements etc) -performance specifications -initial qualifications for operations of operators, aircraft and ATC -post implementation monitoring	NAT SPG/46	Complete	GOLD ad-hoc group	Amendments to GOLD are in work for tasks 3, 5, 6 and 7. Adoption planned at NAT SPG/49.
6	Develop flight crew and controller contingency procedures in the event of service outage, malfunction or failure that would cause performance to degrade below that required by specifications. Review and comment on material for incorporation in GOLD, NAT Doc 006 and Doc 007.	NAT IMG/40 and NAT SPG/48	Draft and review through end 2012.	NAT ATMG/ CNSG	Included in NAT Doc 006. Amendments needed to ensure that long duration outages/degradations are also considered. Similar provisions should be included in the GOLD and in NAT Doc 007.
7	Develop the criteria for resuming data link service, RLatSM, or RLongSM operations after service communication and/or surveillance capabilities are restored to acceptable level of performance. Review and comment on material for incorporation in GOLD, NAT Doc 006 and Doc 007.	NAT IMG/40 and NAT SPG/48	Draft and review through end 2012.	NAT ATMG/ CNSG	Included in NAT Doc 006. Amendments needed to ensure that long duration outages/degradations are also considered. Similar provisions should be included in the GOLD and NAT Doc 007.

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#	TASKS	COMPLETE BY	STATUS	LEAD	Remarks
8	Draft guidance material for the flight plan to define the descriptors for performance specifications, as appropriate, using the new format planned for 2012 implementation. Review and comment on material for incorporation in GOLD.	a) NAT IMG/40 and NAT SPG/48 (as part of the NAT SUPPs PfA) and GOLD b) 12 th Air Navigation Conference – amend Doc 4444	Work needs to be confirmed and assigned. Draft and review through end 2012.	NAT CNSG ICAO (Global)	Definition of P descriptors in Item 10a and expansion or redefinition of descriptors for ADS-C.
9	Draft or update PfA (or revise existing drafts) to the NAT Regional Supplementary Procedures (SUPPs) (Doc 7030) to prescribe the performance specifications for communication and surveillance to support RLatSM and RLongSM. PfA should include criteria for operator eligibility, aircraft equipage, requirements for flight planning, monitoring, alerting and reporting.	NAT IMG/42 and NAT SPG/49	Draft and review through end 2012.	NAT CNSG NAT ATMG	Dependent on timeline for RLatSM and RLongSM. PfA should be part of PfA for each operational improvement.
10	Amend AIPs and other State documents to support SUPPs amendment.	Consistent with Task 8	Consistent with Task 8	States	Consistent with Task 8
11	Implement operational communications performance monitoring capability in ATC automation.	Before the start of operational trials of RLongSM or RLatSM.	Gander – completed Shanwick – completed Reykjavik – 4Q/2011 Santa Maria – 2Q/2011 New York – Completed Bodo – TBD Shannon – 1Q/2013	NAT ANSPs	Should be in place prior to effective date of data link mandate and start of RLatSM or RLongSM trials.

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#	TASKS	COMPLETE BY	STATUS	LEAD	Remarks
12	Measure actual performance against specifications for feasibility, i.e., ACP, ACTP, PORT, ADS-C latency for operators and aircraft types	Prior to operational implementation	Ongoing	ANSPs/ DLMA/ CNSG/ SARSIG	Collect and analyze data in accordance with GOLD, Apx D.
	AIRWORTHINESS AND OPERATIONAL ELIGIBILITY				
13	Provide guidance to State regulators related to aircraft equipage and operator eligibility requirements taking into account the GOLD and appropriate RCP and surveillance performance specifications. Review and amend GOLD, if required.	NAT IMG/40 and NAT SPG/48	Draft and review through end 2012.	OPSAIR SG	Refer to FAA AC 20-140A and AC 120-70B. Other State material may apply.
14	Develop or revise State guidance and/or regulations, as necessary. Establish State airworthiness requirements. Establish operational policy/procedures requirements for operational approval. Prepare State inspectors to perform tasks for operational approval. Develop plan to issue operational approval to national operators by [date], to extent possible. Train pilots and, if applicable, dispatchers on RCP and surveillance performance aspects of reduced separation. Develop and distribute operations manuals, pilot bulletins or other appropriate docs containing RCP and communication surveillance performance policy/procedures.	End of 2014 Prior to operational implementation of RLatSM or RLongSM	On-going Need status reports from States	SOG/ States/ ANSPs/ Users	Implementation tasks in this plan need to be completed by NAT SPG/49 (June 2013) to allow time for operational readiness to implement RCP/surveillance performance by 2015.

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#	TASKS	COMPLETE BY	STATUS	LEAD	Remarks
	POST IMPLEMENTATION TASKS				
15	Post-implementation monitoring, analysis and corrective action per GOLD, Apx D and any other necessary monitoring tasks.		On-going See related Task 11.	ANSP/ DLMA/ CNSG	When performance falls below specified levels, operational judgment may be a consideration in determining appropriate actions.
16	Develop a guidance material to clarify the interpretation of RCP and surveillance specification in terms of compliance/non-compliance.	NAT IMG/41 NAT SPG/49	In progress	CNSG	
17	Conduct workshops to raise awareness on RCP and surveillance performance.	NAT SPG/49		ICAO/ States	

ASIA/PACIFIC REGION**PERFORMANCE FRAMEWORK FORM
(REGIONAL)
ASIA/PACIFIC REGION****PERFORMANCE FRAMEWORK FOR
(REGIONAL)***(Amended in July 2011)*

REGIONAL PERFORMANCE OBJECTIVE: <u>APAC Objective 9</u>				
ENHANCED COMMUNICATIONS AND SURVEILLANCE CAPABILITY IN OCEANIC AREAS				
Benefits				
Environment	<ul style="list-style-type: none"> • reductions in fuel consumption and gaseous emissions as a result of efficiency gains; 			
Safety	<ul style="list-style-type: none"> • improved monitoring of airspace will result in safety enhancement 			
Efficiency	<ul style="list-style-type: none"> • facilitate utilization of advanced technologies (e.g. area navigation, UPRs, DARPs) and ATC decision support tools (e.g., vertical and lateral adherence monitors, short and medium term conflict detection), thereby enhancing safety and increasing efficiency. • enable aircraft to conduct flight more closely to preferred trajectories; • increase airspace capacity by enabling implementation of RTHM using data link; 			
Strategy				
Short term (2009-2011)				
ATM OC COMPONENTS	TASKS	TIME FRAME	RESPONSIBILITY	STATUS
AOM <i>(Airspace Organization and Management)</i> CM <i>(Conflict Management)</i> AUO <i>(Airspace Users Operations)</i>	Improve provision of satellite based communications and surveillance capabilities to enable FANS 1/A data link (ADS-C, CPDLC) to RNP 4 and RCP 240 specifications.			
	<ul style="list-style-type: none"> • codify/quantify existing anecdotal information and combine with available end-to-end system performance data; to summarise current satellite data link performance; 	2009	Regional ANSPs, operators, FITS, CRAs. Communications Service providers (CSP)	Reported to Satellite Operational Continuity Meeting (SOCM/1), Bangkok, Thailand, August 2009

	<ul style="list-style-type: none"> identify non conformities in current satellite data link performance against; <ul style="list-style-type: none"> specifications in Global Operations Data Link Document (GOLD); specifications in RCP Manual (Doc 9869); and specifications in Oceanic SPR) 	2009	Regional ANSPs, operators, FITS, CRAs.	reviewed status and identify issues at Satellite Operational Continuity Meeting (SOCM/1), August 2009
	<ul style="list-style-type: none"> provide summary information on non conformities in current satellite data link performance to all affected parties in the end-to-end communications chain. 	2009	Satellite Operational Continuity Meeting (SOCM) August 2009 to summarize and circulate information to affected parties, including CSP, Ground Earth Station (GES) providers, equipment suppliers and satellite service providers.	Issues identified have been summarized in the report of the first meeting of Satellite Operational Continuity Meeting (SOCM/1).
	<ul style="list-style-type: none"> Implement mitigations and solutions in accordance with timelines in regional strategy 	2010	Regional ANSPs, operators, FITS, CRAs, CSP, Ground Earth Station (GES) providers, equipment suppliers and satellite service providers.	State Letter dated 12 July 2010 issued conveying mitigation solution suggested by ICAO
	<ul style="list-style-type: none"> develop a regional strategy and work programme to identify/design suitable long term mitigations and solutions to non conformities that will enable continuous operational compliance with specifications for RNP4 and RCP 240. 	201 2	Regional ANSPs, operators, FITS, CRAs, CSP, Ground Earth Station (GES) providers, equipment suppliers and satellite service providers.	The Satellite Communication Datalink Service has been improved since late 2009 to some extent. But still does not fully meet operational requirements satisfactorily.
	<ul style="list-style-type: none"> Develop a sample service level agreement for possible use by ANSPs 	201 2	Regional ANSPs, operators, FITS, CRAs, CSP	SOCM/2 scheduled for November 2011 to progress this work

	<ul style="list-style-type: none"> • monitor implementation progress 	201 <u>2</u>	Regional FITS, CRAs provide feedback to all affected parties	Assess implementation of mitigation solution in the next SOCM meeting
GPIs	GPI/5: RNAV and RNP, GPI/7: dynamic and flexible ATS route management, GPI/17: data link applications and GPI/22: Communication Infrastructure;			
References	<ul style="list-style-type: none"> • <i>Manual on Required Communication Performance (Doc 9869)</i> • <i>RTCA DO-306/EUROCAE ED-122, Safety and Performance Standard for Air Traffic Data Link Services in Oceanic and Remote Airspace (the “Oceanic SPR”)</i> • <i>FANS-1/A Operations Manual (FOM)</i> • <i>Global Operational Data Link Document (GOLD)</i> • <i>Guidance Material for End-to-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems in the Asia/Pacific Region</i> • <i>CEANS Report(2008) on ANS Infrastructure</i> • <i>APANPIRG Conclusion 19/24, 20/31, 20/32/20/33, 20/34 and 20/73</i> 			