INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE

REPORT OF THE NINTH MEETING OF FANS IMPLEMENTATION TEAM, SOUTH-EAST ASIA (FIT-SEA/9) AND THE SIXTEENTH MEETING OF THE SOUTH-EAST ASIA ATS COORDINATION GROUP (SEACG/16)

Bangkok, Thailand

11 to 15 May 2009

The views expressed in this report should be taken as those of the meetings and not of the International Civil Aviation Organization (ICAO)

Approved by the meetings
and published by ICAO Asia and Pacific Office

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PART I – HISTORY OF THE MEETING

1. Introduction

1.1 The ninth meeting of FANS Implementation Team, South-East Asia (FIT-SEA/9) was held at Kotaite Wing of ICAO Asia and Pacific Office, Bangkok, Thailand on 11 May 2009. Subsequently, the sixteenth meeting of South-East Asia ATS Co-ordination Group (SEACG/16) was held at the same venue from 12 to 15 May 2009.

2. Attendance

2.1 Forty-six participants attended the meetings from Brunei Darussalam, Cambodia, Hong Kong China, Japan, Lao PDR, Philippines, Singapore, Thailand, Viet Nam, IATA, IFALPA, ARINC, BOEING and SITA. A list of participants is at **Attachment 1** to this report.

3. Officers and Secretariat

3.1 Mr. Kwek Chin Lin, Air Traffic Control Manager (Systems), Civil Aviation Authority of Singapore was elected as the Rapporteur of FIT-SEA/9. Mr. Tinnagorn Choowong, Vice President, Air Traffic Services Bureau 1 and Acting Director, Air Traffic Management Centre, Aeronautical Radio of Thailand, Ltd. continued the service as the Chairperson of SEACG. Mr. Kyotaro Harano, Regional Officer ATM, ICAO Asia and Pacific Office acted as the Secretary for the FIT-SEA and the SEACG meetings.

4. Opening of the Meeting

4.1 Mr. Kyotaro Harano, on behalf of Mr. Mokhtar A. Awan, Regional Director, ICAO Asia and Pacific Office extended a warm welcome to the participants. Recognizing that the sudden onset of the ‘pandemic flu’ and consequent impacts within the aviation industry had resulted in some non-attendances at and some cancellations of meetings, it was pleasing to see the good number of States and international organization participants at this meeting.

4.2 Mr. Harano recalled that FIT-SEA had made significant progress during the past years in expanding the ADS/CPDLC services in the South China Sea area in a very active manner. Viet Nam started the regular operations of ADS/CPDLC in April 2008. He commended all involved for the regular operations of ADS/CPDLC in this area. He thanked Japan for their continuous support in absorbing the costs of providing central reporting agency (CRA) services for the South China Sea area. The meeting would review the regular operations of one year after reported at FIT-SEA/8 (May 2008, Bangkok), based on the experience of ATS providers and airlines, and the technical analysis of data by CRA-Japan. The implementations of FANS data link are necessary to achieve 50 NM/50 NM separation minima in a wider area and he welcomed the Philippines coming back to FIT-SEA in two years.

4.3 Mr. Harano remarked that SEACG/16 would discuss a wide range of matters related to ATS. Although ATS providers spent past few years in implementing many major airspace projects bringing substantial benefits to operators as well as to the environment, there was still a need for States to improve their ATS. He stressed that SEACG was the group for States and international organizations, and hoped that the participants were actively involved in the discussion. He wished the meetings a fruitful success.

4.4 Mr. Tinnagorn Choowong extended a warm welcome to all delegates attending the SEACG/16. He emphasized that SEACG/16 would review the results of FIT-SEA/9, and other issues such as the new CNS/ATM system, ATS routes and contingency plans. Toward these objectives, he expected active involvement in the discussion by the participants and wished the meeting a great success.

5. Documentation and Working Language

5.1 The working language of the meeting and the language for all documentation were English. Seven (7) working papers (WPs), seven (7) information papers (IPs) and one (1) presentation were presented to FIT-SEA/9, and twenty-six (26) WPs and ten (10) IPs were presented to SEACG/16. The list of papers and presentations is shown at **Attachment 2** to this report.

FIT-SEA/9

REPORT OF FIT-SEA/9

Agenda Item 1: Adoption of Agenda

1.1 The meeting unanimously elected Mr. Kwek Chin Lin, Air Traffic Control Manager (Systems) from the Civil Aviation Authority of Singapore (CAAS) as the Rapporteur of FIT-SEA/9. Subsequently, the meeting adopted the agenda as follows:

Agenda Item 1: Adoption of Agenda

Agenda Item 2: Central Reporting Agency

Agenda Item 3: Review of ADS/CPDLC Implementation

Agenda Item 4: Data link Guidance Materials

Agenda Item 5: Update Task Lists

Agenda Item 6: Any other business

Agenda Item 7: Date and Venue for the Next Meeting

1.2 The meeting noted the Terms of Reference (TOR) for FIT-SEA as follows:

Composition of FANS Implementation Team (FIT)

The FANS Implementation Team (FIT) will consist of representatives from aircraft and ancillary equipment manufacturers, airlines, data communication service providers (DSP), ATS providers, IATA, ICAO, IFALPA and IFATCA.

FIT-SEA Terms of Reference (TOR)

The FANS Implementation Team for the South East Asia region (FIT-SEA) shall be responsible for system configuration and oversee the end-to-end monitoring process to ensure the FANS 1/A systems are implemented and continue to meet their performance, safety, and interoperability requirements.

FIT-SEA shall:

a) Determine the common operational architecture to support CPDLC and ADS;

b) Support the implementation and operational benefits of CPDLC and ADS;

c) Authorize and coordinate system testing and operational trials;

d) Develop interim operational procedures to mitigate the effects of problems until such time as they are resolved;

e) Review de-identified problem reports and determine appropriate resolution;

f) Monitor the progress of problem resolution; and

g) Assess system performance based on information in Central Reporting Agency periodic reports.

Preparation of Reports

The Central Reporting Agency (CRA) will report, as required, to FIT-SEA. FIT-SEA will report to the South-East Asia ATS Coordination Group (SEACG). ICAO will submit reports to appropriate sub-groups of APANPIRG.

(Adopted by SEACG/11, 2003)

Agenda Item 2: Central Reporting Agency

Statistical Analysis on System Performance

2.1 CRA-Japan was designated as FIT-SEA CRA by FIT-SEA, and has been supported by Air Traffic Control Association - Japan (ATCA-J). The meeting noted that FIT-SEA CRA had been providing the CRA services according to the TOR that was agreed upon by FIT-SEA/3 (November 2005, Bangkok).

2.2 The meeting recalled that FIT-SEA/6 (May 2007, Hanoi) agreed to the arrangement for the phase 2 operational trial of data link in the Ho Chi Minh flight information region (FIR), and the trial was commenced from 0001 UTC on 2 August 2007. FIT-SEA/7 (January-February 2008, Fukuoka) agreed that the phase 2 operational trial of data link in the Ho Chi Minh FIR could move on to the regular operations. The regular operations were commenced on the eight oceanic RNAV routes L625, L628, L642, M765, M768, M771, N500 and N892 in the Ho Chi Minh FIR from 10 April 2008. Japan informed the meeting that CRA-Japan (FIT-SEA CRA) provided an interim six-month report (from April to September 2008) of the analyses of the system performance and problem reports (PRs) with their comments to Singapore and Viet Nam in November 2008, according to a request at FIT-SEA/8 (May 2008, Bangkok).

2.3 CRA-Japan made a presentation as in **Appendix A** to this report under the Report of FIT-SEA CRA on their activities, the statistical analyses on system performances such as CPDLC downlinks, uplinks, uplink messages success rate and auto transfer success rate for both the Ho Chi Minh and the Singapore FIRs. There were performance issues detected for downlink performance in both FIRs.

2.4 CPDLC performances of downlink in the Ho Chi Minh FIR was 1 minute and 1second for 95 %, which only marginally met the system performance criterion specified in the *FANS Operations Manual* (FOM, the criterion is 1 minute for 95 %). The performance criterion of 3 minutes for 99 % was met in the Ho Chi Minh FIR. The system performances in the Singapore FIR for downlink were 93.88 % for 1 minute and 98.88 % for 3 minutes. This did not meet the performance criteria of 95 % and 99 % specified in the FOM. However, the CPDLC performances of round trip time both in the Ho Chi Minh and the Singapore FIRs met the system performance criteria specified in the FOM.

2.5 For the auto transfer success rate, there was no prescribed criterion in the FOM but statistics were provided for both the Ho Chi Minh and the Singapore FIRs. The success rates in Singapore ranged from 96 % in April 2008 to 99 % in December 2008, and those in the Ho Chi Minh FIR was between 95 % in October 2008 and 98 % in August 2008.

2.6 The meeting noted that there had been no PR for 12-months from Singapore and Viet Nam. From the experience in the North Pacific where hundreds of PRs have been reported, the situation of no PR in the South China Sea area could not be justified.

2.7 IATA informed the meeting that one possible situation could be that aircrew who failed in the establishment of data link connection could contact ATC through the alternative HF radio. The aircrew might not see this situation as problem and therefore did not submit a PR. CRA-Japan commented that a PR should be submitted in such a situation. Singapore concurred and noted that there could probably had been some missed PRs from the area of automatic transfers (Next Data Authority, NDA) as the success rate was averaging 98%.

2.8 The meeting agreed that aircrew be reminded of the correct PR procedures contained in the Singapore and Viet Nam AIP supplements. In this regard, the meeting concluded that reminding NOTAM should be issued from Singapore and Viet Nam with reference to the respective AIP supplement as appropriate. In the same respect, Singapore and Viet Nam agreed that the operational air traffic controllers needed to review their internal procedures of PR to ensure that PR are duly submitted to CRA-Japan.

2.9 The meeting reviewed the information contained in the system performance analysis of WP/5, and strongly encouraged FIT-SEA stakeholders to provide reports of any anomalies that they might experience. FIT-SEA CRA (CRA-Japan) emphasized that PR formed the basis for analysis which leads to deficiencies being identified and rectified early.

Typical Problem Report

2.10 Subsequently, CRA-Japan presented some typical PRs experienced in the North Pacific airspace as information for FIT-SEA members, as in **Appendix B** to this report. These examples covered the following:

a) possible causes of uplink failures;
b) use of HF data link; and
c) ADS disconnect.

2.11 Examples of specific PR from the Fukuoka FIR included causes of data link failure, inability to logon and ADS reports with incorrect Intermediate Intend data. As there was no PR submitted to FIT-SEA for similar cases, the Secretariat expressed view that those examples could have occurred in the South China Sea area as well and encouraged States and operators of FIT-SEA to contribute PR. The meeting thanked CRA-Japan for sharing the information.

Future Direction of CRA-Japan and the Formal Establishment of FIT-SEA CRA

2.12 The meeting recalled that FIT-SEA CRA services had been provided by CRA-Japan on a temporary basis until a formal FIT-SEA CRA is established, in accordance with the TOR of FIT-SEA CRA. Japan, however, could consider extending the provision of FIT-SEA CRA services for a couple of years if the Philippines was able to initiate the ADS/CPDLC operation trial in the Manila FIR by 2010. The meeting recognized the need to establish a formal FIT-SEA CRA and requested update at the next meeting from the Philippines. The meeting acknowledged and appreciated the contributions made by CRA-Japan towards the ADS/CPDLC operations which enabled the quick implementation of the data link services in the Ho Chi Minh FIR.

Agenda Item 3: Review of ADS/CPDLC Implementation

Performance Analysis by Singapore

3.1 Singapore gave an overview of the data link performance in the Singapore FIR with detailed analysis of delivery performance on the following areas of interest:

i) uplink performance;
ii) downlink performance;
iii) message reject rate;
iv) system availability; and
v) automatic transfer handover (NDA).

3.2 These covered the period from January 2008 to March 2009. Generally, the performances met the FOM requirements except for the downlinks. An analysis of the traffic numbers, mix and operators were also presented. The presentation is at **Appendix C** to this report.

3.3 The meeting was informed on the resolution measures which were taken to address the uncharacteristic marginal downlink performance. With the cooperation of SITA, each of the messages was analyzed over a few months. These were broken down into media, type of messages and aircraft types. The results indicated that the downlink performance of the B777 type were lower than the other aircraft types. As the majority of the data link users in the Singapore FIR were the B777 type, these could have brought down the overall performance for the downlink. Discussions with Boeing CRA indicated that a software release to provide a fix was imminent, with May and August 2009 being the dates for AIM-2 and AIM-1 software, respectively. Singapore would continue to monitor the situation closely. The meeting thanked Singapore for identifying the problem.

Note: - Boeing confirmed at the subsequent SEACG/16 that system performance monitoring had detected some data link performance problems with the Boeing 777 type aircraft. Boeing CRA determined that the problem was related to VHF to SATCOM link transitions after spending many hours in their avionics labs with an aim of trying to reproduce the problem. Boeing confirmed that the root cause to the problem had been identified and a free of charge software update fix will be available in late May 2010 for AIMS II configured 777s and in August 2010 for AIMS I configured aircraft.

ADS/CPDLC Operations in the Ho Chi Minh FIR

Operation Status

3.4 Viet Nam reported technical status as follows:

- ATM system has been operated well.

- Data link provided by ARINC is stable to provide ADS/CPDLC applications properly; there were some moments in which the link went to standby link.

- CPDLC up link performance met the FOM criteria.

- CPDLC down link performance at 99 percentile met the FOM criterion. The 95 percentile criterion of 1 minute was nearly met as summarized below:

January 2009: 01'01"
February 2009: 01'01"
March 2009: 01'00"
April 2009: 00'59"

- Civil Aviation Administration of Vietnam (CAAV) has instructed Vietnam Air Navigation Service Corporation (VANSCORP) to closely work with ARINC and CRA-Japan for analyzing the matter as well as improving this performance.

3.5 Data link transfers from Ho Chi Minh Area Control Centre (ACC) to Singapore ACC had been taking place smoothly. The Periodic Status Reports had been compiled weekly and submitted to CRA-Japan for their analyses.

Future Improvement

3.6 Viet Nam expected that further cooperation amongst Vietnam, ICAO, IATA, Singapore, Japan and others concerned should be enhanced in supporting the implementation of ADS/CPDLC in the area. CAAV requested JCAB for their continuous support for the CRA service. The meeting thanked Viet Nam for the information.

Review of RASMAG List of Competent Airspace Safety Monitoring Organization

3.7 The meeting reviewed the 'RASMAG List of Competent Airspace Safety Monitoring Organizations' as in **Appendix D** to this report.

Tables of ADS/CPDLC Equipage and ATS Participation Status

3.8 Philippines updated the table of Southeast Asia ADS/CPDLC Equipage and ATS Participation Status as in **Appendix E** to this Report. Philippines indicated that the data link service trial would start by Q3 or 4 of 2010.

Agenda Item 4: Data Link Guidance Materials

FANS Operations Manual Ver. 6 and Updated End-to-End Guidance Material

4.1 ICAO Asia and Pacific Office maintains the *Guidance Material for End-to-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems in the Asia/Pacific Region.* Editorial responsibility for this guidance material lies with the Regional Airspace Safety Monitoring Advisory Group (RASMAG). The ninth meeting of RASMAG (RASMAG/9, May 2008), which was held right after FIT-SEA/8, adopted the Version 3 of the End-to-End guidance material. Up-to-date versions of the FOM (Version 6, September 2008) and the End-to-End guidance material (Version 3, May 2008) are available at http://www.crasa.cra-japan.org and http://www.bangkok.icao.int/edocs/index.html, respectively.

Global Operational Data Link Document (GOLD) Update and Action

4.2 At the Informal Pacific ATC Coordinating Group (IPACG) and the Informal South Pacific ATS Coordination Group (ISPACG) and the respective FANS Interoperability Teams (FIT), it was concluded that a comprehensive review of the FOM should be undertaken with the aim of revising the format and wording used as required to achieve global endorsement of the FOM. This

work was being progressed by the Ad Hoc Working Group, which had been coordinating directly with related data link groups, to develop the *Global Operational Data Link* document (GOLD).

GOLD Ad Hoc Working Group

4.3 ICAO headquarters secretariat supports the work. Points-of-contact (POCs) have been identified to serve on the Ad Hoc Working Group. It was expected that a more mature draft for a broad review would be in as early as July 2009.

Status of the GOLD

4.4 The meeting noted that the Ad Hoc Working Group had produced the GOLD version 0.4, with 241 pages, for internal use, which contains nearly all the relevant information provided in the *Guidance Material for ATS Data Link Services in North Atlantic Airspace* (NAT GM), the FOM and DO-306/ED-122. The current high-level outline of the GOLD was as follows (parenthesis includes the number of pages for that section):

FOREWORD (3)
1. Definitions (15)
2. Overview of data link operations (TBD)
3. Administrative provisions for data link (14)
4. Operating procedures (62)
APPENDICES (120)

4.5 The GOLD coordinator maintains a number of documents that provide traceability between the GOLD and the source documents, e.g., the NAT GM and the FOM, and track open comments. Some materials in the NAT GM still need to be reviewed for inclusion.

4.6 The Ad Hoc Working Group was proceeding to complete the sections of the document requiring additional information and ensuring complete coverage of the FOM and the NAT GM. In addition, further work was needed to simplify text, ensure consistency in style, clean it up, and streamline the document. While version 0.4 of the GOLD was intended for internal use, the POCs intended to coordinate within their respective regions and/or organizations with guidance to obtain the appropriate level of comments on the GOLD, given the current state of its maturity, so that significant issues can be identified early in the process.

Agenda Item 5: Update Task Lists

5.1 The meeting reviewed and updated the list as in **Appendix F** to this report. Four items had been completed or closed and three new items were added to the list.

Agenda Item 6: Any Other Business

Summary Reports to APANPIRG of Southeast Asia ATS Coordination Group, FANS Implementation Team, Southeast Asia and Southeast Asia RNP Implementation Task Force

6.1 The 19th meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/19, September 2008) reviewed outcomes of SEACG/15 (May 2008, Bangkok), the second and third meetings of RNP Implementation Task Force (RNP-SEA/TF/2 and 3, March and June, respectively, 2008), and FIT-SEA/7 and 8.

Summary Report of the Fifteenth Meeting of Southeast Asia ATS Coordination Group

6.2 APANPIRG/19 reviewed the summary report of SEACG/15 and noted that SEACG/15 drafted a conclusion inviting the Philippines to expedite implementation of ADS-C and CPDLC, for consideration by the ATM/AIS/SAR Sub-Group (ATM/AIS/SAR/SG).

6.3 APANPIRG/19 reviewed reports of RNP-SEA/TF/7 and 8 with highlights as follows:

a) Affected States supported the 50 NM/50 NM separations on L642 and M771;

b) Target implementation date of 3 July 2008 was agreed;

c) The engagement of a safety assessment expert by Singapore was noted;

d) Amendment to the *Regional Supplementary Procedures* (Doc 7030) was proposed;

e) It was agreed that the safety assessment supported the 50 NM/50 NM separation standards;

f) The title of *"South East Asia Safety Monitoring Agency"* (SEASMA) was noted; and

g) A 'Go" decision for 50 NM/50 NM horizontal separations was agreed.

Status of FANS Data Link Services in the Manila Flight Information Region

6.4 Philippines informed the meeting that budget approval was obtained for the ACC replacement project, which will replace the current equipment with new ones that has build-in data link capability. This was graded as a priority project and data link trials were planned for Q3 or 4 of 2010. In conjunction with this project, the Philippines was commencing ADS/CPDLC refresher course and enhanced simulator training courses from the end of May 2009.

Data Link Implementation Table for Capacity Planning

6.5 The meeting reviewed and updated the table as in **Appendix G** to this report with the report from the Philippines on their data link trial planned in Q3 or 4 of 2010.

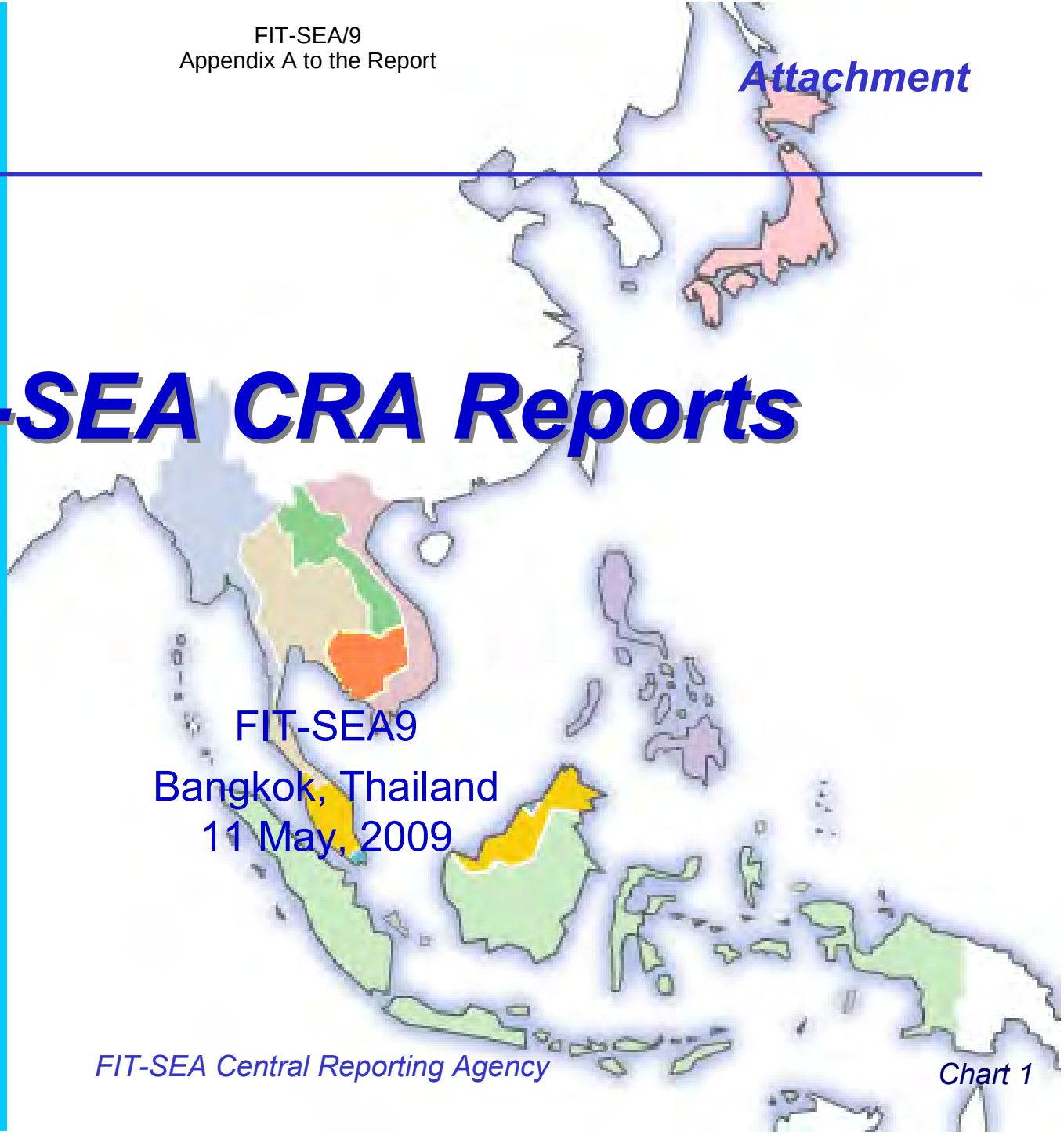
Agenda Item 7: Date and Venue for the Next Meeting

7.1 The meeting agreed that the next SEACG/10 would be held in May 2010 in conjunction with SEACG/17 at the Regional Office.

APPENDICES TO THE REPORT OF FIT-SEA/9

Attachment

FIT-SEA CRA Reports



FIT-SEA9

Bangkok, Thailand

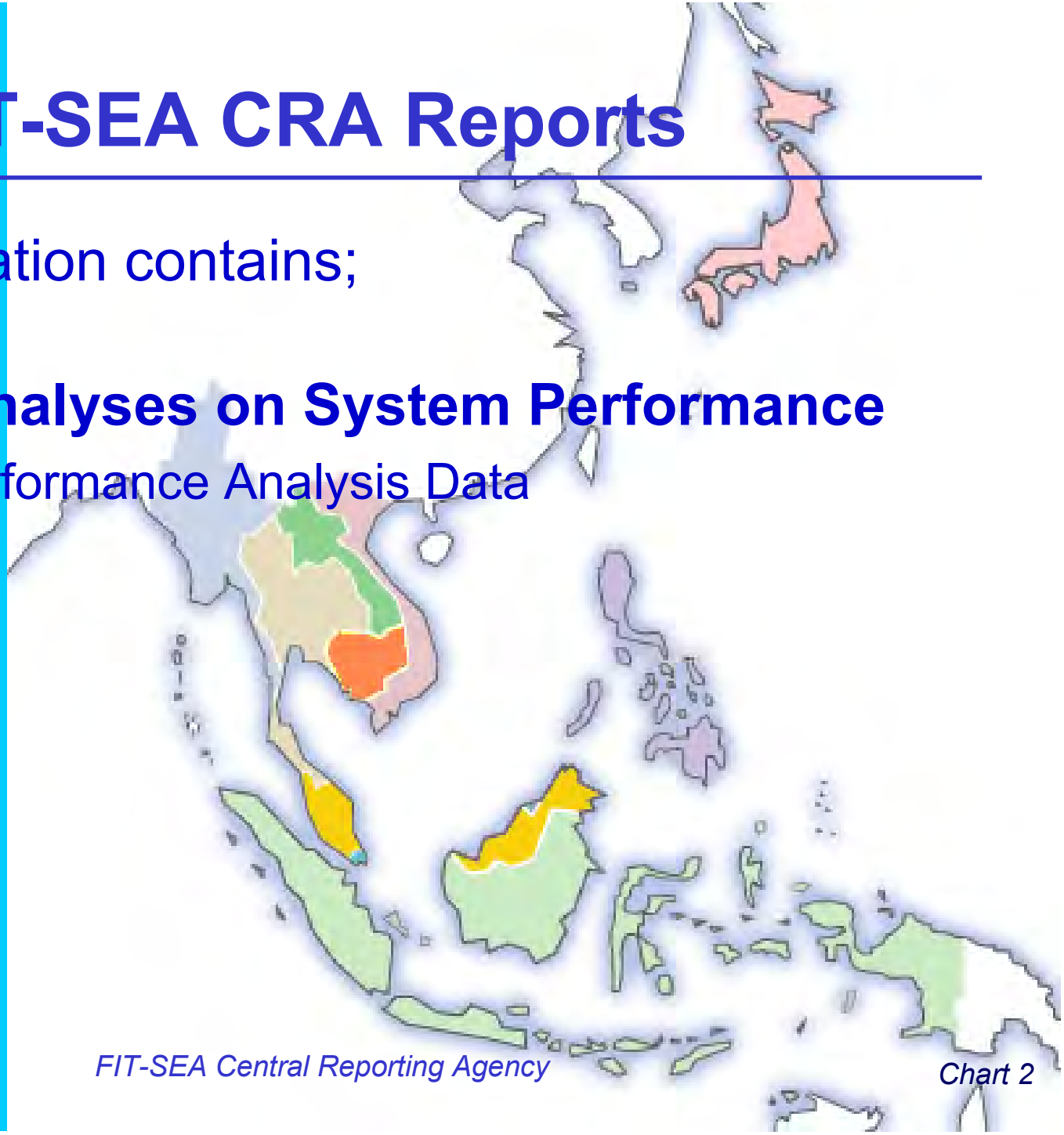
11 May, 2009

FIT-SEA CRA Reports

This presentation contains;

Statistic Analyses on System Performance

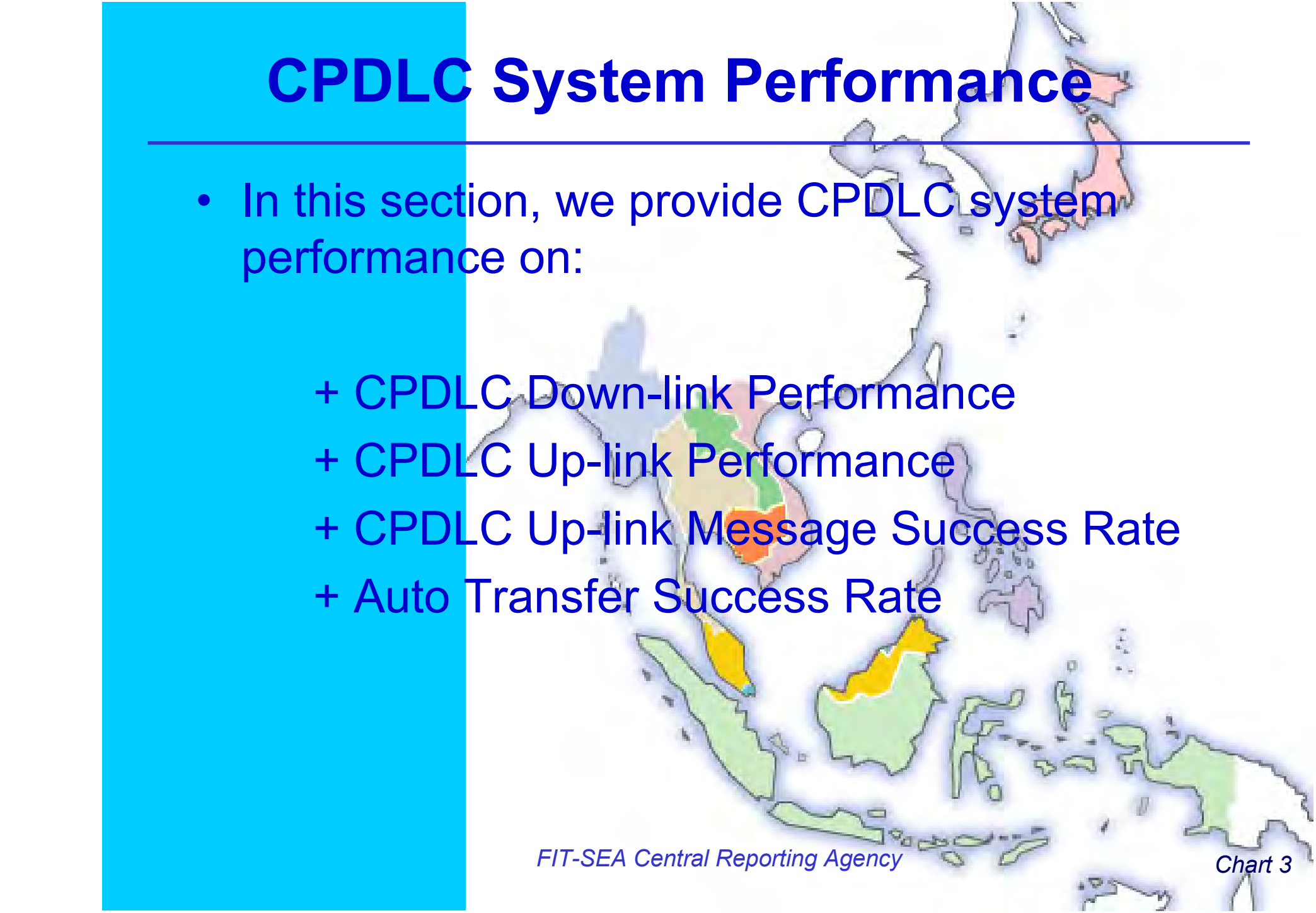
System Performance Analysis Data



CPDLC System Performance

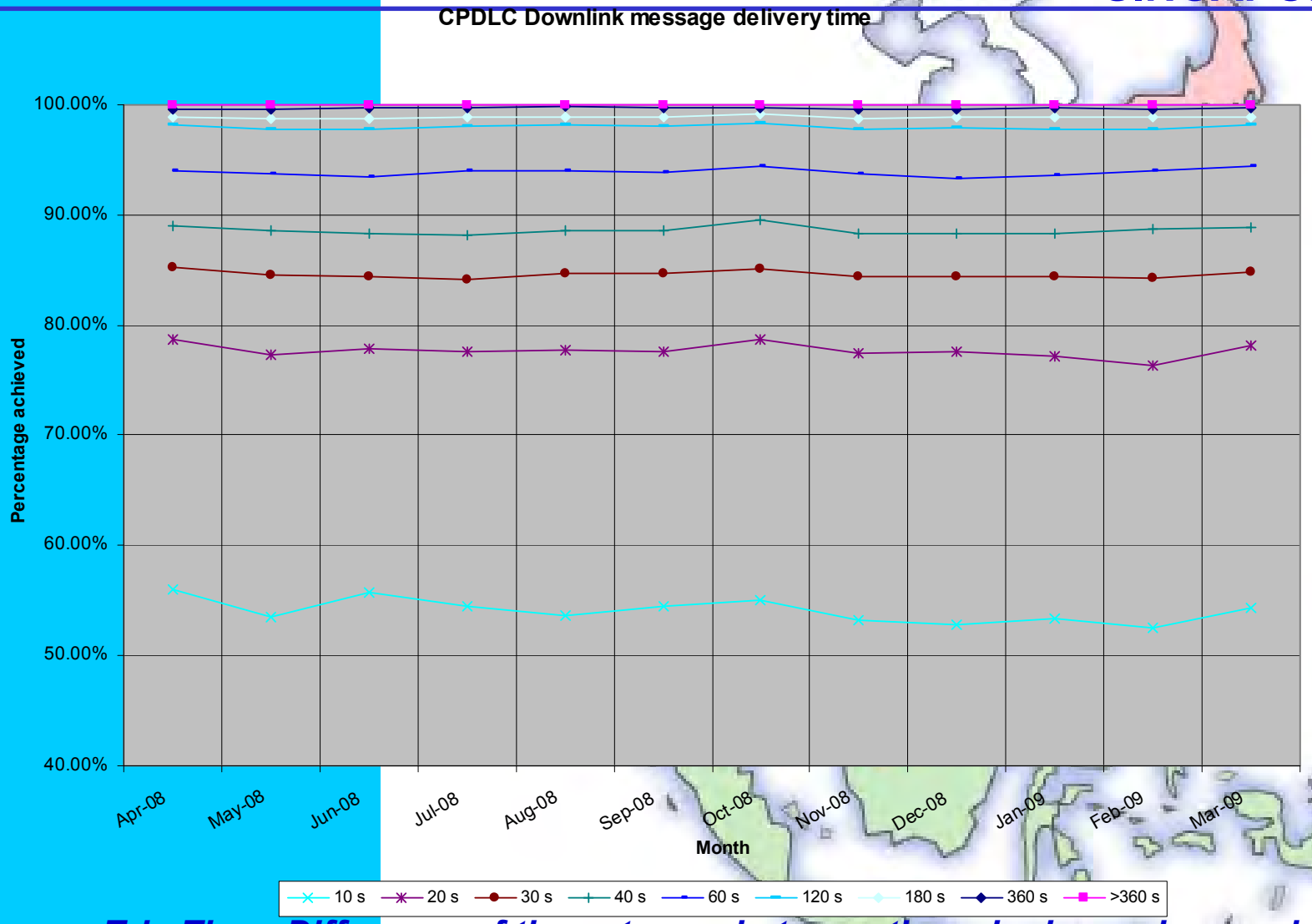
- In this section, we provide CPDLC system performance on:

  + CPDLC Down-link Performance
  + CPDLC Up-link Performance
  + CPDLC Up-link Message Success Rate
  + Auto Transfer Success Rate



CPDLC Down-link Performance

<SINGAPORE>

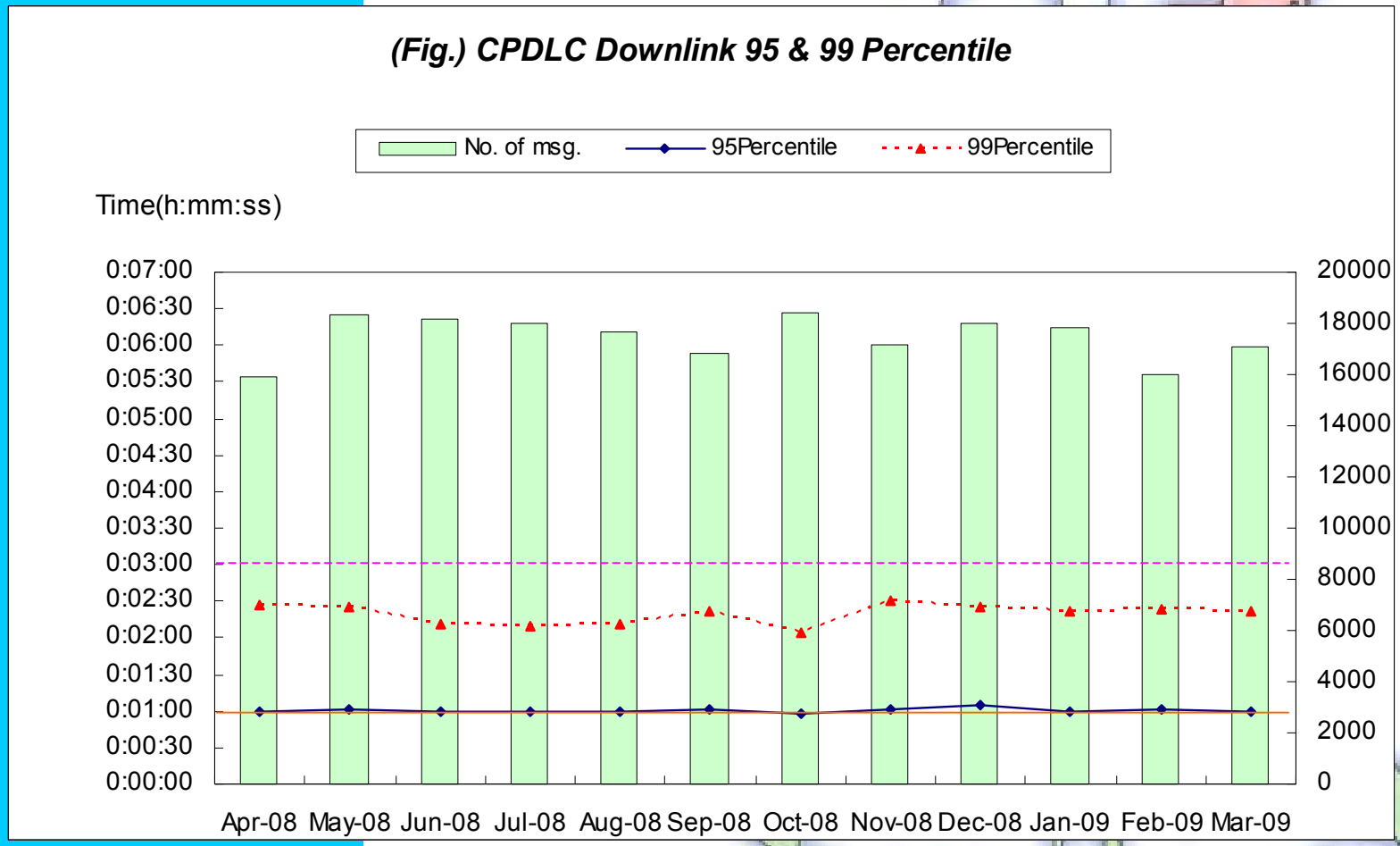


One-way Trip Time: Difference of time-stamps between the avionics and ground systems

CPDLC Down-link Performance

<VIET NAM>

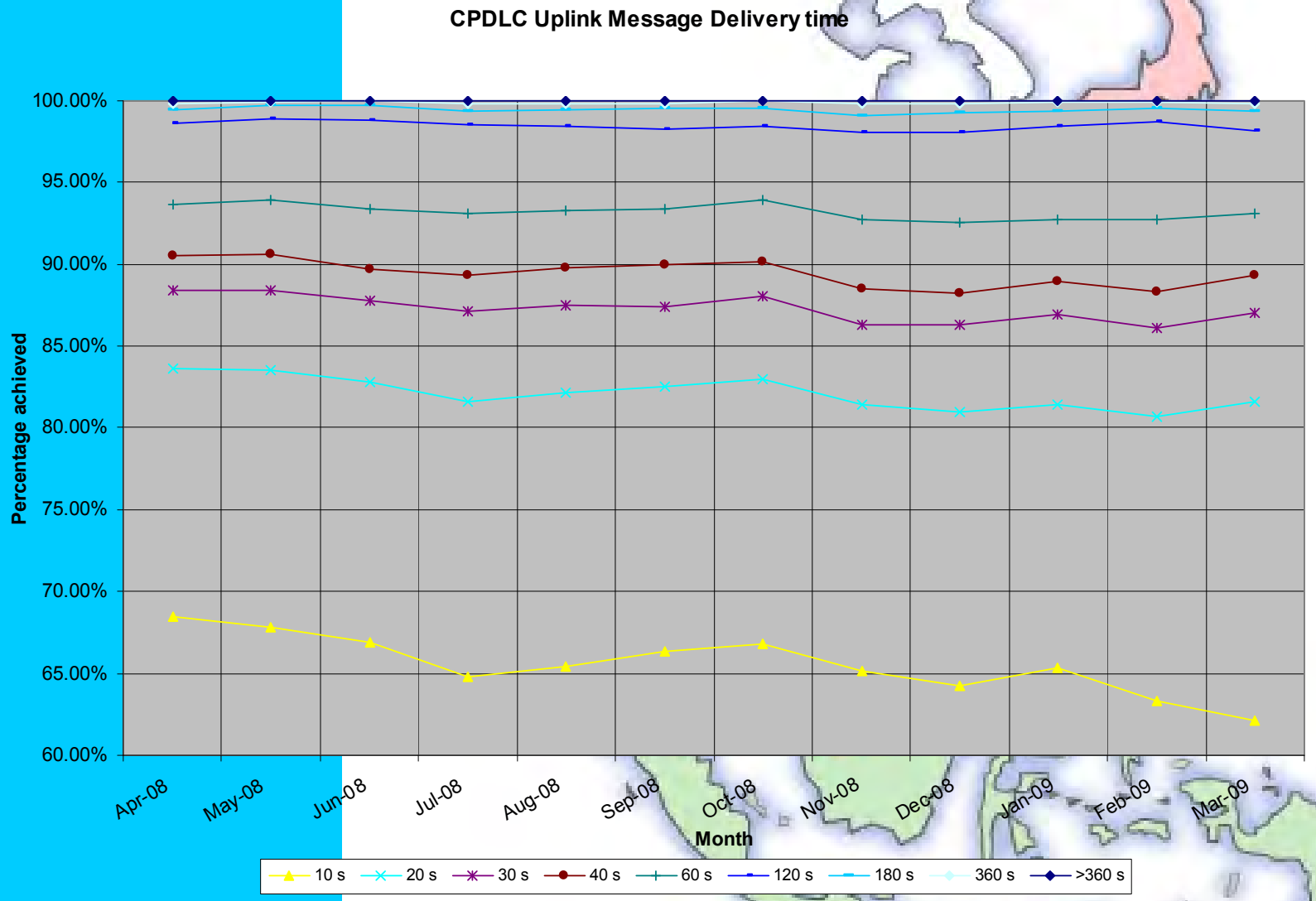
(Fig.) CPDLC Downlink 95 & 99 Percentile



One-way Trip Time: Difference of time-stamps between the avionics and ground systems

CPDLC Up-link Performance

<SINGAPORE>



Round Trip Time: Transit-delay-time from time-stamp of up-link to receipt time of MAS

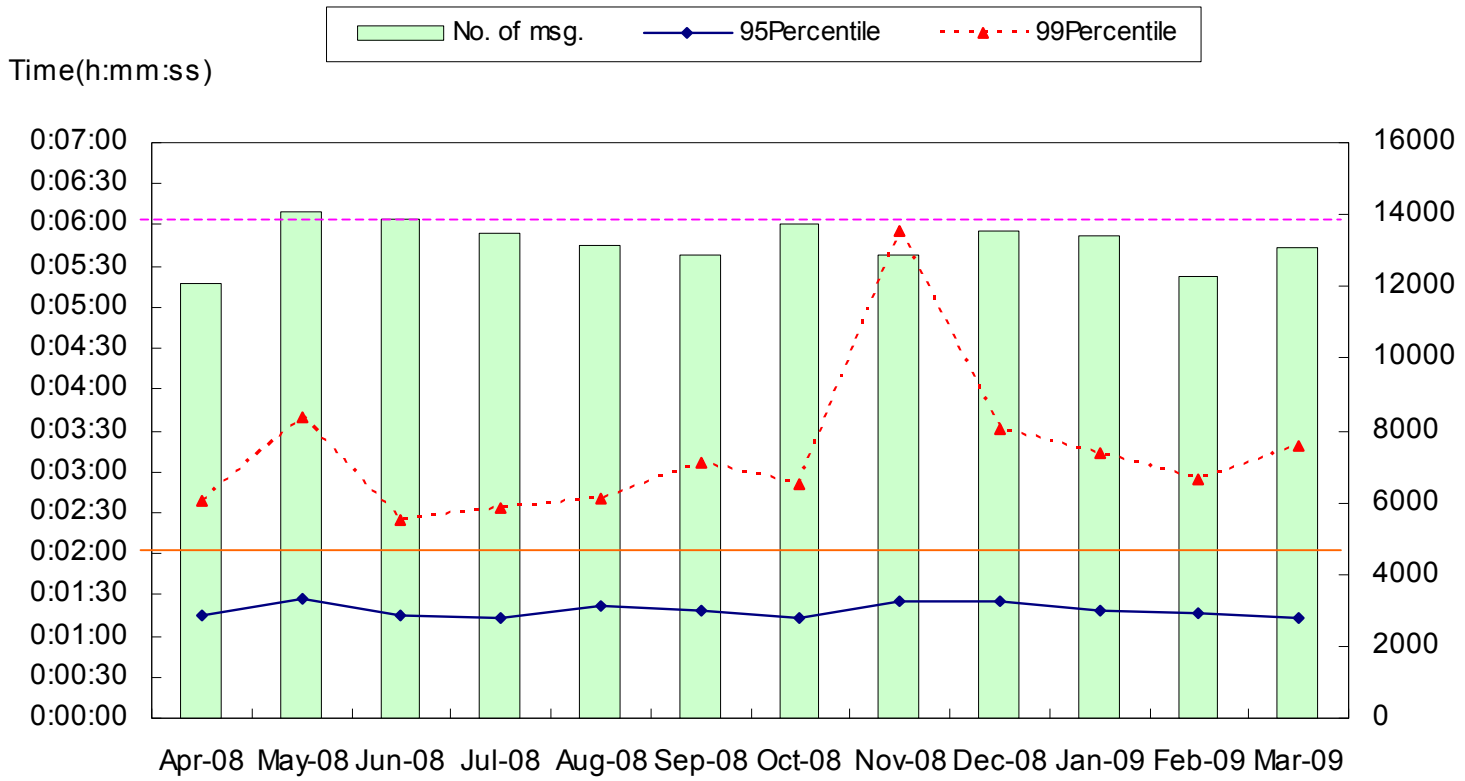
FIT-SEA Central Reporting Agency

Chart 6

CPDLC Up-link Performance

<VIET NAM>

(Fig.) CPDLC Uplink 95 & 99 Percentile

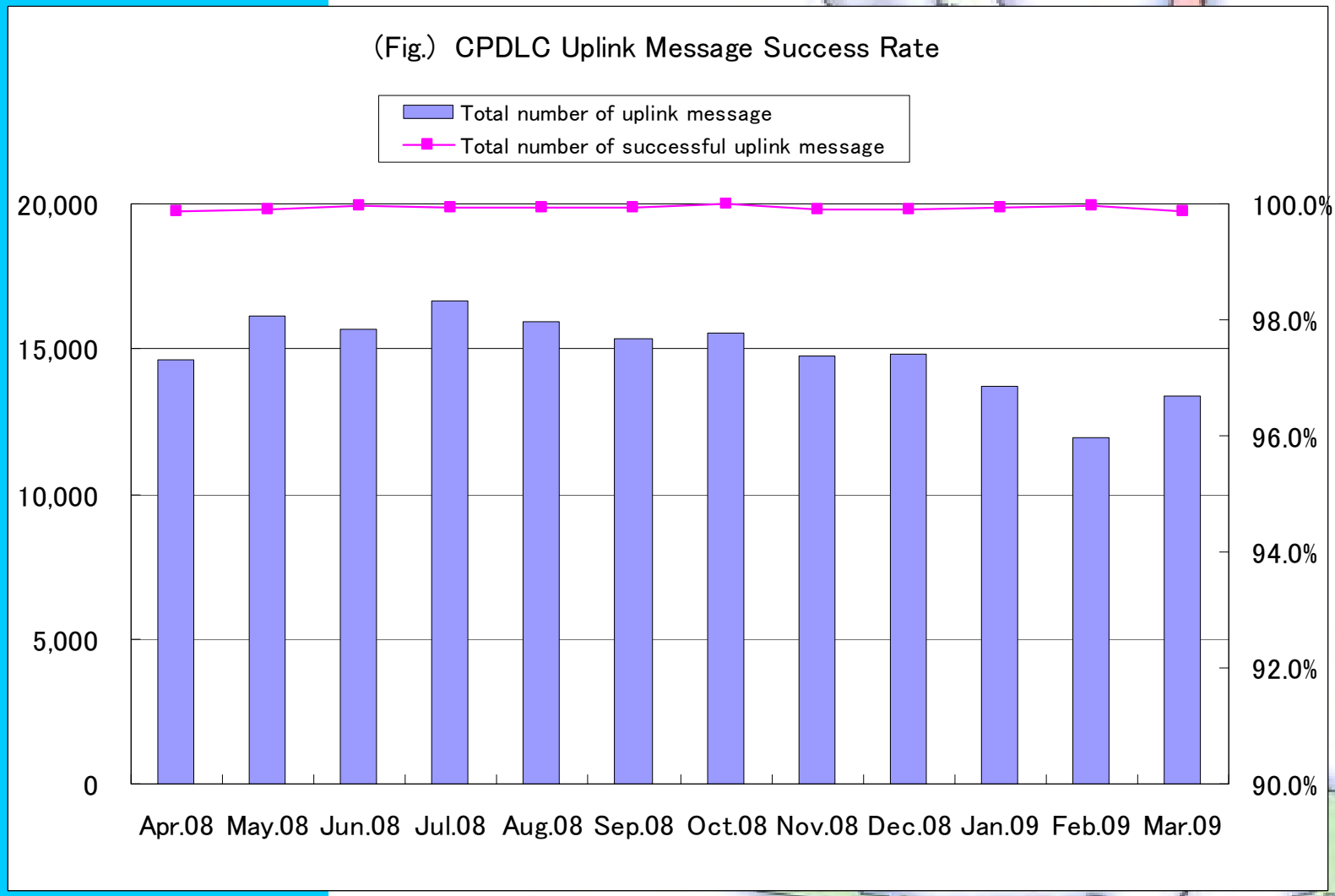


Round Trip Time: Transit-delay-time from time-stamp of up-link to receipt time of MAS

CPDLC Up-link Message Success Rate

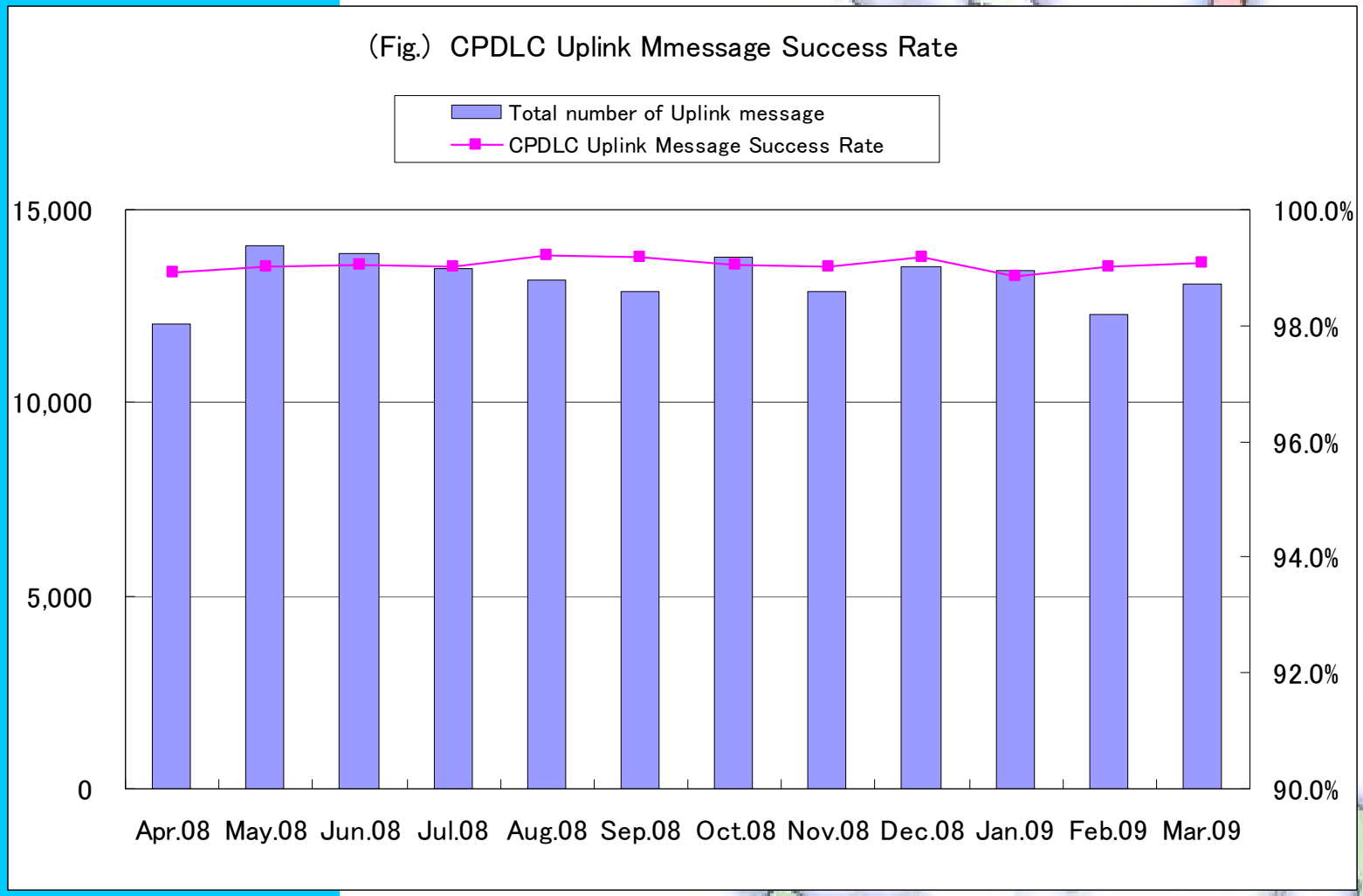
<SINGAPORE>

(Fig.) CPDLC Uplink Message Success Rate



CPDLC Up-link Message Success Rate

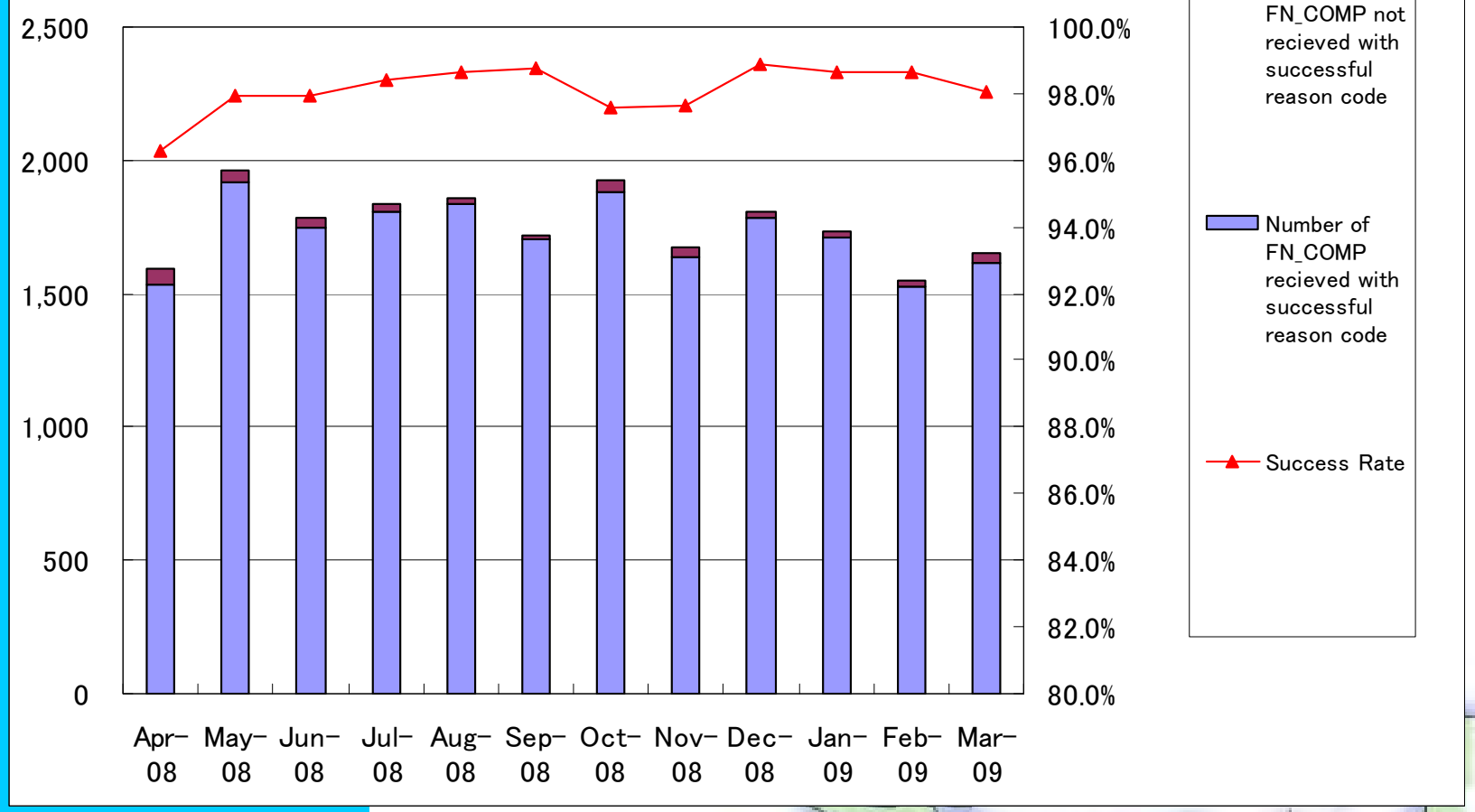
<VIET NAM>



Auto Transfer Success Rate

<SINGAPORE>

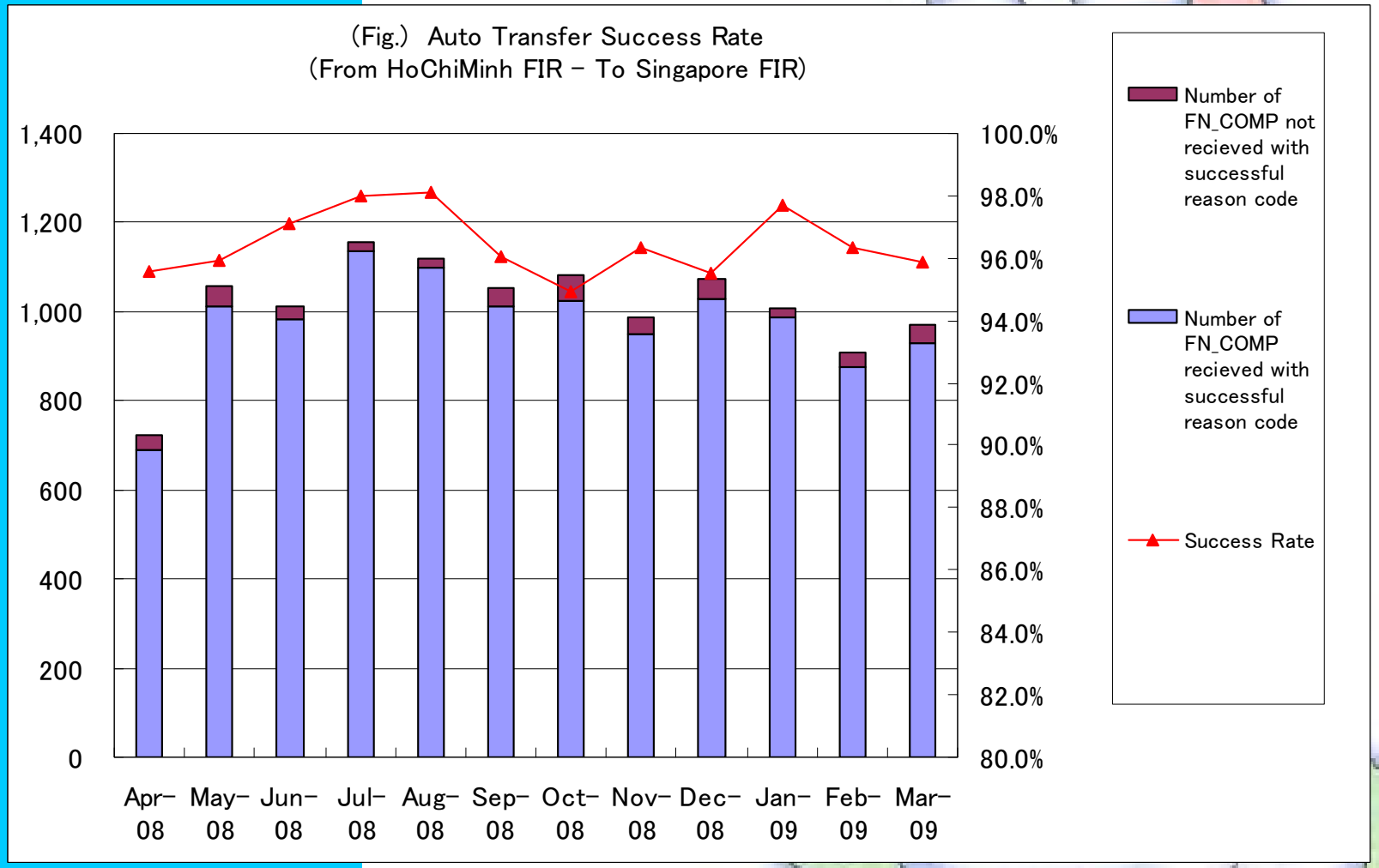
(Fig.) Auto Transfer Success Rate
(From Singapore FIR – ToHoChiMinh FIR)



Auto Transfer Success Rate

<VIET NAM>

(Fig.) Auto Transfer Success Rate
(From HoChiMinh FIR – To Singapore FIR)



Thank you for your attention!

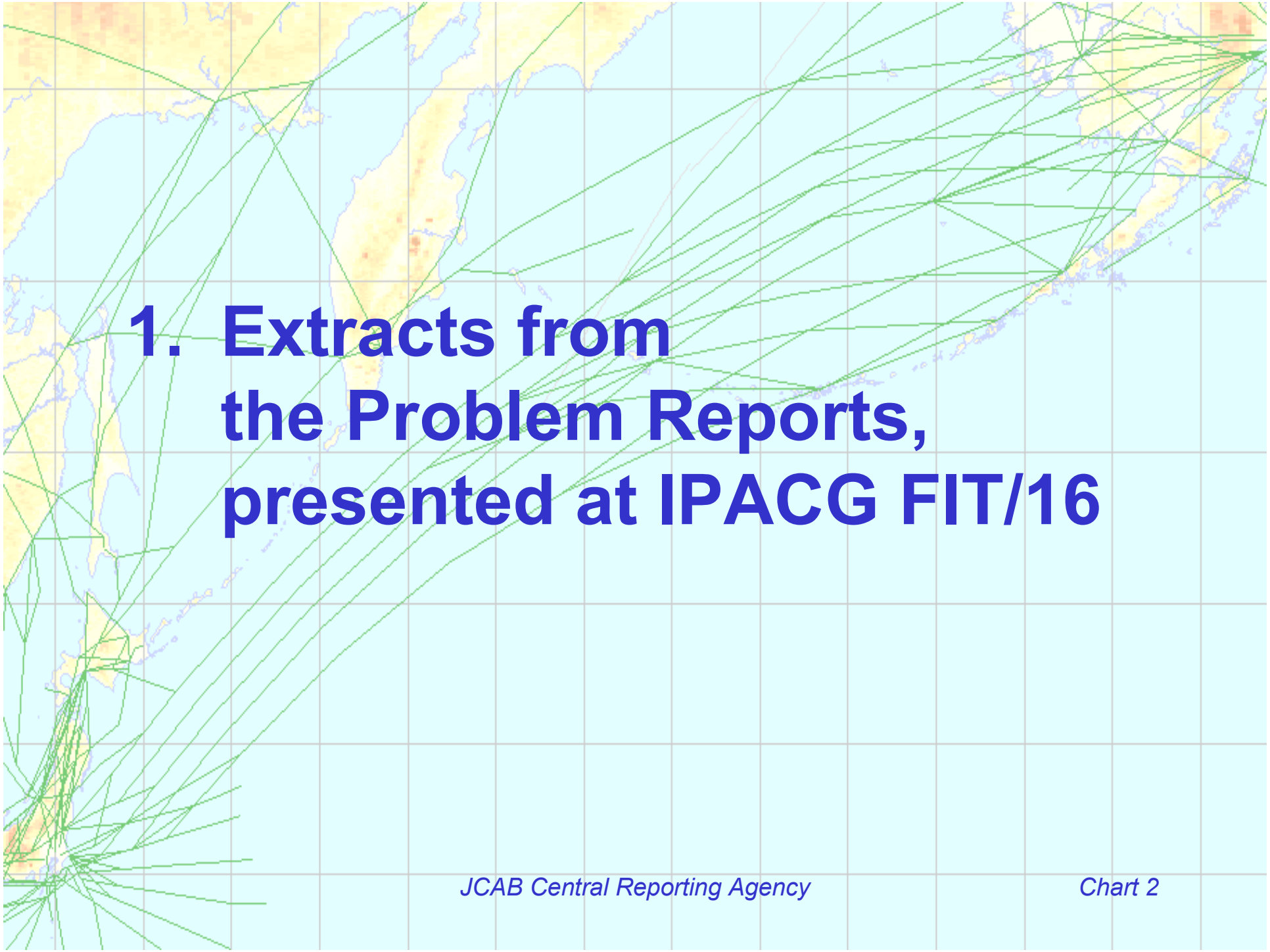
Attachment

Typical Problem Reports

FIT-SEA9

Bangkok, Thailand

11 May, 2009



1. Extracts from the Problem Reports, presented at IPACG FIT/16

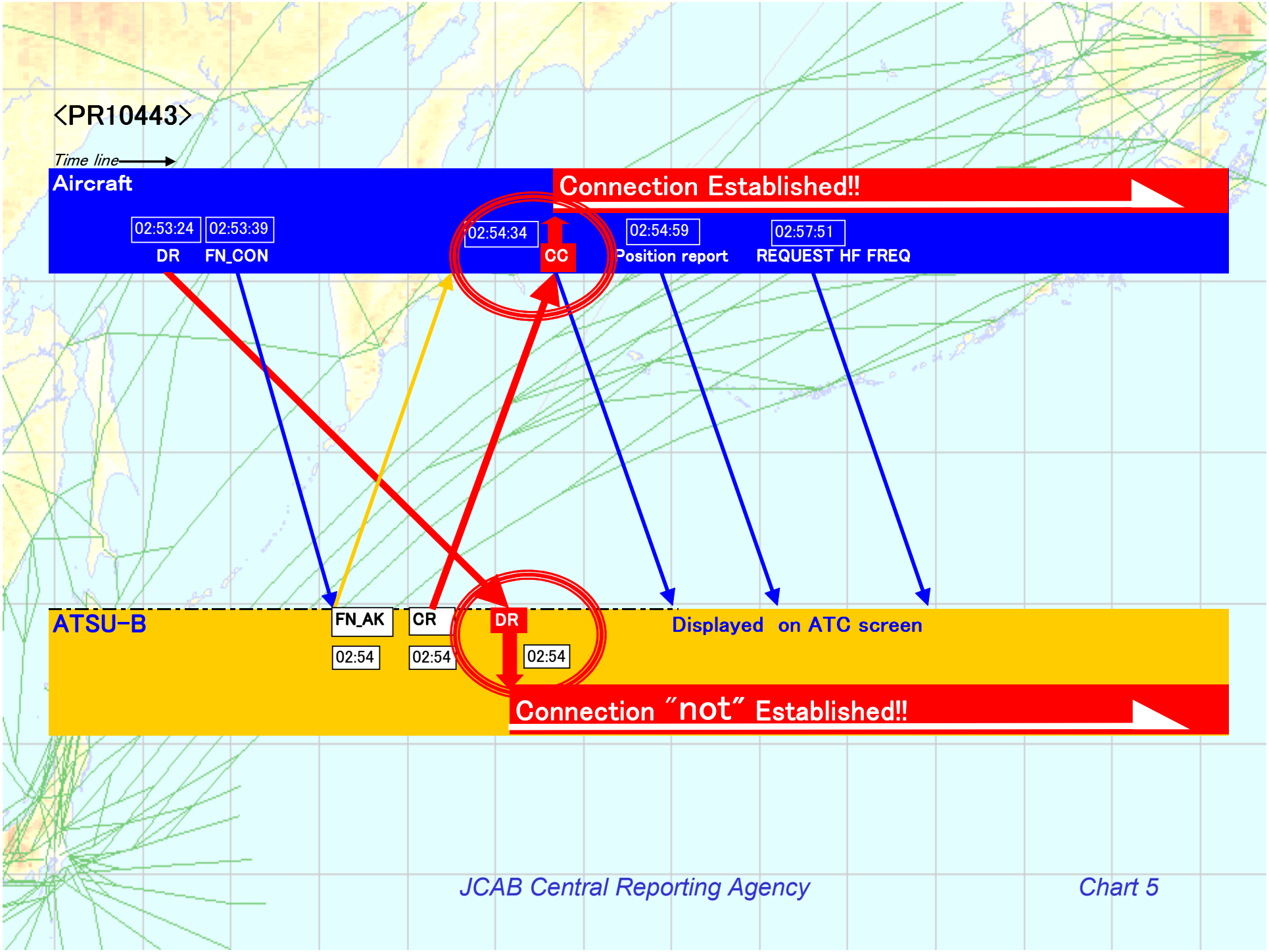
Specific PRs

- Uplink failures.(PR10443,10456,10464)
- Use of HFDL.(10445,10457,10459)
- Reception of ADS DIS.(10447,10465)

Uplink failure

PR Number: 10443,10456,10464

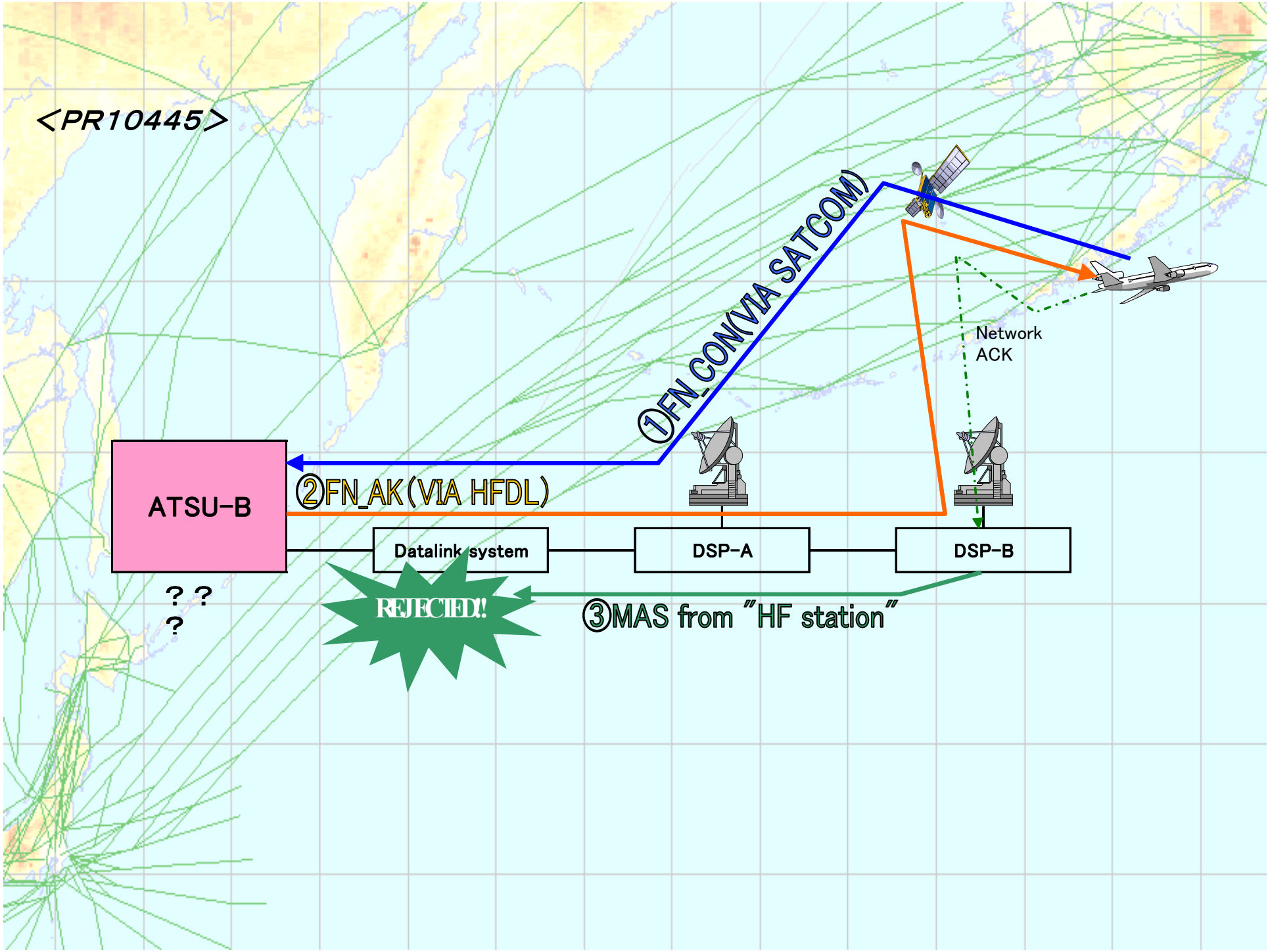
- These PRs were “Uplink failure” problems which brought about the uplink disconnection of CPDLC at the ATSU, because DR was downlinked from the aircraft in response to CR uplink.
- Meanwhile, aircraft has got continuous CPDLC connection with ATSU on account of sending an effective CC in response to CR from ATSU.
- Each case indicated that they had only 10 to 30 seconds intervals between ATC COMM OFF and following LOGON.
- The avionics system is primarily designed to give priority to AFN message when downlinking therefore, CPDLC message is processed next. Even though ATC COMM OFF is initiated first, following FN-CON message is first downlinked to ATSU.
- When an aircraft is manually disconnecting with ATSU, flight crews are expected to provide more than 1 minute interval when initiating LOGON following ATC COMM OFF.


<PR10443>
Time line
Aircraft
Connection Established!!
02:53:24
DR
02:53:39
FN_CON
02:54:34
CC
02:54:59
Position report
02:57:51
REQUEST HF FREQ
ATSU-B
FN_AK
02:54
CR
02:54
DR
02:54
Displayed on ATC screen
Connection "not" Established!!

Use of HFDL

PR Number: 10445,10457,10459

- Messages downlinked via HFDL were rejected by the data link system of the ATSU and failed to reach its end system.
- 10445: Data link failure caused by the uplink via HFDL and its MAS rejected at DLCS(Data Link Center System).
- 10457: DR downlinked via HFDL was rejected and failed to reach ATSU end system, resulting in unsuccessful LOG OFF.
- 10459: CPDLC position report downlinked via HFDL was rejected and failed to reach the ATSU end system.
- The use of HFDL in the FIR is not authorized. It shuould be desseminated to the participants concerned.


<PR10445>
①FN_CON(VIA SATCOM)
②FN_AK(VIA HFDL)
③MAS from "HF station"
Network ACK
ATSU-B
Datalink system
DSP-A
DSP-B
REJECTED!
? ?
?

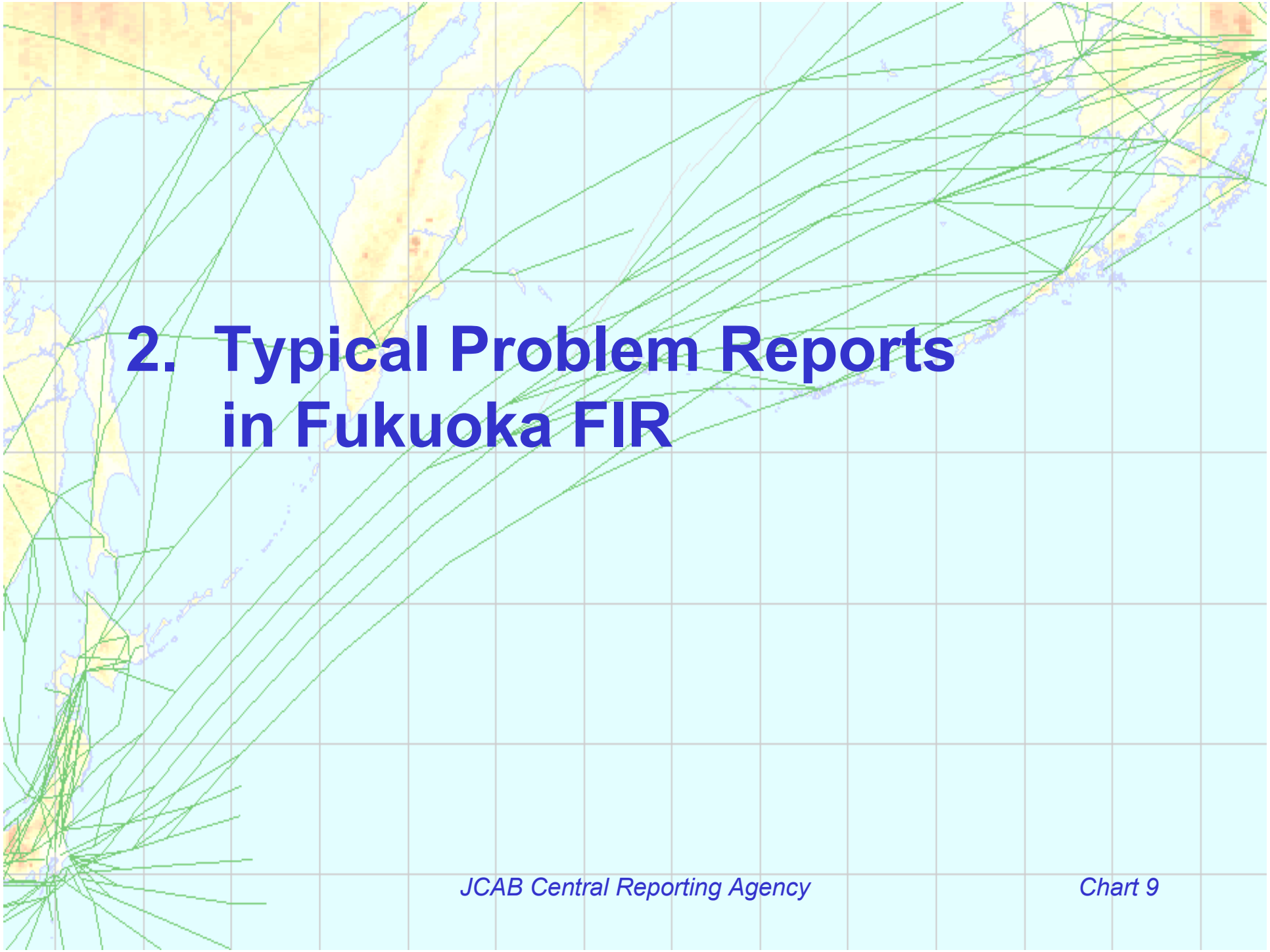
Baffling downlink of ADS DIS

PR Number: 10447,10465

- **ADS DIS was downlinked abruptly after terminating ADS contract.**
- **PR10447: While the avionics ADS acting normally, ATSU repeatedly requested CPDLC position report.**
  - → **Selecting ADS OFF resulted in downlink of DIS（Reason code=2) .**
  - → **It is not certain whether the flight crew conducted ADS OFF then ADS ON again or not.**
- **PR10465: Before entering ATSU's area of jurisdiction, ADS was kept OFF. And after entering, aircraft sent ADS DIS(2) in response to ADS periodic request.**
  - → **When receiving an ADS request while ADS being OFF, the FMS downlinks the ADS DIS(2) according to its specifications.**
- **It is requested:**

  for avionics; to provide mechanism not to downlink DIS easily and,

  for ATSU; to provide mechanism to keep ADS contract even if receiving DIS downlink.



2. Typical Problem Reports in Fukuoka FIR

2. Typical PRs

(1) Datalink failure

(2) Unable to LOGON

(3) ADS reports with incorrect Intermediate Intent Data

(1) Datalink failure

- In this problem, basically there are two causes as follows:

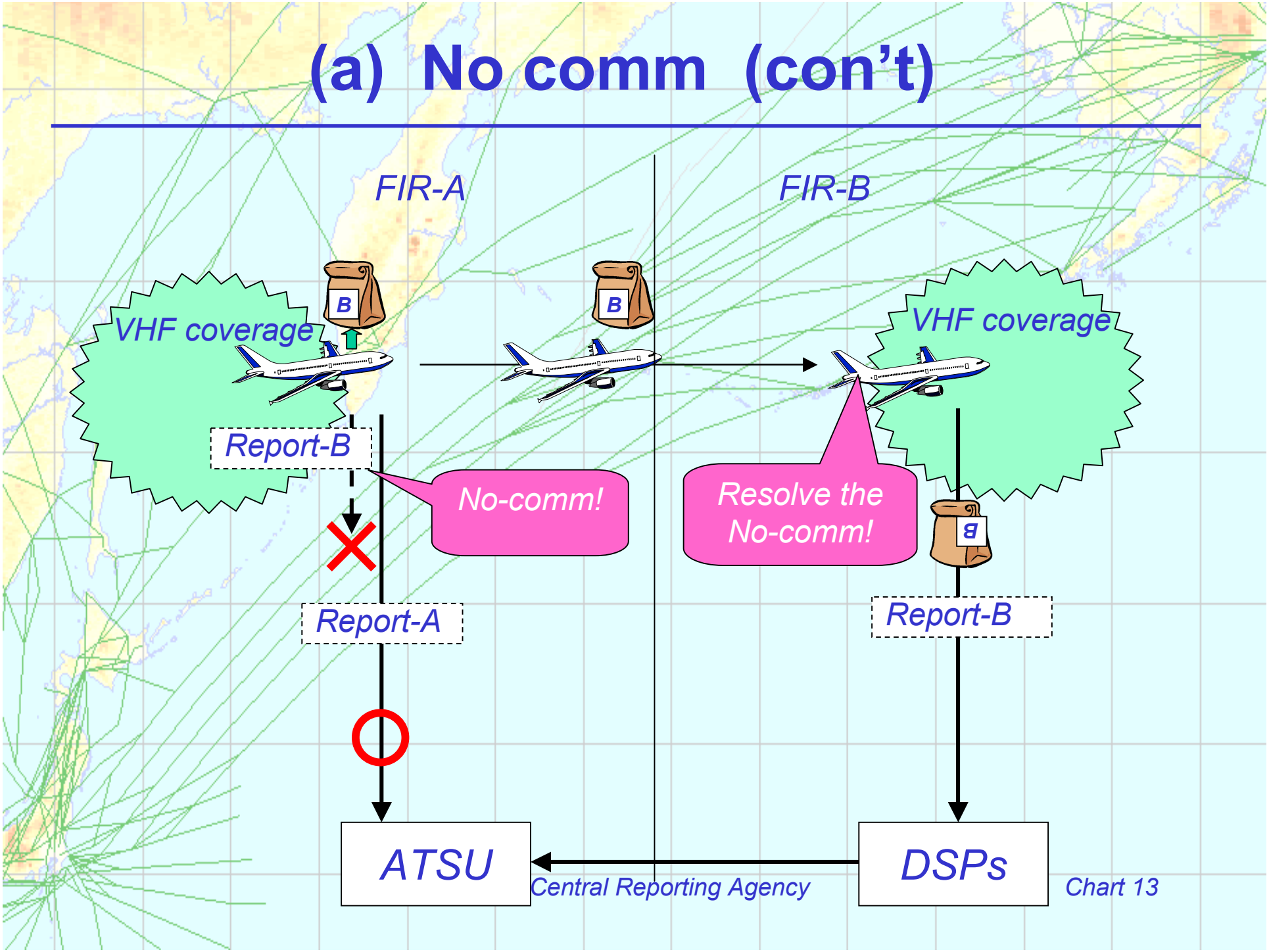
(a) No-comm

(b) Avionics(CMU) problem

(a) No-comm

- An aircraft failed to downlink and ATSU received some delayed downlink messages.
- Due to some air/ground communication problems, the aircraft was being temporarily in [No-comm] situation.
- With successful downlinking of message or reception of valid uplink message, the aircraft could solve the [No-comm] situation and downlink those messages.

(a) No comm (con't)



(b) Avionics(CMU) problem

- Aircraft failed to downlink ATC messages, however, the other message(AOC/MED etc.) can be downlinked.
- Suspect media management problem with particular CMU.

(2) Unable to LOGON

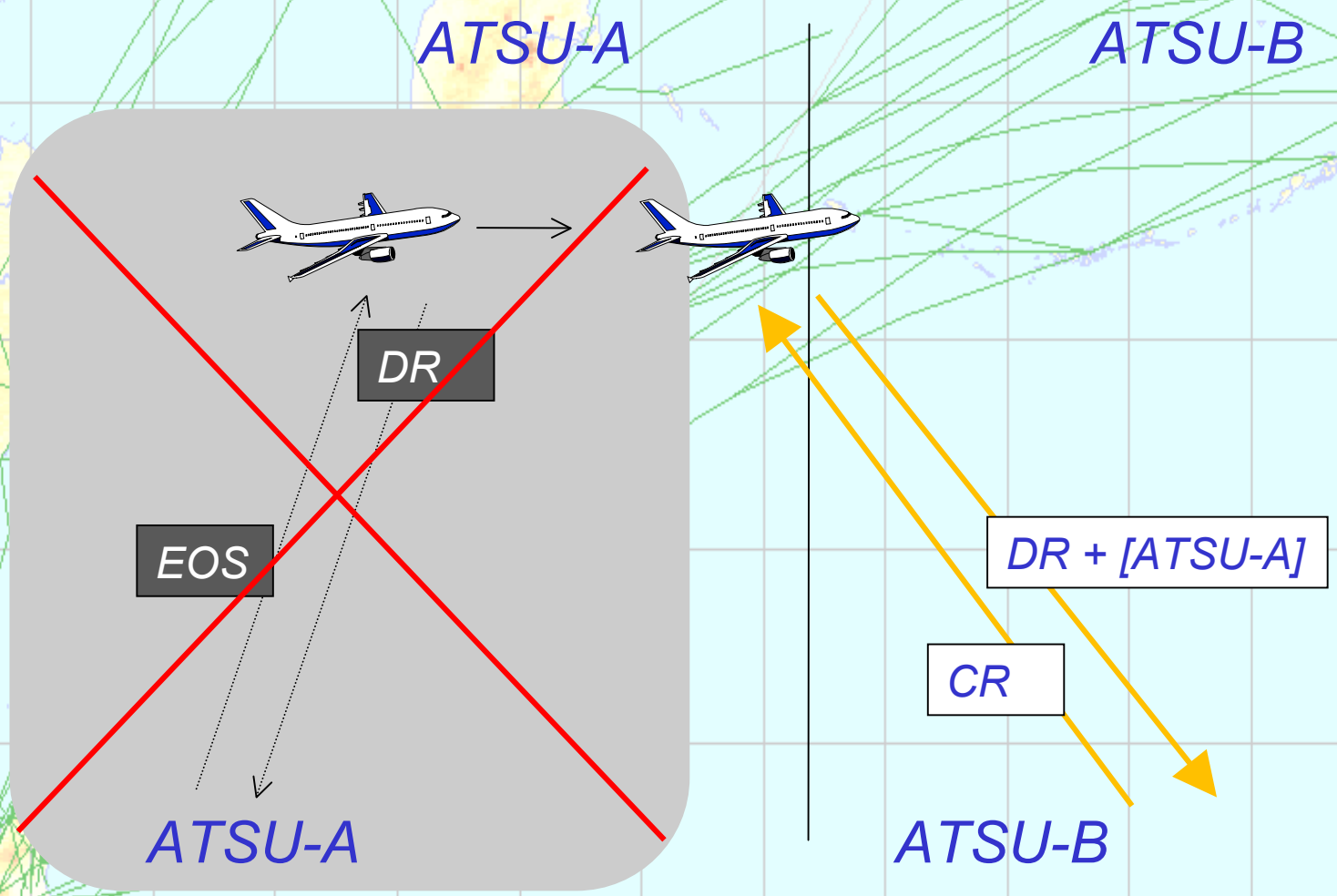
- ATSU-B uplinked CPDLC CR(Connection Request),but the aircraft responded with promptly:

  “DR(Disconnect Request) + [Current ATSU-A address]”.

- It was caused by ATSU-A(current ATSU) had not uplink “End of Service”.

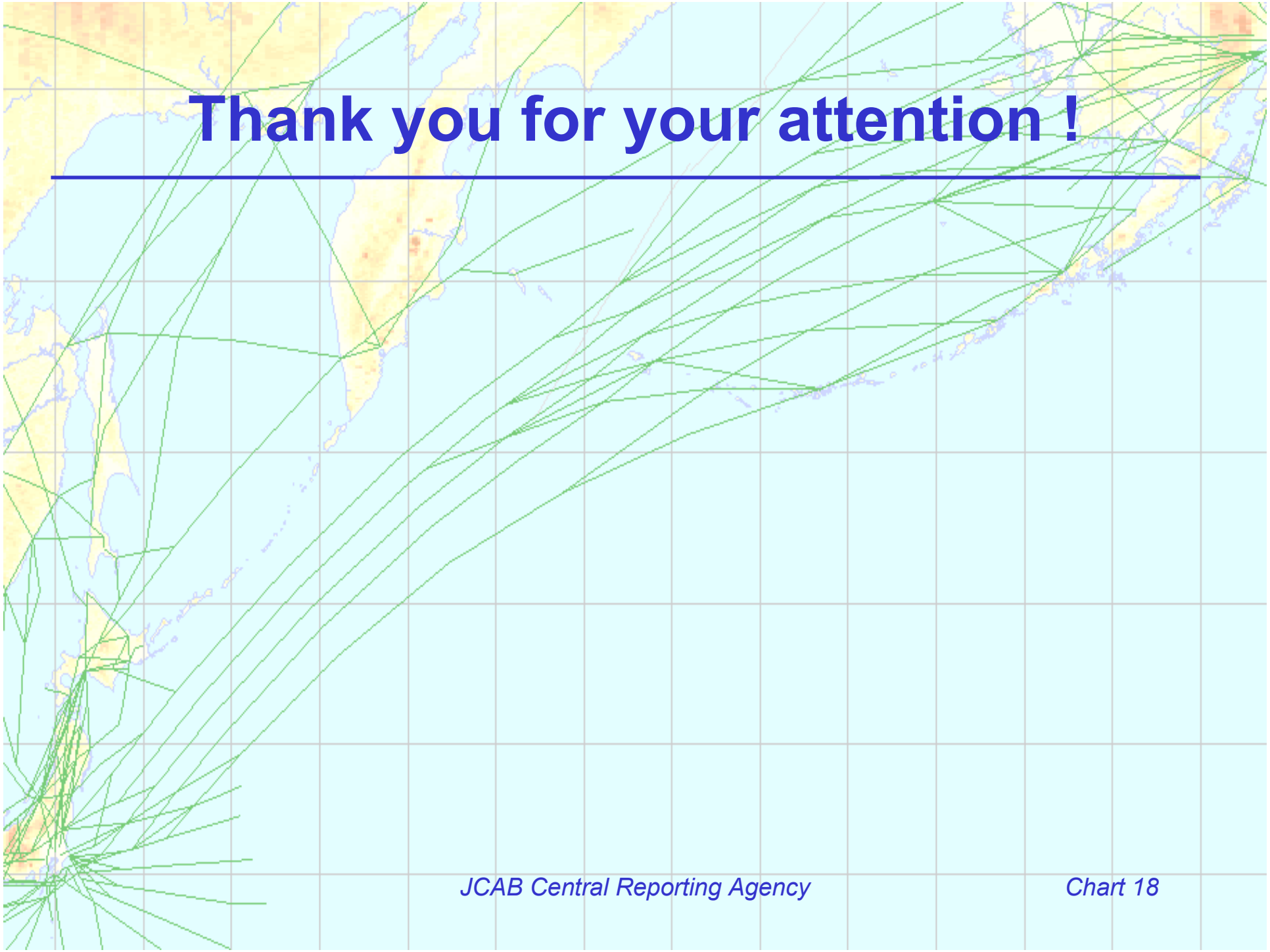
- CPDLC datalink transfer was not completed.

(2) Unable to LOGON (Con't)



(3) ADS reports with incorrect Intermediate Intent Data

- An ATSU end system displayed incorrect intent of the aircraft on ATC situation display
- The aircraft downlinked some incorrect intent data. (Intermediate group)
- Inquiry about the problem event has been sent to the aircraft manufacturer.



Thank you for your attention !

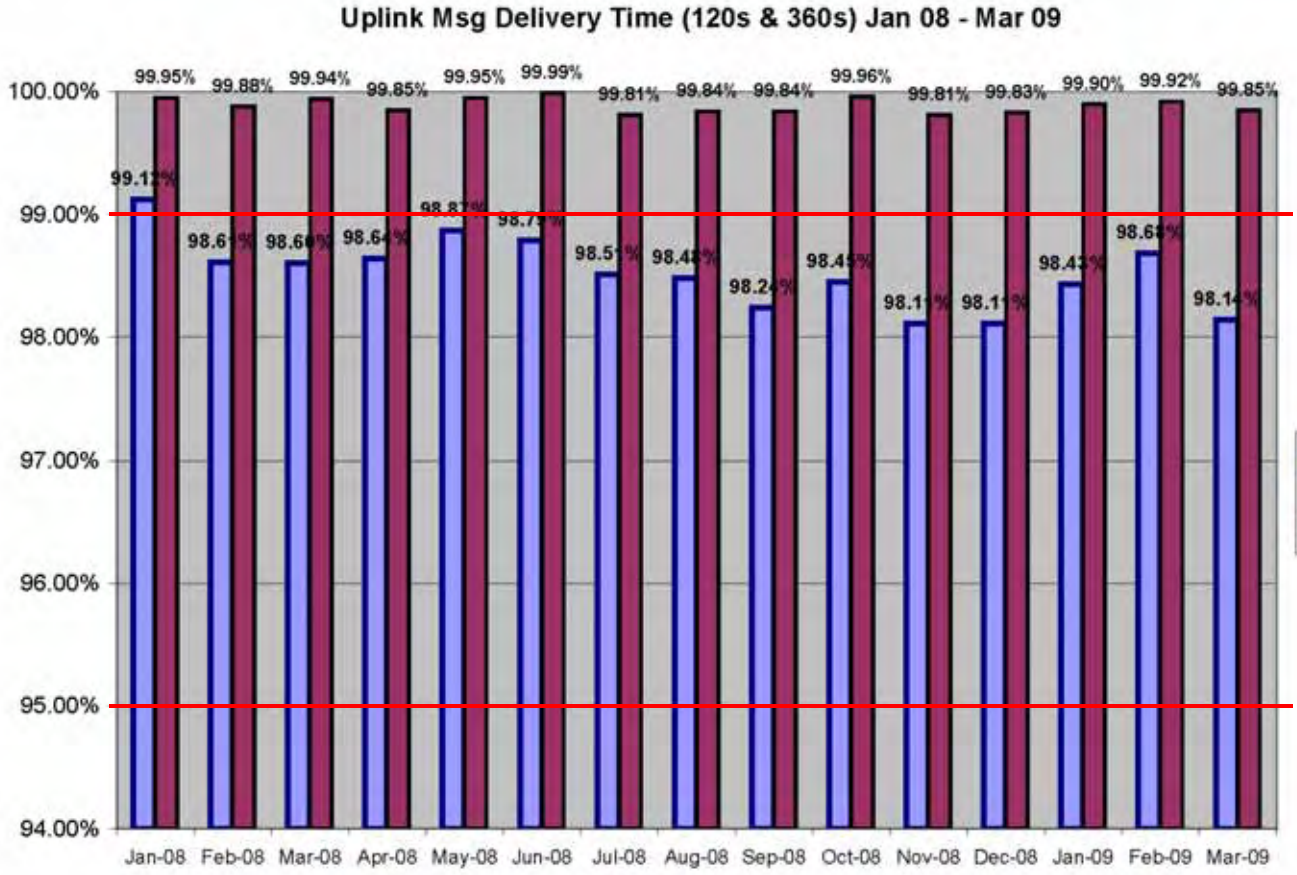
FIT-SEA/9
Appendix C to the Report

ATS Datalink System Performance / Operations Review

For period Jan 08 – Mar 09

Presented by Singapore

System Performance Jan 08 – Mar 09

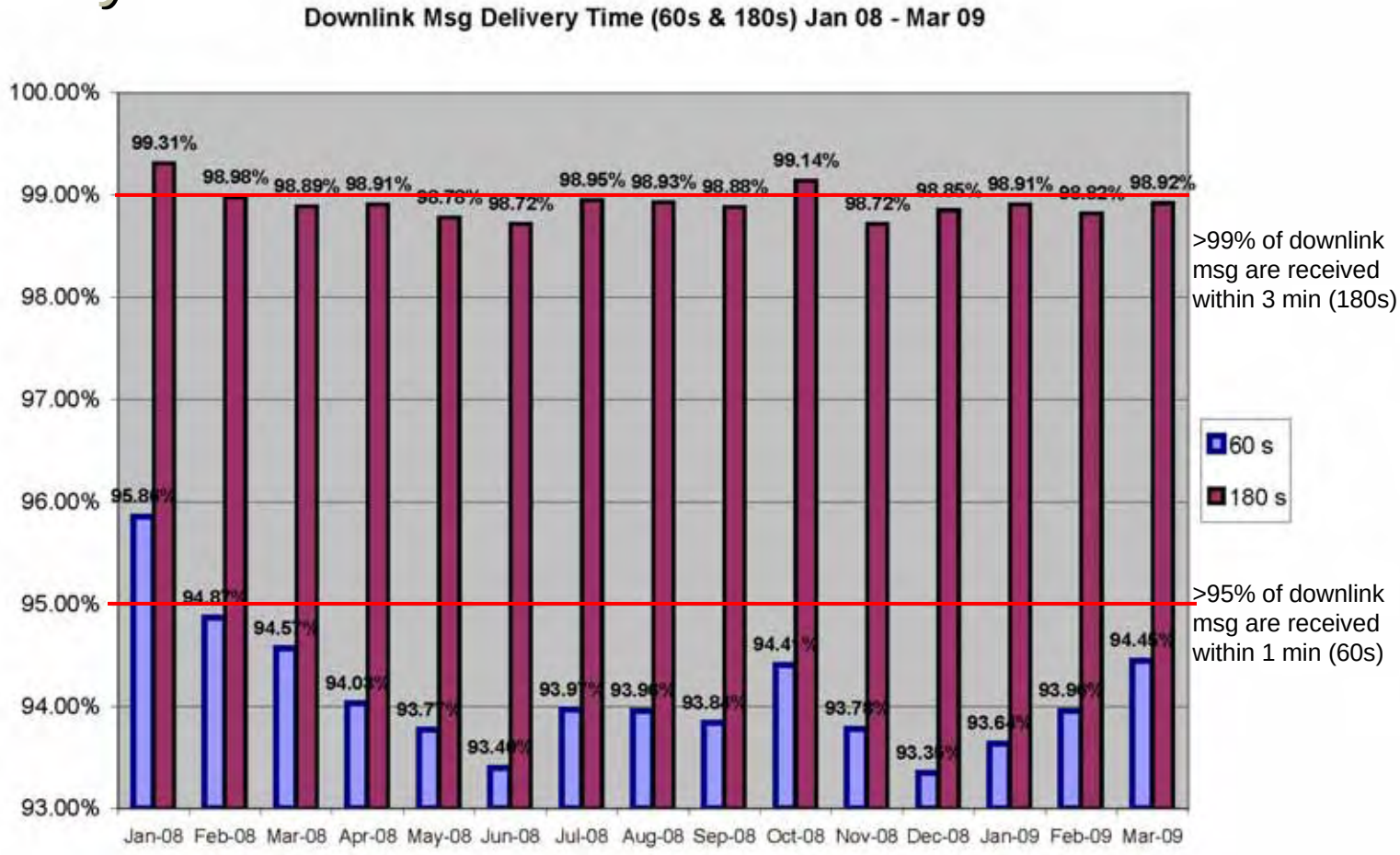


>99% of uplink msg are received within round trip time of 6 min (360s)

>95% of uplink msg are received within round trip time of 2 min (120s)

CAAS
Civil Aviation Authority of Singapore

System Performance Jan 08 – Mar 09

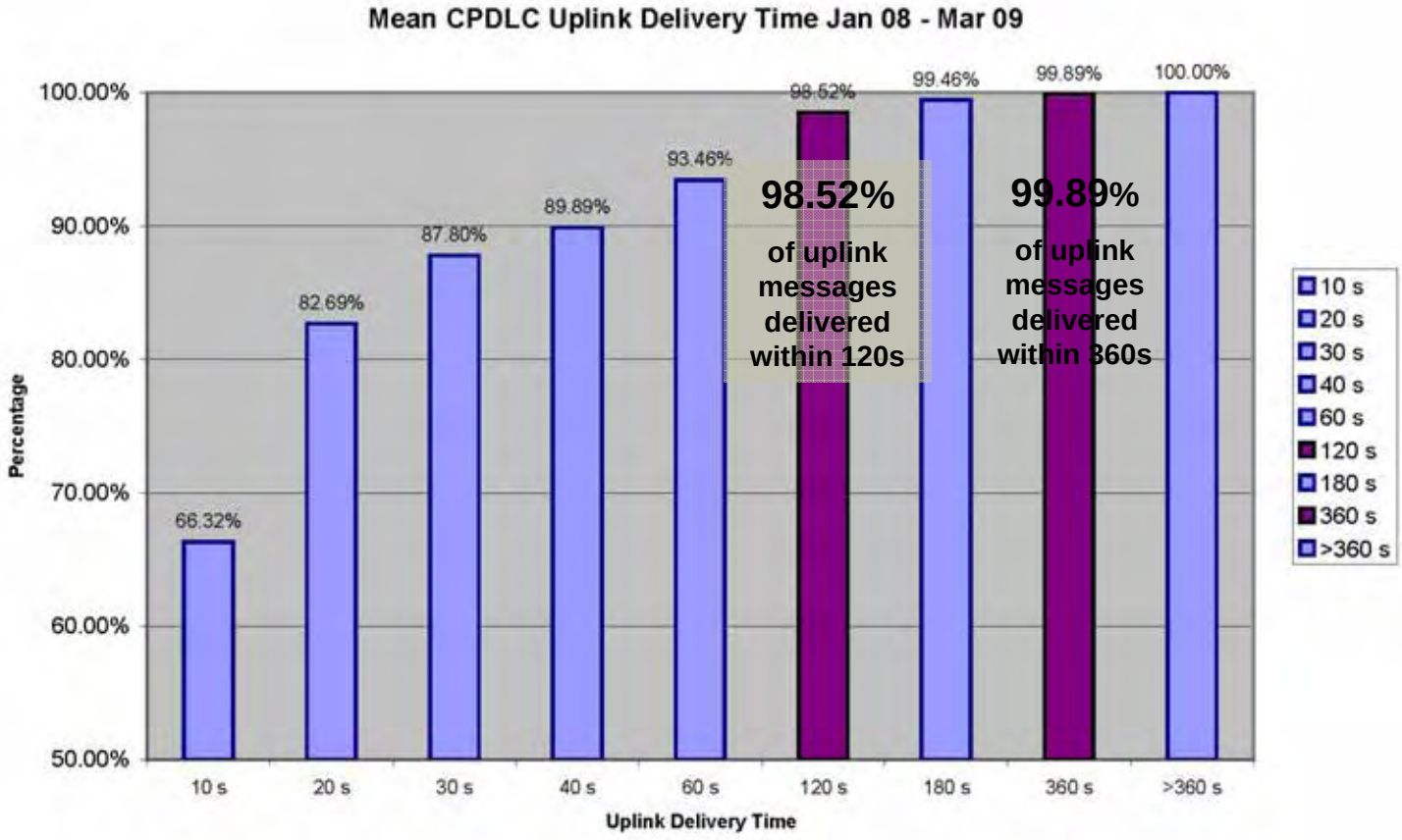


>99% of downlink msg are received within 3 min (180s)

>95% of downlink msg are received within 1 min (60s)

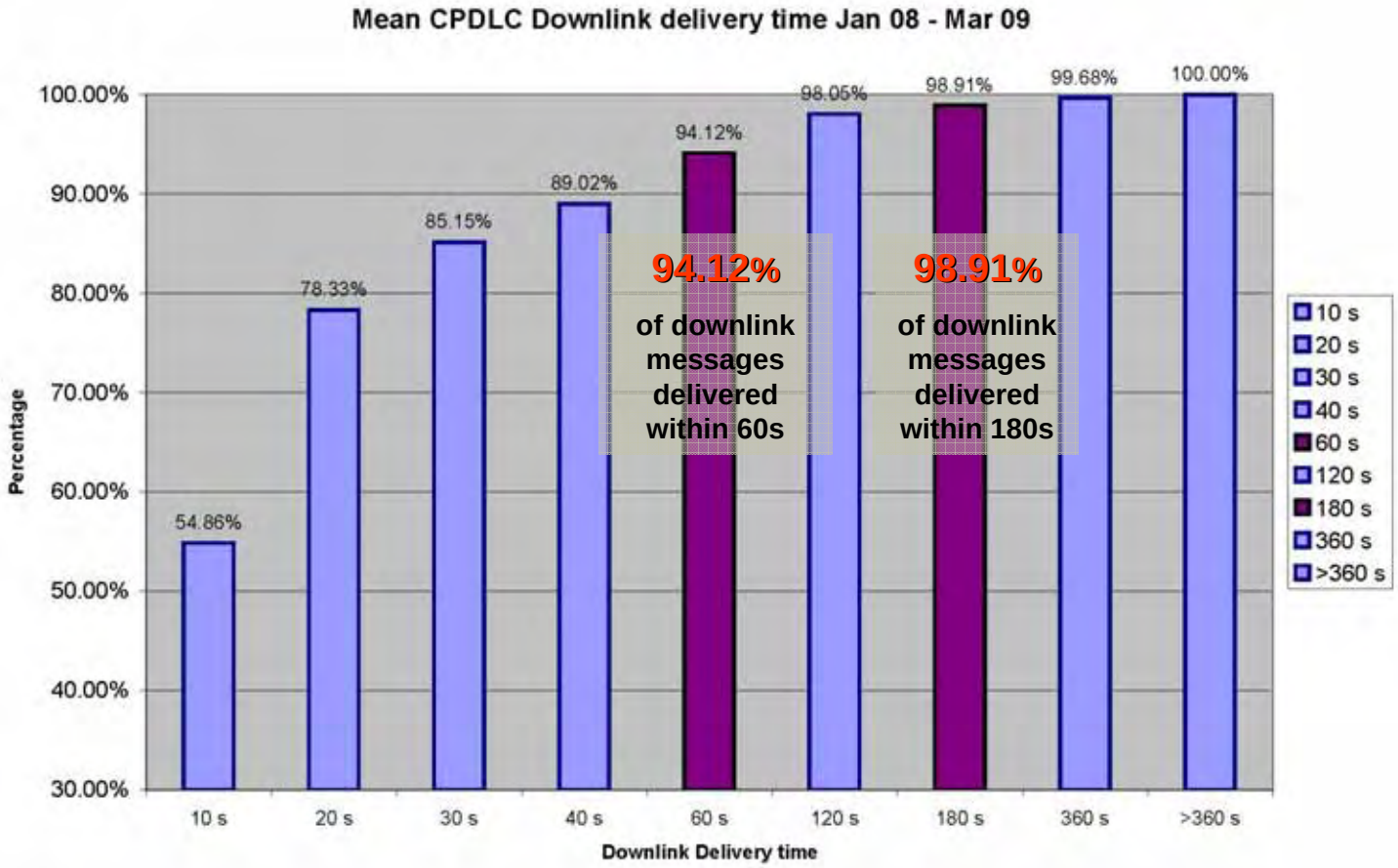
CAAS
Civil Aviation Authority of Singapore

System Performance Jan 08 – Mar 09



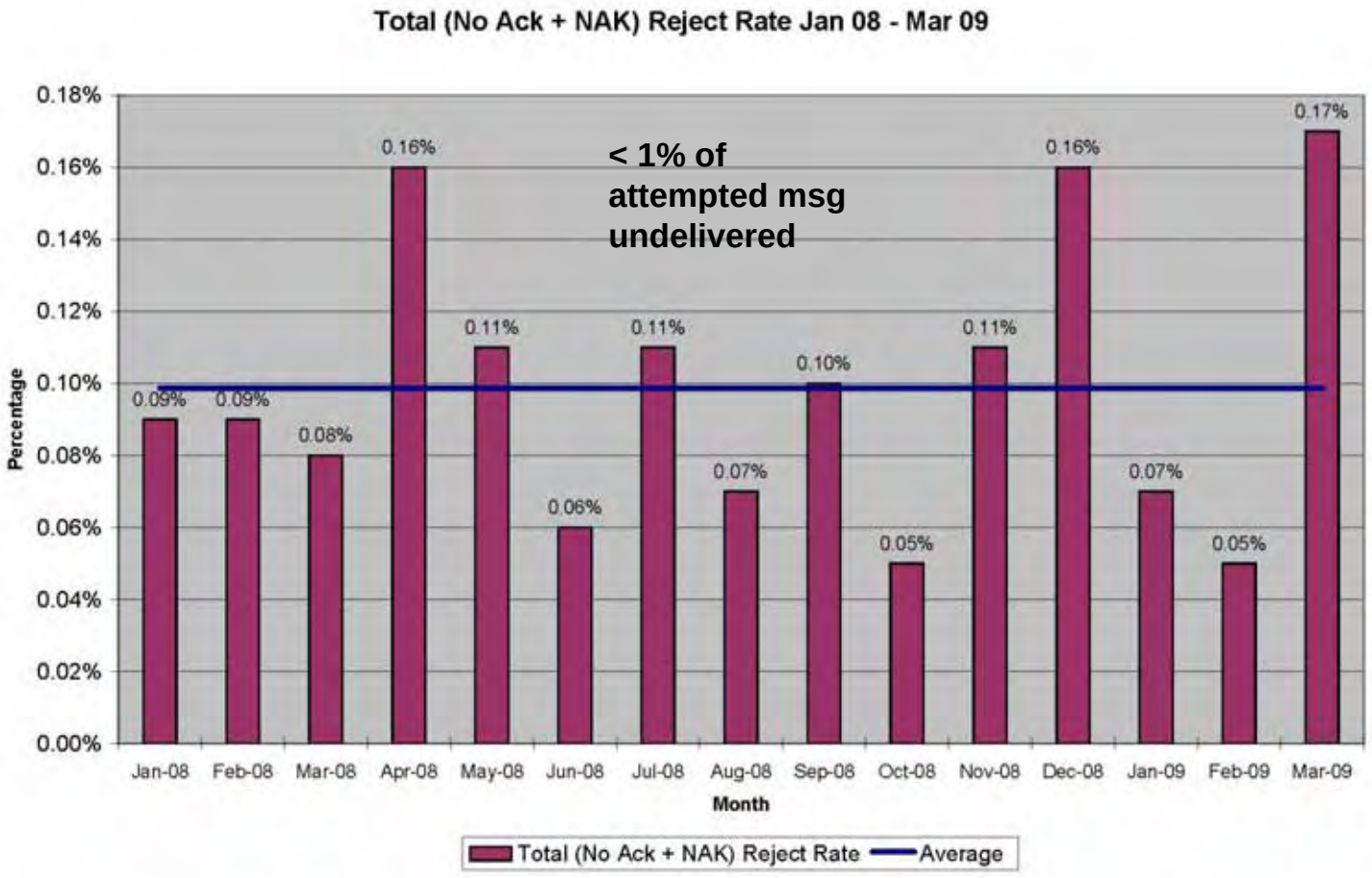
Civil Aviation Authority of Singapore

System Performance Jan 08 – Mar 09



Civil Aviation Authority of Singapore

System Performance Jan 08 – Mar 09



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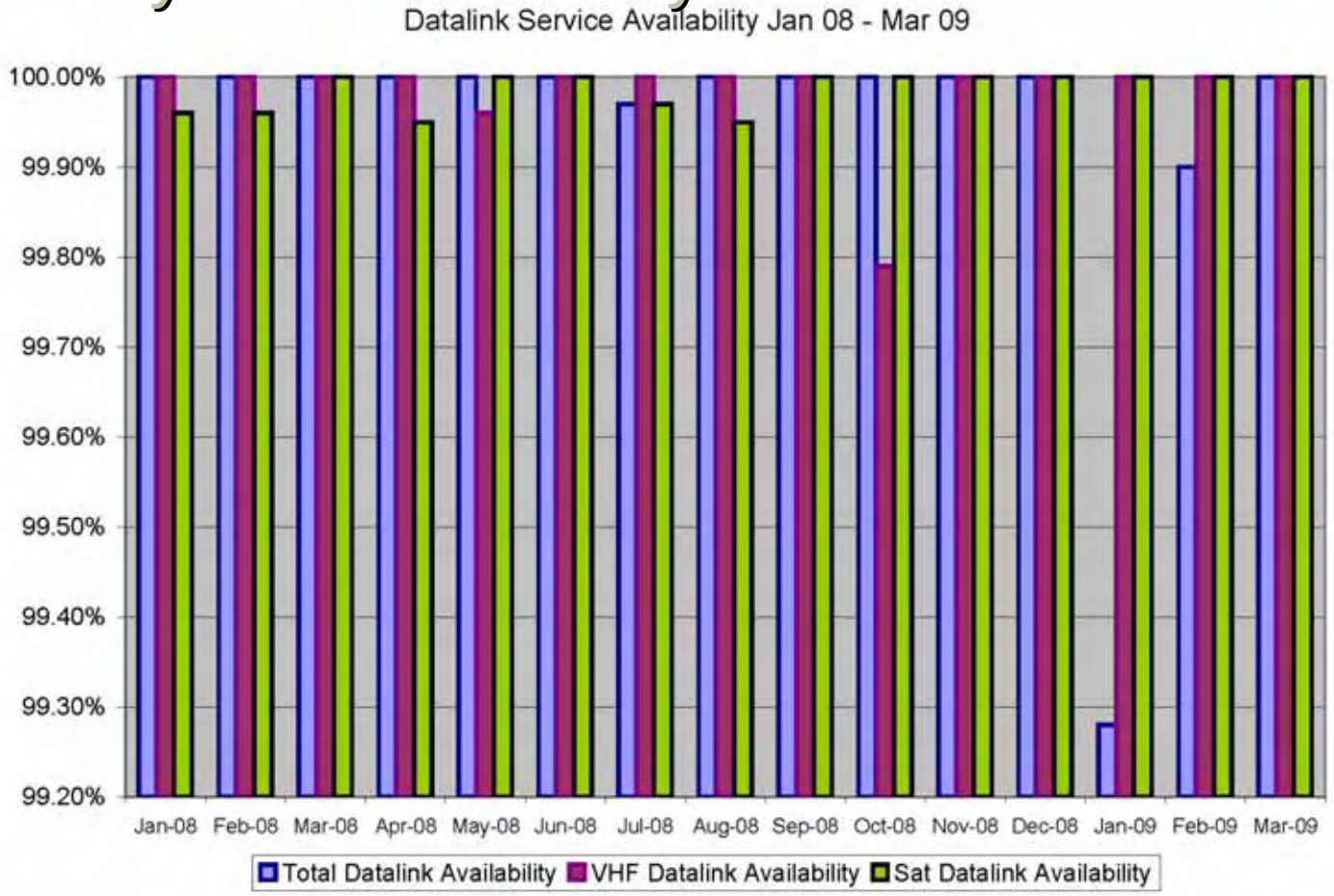
System Availability Jan 08 – Mar 09



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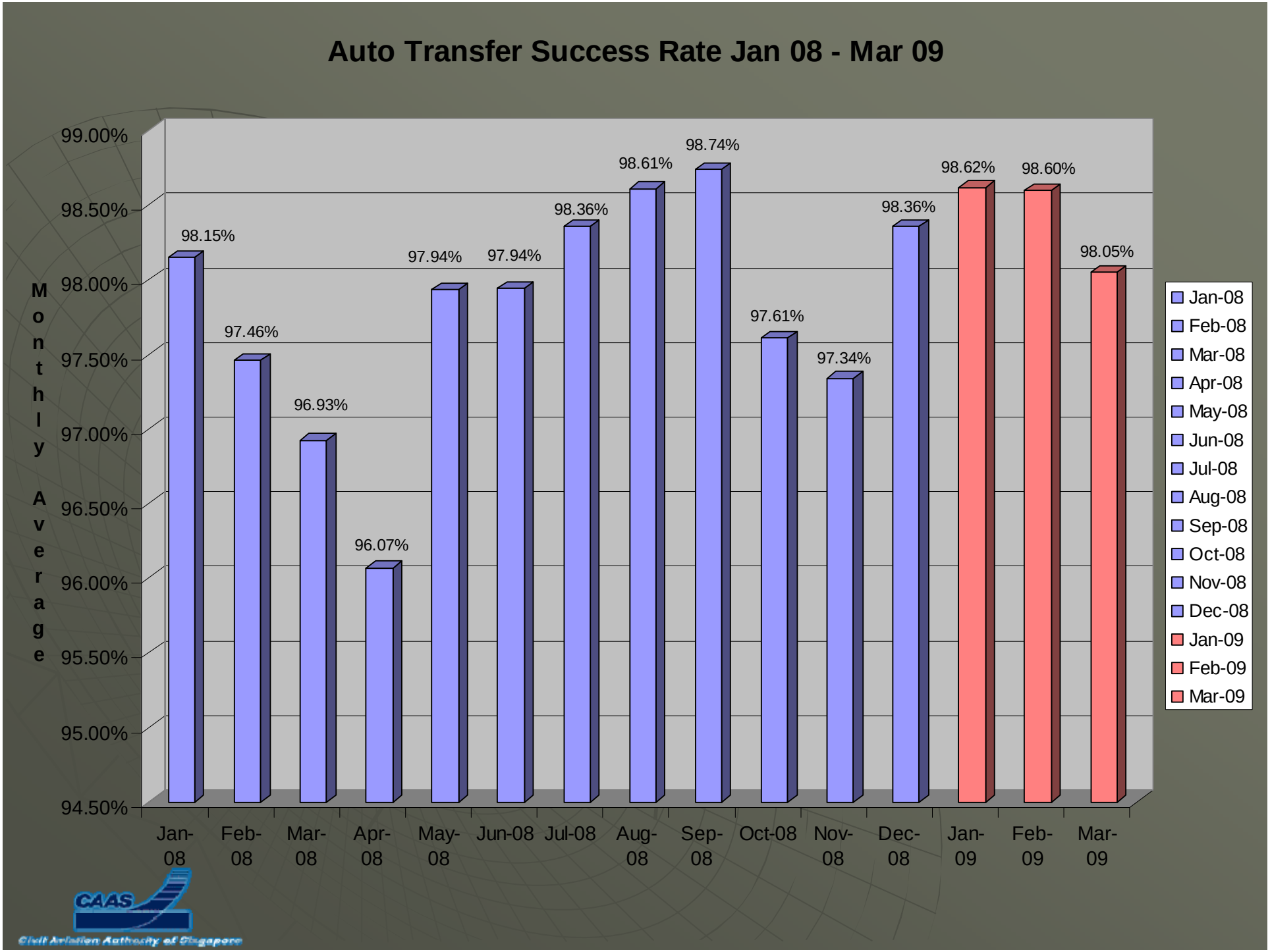
Auto Transfer Success Rate Jan 08 - Mar 09



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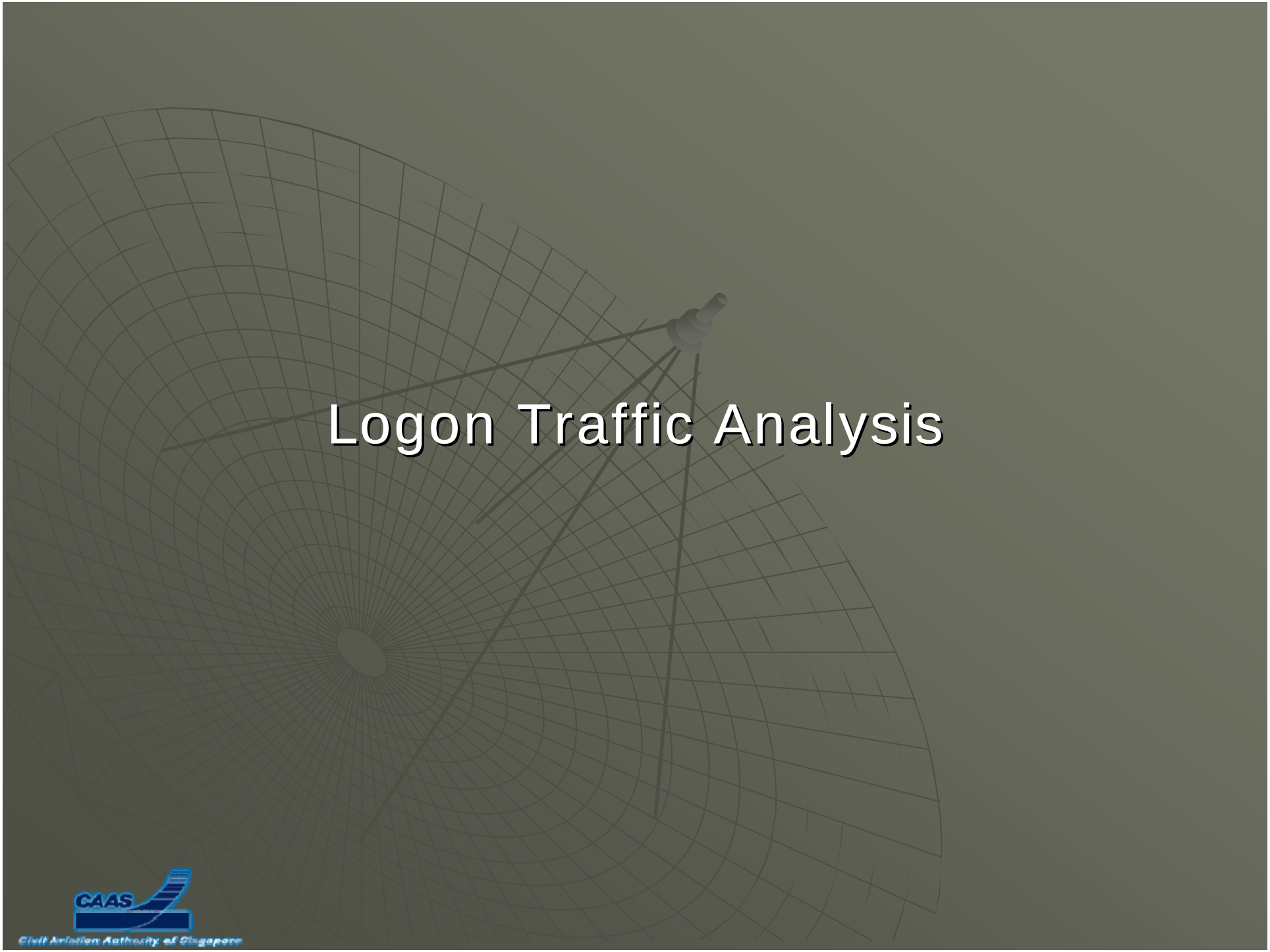
Logon Traffic Analysis



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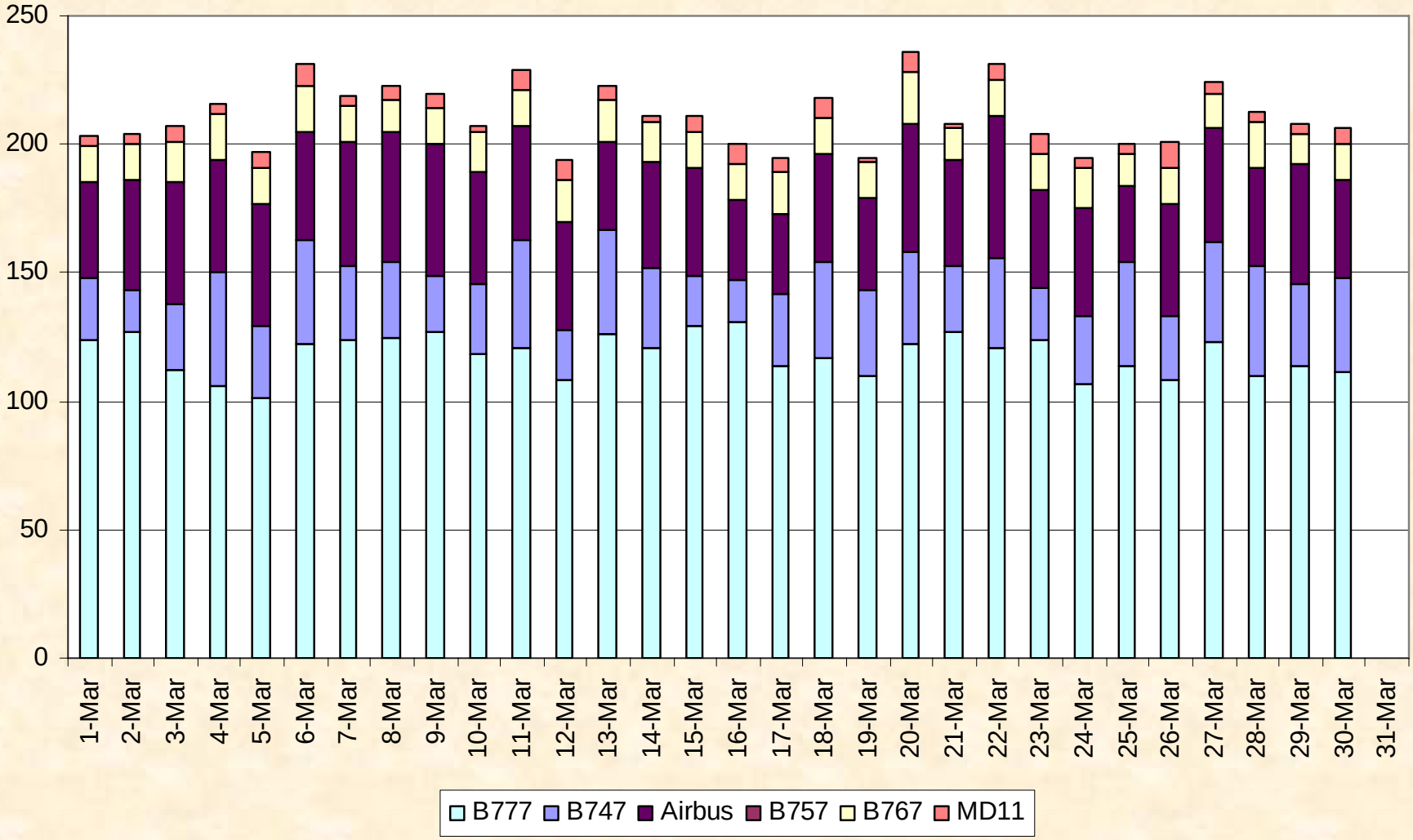
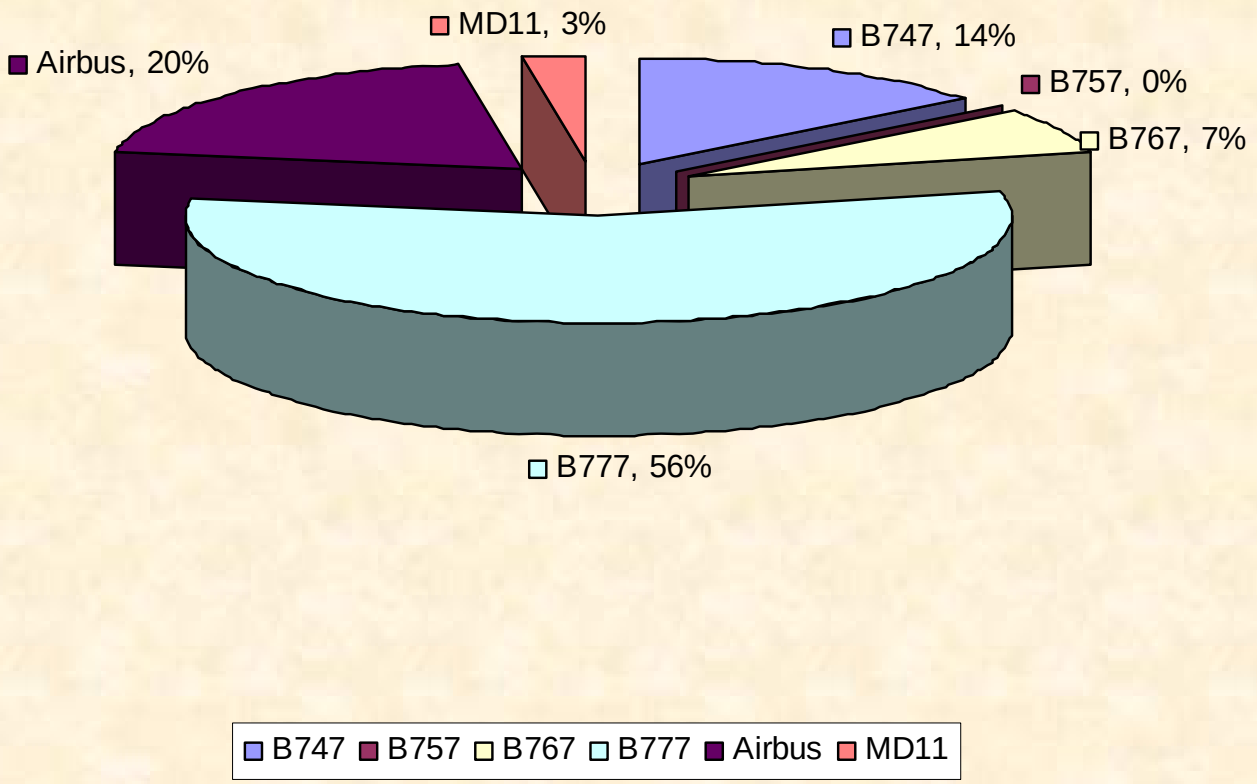
FANS 1/A Daily Logon Statistics
(Aircraft Type)
March 2009



Civil Aviation Authority of Singapore

FANS 1/A Monthly Logon Statistics
(Aircraft Type)
March 2009



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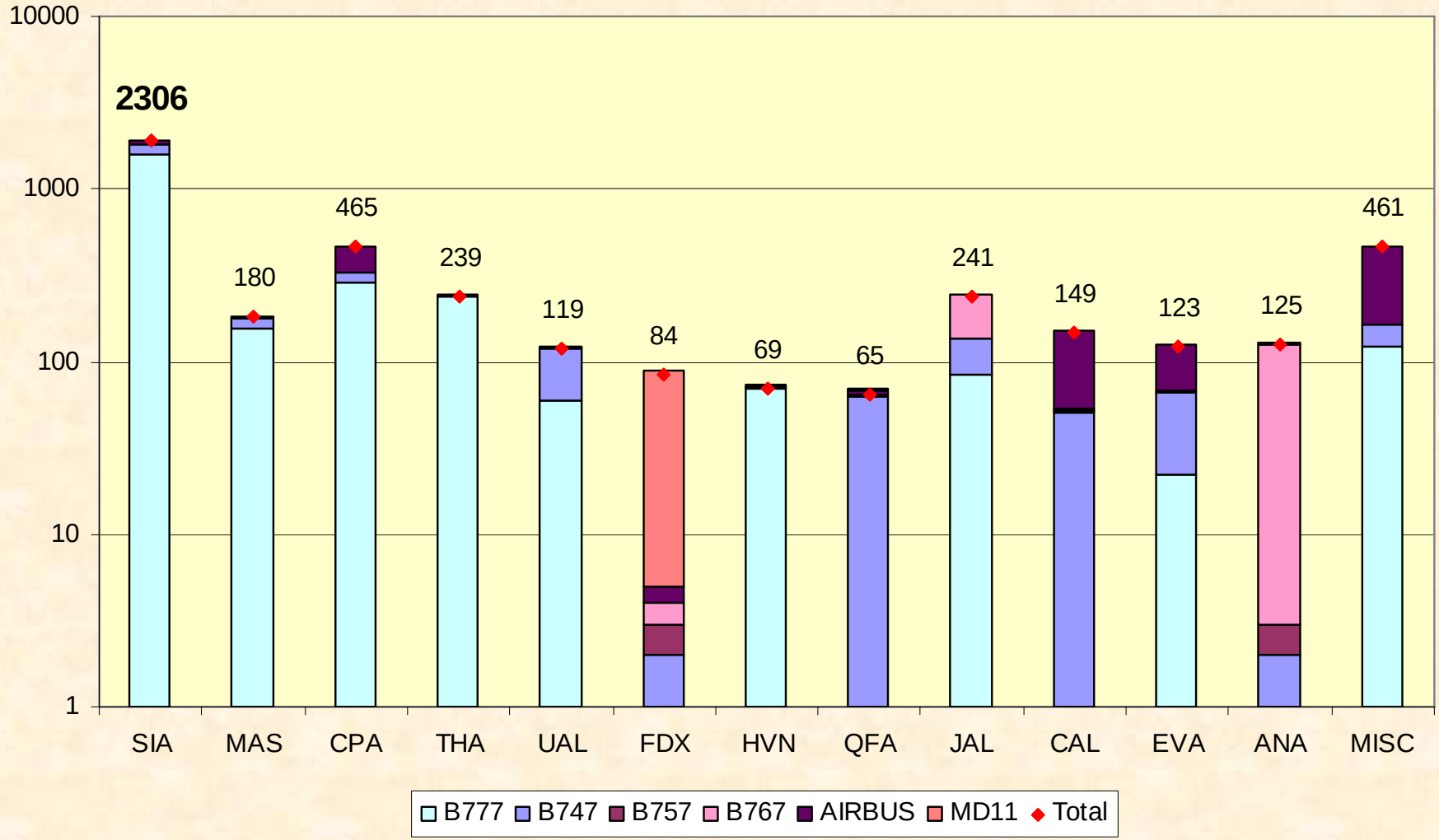
FANS 1/A Logon Statistic
(Airlines)
March 2009



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Investigation into downlink performance

- Uncharacteristic marginal Downlink performance
- No significant impact to operations
- Detailed investigation into launched in co-operation with SITA
- Each media was analyzed separately to identify the problem
- Conclusion was the poor SATCOM performance for B777 was the primary cause
- This affected overall datalink performance as B777 type formed the majority of the logon traffic

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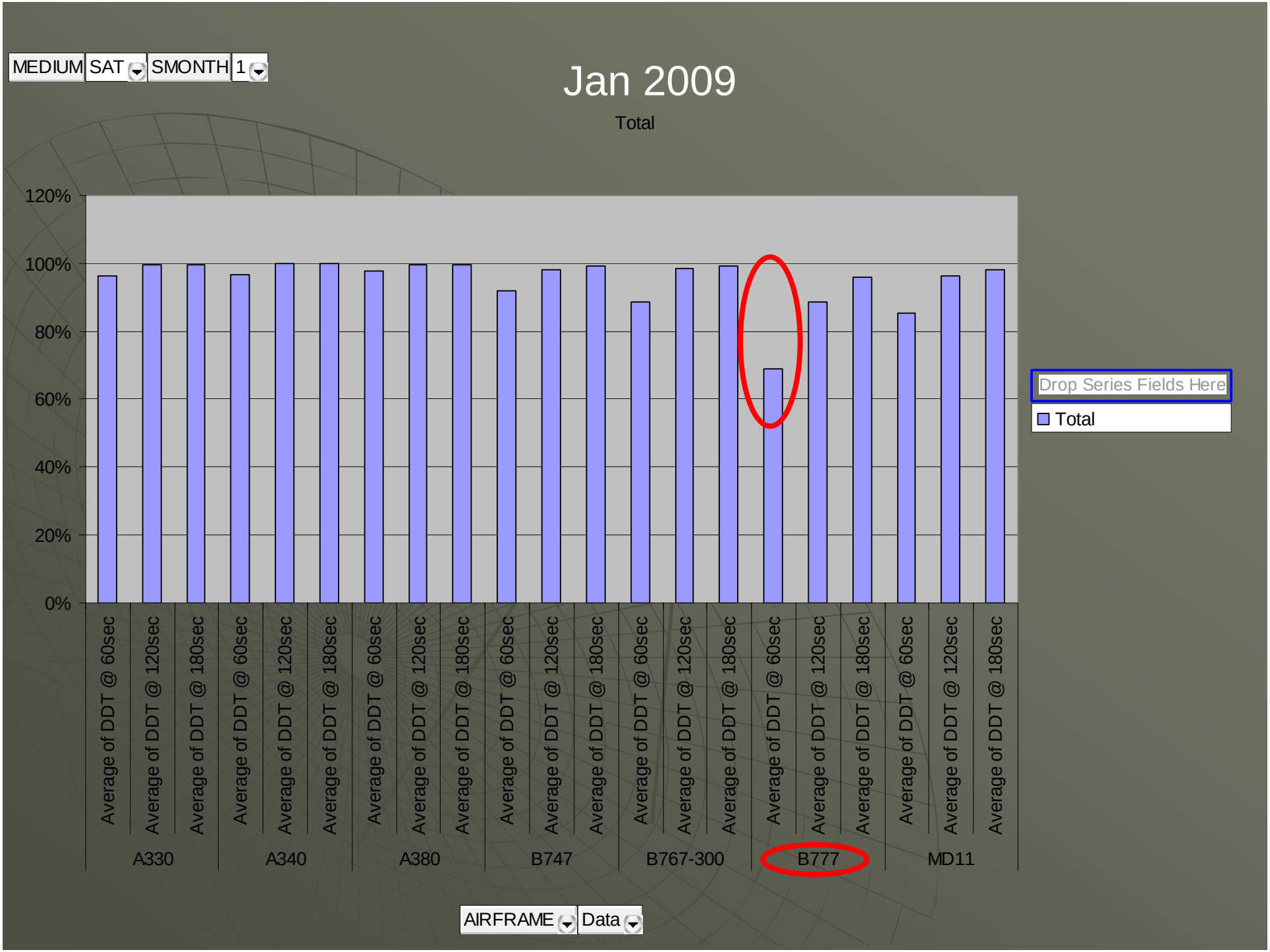
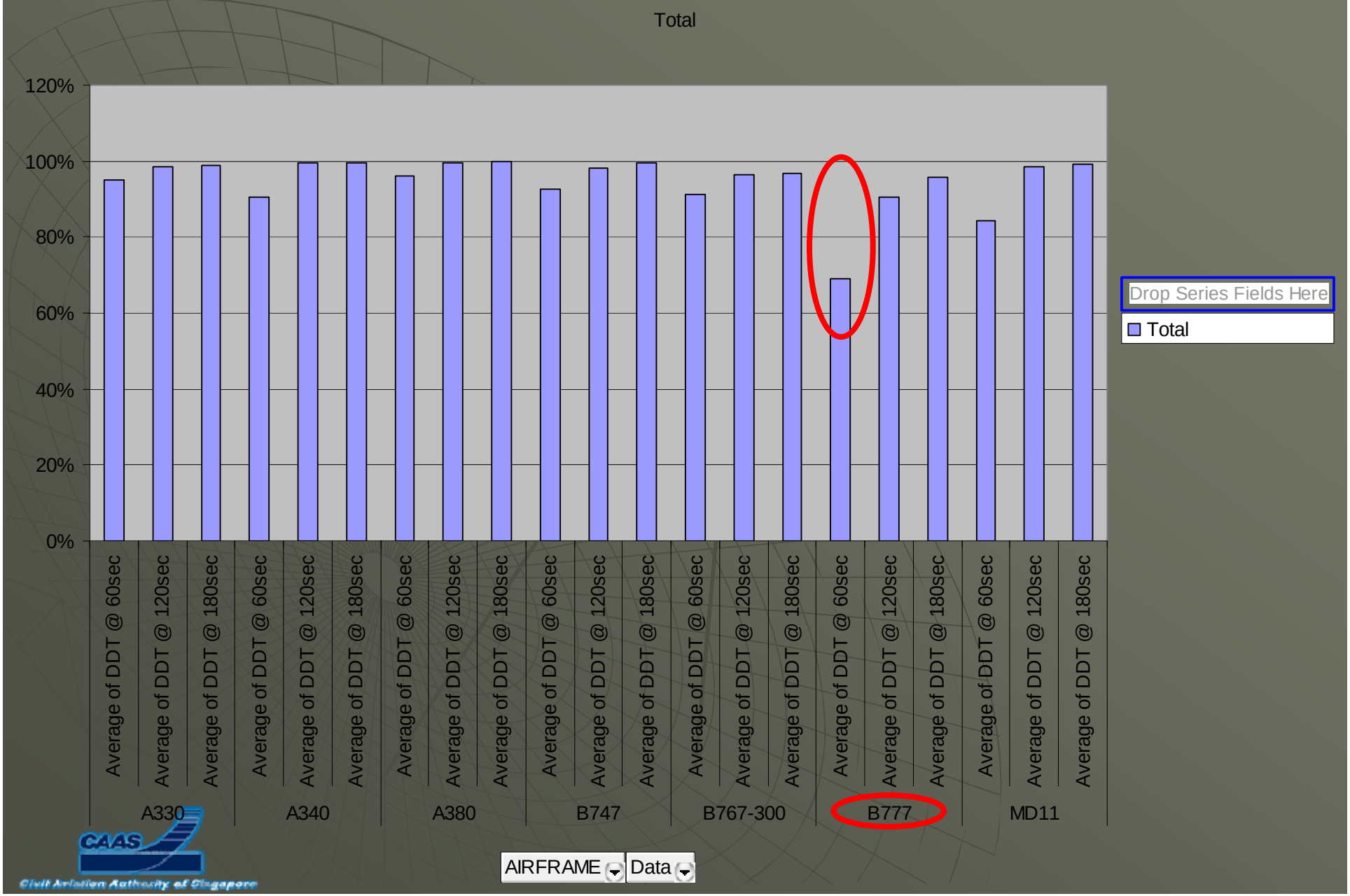

MEDIUM
SAT
SMONTH
1
Jan 2009
Total
120%
100%
80%
60%
40%
20%
0%
Average of DDT @ 60sec
Average of DDT @ 120sec
Average of DDT @ 180sec
A330
A340
A380
B747
B767-300
B777
MD11
Drop Series Fields Here
Total
AIRFRAME
Data

MEDIUM SAT SMONTH 2

Feb 2009



AIRFRAME Data

Civil Aviation Authority of Singapore

- Similar trend was reported by Airways Corp NZ in ISPACG
- This same issue did not have same effect in ISPACG as the B777 aircraft type is relatively low
- Boeing confirmed that a fix for B777 was planned for late May and August to address this issue for AIM-1 and AIM-2 software
- CAAS will continue to monitor this matter closely

CAAS
Civil Aviation Authority of Singapore

Civil Aviation Authority of Singapore

APANPIRG Asia/Pacific Airspace Safety Monitoring

RASMAG LIST OF COMPETENT AIRSPACE SAFETY MONITORING ORGANIZATIONS

The Regional Airspace Safety Monitoring Advisory Group of APANPIRG (RASMAG) is required by its terms of reference to recommend and facilitate the implementation of airspace safety monitoring and performance assessment services and to review and recommend on the competency and compatibility of airspace monitoring organizations. In order to assist in addressing these requirements, RASMAG updates and distributes the following list of competent airspace safety monitoring organizations for use by States requiring airspace safety monitoring services. In the context of the list, abbreviations have meanings as follows:

- RMA – Regional Monitoring Agency – safety assessment and monitoring in the vertical plane (i.e. RVSM);
- EMA – En-route Monitoring Agency – safety assessment and monitoring in the horizontal plane (i.e. RHSM, RNAV10, RNP4);
- CRA – Central Reporting Agency – technical performance of data link systems (i.e. ADS/CPDLC); and
- FIT – FANS 1/A Interoperability/Implementation Team – parent body to a CRA.

(last updated 19 December 2008)

Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
Australian Airspace Monitoring Agency (AAMA) - Airservices Australia Mr Robert Butcher, Manager Human Factors and Analysis, Safety Management Group, email robert.butcher@airservicesaustralia.com	Australia	APANPIRG RMA	Current	Brisbane, Honiara, Jakarta, Melbourne, Nauru, Port Moresby and Ujung Pandang FIRs.
		EMA	Current	Brisbane, Melbourne FIRs.

Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
China RMA - Air Traffic Management Bureau, (ATMB) of Civil Aviation Administration of China (CAAC) Mr. Tang Jinxiang, Engineer of Safety and Monitoring Technical Group, ATMB e-mail: tangjx@adcc.com.cn	China	APANPIRG RMA	Current	Beijing, Guangzhou, Kunming, Lanzhou, Shanghai, Shenyang, Urumqi and Wuhan FIRs and Sector 01 (airspace over Hainan Island) of the Sanya FIR.
JCAB RMA - Japan Civil Aviation Bureau Mr. Kazunaga Suzuki, Special Assistant to the Director, Flight Procedures and Airspace Program Office, email suzuki-k22z@mlit.go.jp	Japan	APANPIRG RMA	Current	Fukuoka FIR
		EMA	Available second quarter – 2009	Fukuoka FIR
Monitoring Agency for the Asia Region (MAAR) – Aeronautical Radio of Thailand LTD Mr. Nuttakajorn Yanpirat, Executive Officer, Systems Engineering,Aeronautical Radio of Thailand Ltd. Email: nuttakajorn.ya@aerothai.co.th	Thailand	APANPIRG RMA	Current	Bangkok, Kolkatta, Chennai, Colombo, Delhi, Dhaka, Hanoi, Ho Chi Minh, Hong Kong, Karachi, Kathmandu, Kota Kinabalu, Kuala Lumpur, Lahore, Male, Manila, Mumbai, Phnom Penh,

Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
				Pyongyang, Sanya FIR, Singapore, Taibei, Ulaan Bataar, Vientiane, Yangon FIRs
Pacific Approvals Registry and Monitoring Organization (PARMO) – Federal Aviation Administration (US FAA) Mr. Dale Livingston, Manager, Separation Standards Analysis Team, FAA, email: dale.livingston@faa.gov	USA	APANPIRG RMA	Current	Anchorage Oceanic, Auckland Oceanic, Incheon, Nadi, Oakland Oceanic, Tahiti FIRs
		EMA	Current	Anchorage Oceanic, Oakland Oceanic
South East Asia Safety Monitoring Agency (SEASMA) - Civil Aviation Authority of Singapore (CAAS) Mr. Kuah Kong Beng, Chief Air Traffic Control Officer, email: KUAH_Kong_Beng@caas.gov.sg	Singapore	EMA for South China Sea	Current	Hong Kong, Ho Chi Minh, Kota Kinabalu, Kuala Lumpur, Manila, Sanya and Singapore FIRs
FIT - SEA (ICAO Regional Office email icao_apac@bangkok.icao.int & **CRA Japan** Mr. Masahisa Hayashi, Deputy Director, Air Traffic Control Association Japan, email:hayashi@atcaj.or.jp	ICAO Regional Office & CRA Japan	FIT & CRA	Current	South China Sea FIRs

Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
IPACG/FIT Mr. Takahiro Morishima, JCAB Co-Chair, email: morishima-t2zg@mlit.go.jp & Mr. Reed Sladen, FAA Co-Chair, email reed.b.sladen@faa.gov	Japan & USA	FIT & CRA	Current	North & Central Pacific (Oceanic airspace within Fukuoka FIR, and Anchorage & Oakland FIRs)
CRA Japan Mr. Masahisa Hayashi, Deputy Director, Air Traffic Control Association Japan, email:hayashi@atcaj.or.jp	Japan	CRA	Current	Fukuoka FIR for IPACG/FIT Ho Chi Minh, Manila, Singapore FIRs for FIT-SEA
FIT - BOB ICAO Regional Office email icao_apac@bangkok.icao.int & Mr. Bradley Cornell, Boeing Engineering, email Bradley.D.Cornell@Boeing.Com	ICAO Regional Office & Boeing USA	FIT & CRA	Current	Bay of Bengal FIRs, Ujung Pandang and Jakarta FIRs, provides assistance to the members of the Arabian Sea/Indian Ocean ATS Coordination Group (ASIOACG)
ISPACG/FIT Mr. Bradley Cornell, Boeing Engineering, email Bradley.D.Cornell@Boeing.Com	Boeing USA	FIT & CRA	Current	South Pacific FIRs and members of the Informal South Pacific ATS Coordination Group (ISPACG)

Southeast Asia - ADS/CPDLC Equipage and ATS Status

(last update - May ~~2008~~ 2009)

STATE/ ORGANIZATION	**FIR**	**LOGON CODE**	**Ground Station Manuf-acturer**	**DSP** (e.g. SITA, ARINC)	**ADS**	**CPDLC**	**AIDC**	**FDP**	**Test, Ops Trial or Operational**	**Procedures Published**	**ADS/CPDLC TRIAL**	**CONTACTS** (ATM contact in **bold)**	**REMARKS**
CHINA CAAC - General Administration of Civil Aviation of China	Sanya FIR												
HONG KONG, CHINA CAD - Civil Aviation Department	Hong Kong FIR				YES (trial equipment)	YES (trial equipment)	YES	YES	Stopped	NO	conducted from 1997 to 2002	Mr. P F Wong Assistant Director-General of Civil Aviation (Air Traffic Engineering and Standards) Tel: (852)2591 5000 Fax: (852)2845 7160 Email: phwong@cad.gov.hk	
JAPAN JCAB - Civil Aviation Bureau of Japan	Fukuoka FIR	RJJJ		SITA	YES	YES	YES (with Oakland & Anchorage, trial with Incheon)	YES	Operational	PUBLISHED	completed in July 2006	**Mr. Takahiro Morishima** Special Assistant to the Director, JCAB ATS Systems Planning Division, Tel: +81-3-5253-8111 ext 51128 Fax: +81-3-5253-1663 E-mail: morishima-t2zq@mlit.go.jp	FUKUOKA FIR Oceanic participating in the IPACG FIT

STATE/ ORGANIZATION	**FIR**	**LOGON CODE**	**Ground Station Manuf-acturer**	**DSP** (e.g. SITA, ARINC)	**ADS**	**CPDLC**	**AIDC**	**FDP**	**Test, Ops Trial or Operational**	**Procedures Published**	**ADS/CPDLC TRIAL**	**CONTACTS** (ATM contact in **bold)**	**REMARKS**
MALAYSIA Department of Civil Aviation	Kuala Lumpur FIR (FIT-BOB)	WMFC		ARINC			NO	YES	Ops trial from 1 June 2008		No	**Mr. Ahmad Nizar Zofakar** Director ATS Tel: 603-88714000 Fax: 603-88714290 E-mail: nizar@dca.gov.my **Mr Omran Zakarina** Deputy Director ATS Email:omran@dca.gov.my:	Control on-going, equipement , ops trial 1 Jun.
	Kota Kinabalu FIR	WBFC		ARINC			NO	YES			No		
PHILIPPINES ~~Air Transportation Office~~Civil Aviation Authority of the Philippines	Manila FIR	RPHI									No	**Mr. Salvador G. Rafael** Chief, ATC Division Tel: 632-8799160 Fax: 632-8799160 E-mail: ~~raffy_thunder92@yahoo.com~~zulu_whiskey52@yahoo.com	Ops Trial planned in Q3 or 4 2010
SINGAPORE Civil Aviation Authority of Singapore	Singapore FIR	WSJC	Thales	SITA	YES	YES	NO	YES	Operational	PUBLISHED	Completed	Mr. Yeo Cheng Nam Senior Engineer (Surveillance) yeo_cheng_nam@caas.gov.sg **Mr. Kwek Chin Lin** ATC Manager (Systems) kwek_chin_lin@caas.gov.sg Mr. Kwek Chin Lin ATC Manager (Systems) E-mail: kwek_chin_lin@caas.gov.sg	Ops Trial completed 1999, integrated system

STATE/ ORGANIZATION	**FIR**	**LOGON CODE**	**Ground Station Manuf-acturer**	**DSP** (e.g. SITA, ARINC)	**ADS**	**CPDLC**	**AIDC**	**FDP**	**Test, Ops Trial or Operational**	**Procedures Published**	**ADS/CPDLC TRIAL**	**CONTACTS** (ATM contact in **bold)**	**REMARKS**
THAILAND AEROTHAI	Bangkok FIR	VTBB	ARINC	ARINC	YES	YES	YES	YES	Ops Trial	NOTAM every three months	No	Mr. Choosit Kuptaviwat Tel: 66-285 9457 Fax: 66-228 59538 Email: choosit.ku@aerothail.co.th **Mr. Tinnagorn Choowong** Tel: 66-2-287 8423 Mobile: 66-09-816 6486 Fax: 66-2-287 8424 E-mail: tinnagorn.ch@aerothai.co.th	Pending an operational trial in the Bay of Bengal after six months period and will study CPDLC aplication over the continental area base on ATN protocal.
VIETNAM Civil Aviation Administraion of Viet Nam	Ho Chi Minh FIR	VVTS	Thales	ARINC	YES	YES			Operational	PUBLISHED	Completed	**Mr. Nguyen Manh Quang** Tel: (84-4) 8725272 Fax: (84-4) 8725281 e-mail: vatmats@n.vnn.vn	Phase 1 started in March 2007 and Phase 2 started in August 2008. Operational since 10 Aprtil 2008
	Hanoi FIR										No		
CENTRAL REPORTING AGENCY (CRA) CRA-Japan	Ho Chi Minh, Manila and Singapore FIRs	N/A										Mr. Masahisa Hayashi K-1 Building, 3rd floor 1-6-6, Haneda Airport. Ota-ku, Tokyo 144-0041, Japan Telephone: +81-3-3747-1231 Fax: + +81-3-3747-1231 E-mail: crasa@cra-japan.org hayashi@atcaj.or.jp	FIT-SEA CRA, operated by CRA Japan

STATE/ ORGANIZATION	**FIR**	**LOGON CODE**	**Ground Station Manuf-acturer**	**DSP** (e.g. SITA, ARINC)	**ADS**	**CPDLC**	**AIDC**	**FDP**	**Test, Ops Trial or Operational**	**Procedures Published**	**ADS/CPDLC TRIAL**	**CONTACTS** (ATM contact in **bold)**	**REMARKS**
IATA	N/A											Mr. Soon Boon Hai Assistant Director Safety Operations & Infrastructure Tel: 65 62397267 Fax: 65 65366267 E-mail: soonbhd@iata.org	
IFALPA	N/A											Capt. Korn Masumitchtai 484 Rachadanivet Soi 12, Bangkok, Thailand 10320 Tel: +66-81-344-6055 Fax: +66-2-513-0030 Email: captainkorn@gmail.com	
ARINC	N/A											Mr. Sarawut Assawachaichit Program Manager, Globalink Asia Tel: 66 2 2859435-6 Fax: 66 2 2859437 E-mail: sassawac@arinc.com	
SITA	N/A											Mr. David Fung SITA Regional Manager, Asia AIRCOM CNS Services Room 1201, 12/F Centre Point 181-185 Glovcester Road Wanchai Hong Kong, China Tel: 852-9400 7979 E-mail: david.fung@sita.aero	
ICAO	N/A											Mr. Kyotaro Harano Regional Officer ATM Tel: 66 2 5378189, ext. 159 Fax: 66 2 537 8199 E-mail: kharano@bangkok.icao.int icao_apac@bangkok.icao.int	

FIT- SEA TASK LIST

(Last updated May ~~2008~~2009)

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	Status	REMARKS
1.	ATS providers to use the *FANS Operations Manual* (FOM), and to review and update their ATS operating procedures to align with the FOM.	Ongoing activities as additional States join the operations.	All States	Ongoing	Important that all ATSU adopt common operating procedures. APANPIRG/15 (August 2004) agreed that the FOM be used as the basis for ADS and CPDLC operations in conjunction with Annex 10, PANS-ATM and regional guidance material.
2.	ATS providers to coordinate with adjacent area control centres (ACCs) to review and update letters of agreement for introduction of ADS/CPDLC services on a trial basis.	Ongoing activities as additional States join the operational trial.	Philippines	Ongoing	Ensure common ATC procedures applied. Letter of agreement between Singapore and Viet Nam for trial was finalised and signed in February 2007 and would be amended for the regular operations in April 2008.
3.	ATS providers issue AIC/AIP supplement on the commencement of the operational trial.	AIC prior to the Phase 1 commencement and AIP Supplement prior to Phase 2 commencement	Philippines	As required	Publications of AIC and AIP Supplement by the Philippines are subject to the readiness in the Manila FIR.

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	Status	REMARKS
4.	Coordinate with Southeast Asia States on the operational trial.	Ongoing activities as additional States join the operational trial.	ICAO, State	Ongoing	Determine status on trial participation Philippines planning to commence trial in the 3rd or 4th quarters 2010.
5.	Collect ADS/CPDLC Problem Reports (PR) and submit to the CRA from the State.	Ongoing activities	States, operators	Ongoing	To be submitted as soon as practicable to facilitate analysing the reports. FIT-SEA CRA operated by CRA Japan undertakes CRA services from March 2007.
6.	Provision of monthly monitoring ADS/CPDLC system performance data to the CRA.	Monthly	States	Ongoing	Essential for evaluating overall system performance. FIT-SEA CRA operated by CRA Japan ~~to~~ undertake~~s~~ CRA services from March 2007.
7.	Training of controllers and technical staff on ADS/CPDLC operational procedures based on the FOM.	Ongoing activities as additional States join the operational trial.	States	Ongoing	Philippines will hold refresher course starting at the end of May 2009
8.	Nominate contact person (technical and ATS) and keep details updated.	Ongoing activities as additional States join the operational trail	States, operators	Ongoing	Important that CRA has contact with engineering and operational personnel to analyse problem reports and performance data.

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	Status	REMARKS
					Contact persons to be included in the Table of ADS/CPDLC Equipage and ATS Status retained by FIT-SEA FIT-SEA CRA operated by CRA Japan undertook CRA services in March 2007.
9.	Conclude data confidentiality agreements between States and the CRA, and the States and operators participating in the trial.	Prior to the commencement of trial	CRA, Philippines and operators	Open	To conclude agreement between States, operators and data providers for release of data and to de-identify reports. Singapore and Viet Nam have singed.
10.	Update ICAO Guidance Material on CNS/ATM Operations in APAC Region.	As soon as practicable	ICAO	Ongoing	Part III harmonized with FOM. ICAO Headquarters continuing the review/harmonisation of Guidance Material. International Data Link Manual (IDLM) in preparation under the auspices of ICAO EUR/NAT Office. The Global Operational Data Link Document (GOLD) is being considered by the Ad Hoc Working Group.

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	Status	REMARKS
11.	Update table of ADS/CPDLC implementation planning for all FIT-SEA flight information regions (FIRs) including estimated dates for trial, implementation of CPDLC communications, 50 NM/50 NM reduced separation and 30 NM/30 NM reduced separation to provide basis for long-term satellite traffic load estimates to assist data service providers (DSP) network planning.	As required	SITA, ANSP	Ongoing	~~SITA has launched global satellite capacity/performance planning initiative to collect data from ANSPs and users to ensure timely network enhancement to meet future network requirements~~ (Raised at FIT-SEA/4)
~~12.~~	~~Coordinate with FOM editorial group on the Request for Change (RFC) to the FOM.~~	~~As required~~		~~Ongoing~~ Closed	~~SEA FOM editor to be nominated.~~ ~~FOM includes Request for Change (RFC) processes.~~
~~13.~~	~~Issue AIP amendment/supplement on the commencement of the regular operations of ADS/CPDLC.~~	~~29 February 2008~~	~~Viet Nam~~	~~Ongoing~~Completed	~~Singapore has already issued AIP on availability of ADS/CPDLC services in the Singapore FIR~~ ~~AIC for Phase 1 trial was issued by Viet Nam in January 2007. AIP Supplement for Phase 2 trial was published on 21 June 2007. AIP Supplement for the regular operation will be issued on 29 February 2008.~~

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	Status	REMARKS
~~14.~~	~~Revise and sign the Supplementary Letter of Agreement (SLOA) on transfer of ADS/CPDCL between Ho Chi Minh and Singapore Area Control Centres~~	~~As soon as practicable~~	~~Singapore and Viet Nam~~	~~Ongoing~~Completed	~~The Supplementary Letter of Agreement (SLOA) on transfer of ADS/CPDCL between Ho Chi Minh ACC and Singapore ACC would be revised and signed after proposed plan being approved.~~ ~~(Raised at FIT-SEA/7)~~
~~15.~~	~~Submit the final report of Phase 2 by Singapore, Viet Nam and FIT-SEA-CRA.~~	~~FIT-SEA/8~~	~~Singapore, Viet Nam and FIT-SEA-CRA~~	~~Ongoing~~Completed	~~FIT-SEA/8 will review the ADS/CPDLC system performance and the final report of the Phase 2 should be submitted by Singapore, Viet Nam and FIT-SEA-CRA~~ ~~(Raised at FIT-SEA/7)~~
12	Issue NOTAM reminding operators of the correct PR procedures	Immediate	Singapore and Viet Nam	Open	In light of the no PR reported in the South China Sea area, NOTAM to draw attention of operators to the correct PR procedures in the Singapore and the Viet Nam AIP supplements. (Raised at FIT-SEA/9)

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	Status	REMARKS
13	Update on the plan for the operational trial for the consideration of CRA service temporarily provided by CRA-Japan	Long-term	Philippines	Open	To decide the future direction of CRA service provided by Japan, the Philippines is requested to update FIT-SEA/7 on their operational trial. (Raised at FIT-SEA/9)
14	Consider the establishment of the formal FIT-SEA CRA to take over the role from CRA Japan.	Long-term	States	Open	CRA service is provided by Japan on a voluntary basis until the formal FIT-SEA CRA is established. Japan indicated the possible withdrawal of the service unless the data link service trial starts in 2010 as planned. (Raised at FIT-SEA/9)

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SOUTHEAST ASIA DATA LINK IMPLEMENTATION

STATES	FIR	ESTIMATED/ STARTED DATE	DATE COMPLETED	NOTES
Commence ADS/CPDLC Operational Trial				
Malaysia	Kuala Lumpur	1 June 2008	–	Participated in the Bay of Bengal (BOB) trials in Q1 2008.
Philippines	Manila	~~TBA~~Q3 or 4 2010		
Singapore	Singapore	1997	1997	
Thailand	Bangkok	TBA		Had previously participated in BOB trials, some equipment issues.
Viet Nam	Ho Chi Minh	15 March 2007	10 Apr 2008	
Implement CPDLC - Data Link Communications only				
Malaysia	Kuala Lumpur	TBA	–	Only for FIT-BOB
Philippines	Manila	TBA		
Singapore	Singapore	1997		
Thailand	Bangkok	TBA		
Viet Nam	Ho Chi Minh	2008		
Implement 50 NM/50 NM Based on RNP 10				
Malaysia	Kuala Lumpur	TBA		
Philippines	Manila	TBA		
Singapore	Singapore	3 July 2008		
Thailand	Bangkok	TBA		
Viet Nam	Ho Chi Minh	3 July 2008		Based on VHF on L642 and M771

STATES	FIR	ESTIMATED/ STARTED DATE	DATE COMPLETED	NOTES
Implement 30 NM/30 NM Based on RNP 4				
Malaysia	Kuala Lumpur	TBA		
Philippines	Manila	TBA		
Singapore	Singapore	2010		
Thailand	Bangkok	TBA		
Viet Nam	Ho Chi Minh	TBA		

SEACG/16

REPORT OF SEACG/16

Agenda Item 1: Adoption of Agenda

1.1 The meeting adopted the following as the agenda for the meeting:

Agenda Item 1:	Adoption of Provisional Agenda
Agenda Item 2:	Review Outcomes of Related Meetings
Agenda Item 3:	Review of FIT-SEA/9
Agenda Item 4:	Review Current Operations across South-East Asia and Identify Problem Areas
Agenda Item 5:	Implementation of the New CNS/ATM Systems in the Region
Agenda Item 6:	ATS Route Development
Agenda Item 7:	Development of State Contingency Plans
Agenda Item 8:	Civil Military Coordination
Agenda Item 9:	Develop a Coordinated Plan for Implementation of Actions Agreed by the Meeting
Agenda Item 10:	Any Other Business
Agenda Item 11:	Date and Venue for the Next Meeting

1.2 The meeting recalled that the objectives of SEACG were to discuss problems affecting the provision of ATS in the area and to develop a co-ordinated plan for implementation of actions agreed, including reviewing the implementation of the new ICAO CNS/ATM systems (paragraph 1.1.2 of the Report of SEACG/10, March 2002). Further, the objective of SEACG was not for long-range planning but to identify and solve current problems or deficiencies in ATS by means of an action plan with time lines (paragraph 6.1.5 of the Report of SEACG/10).

Agenda Item 2: Review Outcomes of Related Meetings

Outcomes of APANPIRG/19

2.1 The meeting reviewed the outcomes of APANPIRG/19.

First Meeting of ICAO Flight Plan & ATS Messages Implementation Task Force

2.2 In conjunction with the review of the outcomes of APANPIRG/19, the meeting reviewed the outcomes the first meeting of Asia/Pacific Flight Plan & ATS messages Implementation Task Force (FPL&AM TF/1, March 2009) held at the Regional Office. The meeting reviewed the *Interim Strategy for the Implementation of New ICAO Flight Plan Format and Supporting ATS Messages*.

2.3 Hong Kong China and IATA queried the intention of the transition period over one and half years from 1 July 2011 until 15 November 2012. IATA was of view that as far as airlines were concerned, they preferred a single cut-off time/date in transiting from the PRESENT to the NEW format. Hong Kong China and IATA agreed that they would seek clarification on the intention at the 19th meeting of ATM/AIS/SAR/SG (ATM/AIS/SAR/SG/19) in June 2009.

Outcomes of RASMAG/10

2.4 The meeting reviewed the outcomes of RASMAG/10 (December 2008, Bangkok).

Minimum Monitoring Requirements

2.5 In reviewing the height monitoring requirements for airframes used in RVSM operations, RASMAG/10 understood that the Annex 6 provisions for global monitoring would take effect in about two years, from November 2010, so were not presently applicable. Also, as the *Manual of Operating Procedures and Practices for Regional Monitoring Agencies in Relation to the Use of a 300 m (1000 ft) Vertical Separation Minimum above FL 290* (RMA Manual) was further delayed, the status of the Minimum Monitoring Requirements (MMRs) in the RMA Manual was questionable. RASMAG/10 recognized that the MMRs promulgated by the Monitoring Agency for the Asia Region (MAAR) had only slight differences from the MMRs in the RMA Manual and were always at least equal to or more exacting than the Annex 6 requirements. Consequently, RASMAG/10 agreed that, in the interim, the MAAR MMRs that that been adopted by RASMAG/3 should continue as the basis of MMRs used by Asia/Pacific RMAs.

2.6 RASMAG/10 had recognized that the monitoring of airframe was a significant burden to the operator and that monitoring therefore should be at the minimum rate necessary. Recognizing that APANPIRG had not formally adopted MMRs and noting the extended delays in finalization of the RMA Manual and the 2010 effective date for the Annex 6 provisions, RASMAG/10 drafted Draft Conclusion RASMAG 10/1 – Adopt RVSM Minimum Monitoring Requirements.

RVSM Non-Approved Operators Using RVSM Airspace

2.7 RASMAG/10 expressed serious concern in relation to flights that were operating in RVSM airspace when they apparently did not have the State approvals to do so. In agreeing that this issue ultimately required regulatory intervention, APANPIRG/19 requested RASMAG to continue its investigations with the objective of providing a more comprehensive briefing to APANPIRG/20 (September 2009, Bangkok) in relation to this issue**.**

Establishment of Singapore SMA – SEASMA

2.8 RASMAG/10 was informed that, recognizing that safety assessment and monitoring capability was urgently necessary to enable the implementation of 50 NM lateral/50 NM longitudinal reduced separations on RNAV routes L642 and M771 in the South China Sea area, Singapore committed to establishing the safety monitoring agency (SMA) for the South China Sea area, with the objective of providing full SMA services from 1 July 2008. Singapore adopted the title “South East Asia Safety Monitoring Agency” (SEASMA) as the name for the SMA and took steps to procure the URL www.seasma.com for the SEASMA website which was expected to be operational before the end of 2008.

2.9 Following the finalization of implementation by RNP-SEA/TF, successful implementation of reduced horizontal separations on L642 and M771 occurred on the 3 July 2008 AIRAC day. Hong Kong, China led RASMAG/10 in congratulating Singapore in this achievement.

RVSM Safety Performance – WPAC/SCS Airspace

2.10 RASMAG/10 was informed that annual flight hours, calculated based on the December 2007 traffic sample data (TSD), were 929,385 hours for the Western Pacific/South China Sea (WPAC/SCS) airspace. RASMAG/10 expressed concern that the target level of safety (TLS) was not being satisfied, but recognized that only three months data, i.e. July, August and September 2008, were available since the implementation of the revised flight level arrangements on 3 July 2008. As such, it was probably too early to draw any reliable conclusions about the effect of the new flight level arrangements on the overall RVSM safety performance. RASAMG/10, however, noted that the aggregate large height deviation (LHD) duration being reported over the three months was moderate and also noted the relatively higher LHD durations recorded in October and December 2007, as well as March and May 2008 before the implementation of the new flight level arrangements.

PBN Regional Implementation Plan

2.11 The third meeting of the PBN Implementation Task Force (PBN/TF/3, July 2008) noted that the new text proposed for the Regional PBN Implementation Plan by RASMAG/9 summarized ICAO requirements. Accordingly, PBN/TF/3 incorporated the draft text from RASMAG as Section 9 of the Regional PBN Implementation Plan.

Expand December TSD for airspace planning

2.12 ICAO Asia/Pacific Air Traffic Flow Management (ATFM) Seminar/Workshop (October 2008) was held in Fukuoka, Japan. The ATFM Seminar/Workshop recognized the fundamental and critical need for accurate and timely data to be continuously available to support implementation and ongoing ATFM operations. This was essential in two aspects:

a) static data identifying historical traffic loadings, for use as strategic planning; and
b) dynamic real-time data that was used for the tactical management of traffic.

2.13 Although vertical and horizontal traffic data was currently used exclusively for airspace safety monitoring purposes, the ATFM Seminar/Workshop considered it likely that this annual traffic count would provide a very useful source of data for airspace planning purposes in general and specifically to identify peak traffic loadings for ATFM purposes. Consequently, the Seminar/Workshop recommended that RASMAG review the situation, with the objective of expanding the use of the annual December RVSM data collection for airspace implementation planning and implementation in general (ATFM, PBN, ATS routes etc) and, under supervision of the Regional Office, enabling this data to be made available to implementation groups as required to support all regional ATM implementations.

Review of the Outcome of RASMAG/10 by Hong Kong, China

2.14 Hong Kong, China recalled that RASMAG/10 had reviewed interim edition of the regional PBN Plan and proposed additional text for Section 9 - *Safety Assessment & Monitoring Requirements* to clarify that the responsibility for safety assessment and ongoing monitoring lies with the implementing States, not with RASMAG. States were encouraged to coordinate with RASMAG regarding the en-route safety assessment and monitoring requirements and methodologies.

2.15 Whilst it was recognized that the responsibility for safety assessment and ongoing monitoring lied with the implementing States, it should be noted that some States in the regions

neither have the level of technical expertise nor the resources in conducting safety assessment. In particular, implementation of enroute PBN initiatives in the region would very likely involve concerted efforts of multiple States. Given the scale and complexity of such regional airspace safety assessment/monitoring initiative, the process would necessarily rely heavily on the assistance provided by the regional monitoring agencies (RMA)/enroute monitoring agencies (EMA) under the auspice of ICAO until such time when most States were competent enough to undertake these highly specialized safety assessments.

2.16 As most of the airspace safety assessment expertise are concentrated in a few RMA/EMA in the regions, ICAO was requested to consider continuing the current practice in provide assistance to States through the RMA/EMA in conducting airspace safety assessment. Meanwhile, steps should be taken to build up the technical expertise of States in conducting airspace safety assessment in a progressive manner.

2.17 The meeting noted the fact that the scale and complexity of regional airspace safety assessment/monitoring would require concerted efforts of multiple States, and some States have yet to build up their competence in conducting airspace safety assessment. The meeting noted that there is currently no capability to conduct safety assessment in the terminal airspace.

2.18 Attention of ATM/AIS/SAR/SG should be drawn to the feasibility for regional RMA/EMA in continuing of providing assistance to States in conducting airspace safety assessments and to strengthen the technical expertise of States in conducting such assessments. In this regard, Hong Kong, China would put forward a working paper to ATM/AIS/SAR/SG/19.

AIS Update from the First Meeting of ICAO AIS-AIM Study Group and the Fourth Meeting of Asia/Pacific AIS-AIM Implementation Task Force

2.19 The first meeting of the Aeronautical Information Services-Aeronautical Information Management Study Group (AIS-AIMSG/1, December 2008) was held at the ICAO headquarters in Montréal, Canada. Subsequently, the fourth meeting of the AIS-AIM Implementation Task Force (AAITF/4, February 2009) was graciously hosted by Japan Civil Aviation Bureau (JCAB) at Narita, Japan back-to back with the AIS Automation/electronic Terrain and Obstacle Data (eTOD) Seminar/Workshop.

First Meeting of AIS-AIMSG

2.20 The group discussed how the Roadmap for the AIS-AIM Transition would be distributed to States. Subsequent to consideration of the roadmap by the Air Navigation Commission (ANC) in February 2009, it was intended that the roadmap would be placed on the ICAO public website in English.

2.21 The group noted that given constraining timeframes for eTOD (2008-2010), the lack of resources and survey equipment, fragmented responsibilities, ambiguities in requirements and the costs for compliance, the requirements had caused significant concern in States and raised the possibility of a lack of compliance. The group also noted the possibility that an outcome of the consultation with Contracting States would be that the applicability date of the eTOD provisions in Annex 15 – *Aeronautical Information Services*, Chapter 10 might be delayed. Informing States as soon as possible was considered of such importance in view of the financial implications related to the implementation of eTOD, and the group volunteered to assist, in any way possible, e.g. through their respective website, AIS Agora, the eTOD Discussion Forum and through their participation in other group, to raise awareness of the possible changes.

2.22 The group had stressed that clear provisions and guidance were necessary to prevent proliferation of electronic aeronautical information publication (eAIP) formats. It was noted that a standard look would make it user friendly. Action agreed 1/7 — Draft Amendment 36 to Annex 15: Electronic AIP (eAIP) was agreed.

2.23 The current Standard in Annex 15 related to the NOTAM format allows for a future date to be inserted in Item B) (date/time) in NOTAMR (replacing) as well as NOTAMC (cancelling). The group noted that this created a situation in which the recipient could not discern whether the NOTAM to be replaced must be replaced immediately or if it remained valid until the date/time that appears in Item B). A simple solution to the issue was agreed by the group as proposed in Action agreed 1/10 — Draft Amendment 36 to Annex 15: NOTAM date and time**.**

2.24 The group discussed the problem of postponement of effective dates of major and significant changes, and the consequences on efficient operations and safety. Acknowledging that the text of the Recommended Practice would be reviewed by the Secretary, the group agreed to take Action agreed 1/12 — Draft Amendment 36 to Annex 15: AIRAC late postponement.

2.25 The group noted that Annex 15, paragraph 3.2.1 required that each State shall take all necessary measures to introduce a properly organized quality system containing procedures, processes and resources necessary to implement quality management at each function stage of AIS. Annex 4 – *Aeronautical Chart*, Annex 11 – *Air Traffic Services* and Annex 14 - *Aerodromes* also contained provisions related to the quality of aeronautical information. The group considered that guidance material for an AIS quality manual was required as soon as possible to support the consistent implementation of quality systems in accordance with the abovementioned Annex provisions.

2.26 The group noted that the EUROCONTROL document *Operating Procedures for AIS Dynamic Data* (OPADD) contained European Civil Aviation Conference (ECAC) States' approved guidelines for the handling of dynamic data. The scope of the OPADD was mainly procedures related to NOTAM. It also covered examples of SNOWTAM and ASHTAM as well as specific guidance for harmonization of these messages. The group learned that a new version of this document was under preparation as OPADD 3.0 which would, for the first time, contain a chapter presenting guidelines covering the retrieval and provision of pre-flight information bulletins (PIB). The group considered that this represented valuable guidance material for States and accordingly agreed to Action agreed 1/22 — Guidance material on NOTAM.

2.27 The group was briefed on the availability of EUROCONTROL documentation related to AIS Data Process and Static Data Procedures. It was therefore agreed that these documents would be valuable information to provide as guidance material related to quality. The group agreed to Action agreed 1/29 — Data process and procedures in the AIS quality manual and Action agreed 1/30 — Identify data process and procedures that would be required for the provision of new datasets**.**

Fourth Meeting of AAITF

2.28 AAITF/4 noted that the ANC considered a work programme to enable the global transition from AIS to AIM in March 2008. A number of issues relating to Annexes 4 and 15, and associated guidance material were identified including the need for a global strategy/roadmap for the transition from AIS to AIM.

2.29 An ANC working paper to propose amendments to ICAO documents was presented to the meeting. Due to the expected implementation issues as noted by AIS-AIMSG/1, AAITF/4 noted in the working paper that the applicability date for Areas 2 and 3 would be extended to 15 November 2012 (proposed Annex 15, paragraph 10.6.1.2 refers). As the Aerodrome Terrain and

Obstacle Chart — ICAO (Electronic) is based on Annex 15 specifications for Area 2 and 3 eTOD, a consequential amendment was proposed to Annex 4, paragraph 5.2.1.

2.30 With regard to NOTAM, Japan reported that JCAB had begun officially graphic NOTAM distributions since 27 August 2008 after a trial run. AAITF/4 noted that maintenance and construction works took place almost everyday, especially at large scale airports. In proportion to the works, NOTAMs relating to closure and restriction of runway, taxiway and apron were ever increasing. It became harder to handle these massive NOTAMs manually.

2.31 Graphic NOTAM is graphic information provided with Scalable Vector Graphic (SVG) format. SVG is an XML specification and file format for describing two dimensional vector graphics. SVG retains the resolution at any size and with any change of the viewing device.

2.32 AAITF/4 recalled that the matter of the AIRAC effective time difference and associated problems were first raised by Japan at AITF/3 (June 2008, Singapore). Japan had remarked the problems in Asia/Pacific Regions caused by the different AIRAC effective times. Especially between Japan and the Republic of Korea, problems had been experienced by Japanese airline companies in the operation between the two States.

2.33 In light of the foregoing, Japan prepared an information paper on the problem caused by different AIRAC effective time in the regions. Japan demonstrated a case of the operational problems experienced during flights between Japan and the Republic of Korea, which is caused by the 24 hour difference in AIRAC effective time between the two States, with a PowerPoint presentation highlighting the difficulties to operators.

Sixth Meeting of the Western Pacific/South China Sea RVSM Scrutiny Group

2.34 The meeting reviewed the outcomes of the sixth meeting of the WPAC/SCS RVSM Scrutiny Group (WPAC/SCS RSG/6, April 2009) held at ICAO Asia and Pacific Office, Bangkok, Thailand.

RMA Update for WPAC/SCS Area

2.35 Table 1 below summarizes the results of the airspace safety assessment, as of April 2009, in terms of the technical and total risks for the RVSM operation in the WPAC/SCS RVSM airspace.

Source of Risk	Lower Bound Risk Estimation	Target level of safety (TLS)	Remarks
Technical Risk	0.76×10^{-9}	2.5×10^{-9}	Satisfies Technical TLS
Operational Risk	4.05×10^{-9}	-	-
Total Risk	**4.81×10^{-9}**	**5.0×10^{-9}**	**Satisfies Overall TLS**

Table 1: Risk Estimates for the RVSM Implementation in WPAC/SCS Airspace

WPAC/SCS FLOS/FLAS Implementation Feedback

2.36 Viet Nam had informed WPAC/SCS RSG/6 that there were issues as follows:

a) The flow control restrictions on traffic bound for Taipei on ATS route A1 and traffic bound for Shenzhen or Guangzhou on RNAV route M771 have been imposing workload on controllers. In Viet Nam's view, closer ATC coordination amongst ACCs concerned should be made.

b) Flight level changes at BITOD take place due to the track direction change for traffic on route L637 – M753/M755 and vice versa. One of measures proposed by Viet Nam was the consideration of additional ATS/RNAV routes.

c) Viet Nam considered that the quality of transfer of control between Ho Chi Minh ACC and Manila ACC should be improved and flight crews should pay careful attention to the assigned flight level, particularly in airspace under HF communications.

2.37 Thailand informed WPAC/SCS RSG/6 that as a result of the work of WPAC/SCS RSG a number of operational benefits had resulted in for Thailand, as reported to WPAC/SCS RSG/5 (October 2008, Bangkok). In conjunction with the implementation of the revised flight level arrangements, Thailand had reviewed their internal procedures to improve ATC and airspace efficiency.

2.38 Thailand had also experienced traffic flow restrictions from the Taipei FIR, and noted that in most cases that appeared to be due to ATM system during the night time peak period which affected ATC coordination and airline operators.

LHD Reduction Activities

2.39 WPAC/SCS RSG/6 recognized that the large numbers of LHDs attributable to errors in ATC unit-to-ATC unit coordination were still driving the risk estimate high and needed to be corrected. The situation in this respect had significantly improved over the life span of RSG, but improvements in reducing LHD events were still actively sought.

Large Scale Weather Deviations

2.40 WPAC/SCS RSG/6 recalled that WPAC/SCS RSG/5 agreed that a solution to the Large Scale Weather Deviation (LSWD) matters was ideally necessary before the commencement of the next typhoon season in April/May 2009, and requested that the next WPAC/SCS RSG/6 address the LSWD issue as a priority. States were encouraged to conduct coordination of proposed LSWD arrangements before RSG/6 in order to ensure that RSG/6 was well positioned to reach agreement on a suitable procedure.

2.41 WPAC/SCS RSG/6, however, recognized that transmission of NOTAMs to advise capacity restrictions would go to addressees globally and it was likely that many addressees would not be related to the capacity reduction in the WPAC/SCS area. As such, a short list of NOTAM addressees which comprises only the affected ACCs was discussed, but the limitations in appropriately informing users were identified. Ultimately, WPAC/SCS RSG/6 agreed that further study was necessary and requested that this matter be tabled at SEACG/16 for further discussion.

ATS Route matters

2.42 To WPAC/SCS RSG/6, Viet Nam had submitted a number of proposals for ATS route amendments and new ATS routes, with the objective of reducing flight distance and time, and facilitating flight and ATC operations. IATA thanked Viet Nam for those initiatives. All participants would study the proposals with the objective of providing feedback to SEACG/16. Viet Nam updated SEACG/16 on the progress of their coordination with the respective civil aviation authorities affected.

Future Directions and Arrangements

2.43 WPAC/SCS RSG/9 agreed to Draft Conclusion RSG/1- *Dissolution of Western Pacific/South China Sea RVSM Scrutiny Working Group* for consideration by ATM/AIS/SAR/SG in June 2009.

Any Other Business

2.44 An amendment proposal to the Basic Air Navigation Plan (Doc 9673) to amend the FIR boundary between Manila, Oakland and Ujung Pandang was being prepared in coordination with the Regional Office to implement the changes in a coordinated manner on a suitable AIRAC date. In order to minimise the complexity of the ATC coordination required in this vicinity, the three States also agreed to simultaneously realign ATS route A450 and a suitable amendment proposal would be coordinated with the Regional Office for this realignment.

Agenda Item 3: Review of FIT-SEA/9

Review of FIT-SEA/9

3.1 The meeting reviewed the outcomes of FIT-SEA/9. Boeing confirmed that system performance monitoring had detected some data link performance problems with the Boeing 777 type aircraft. Boeing CRA determined that the problem was related to VHF to SATCOM link transitions after spending many hours in their avionics labs with an aim of trying to reproduce the problem. Boeing confirmed that the root cause to the problem had been identified and a free of charge software update fix would be available in late May 2010 for AIMS II configured 777s and in August 2010 for AIMS I configured aircraft. The meeting thanked Boeing for the update.

Agenda Item 4: Review Current Operations across South-East Asia and Identify Problem Areas

Restrictions Imposed on Traffic Operating on RNAV Route M771 and Application of Large Scale Weather Deviation (LSWD) Procedures in the South China Sea (SCS) Area

Impact on Air Traffic Management Due to Time Restriction on M771

4.1 Singapore also reported that there were at least 61 occasions where time restrictions were imposed on M771 during the period from 3 July 2008 to 20 April 2009. The time restrictions required Singapore ATC to provide a time buffer for either all flights or between flights bound for the same destination, regardless of flight level. The time restrictions imposed varied from 5 to 30 minutes between flights and the duration where these time restrictions were imposed ranged from 1 to 12 hours. Usually explanations given for such restrictions included weather deviations and flow control measures, etc.

4.1.1 It was difficult for the controllers to adapt as different types of restrictions were imposed. Workload on controllers had increased as No-Pre-Departure Coordination (No-PDC) arrangements with adjacent ACCs had to be suspended when restrictions were imposed by downstream ACC. Request had to be made for individual flights prior to departure. At times, in order to meet the restrictions from downstream ACC, aircraft had to be taken off the route and radar vectored for delay to meet the required buffering, thus causing increased workloads for pilots and controllers. The extra fuel burned would also have adverse impact on the environment and the operating cost of airlines.

4.1.2 For the four month period between 1 January and 20 April 2009, there were 39 occasions where capacity reduction measures were initiated by downstream ACCs, with only one occasion due to LSWD in the Sanya FIR. The rest were due to imposition of ad-hoc time restrictions on M771

4.1.3 The time restrictions imposed by adjacent ACCs were not in accordance to longitudinal separation standards requirements. From 1 Jan 2009 to 20 April 2009, time restrictions were imposed on M771 for flights bound for Guangzhou and/or Shenzhen. Prior to 1 Jan 2009, there were time restrictions imposed on M771 for flights to North Asia and Northeast Asia. It should be noted that M771 is a route with high traffic volume used by flights from Indonesia, Malaysia and Singapore, and the imposition of such ad-hoc time restrictions greatly impacted the efficiency of flights and shifted the tactical traffic management of downstream ACCs onto upstream ACCs. This had increased the complexity in traffic management, controllers' coordination and workload. At times when no reasons were given for the restrictions from the downstream ACCs, controllers' radio communication and coordination workload would increase as pilots and adjacent ACCs would query the need for the restrictions.

4.2 Hong Kong, China remarked that the traffic flow regulation on M771 placed on aircraft bound for Guangzhou and Shenzhen, China was mainly due to the limited number of transfer of control points/flight levels that are available for those flights between Hong Kong and China as well as the high traffic density in the Hong Kong terminal control area (TMA). Hong Kong, China agreed to regularly review the situation and endeavour to place the traffic regulation only as the last resort so as to minimize the impact on the upstream ACCs.

Notification of Large Scale Weather Deviation (LSWD) Procedures

4.3 Singapore informed the meeting that the LSWD procedures on the six trunk routes over SCS area, i.e. L625, L642, M767, M771, N884 and N892, were utilized when required during the months from July to December 2008. Very often, ACC initiating the LSWD procedures did not provide an estimated time when operations could revert to normal. This created uncertainty for upstream ACCs and airspace users. As discussed at WPAC/SCS RSG/6, the LSWD were further refined including the need on the issuance of a NOTAM by the ACC which activated the LSWD procedures.

4.4 In the period of about nine months from 3 July 2008 to 20 April 2009, there were at least 22 occasions of the LSWD procedures being applied on the SCS routes that include L625, L642, M767, M771, and N884. The duration of the application of LSWD procedures ranged from 30 minutes to 17 hours.

4.5 The meeting reviewed the LSWD procedures as in **Appendix A** to this report. The meeting recalled that the LSWD procedures were activated in circumstances where deviations of more than 10 NM are experienced or anticipated by five or more aircraft and the deviations are not wholly contained in one FIR. Therefore, the LSWD procedures must be activated simultaneously by more than one FIR. The meeting confirmed that NOTAMs be issued by the ATS providers who activate the LSWD procedures and agreed with the following short list of NOTAM offices (NOF) to which the NOTAM should be sent:

China, Hong Kong China, Indonesia, Taipei, Japan, Malaysia, Singapore, Philippines, Vietnam

4.6 The meeting agreed with sample text of the NOTAM as follows:

(WIE/FROM [time]), DUE ACTIVATION OF LSWD PROCEDURES ON [route] BTN [point] AND [point], FLIGHT LEVEL AVALABILITY IS LIMITED [TO FL [number], [number] AND [number]] (UNTIL [time]/UFN). REFER TO AIP SUP [number/year].

4.7 The meeting confirmed that this NOTAM arrangement should take immediate effect upon the agreement at this meeting without any further actions such as formal agreement through the amendment of LOAs.

Flow Control Restriction on A1/G86

4.8 Subsequent to the review of WPAC/SCS RSG/6, Thailand updated the meeting in many occurrences in the past of flow control restriction imposed by Taipei ACC, due to system maintenance between 1525 – 1840 UTC (2225 – 0140 Thailand time). Traffic affected by the restriction were via A1, B348, G86 and M750; inbound Taipei FIR via points ELATO (A1), ENVAR (M750), KAPLI (G86) and POTIB (B348) with the spacing requirement of 3 minutes or 20 NM regardless of flight levels. As a result, Bangkok ACC being the most upstream FIR, on many occasions, was advised of 6 minutes flow rate for ATS route A1 ELATO/M750 ENVAR and 3 minutes for traffic on G86 KAPLI during the above time which had caused significant delays on eastbound departures from Bangkok International Airport and other airports within the Bangkok FIR.

4.9 Thailand understood the predicament was shared by many air navigation service providers (ANSP) in the region and that the passing on of flow control restrictions from one ACC to another was a common practice. With today's economic situation, however, Thailand believed it was airlines that would be most affected by the constraint which would translate to delays, increased fuel burn and in some cases the inability to maintain connecting schedule. Further, the imposed time of 1525 – 1840 UTC was the prime period for departures from Southeast Asia to destinations in Japan and the Republic of Korea, and there were 15-20 flights which had been affected with the restriction.

4.10 The meeting noted the situation and its consequences as raised by Thailand and discussed ways to alleviate the affect on operators. Hong Kong China and Japan would bring this forward to the attention of Taipei ACC at East Asia ATM Coordination Group in June 2009.

Extended CPDLC Connection over HF Communication – Manila FIR

4.11 IFALPA informed the meeting that a NOTAM regarding HF communication in the Manila FIR was recently issued. According to the NOTAM, when HF contact is not established with Manila Radio or ACC, pilots should maintain the last assigned flight level until establishing VHF communication.

4.12 IFALPA advised that Annex 10 – *Aeronautical Telecommunications*, Volume II – *Communication Procedures Including those with PANS Status*, paragraph 5.2.2.7.1 provides that "When an aircraft station fails to establish contact with the appropriate aeronautical station on the designated channel, it shall attempt to establish contact on the previous channel used…." in case of voice communication failure.

4.13 Manila HF Radio only covers small areas in terms of east- and west-bound traffic flow. If the CPDLC connection with the upstream ACC is retained or established with another available neighboring ATC unit, position reports could be relayed to Manila ACC from the controller who has the CPDLC connection through controller to controller communication.

4.14 IFALPA was of view that the air traffic control authority should remain in Manila even though the CPDLC connection is extended into the Manila FIR, hence only the communication using CPDLC is extended. Therefore, using HF to communicate with Manila Radio remains the primary communication means and the position report by CPDLC of the neighboring ATC units could be the secondary means of communication. If the CPDLC connection is kept when HF communication cannot be established, the pilot may comfortably get responded instantaneously from ATC in such cases as a weather deviation.

4.15 IFALPA recommended that this course of action to implement the extended CPDLC connection to cover the portion of Manila HF Radio operations. IFALPA believed that this would improve flight safety in this area.

4.16 Singapore advised the meeting that the arrangement to utilize CPDLC of the upstream ACC could not be so simple. Modifications to ground system would need to be made at the upstream ACC to make the arrangement possible. Also, a concern was raised about the increasing workload to the controllers of upstream ATC units. Japan shared the concern raised by Singapore and added that there would be a liability issue in case that the relayed messaged went wrong between controller and controller. Japan suggested the use of SATCOM as the alternate means of communication. Philippines advised that Manila ACC was not equipped with SATCOM.

4.17 IATA requested the meeting to consider whether Singapore Radio could assist Manila Radio, considering that their HF communication coverage overlaps with Manila Radio' coverage. An arrangement could be made where Singapore Radio could acknowledge and relay messages to Manila Radio/ACC. Singapore added that there were already ad-hoc arrangements for Singapore ACC to assist Manila ACC to cover communication on some portion of ATS routes adjacent to the Singapore FIR.

4.18 Philippines advised the meeting that the HF communication had now improved and the HF communication problem no longer exists.

Radar Coverage Chart of the South China Sea Area and the Status Matrix of Application of Radar Handover Procedures

4.19 At SEACG/14 (May 2007, Hanoi), Thailand suggested that the existing radar facilities and coverage should be utilized to allow for the radar spacing from the Bangkok FIR to the Taipei FIR all the way through the Ho Chi Minh, Sanya, Hong Kong FIRs and vice versa along ATS routes A1, G581 and M750. This spacing had already been applied between some of the FIRs but limitations were still seen due to non-uniformity between all FIRs.

4.20 In light of the above, SEACG/14 reviewed the radar coverage chart of the South China Sea and the table of the Status of Application of Radar Handover in the Southeast Asia developed by SEACG/13 and updated the table. SEACG/14 was of view that there was a feasibility

to implement radar spacing along some ATS routes, and encouraged States to carry out the bilateral coordination to apply the radar spacing and report to SEACG/15 (May 2008, Bangkok) of the outcomes.

4.21 Lao PDR and Viet Nam updated the radar coverage chart of the South China Sea. The meeting recalled that there should be a note in the chart that the Sanya FIR is fully covered by radars. The radar coverage chart was updated accordingly as in **Appendix B** to this report. Viet Nam and the Philippines updated the Status of the Application of Radar Handover Procedures as in **Appendix C** to this report.

Summary of the Fourth Meeting of South-East Asia RNP Implementation Task Force

4.22 The meeting reviewed the outcomes of the fourth meeting of ICAO South-East Asia Required Navigation Performance Implementation Task Force (RNP-SEA/TF/4, September 2008) held at Singapore Aviation Academy, Singapore.

Operational Issues

4.23 RNP-SEA/TF/4 noted the following:

a) Route Capacity and Utilisation

i) TSD was collected over two months on RNAV routes L642 and M771.

ii) After the implementation, the maximum movement rate on M771 stood at 15 movements per hour, a 7% increase, whereas on L642 the maximum movement rate had gone up from 11 to 13 movements per hour, an 18 % increase.

b) Departure Delays on M771

i) The data collected showed that average departure delay per flight had reduced from 1.28 minutes down to 1.09 minutes, a 15 % reduction.

c) Flight Safety

i) With the implementation of 50 NM lateral separation for flights operating on M771 and L642, weather deviations of up to 10 NM could be permitted as long as lateral separation of 50 NM could be maintained between flights on adjacent routes occupying the same flight level without infringing the lateral separation.

ii) The onset of typhoon season over the north-eastern part of the South China Sea had reduced the opportunity for controllers to apply the reduction of separation especially when the LSWD procedures were activated.

4.24 China, Malaysia and Viet Nam informed RNP-SEA/TF/4 that they did not face any operational issues regarding flight safety and navigation errors since the implementation of RNP 10 operations on L642 and M771. Hong Kong, China advised RNP-SEA/TF/4 that there was improvement to traffic flow on L642 during their departure peak hours. Hong Kong, China informed RNP-SEA/TF/4 that the LSWD procedures would be reviewed at WPAC/SCS RSG/6.

Safety Analysis and Airspace Monitoring Issues

4.25 Singapore presented RNP-SEA/TF/4 with the post-implementation safety assessment of implementing 50 NM lateral and 50 NM longitudinal separation on RNAV routes L642 and M771. Firstly, the flight levels preferred for operations had changed as the result of the change in the flight level allocation scheme (FLAS).

4.26 From 3 July through the end of October 2008, there was no report of lateral errors of 15 NM or greater magnitude for operations on L642 and M771. Also, there had been no reports of large individual-aircraft longitudinal errors or loss of longitudinal separation between pairs of aircraft.

4.27 RNP-SEA/TF/4 accepted that the safety assessment and agreed that the application of RNP 10 (50 NM/50 NM) horizontal separation could continue on L642 and M771. RNP-SEA/TF/4 also agreed that the 2008 TSD from the Ho Chi Minh, Hong Kong, Sanya and Singapore FIRs should be used to re-estimate the opposite-direction lateral occupancy parameter of the lateral collision risk model and the aircraft-pair distributions of initial separation and separation loss or gain used in the longitudinal collision risk model when the TSDs are available in early 2009.

Future Direction and Arrangements

4.28 RNP-SEA/TF/4 was invited to review the PBN Regional Plan and provide feedback. RNP-SEA/TF/4 noted in the regional plan that RNP 4 is preferred (RNAV 10 is acceptable) in oceanic airspace in the short term (2008-2012) and RNP 2 is preferred (RNP 4 and RNAV 10 are acceptable) in the medium term (2013-2016). RNP-SEA/TF/4, however, recognized that there was no need to wait for these dates to conduct implementations and, where States were agreeable, implementations could take place earlier than the guidelines given in the PBN regional plan. Hong Kong, China highlighted to RNP-SEA/TF/4 that they would most likely adhere to the interim PBN Regional Plan which was adopted by APANPIRG/19 to implement RNP 4 in the region.

4.29 In accordance with the agreement at RNP-SEA/TF/4, the Chairman and the Secretariat met at the Regional Office on 17 February 2009. As to the RNP 4 implementation on L642 and M771, Hong Kong, China had informed the Regional Office that the implementation of RNP 4 on these two routes could take place in the Hong Kong FIR around 2013, in line with their internal airspace improvement/enhancement programme.

4.30 With regard to the further reduction of the separation utilizing radar, Hong Kong, China informed the meeting that their radar marginally covered the transfer of control points between the Hong Kong and the Sanya FIRs. Radar signal was partly fed from the Sanya FIR but their confidence level to the radar system in that area was not good enough to move on to the further reduced separation of 30 NM/30 NM.

4.31 The meeting noted that RNP-SEA/TF/5 will not be held until:

i) RNP 4 is agree on L642 and M771 by Hong Kong, China; or

ii) RNP 10 can be introduced on other four RNAV routes with the implementation of data link in the Manila FIR.

Outcomes of ATFM Seminar/Workshop

4.32 ICAO Asia/Pacific Air Traffic Flow Management (ATFM) Seminar/Workshop (October 2008) hosted by JCAB, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) was held in Fukuoka, Japan. The ATFM Seminar/Workshop addressed the following objectives:

a) to raise awareness of ICAO provisions regarding ATFM;
b) to enhance coordination and cooperation between providers and users; and
c) to identify regional initiatives to optimize ATFM activities.

4.33 The Workshop was informed of Japan's proposals for further development of ATFM in their areas of responsibility and an initial proposal for the establishment of a regional ATFM initiative in East Asia, possibly encompassing the Beijing, Fukuoka, Hong Kong, Incheon, Manila, Shanghai and Taipei FIRs. The Workshop received detailed information from the United States on methodologies useful for planning the near-term ATFM implementation. The ATFM Seminar/Workshop, in its review of the information provided to the Seminar and arising from the discussions held during the Workshop, made recommendations as outlined below.

Recommendations

ATFM Seminar/Workshop Recommendation 1:

That the present arrangements for annual month of December traffic sampling by all States for airspace safety analysis enabled by APANPIRG Conclusion 16/4 be expanded to enable this data to also be used, under authority of the ICAO Asia/Pacific Regional Office, for airspace planning and implementation purposes.

ATFM Seminar/Workshop Recommendation 2:

Recognizing that the sharing of dynamic data between adjacent ANSPs on a continuous and real time basis was a key requirement in realizing ATFM benefits, regional strategies be developed with the objective of implementing formalized data sharing arrangements with relevant parties within, and between, States.

ATFM Seminar/Workshop Recommendation 3:

That guidance material in the ICAO ATS Planning Manual (Doc 9426) be reviewed and utilized as the basis for development of Sector capacity assessments.

ATFM Seminar/Workshop Recommendation 4:

That the draft ATFM Communications Handbook for the Asia/Pacific Region (**Appendix D** to this report) *be advanced through the normal ICAO processes with the objective of gaining APANPIRG approval as a regional guidance material.*

ATFM Seminar/Workshop Recommendation 5:

That the ICAO regional Secretariat provides all material associated with the ATFM Seminar/Workshop to the ICAO Headquarters Secretariat for consideration in the ICAO HQ ATFM work programme scheduled during 2009/2010.

Safety Assessment on ATS Routes Crossing the Vientiane FIR

4.34 Lao PDR recalled the previous meetings of SEACG recognized a need to study restructuring of A1, including the establishment of parallel uni-directional route. Lao Department of Civil Aviation (DCA) had completed the safety assessment of routes crossing the Vientiane FIR.

4.35 Lao PDR informed the meeting of their support for the realignment of ATS route A1 for the purpose of increasing airspace utilization. The crossing routes B329 and R575, however, should be taken into consideration.

4.36 Lao PDR agreed with harmonization amongst States concerned to support the application of radar spacing and handover procedures. Whenever practicable, the sharing of the radar information among the adjacent FIRs should be considered.

4.37 Thailand supported the concept of radar data sharing as presented by Lao PDR and would coordinate to harmonize the radar signal among the two ANSPs. The meeting was also of the view that the sharing of the radar signal would enhance ATM capability and encouraged ANSPs to study the feasibility of sharing resources.

Upgrading of Brunei Darussalam's ATM Surveillance System

4.38 The meeting was advised by Brunei Darussalam that its ATM system was implemented in 1996, together with surveillance systems such as Primary Surveillance Radar system with a 70 NM range and Mono-pulse Secondary Surveillance Radar (MSSR) system with a 256 NM range. Outage of the primary radar system due to lightning strike and unreliability of the secondary surveillance radar system due to wear and tear had some impacts to the control of traffic in Brunei TMA, which is within the Malaysia's Kota Kinabalu FIR. Such outages had resulted in delay to traffic arriving at and departing from Brunei International Airport when controllers reverted to procedural control. Brunei Darussalam informed the meeting that the acquisition of new solid state surveillance systems began last year, the installation of the Primary Surveillance Radar system was in progress currently and would become operational at Q3 of 2009, and MSSR may be replaced in Q2 of 2010.

4.39 The meeting noted the information provided on the upgrading of Brunei Darussalam's ATM Surveillance System.

Traffic Sample Data (TSD) State Letter

4.40 The meeting noted that the Regional Office issued the State Letter Ref.: T3/10.0, T3/10.1.17 – AP169/08 (ATM), dated 26 November 2008, requesting submission of December 2008 TSD to relevant regional monitoring agencies.

Agenda Item 5: Implementation of the New CNS/ATM Systems in the Region

Updates on ATS Activities in Viet Nam

5.1 Viet Nam briefed the update of major ATS activities from 2008 – 2009, as follows:

Regulations and Programmes:

- Adoption of the Guidance on ATC unit operations, Guidance on issuance of ANS unit operational approval;
- Finalizing the ATS Contingency Plan;
- Issuance of new and revised Manuals on Flight Operations in the aerodrome airspace areas, flight procedures at certain aerodromes and associated operational minima.
- Deploying the Programme on issuance of Operational Approval for ANS systems/equipments from August 2008 to March 2009 and the Programme on issuance of Operational Approval for ATS, CNS, MET, AIS units from August 2008 to June 2009.
- Deploying the Programme on overcoming ICAO Audit Team's findings/recommendations in ATS.

ATS Routes:

- In collaboration with the relevant organizations and agencies, the Civil Aviation Administration of Viet Nam (CAAV) has developed a comprehensive Plan for establishing, revising ATS routes including both of domestic and international routes.

ATS Activities:

- Implementation the revised RVSM flight level system within the Ho Chi Minh FIR from July 2008.
- Participating in AFTM operations for the westbound traffic overflying the Kabul FIR.
- Continuation of ADS/CPDLC operation within the Ho Chi Minh FIR.
- Implementation of 40 NM radar spacing along ATS routes A202 and R474.

Coordination between Relevant ACCs:

- Ha Noi ACC: Nanning, Ho Chi Minh, Sanya, Vientiane and Kunming ACCs. ATC LOAs between Ha Noi ACC and Sanya, Vientiane, Nanning ACCs have been revised. ATC LOA between Ha Noi ACC and Kunming ACC has been signed.

- Ho Chi Minh ACC: Manila, Sanya, Singapore, Kuala Lumpur, Phnom Penh, Vientiane and Ha Noi ACCs. ATC LOAs between Ho Chi Minh ACC and the ACCs concerned (except Kuala Lumpur) have been revised for the implementation of revised RVSM flight level system in the area.

- The coordination is in accordance with the ICAO provisions and current ATC LOAs. It is continuously enhanced in the respect of communication means, ATC coordination procedures and controller's skill.

- The coordination between Ho Chi Minh ACC and Manila ACC should be enhanced in regard to the quality of ATS speech circuit and practice in order to avoid potential LHD caused by ATC coordination.

- The revised ATC LOA between Ho Chi Minh and Kuala Lumpur, which has been addressed by CAAV at SEACG/15, should be signed as soon as possible,

CNS/ATM:

- Advanced ATM system with integrated ADS/CPDLC capabilities is operated at Ho Chi Minh ACC. Project on developing the Master Plan for CNS/ATM systems which are sponsored by Japanese government is being deployed in Vietnam. Project on ADS-B will take place. AIDC between Ho Chi Minh ACC and Sanya ACC has been agreed, etc.

Reviewing the Recommended Actions as agreed at SEACG/15

- Viet Nam took the corrective actions for air navigation deficiencies in respect of ATS field, namely: ATS route G473 and airspace classification; and other activities.

5.2 The meeting noted information presented by Viet Nam.

Fourth Meeting of Asia/Pacific PBN Implementation Task Force

5.3 The meeting reviewed the outcomes of the fourth meeting of the PBN Task Force (PBN/TF/4, March 2009).

State/Industry Presentation

5.4 Cambodia informed PBN/TF/4 that:

a. Cambodia had no plan for PBN and was still in the process of studying to establish the CNS/ATM Master Plan.

b. PBN would be a part of the CNS/ATM Master Plan, which is being provided under the support of the Japanese government. The Japan International Cooperation Agency (JICA) project is for the Indochina countries, i.e. Cambodia, Laos, and Viet Nam.

c. PBN had been introduced in the aviation industry, however, Cambodia had not introduced the PBN concept to either its staff or at the management level.

d. Cambodia now had a clear picture of the PBN concept after having attended the two day seminar in Osaka, Japan (March 2009).

5.5 China informed PBN/TF/4 that the General Administration of Civil Aviation of China (CAAC) issued the official order to implement PBN in September 2008. It follows the ICAO's guidance, harmonizes with the international standards, and enhances the cooperation with related organizations, manufactures and authorities.

5.6 Japan informed PBN/TF/4 that they started the trial of RNAV in 1992 and introduced RNAV that meets the global standards, first in Asia, in 2007. Japan established the RNAV Road Map based on the ICAO *Performance Based Navigation Manual* in 2007, and updated the Road Map last year in order to accelerate the implementation of RNAV. According to the Road Map, Japan will complete the RNAV implementation for almost all major domestic city-pairs by 2011.

5.6.1 So far, Japan had introduced 91 RNAV 5 routes for en-route, RNAV 1 routes in terminal area for 13 airports and RNAV (GNSS) approach at 15 airports, including RNP approach in four airports. Furthermore, Japan planed to introduce RNAV AR approaches in the near future.

5.7 Philippines informed PBN/TF/4 that the Civil Aviation Administration of the Philippines (CAAP) National Working Group consisted of representatives from CAAP, airline operators and pilot association. It had already had a series of coordination meetings with five major airlines operators. CAAP is still in the planning process for the full implementation of PBN in the Philippines.

5.8 Viet Nam informed PBN/TF/4 that they started drafting national PBN implementation plan harmonizing with the Regional PBN Implementation Plan in 2009.

Task Lists Review

5.9 PBN/TF/4 reviewed both the Regional PBN Implementation Plan Subgroup Task List and the State PBN Implementation Plan Task List from PBN TF/3 (July 2008, Bangkok).

Review of Interim Edition of Regional PBN Plan

5.10 PBN/TF/4 reviewed at length the RASMAG proposals (Version 0.1) and accepted the proposed editorial changes to the Plan. PBN/TF/4 adopted Conclusion 4/04: The APAC PBN Task Force requested that the Interim Edition (V '0.2') of the Regional PBN Implementation Plan be presented at ATM/AIS/SAR/SG/19 for review as required by APANPIRG/19**.** The Version 0.2 of the document is placed at **Appendix E** to this report.

Date and Venue for Next Meeting

5.11 PBN/TF agreed to hold the fifth meeting at ICAO Asia and Pacific Office from 15 – 17 July 2009. PBN/TF/4 agreed to meet twice a year around January and July.

Agenda Item 6: ATS Route Development

Proposals for Establishing and Revising ATS Routes

6.1 Viet Nam summarized the ATS routes being implemented since 2001 as follows:

- the revised ATS route structure applying RNP 10 in the area since November 2001;
- four new domestic routes (W3, W19, W20, W21) and one international route (L644) in January 2005;
- three new international routes (A206, R575 and M755), revised six routes (use of domestic route W1 for international traffic; revised routes W8, R474 and M768; renaming route B465A as B468, and extending route L644 from Con Son Island to Anloc in January 2005;
- New ATS route R471 serving traffic between Hanoi and Kunming, and consequently revised ATS route R474 since April 2008;
- four revised domestic ATS routes (W2, W7, W11, W15) since November 2008.

6.2 Viet Nam also advised that CAAV had developed a comprehensive plan for establishing, revising ATS routes including both of domestic and international routes. CAAV had closely coordinated with Vietnam Airlines, Vietnam Air Navigation Services Corporation, Regional Airport Corporations and respective military agencies in finalizing this plan with various optimum ATS route options. Those routes would aim at reducing flight distance and time, facilitate flight and ATC operations. This programme would be carried out in coordination with the Regional Office, Cambodia, China, Laos, Singapore and Thailand.

6.3 In regard to domestic ATS routes, two new ATS routes W17 and W22, two extended ATS routes W10 and W12, and other revised ATS routes were expected to be implemented in July 2009 to support flight operations of airlines. In regard to international ATS routes, the coordination meetings between CAAV and the State Secretariat of Civil Aviation (SSCA) of Cambodia, Lao DCA and CAAC were convened. Further coordination would take place.

6.4 Viet Nam proposed the establishments and the revisions of the following ATS routes with the target date proposed by Viet Nam of the 3rd or the 4th quarter of 2009;

1) New ATS route B214 Nasan – LADIS (N211330 E1025358) – AKSAG (N204904 E1002716) serving traffic between Ha Noi and Europe. CAAV and Lao DCA had agreed to establish this route.

2) Extension of ATS route B329 from PAKSE to VILAO (N172200, E1060500) – Namha (in the Ha Noi FIR) serving traffic between Ha Noi and Siem Riep/Phnom Penh. CAAV and Lao DCA agreed to establish this route segment.

3) New ATS route R213 Can Tho – Phnom Penh serving future traffic between Can Tho City and Phnom Penh/Bangkok/Vientiane. CAAV and SSCA of Cambodia agreed to establish this route segment.

4) Extension of ATS route R334 Bangkok – Koh Kong to Shihanoukville and Phu Quoc serving future traffic between these cities. CAAV and SSCA agreed to establish this route segment.

5) New RNAV route M756 Tan Son Nhat – ENREP (N045223 E1041440) serving traffic between Ho Chi Minh City and Singapore as well as future traffic between Can Tho City and Singapore. Malaysia, Singapore and Viet Nam are to coordinate.

6) New RNAV route Q15 Cam Ranh – MESOX (N135848 E1130242) within the Ho Chi Minh FIR serving traffic between Ho Chi Minh City and Northeast Asia as well as future international traffic to and from Cam Ranh Airport.

7) Extension of ATS route G221 from BUNTA to Phu Cat within the Ho Chi Minh FIR serving traffic between Ho Chi Minh City/Kuala Lumpur and Hong Kong/Northeast Asia as well as future traffic between Ho Chi Minh City and the Hainan Island. CAAC and CAAV agreed to implement this route segment.

8) ATS route B224 Cat Bi – Nankang serving traffic between Ha Noi/Haiphong and Hong Kong/Northeast Asia. CAAV and CAAC agreed to establish this route.

9) Direct ATS route Vientiane - Siem Riep/Phnom Penh within the Vientiane, Bangkok and Phnom Penh FIRs serving traffic Vientiane and Siem Riep/Phnom Penh/Ho Chi Minh City. Lao DCA and SSCA agree to this route.

6.5 The meeting thanked Viet Nam for the information presented by Viet Nam and listed the proposals as the action items (**Appendix F** to this report) to be followed up. The meeting agreed that Myanmar, Singapore and Malaysia, and Thailand be requested to coordinate closely with Viet Nam to implement the proposals 1), 5) and 9) above, respectively, as early as possible to meet the user requirements.

More Efficient Routings in the South China Sea Airspace

6.6 IATA advised the meeting of four working papers presented at WPAC/SCS RSG/6. The intention of the working papers was to invite States to consider the request to increase the capacity and efficiency of the routes using the existing ground surveillance and airborne capabilities, to generate greater ATM efficiency. Working Papers 5, 9, and 10 presented at WPAC/SCS RSG/6 were brought to the attention of this meeting for discussion.

6.7 IATA said none of the proposals presented required radical re-work of the existing route structure and would require relatively minor adjustments of the current route alignment to enhance capacity, safety, efficiency and/or fuel economy. The alignments proposed were subject to agreement by the States concerned.

6.8 IATA invited the meeting to review the route realignment proposals, considering the benefits in route capacity, greater ATM efficiency, substantial fuel savings and corresponding reduction in CO_2 emissions through relatively minor adjustments.

Efficient Routing for Bangkok/Hong Kong/Pearl River Delta

6.9 IATA informed the meeting that traffic from Bangkok to Hong Kong/Pearl River Delta and Bangkok to Taipei/Japan and beyond was very busy. Major improvements had been achieved in ATM capabilities to cater for the increasing traffic. In particular the surveillance capability in the area concerned has improved to the extent that the entire area between Pearl River Delta and Bangkok is under radar surveillance.

6.10 At SEACG/14 (May 2007, Hanoi), it was agreed that it was entirely feasible to implement radar spacing along some ATS routes. The current enroute longitudinal spacing applied on A1 is 40 NM. This translates to about five minutes between successive aircraft, in a surveillance environment. This should be reviewed as it is neither a surveillance-based nor a procedural separation.

6.11 IATA also suggested that for greater efficiency, a pair of appropriately spaced uni-directional parallel routes be considered, with associated ATC procedures based on surveillance capability. IATA requested States concerned to review the proposal for a unidirectional parallel route structure between Bangkok and Hong Kong.

Realigning L642 and M771

6.12 Regarding L642 and M771, IATA informed the meeting that they were part of the South China Sea parallel unidirectional route structure. They were originally designed to be RNAV routes laterally separated by 60 NM, with convergence of routes occurring within surveillance coverage. However, as a consequence of the improved surveillance and communications they have been upgraded to RNP 10 routes. In fact the surveillance and communications capabilities are now at a level where even RNP4 can be applied.

6.13 Re-aligning L642 and M771 would reduce the route lengths by 10 NM and 14 NM. More than 2 100 flights per month operate on L642 and a similar number on M771. IATA informed the meeting that annual fuel savings were estimated in the region of 12 700 tonnes (5 300 tonnes for L642 and 7 400 tonnes on M771). CO_2 emissions reduction was estimated at 40 000 tonnes.

6.14 In addition to the re-alignment, which would reduce the route lengths, it was IATA's view that the implementation of RNP 4 would increase route capacity by 40 %. As mentioned above, all the requirements for the implementation of RNP4 are already available.

6.15 The meeting noted the fuel and environmental benefits and listed the proposed alignment as an action item for further consideration from the States concerned.

6.16 Hong Kong, China responded that realignment of L642 and M771 would likely to affect operations on adjacent ATS routes such as A1 and P901, and require safety assessment. A more holistic plan acceptable to all and comprehensive concerned parties would need to be worked out.

Realigning Routes in the Kota Kinabalu and the Manila FIRs

6.17 IATA informed the meeting that flights operating to Southeast Asian airports from Los Angeles/San Francisco routing via G467 were required to route from ENDAX (at the Oakland/Manila FIR boundary at N1415.0 E13000.0) to TOKON (N1142.0 E11940.5) via Jomalig (JOM). Flights were also often routed by ATC from ENDAX to Kota Kinabalu (WBKK) via Tacloban (TAC) even though there is no published routing.

6.18 IATA advised the meeting that the routing from ENDAX to TOKON via Jomalig required a detour, which can be eliminated by implementing the direct route or the DILIS (N1431.1

E12600.1) - TOKON route. IATA also requested that the Philippines consider implementing the direct route between ENDAX and Kota Kinabalu via Tacloban, which is currently available on request to ATC. This would allow airlines to flight plan the route. Further, the Philippines was requested to investigate the possibility of implementing three fixed feeding routes to Cotabato (COT) to facilitate westbound flights from the west coast of the USA to Southeast Asia.

6.19 IATA informed the meeting that Manila ACC had recently issued a NOTAM informing users that M772 would no longer be available for flights from Jakarta to Hong Kong for a lengthy period because Manila HF radio was unserviceable. This had resulted in flights having to route via M754, which is 101 NM longer, and caused an additional fuel burn of between 1 500 to 1 600 kg per flight. Accordingly, IATA proposed that an additional route be established to the west of M772 which routes via the Ho Chi Minh and the Sanya FIRs, rather than via the Manila FIR. Moving the route to the west would take advantage of the existing radar and the data link surveillances and VHF communication capability that were available to the west of M772.

6.20 In implementing the change of FLAS in the South China Sea and the adjoining areas, WPAC/SCS RSG had recognised that implementing additional crossing routes would enhance the flight level availability for flights operating across the uni-directional parallel route structure. IATA informed WPAC/SCS RSG that one such crossing route was M768, which is currently allocated No-PDC eastbound flight levels of FLs 270, 330 and 410, and westbound flight levels of FLs 300 and 380.

6.21 IATA suggested that with the establishment of an additional crossing route parallel to M768, a uni-directional flow could be provided. The same flight levels could then be used in both directions. The routes could be merged when they were clear of the parallel route structure. For example, in the easterly direction, the route can merge at MAMOK (N0405.1 E11547.2) to join B583, which has access to eastbound FLs 290. 330, 370 and 410, and westbound FLs 300, 340 and 380. Towards the west, merging could take place at Phnom Penh or beyond.

More Efficient Routings from the Phnom Penh FIR to South China Sea Airspace

6.22 Cambodia invited the meeting to take into consideration the re-alignment of ATS route R575 from LAVAN (N1405.8 E10541.6) direct to probably Danan in the Ho Chi Minh FIR or somewhere on a proposed route parallel to A1 in the Vientiane FIR, in line with the proposed uni-directional route structure of A1.

6.23 In addition to the re-alignment, the extension of ATS route R588 from Pleiku in the Ho Chi Minh FIR direct IDOSI (N1900.0 E11230.0) to connect P901 or any appropriate point was suggested.

6.24 Another proposal was to establish a new route connecting from Shihanouk Ville in the Phnom Penh FIR to Phuquoc (PQ) in the Ho Chi Minh FIR, which is beneficial to the flight operating in/out Sihanouk Ville International Airport. CAAV and SSCA of Cambodia agreed to establish this route segment.

ATS Route Catalogue

6.25 The ATS Route Network Review Task Force (ARNR/TF, disbanded) developed the draft *Asia/Pacific ATS Route Catalogue*, which was accepted by APANPIRG/16 as a regional planning tool, to be maintained and updated on regular basis. Version 1 of the Catalogue was published in August 2005. The most recent Version 5 is available from the ICAO Asia/Pacific web site (http://www.bangkok.icao.int/) under the menu “APAC eDocuments”. On-going updates have been undertaken by the Regional Office based on the information made available by States and airspace users.

6.26 In considering the role of the Catalogue at ARNR/TF/2 (February 2005, Bangkok), it was intended that the Catalogue should be an informal document that consolidates material from the BANP and related documents to serve as an aid to States and users for route planning purposes. As such, the Catalogue does not replace the BANP or provide a basis to be used in an operational context. It is primarily a one stop information document, showing which routes are contained in the BANP, the status of implementation and amendment of routes, and future route requirements of States and users. In considering updating and amendment of the Catalogue, as the document is meant to be an aid to States and should be a living document, its amendment should be kept to an informal level.

6.27 The meeting reviewed and updated the Route Catalogue version 5 as available from the ICAO Asia/Pacific web site (http://www.bangkok.icao.int/).

Agenda Item 7: Development of State Contingency Plan

Development of State Contingency Plan for Singapore FIR

7.1 At APANPIRG/19, Singapore presented a working paper highlighting that the development of State contingency plans would necessarily involve consultative processes between adjacent authorities. Logistically, this could require a large number of multi-lateral meetings between affected States and this process would need to be completed many times across the region during the next few years in order to ensure widespread completion of contingency plans.

7.2 At APANPIRG/19, ICAO and Singapore considered that it would be more efficient if contingency plan meetings involving many States were held under the ICAO umbrella and taking full advantage of ICAO periodic ATS coordination meetings to hold side meetings amongst the States represented to progress contingency plan preparations.

7.3 States could take example from the collaboration that was achieved under the guidance and leadership of ICAO during the development of the Y2K contingency plan in 1999. States should also adopt the ICAO model of the Indonesian National ATM Contingency Plans of Jakarta and Ujung Pandang FIRs. This model serves as an excellent example and the Regional Office had made this available since May 2007 for States in the region to adopt in developing their contingency plan.

7.4 Guided by these models, Singapore developed a draft contingency plan for the Singapore FIR. The Y2K contingency plan contingency route structure in the Singapore FIR is updated to suit the revised South China Sea ATS route structure that has been implemented since 2001. The routes specified in the contingency plan are selected from the established routes where there are high volumes of traffic flows. Considerations also take into account of ensuring sufficient lateral separation between aircraft during the activation of the contingency plan. Where lateral separation is not achievable, specific level assignments are published to ensure that vertical separation is established.

7.5 Along with the establishment of these contingency routes, segments are demarcated to indicate the portions in which the adjacent ATS providers could step in to ensure that international air traffic flow disruptions are minimised. The apportioning of route segments take into account the availability of alternate provisions of air-ground and ground-ground communications as well as some form of surveillance capabilities. The contingency routes, level assignments and portions in which adjacent ATS provider could step in are depicted in Figure 2 below.

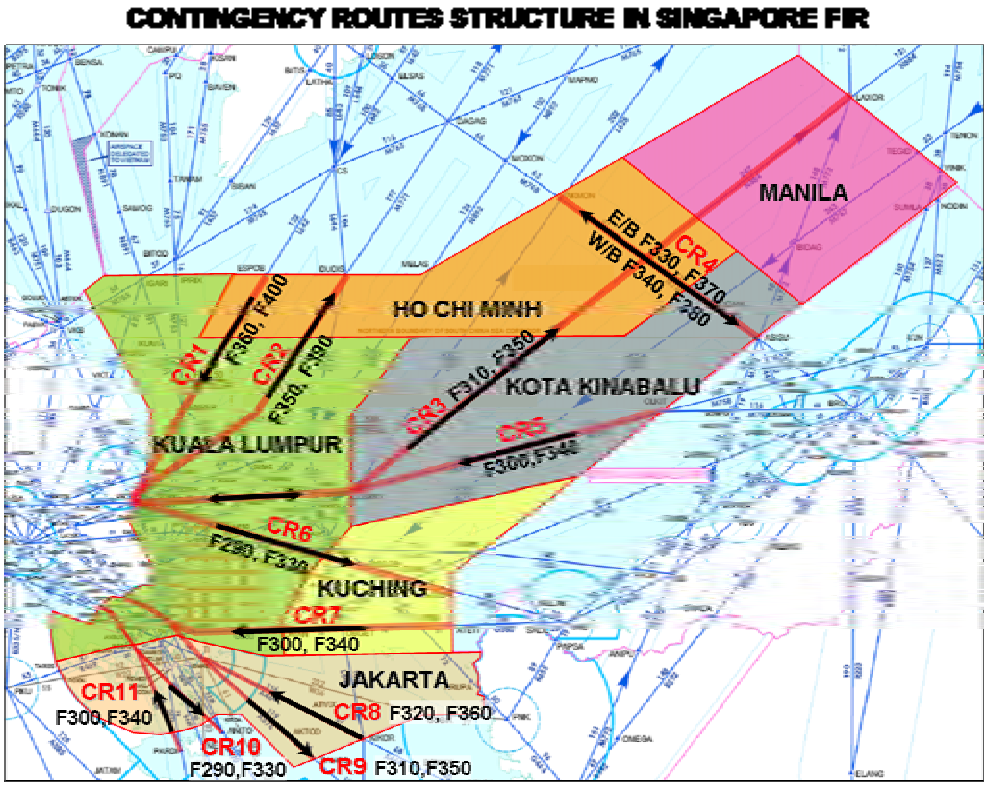


Figure 2: Contingency Routes in Singapore FIR

7.6 In developing the contingency plan for the Singapore FIR, Singapore identified the following key factors that can help States in developing their contingency plan. They are:

(a) identifying the major international traffic flows to ensure minimal disruption;
(b) determining level assignments on the routes to ensure vertical separation; and
(c) demarcating the routes for apportioning to the adjacent ATS providers.

7.7 With the above approach, States can develop their contingency plan as a way forward to collaborating regionally and develop a regional contingency plan. This could eventually assist States in the region to fulfill the ICAO Annex 11 requirements on contingency arrangements.

7.8 The Secretariat recalled that the formulation of the Y2K contingency measures in the event that international air traffic is affected by the rollover to the year 2000 was decided by APANPIRG/9 (August 1998, Bangkok). APANPIRG/9 was of view that the Y2K contingency arrangements should be developed, not only by States, but also on an intra-regional as well as an inter-regional basis, in light of the region-wide nature of the Y2K. Having appreciated the regional effort made for the Y2K, the Secretariat drew to the attention of the meeting that the contingency plans required in Annex 11 – *Air Traffic Services* shall be developed by the State(s) responsible for providing ATS in particular portion of airspace, in the event of disruption of the services, to ensure the safe operations of international air traffic over the high seas. The development of the contingency plans should be progressed by the State(s) based on the particular traffic flow, rather than through the whole regional plan such as the Y2K contingency plan. The Secretariat further clarified that the contingency plans may constitute a temporary deviation from the approved air navigation plans, therefore the plans shall be approved and promulgated according to Annex 11.

7.9 Philippines and Vietnam reported that they were in the process of developing their contingency plans and would approach Singapore for comments when the plans are ready.

7.10 Singapore encouraged the meeting that States take advantage of this opportunity of SEACG to collaborate and make progress on the development of their respective contingency plan.

Agenda Item 8: Civil Military Coordination

Global Air Traffic Management Forum on Civil/Military Cooperation

8.1 The meeting was informed that the Global Air Traffic Management Forum on Civil/Military Cooperation would be held at the ICAO headquarters, Montreal, Canada from 19 to 21 October 2009. The Secretariat distributed brochures inviting to participate in the Forum.

8.2 In follow-up, Japan advised the meeting that a State letter Ref.: AN 13/60-09/23 6 dated 9 April 2009 had been issued as in **Appendix G** to this report.

Agenda Item 9: Develop a Coordinated Plan for Implementation of Actions agreed by the Meeting

9.1 The meeting reviewed and updated the Action Plan as in Appendix G to this report on the basis of discussion made at the meeting.

Agenda Item 10: Any Other Business

Outcomes of the 45th DGCA Conference

10.1 The meeting reviewed the outcomes of the 45th Conference of Directors General of Civil Aviation (DGCAs), Asia and Pacific Region hosted by DCA Malaysia which was held in Kuala Lumpur, Malaysia from 24 – 28 November 2008.

Outcomes of AIS Automation/eTOD Seminar/Workshop

10.2 ICAO AIS Automation/eTOD Seminar/Workshop, graciously hosted by JCAB, MLIT was held in Narita, Japan on 23 and 24 February 2009 in conjunction with AAITF/4. The AIS Automation/eTOD Seminar/Workshop was attended as many as by 160 participants from Australia, Bangladesh, China, Hong Kong China, Fiji, Indonesia, Japan, Malaysia, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, United States, Viet Nam, Eurocontrol, IFALPA and Jeppesen.

AIDC Operational Trial between Japan and the Republic of Korea

10.3 Japan informed the meeting that Japan and the Republic of Korea had been preparing for the implementation of the AIDC operation for a few years. Effective 1500 UTC on 13 May 2009, Fukuoka/Naha/Tokyo ACC and Incheon ACC have just started the operational trial.

10.4 The phased implementation had been introduced, and the meeting noted that in the Phase 1 to 3, the transferring ACC would send verbal transfer messages to the receiving ACC. The receiving ACC would not input the transfer data into the flight plan system to observe whether the AIDC system is operating normally. After a short review, the Phase 4 would be started without verbal transfer. The phases of implementation are as follows:

- Phase 1:From 13 May to 19 May 2009 1500 – 1800 UTC daily (Night time 3 hours)
- Phase 2:From 20 May to 03 June 2009 1100 – 1900 UTC daily (Night time 8 hours)
- Phase 3:From 04 June to 09 June 2009 0000 – 0800 UTC daily (Day time 8 hours)
- Phase 4:From 1500UTC 15 June 2009 to TBD 24 hours daily

10.5 This AIDC operational trial had been started at the same time with concerned ACCs. The AIDC sends the transfer message 30 minutes before the FIR boundary from Korea to Japan/15 minutes before the FIR boundary from Japan to Korea due to some local situations.

10.6 Japan was in the view that AIDC operation would reduce the controllers' workload and transfer errors, increase safety and capability. Japan and Korea would review the results of this operational trial and would discuss the end of it. Then the regular operation would be implemented in the near future.

10.7 The meeting noted the information presented by Japan and congratulated for the successful of the initiative and collaborative from the concerned ANSPs.

Continuous Descent Arrivals (CDA)

10.8 Japan informed the meeting that JCAB had began their initial Continuous Descent Arrivals (CDA) trial to Kansai International Airport (RJBB) from 7th May 2009. The CDA was a descent profile clearance which was cleared via Radio Communication to participating aircraft, currently only Japanese air carriers. The aircraft could then use its Flight Management System (FMS) to fly the most efficient descent to the arrival airport.

10.9 The CDA provided the following savings;

- Reduced fuel burn and CO_2 emissions by having the aircraft fly an optimized descent profile.
- Reduced noise pollution since the aircraft is flying a power off descent.
- Reduced engine wear

10.10 The initial CDA trial would run for a two or three month with only Japanese air carriers. The trial was limited between 23:00JST and 07:00JST when there was very little airport demand.

10.11 A complete CDA was projected to save each flight between 500 pounds (lbs) (B763) and 1,000 pounds (B744) of fuel over the standard arrival profile into RJBB. Due to airport demand, it was not always possible for an aircraft to fly the full CDA. When the arrival demand for the airport increase, aircraft flying the CDA might need to be vectored for arrival spacing, causing the CDA to be terminated. There were, however, still savings to be gained for the aircraft flying partial CDA.

10.12 When developing a CDA, several considerations must be included. The goal was to create a profile that allows the aircraft to fly an engine idle descent to the runway. If the CDA profile contained restrictions that require the aircraft to level off, the aircraft must add power to maintain altitude and the overall fuel savings was reduced. Ideally, the descent profile, when viewed from the side, was a wedge of airspace that keeps the aircraft on a continuous descent. Different factors affected the optimum altitudes at which the aircraft crossed waypoint (fix) on the CDA profile. Those factors included such items as initial altitude, aircraft descent speed, aircraft type, and winds.

10.13 When building the RJBB CDA, the first factors that were considered were minimum en-route altitude (MEA) of these exiting routes. Presently altitude restrictions were only at or above several fixes to much MEA. There were no speed restrictions, but it will be needed for increase full CDA. The procedures applied for RJBB CDA trial was also presented to the Meeting.

10.14 JCAB would continue operational trial for CDA at RJBB only Japanese airlines two (2) or three (3) months for evaluations. After evaluations, CDA would be applied to all aircraft with ETA between 2300JST and 0700JST.

10.15 JCAB would continue study and discuss with airline operators to extend time period at RJBB and possibility to establish for other airports.

10.16 IATA expressed its appreciation to JCAB for the excellent work, which would substantially save fuel and reduce CO_2 emissions, and looked forward to the expansion of CDA to other operators. IATA informed the meeting that DCA Malaysia had also started CDA.

10.17 The Meeting acknowledged the CDA programme and also thanked to Japan in sharing its experiences and urged all ANSPs for further study to introduce CDA procedure at the other airports.

Second Meeting of East Asia ATM Coordination Group

10.18 The meeting was informed by Japan that the second meeting of East Asia ATM Coordination Group (EATMCG/2, September 2008) was held at Okinawa Industry Support Centre, Okinawa, Japan.

10.19 Japan also described that this meeting was sponsored by Air Traffic Control Association Japan (ATCA-J). Thirty experts from civil aviation authorities, air traffic service providers and the International Federation of Air Traffic Controllers' Associations (IFATCA) attended the meeting. The following topics had been discussed at the EATMCG/2.

- Route Structure
- Operational Status
- Large Height Deviation (LHD) Issue
- Traffic Flow Management

10.20 The meeting was also informed of the side meeting being conducted during the meeting on the following topics;

- AIDC implementation between Naha and Tapei ACCs;
- Review FLAS for B348/POTIB and B462/MEVIN;
- Review FLAS for G86/KAPLI; and
- Sharing information for ATFM

Agenda Item 11: Date and Venue for the Next Meeting

11.1 Taking into consideration the number of the papers presented to the recent meetings of SEACG, the meeting agreed that the next meeting could be three day long subsequent to one day FIT-SEA/10.

11.2 The meeting agreed that the next SEACG/17 was tentatively scheduled in May 2010 in conjunction with FIT-SEA/10 in Bangkok, Thailand.

Closing of the meeting

11.2 In closing the meeting, Mr. Kyotaro Harano thanked delegates for the excellent work achieved. He informed the meeting and was very regretful that Mr. Tinnagorn had to step down from the role of chairman because of his commitments in his organization. Mr. Harano expressed appreciation to Mr. Tinnagorn for his four year chairmanship and wished his success in his continuing career.

10.2 In closing, Mr. Tinnagorn thanked all of the efforts that participants had made for the meeting. All the working and information papers had been sent from States and international organizations, and presented to the meeting, showing the initiative from the States and the organizations which are valuable to the meeting. Special thanks went to JCAB who were supporting CRA services for the Southeast Asia region for all the experience that were shared and contributed for the group.

10.3 Mr. Tinnagorn remarked the success of the meeting depended on the mutual cooperation of all of us. He sincere thanked Mr. Kyotaro Harano who play a major role in driving the meeting to the success and the Regional Office which always supports the activities for the region.

APPENDICES TO THE REPORT OF SEACG/16

Flight Level Allocation Scheme (FLAS) for Large Scale Weather Deviations (LSWD) in Western Pacific/South China Sea area

as applicable by

Fukuoka ATMC, Ho Chi Minh, Hong Kong, Kota Kinabalu, Manila, Naha, Sanya, Singapore and Taipei ACCs

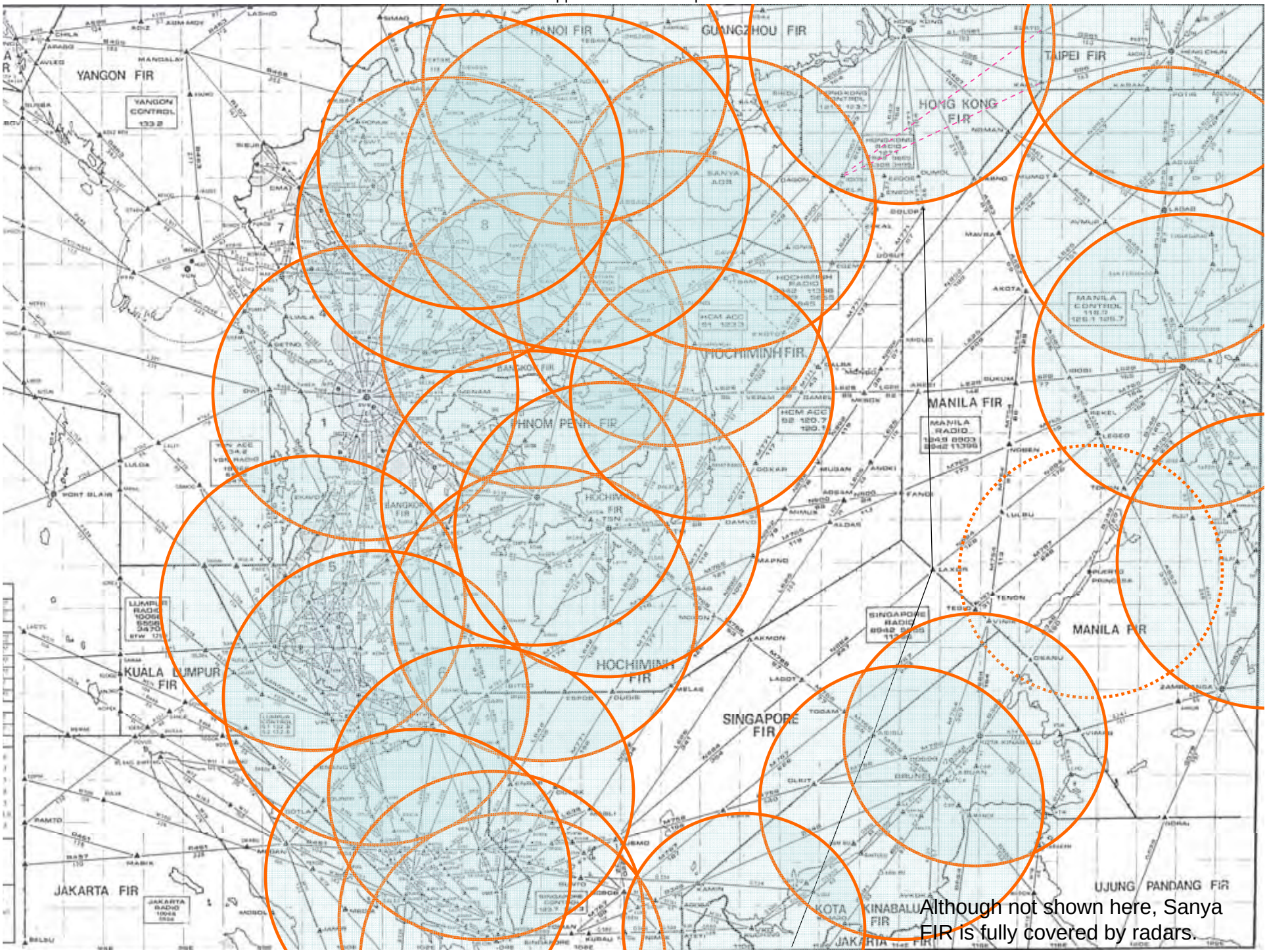
Flight Level Allocation (LSWD)	ATS Route and Direction of Flight										
	N892	**L625**	**N884** *(South of LBG)*	**N884** *(North of CAB)*	**M767**	**A582/B462**		**A590**		**L642**	**M771**
	SW	NE	NE	NE	SW	E	W	E	W	SW	NE
410				410							
400	400				400				400	400	
390		390	390			390		390			390
380							380				
370				370							
360	360				360				360	360	
350		350	350			350		350			350
340							340				
330				330							
320	320				320				320	320	
310		310	310			310		310			310
300							300				
290				290							

Activation conditions:

1) The LSWD procedures will be activated to mitigate effects of widespread adverse weather. Coordination will be conducted in accordance with Operational Letters of Agreement (LOA) between the affected ACCs with the objective of implementing LSWD procedures simultaneously by all ACCs.

2) Activation of LSWD procedures is intended to mitigate situations of potential loss of lateral separation between ATS routes served by the same No-PDC flight levels. For example, this could include situations where 5 or more deviations of more than 10 NM are experienced/anticipated in a 30 minute period and those deviations can not be completed within one FIR.

3) In circumstances where deviations are wholly contained within one FIR, or suitable coordination can be completed between two adjacent FIRs, activation of LSWD procedures may not be necessary.


YANGON FIR
HANOI FIR
GUANGZHOU FIR
TAIPEI FIR
HONG KONG FIR
HOCHIMINH FIR
PHNOM PENH FIR
BANGKOK FIR
MANILA FIR
KUALA LUMPUR FIR
SINGAPORE FIR
JAKARTA FIR
UJUNG PANDANG FIR
KOTA KINABALU FIR
Although not shown here, Sanya FIR is fully covered by radars.

SEACG/16

Appendix C to the Report

Status of Application of Radar Handover in South East Asia

Yes: Implemented
No: Not Implemented
N/A: Not Applicable (radar converages not overlap,thus impossbile)

FIR	Bangkok	Guangzhou	Hanoi	Ho Chi Minh	Hong Kong	Jakarta	Kota Kinabalu	Kuala Lumpur	Manila	Fukuoka	Phnom Penh	Sanya	Singapore	Taibei	Ujung Pandang	Vientiane
Bangkok		N/A	N/A	~~YES~~N/A	N/A	N/A	N/A	YES	N/A	N/A	YES	N/A	N/A	N/A	N/A	YES
Guangzhou	N/A		YES	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A	TBD	N/A	N/A	N/A	N/A
Hanoi	N/A	YES		YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	YES	N/A	N/A	N/A	YES
Ho Chi Minh	~~YES~~N/A	N/A	YES		N/A	N/A	N/A	N/A	N/A	N/A	YES	YES	N/A	N/A	N/A	YES
Hong Kong	N/A	NO	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	NO	N/A	YES	N/A	N/A
Jakarta	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	NO	N/A	N/A	N/A
Kota Kinabalu	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kuala Lumpur	YES	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	YES	N/A	N/A	N/A
Manila	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	~~NO~~YES	N/A	N/A
Fukuoka	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	YES	N/A	N/A
Phnom Penh	YES	N/A	N/A	YES	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	YES
Sanya	N/A	NO	YES	YES	NO	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A
Singapore	N/A	N/A	N/A	N/A	N/A	NO	N/A	YES	N/A	N/A	N/A	N/A		N/A	N/A	N/A
Taibei	N/A	N/A	N/A	N/A	YES	N/A	N/A	N/A	~~NO~~YES	YES	N/A	N/A	N/A		N/A	N/A
Ujung Pandang	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A
Vientiane	YES	N/A	YES	YES	N/A	N/A	N/A	N/A	N/A	N/A	YES	N/A	N/A	N/A	N/A	

INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE

DRAFT

AIR TRAFFIC FLOW MANAGEMENT (ATFM) COMMUNICATIONS HANDBOOK FOR THE ASIA PACIFIC REGION

Version 0.2 – November 2008

Issued by the ICAO Asia/Pacific Regional Office, Bangkok

FOREWORD

Centralized air traffic flow management (ATFM) facilities are best able to communicate the capacity of their national airspace systems to accept traffic from adjacent international air traffic service (ATS) providers. As coordination and collaboration efforts to balance traffic demand and airspace/airport capacity intensify between affected States, common ATFM procedures and communication are essential. Once procedures are defined, a key element in removing language barriers is establishing common terms and phrases. Terminology and phraseology differences in the operational application of ATFM procedures could be a potential source of confusion during communications, both written and verbal, between international ATFM facilities.

Common terminology is an essential element in exchanging definitive, clear, and concise communication between international ATFM facilities. Likewise, the phraseology should follow a technical pattern for the exchange of standardized and harmonized messages. This Asia/Pacific guidance material is intended to support States in meeting these objectives and has been adopted by APANPIRG/xx, under the terms of Conclusion xx/Xx, for this purpose. As this is the first document of its kind for the region, APANPIRG noted that further development and amendment was likely. However, it is expected that the guidance herein will be equally applicable to both verbal ATFM coordination exchanges and as the basis for written ATFM messages. Although the terminologies and phraseologies presented herein are not intended to be a requirement for ATFM communications, they are recommended to States as guidelines for the exchange of ATFM messages.

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Appendix 1: Examples of Air Traffic Flow Management Operational Initiatives…… A1-1

Appendix 2: Sample Table of Abbreviations…… A2-1

1. Introduction

1.1 ATFM is a function of air traffic management (ATM) established with the objective of contributing to a safe, orderly, and expeditious flow of traffic while minimizing delays. This is accomplished through the dynamic use of operational traffic management initiatives supported by continuous coordination and analysis.

1.2 The purpose of ATFM is to balance air traffic demand with airspace and/or airport capacity to ensure the most efficient use of the airspace system. This is achieved by ensuring that capacity is utilized to the maximum extent possible and that air traffic volumes are compatible with the capacities declared by the appropriate air navigation service providers.

1.3 ATFM implementation should provide for the organization and handling of the flow of air traffic in such a way that, while ensuring the safe, orderly and expeditious flight of individual aircraft, the totality of the traffic handled at any given point or in any given area is compatible with the capacity of the air traffic control system.

1.4 The operation of ATFM service includes the application of ATFM measures that are designed to achieve the optimum flow of traffic. These measures include, but are not limited to:

a) Allocating and updating departure slots;
b) Allocating and updating arrival slots;
c) Allocating and updating en-route slots;
d) Re-routing of traffic;
e) Alternate flight profiles;
f) Minutes-in-trail assignments;
g) Mile-in-trail assignments;
h) Airborne holding; and
i) Ground holding.

1.5 Inherent in the provision of an ATFM service is the necessity to coordinate arrangements clearly and accurately between ATC units. In most instances this is achieved via voice coordination between operatives in the respective units, however many occasions also require written messaging to support implementation of ATFM operational initiatives. Accordingly, efficient and effective written and verbal communication using standardized and documented terminologies and phraseologies is essential.

2. General

2.1 The primary goal of this guidance material is to promulgate appropriate terminologies and phraseologies for the exchange of written and verbal ATFM messages between units providing ATFM services, both within States and between States. The terminologies and phraseologies contained herein are intended to reflect the current use of plain language and provide a basis for regional standardization and harmonization.

2.2 Although there are various plain language words and phrases in use today by ATFM service providers, these words and phrases are all capable of being organized into a modular and structured method of delivery to ensure the harmonization of communications and reduce the incidence of misunderstanding between units providing ATFM services.

2.3 It is not the intent of these guidelines to provide detailed information on ATFM concepts, procedures, and initiatives; however, since not all readers may be familiar with ATFM terms used in the examples, a brief description of ATFM operational initiatives is provided at **Appendix 1**. The list is not all-inclusive and does not preclude the innovation and application of other procedures that will result in improved ATFM services.

3. Modular and Structured ATFM messages

3.1 The use of a modular and structured ATFM message provides for consistent ATFM message design and delivery. Each component of the ATFM message can contain plain language elements that, when combined, provide a complete ATFM message. Harmonization is achieved by the delivery of an ATFM message that has all of the required components in a structured format while making allowances for different plain language elements. This is of particular benefit for ATFM service providers that use different ATFM terminology or for non-native English speaking ATFM service providers.

3.2 This guidance material promulgates the concept of modular and structured ATFM messages as the basis for written and verbal ATFM coordination and defines an ATFM message in terms of five modules – the "Who", "What", "Where", "When" and "Why" of the ATFM communication. These five modules are described as follows:

a) **Who:** The ATFM service unit being contacted followed by the ATFM service unit that is initiating the contact;

b) **What:** The ATFM objective to be achieved;

c) **Where:** The location of the ATFM objective to be achieved;

d) **When:** The time and/or duration of the ATFM objective to be achieved; and

e) **Why:** The reason for the ATFM objective.

3.3 There is no module regarding "How" the ATFM restrictions should be achieved by the counterpart ATFM service provider. This is because it is clearly the counterpart's responsibility "how" they fulfill the ATFM restrictions within their airspace. However, the ATC unit being asked

to implement ATFM restrictions may collaborate with the originating ATC unit on the type and method of ATFM measure to be applied.

3.4 Generally speaking, ATFM service providers should resolve demand-capacity related constraints by initiating local and/or national ATFM initiatives first. Hence, ATFM operational initiatives will be requested by an adjacent international ATFM facility only when national measures are exhausted and therefore compliance should be considered highly necessary. Accordingly, once information is exchanged regarding an ATFM initiative and an action is agreed, application of the ATFM operational initiative is considered MANDATORY. Importantly, it should be noted that a critical situation at the receiving ATC unit could require imposition of an ATFM restriction without any option of non compliance by the transferring ATC unit.

3.5 Below are the examples of possible ATFM messages:

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC … REQUIRE 100 MILES IN TRAIL REGARDLESS OF FLIGHT LEVEL ON R220, R580 AND ALL PACOTS TRACKS FOR TRAFFIC LANDING NARITA ESTIMATING FIR BOUNDARY FROM 0100 UTC UNTIL 0500 UTC DUE TO SEVERE WEATHER".

- "FUKUOKA ATMC, THIS IS FAA COMMAND CENTER… CAPACITY RESTRICTION: LOS ANGELES HAS STARTED FLOW RESTRICTIONS FOR ALL AIRCRAFT LANDING LOS ANGELES DUE TO EARTHQUAKE. LOS ANGELES APPROACH IS UNABLE TO ACCEPT INBOUND TRAFFIC UNTIL FURTHER NOTICE".

4. ATFM Message Components

4.1 As the modular and structured ATFM message may contain several different elements of plain language, this section will examine each of the five components and detail some of the possible plain language words and phrases that are in use today.

The WHO Component

4.2 The 'WHO' component identifies the ATFM service unit being contacted followed by the ATFM service unit that is initiating the contact. ATFM units will be addressed by name until ICAO Annex 10 – *Aeronautical Telecommunications* is amended to incorporate appropriate ATFM unit identifiers. Examples of the 'WHO' component include:

- "FUKUOKA ATMC, THIS IS FAA COMMAND CENTER…"
- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC…"

The WHAT Component

4.3 The 'WHAT' component identifies the ATFM objective to be achieved. The 'WHAT' component may also be used to provide ATFM information. Objectives include, but are not limited to:

- "REQUIRE (number) MILES (or MINUTES) IN TRAIL AT THE SAME FLIGHT LEVEL";

- "REQUEST (number) MILES (or MINUTES) IN TRAIL REGARDLESS OF FLIGHT LEVEL";
- "REQUEST A RATE OF LESS THAN (number) AIRCRAFT PER HOUR";
- "FLIGHT LEVELS (number) AND (number) NOT AVAILABLE";
- "ONLY FLIGHT LEVELS (number), (number) AND (number) ARE AVAILABLE";
- "(route/airport/airspace) NOT AVAILABLE DUE (reason) ALTERNATIVE[S] IS/ARE (routes/airports)".

The WHERE Component

4.4 The 'WHERE' component represents the location of the ATFM objective to be achieved. It is often preceded by a modifying clause, indicating which aircraft or group of aircraft the restriction will apply to. The modifying clause and the location combination are used to construct the 'WHERE' component. Examples of which aircraft or group of aircraft are to be restricted include:

- "FOR ALL AIRCRAFT…"
- "FOR TRAFFIC FASTER THAN 300 KNOTS…"
- "FOR HEAVY AIRCRAFT…"
- "FOR TRAFFIC LANDING…"
- "FOR AIRCRAFT DEPARTING…"
- "FOR TRAFFIC OVERFLYING…"
- "FOR AIRCRAFT PASSING…"

4.5 Examples of location include:

- "AT NIPPI…"
- "ON A337…"
- "WESTBOUND ON PACOTS TRACK CHARLIE…"
- "INBOUND ON G344…"
- "ON PACOTS TRACK 2 LANDING SAN FRANCISCO AIRPORT…"
- "ABOVE FLIGHT LEVEL 300…"

4.6 In practice the modifying clause and the location are combined into one ATFM message, for example*:*

- "FOR ALL AIRCRAFT WESTBOUND ON PACOTS TRACK CHARLIE…"

The WHEN Component

4.7 The 'WHEN' component represents the time and/or duration of the ATFM objective to be achieved:

- "[FROM (time)] UNTIL (time)".

4.8 Examples of time/duration include:

- "FROM 0300 UTC UNTIL 0600 UTC…"
- "FROM NOW UNTIL 0600 UTC…"

- "FROM 2300 UTC UNTIL FURTHER NOTICE…"
- "UNTIL FURTHER NOTICE…"

The WHY Component

4.9 The 'WHY' component represents the reason for the ATFM objective:

- "DUE TO (reason)";
- "FOR (reason)".

4.10 Examples of reasons include:

- "DUE TO RUNWAY CLOSURE"
- "FOR (SEVERE) WEATHER"
- "DUE TO COMMUNICATION FAILURE"
- "DUE TO (significant event/natural disturbance such as FIRE or VOLCANIC ASH)"
- "FOR STATE AIRCRAFT ACTIVITY"
- "DUE TO EQUIPMENT OUTAGE"
- "FOR EMERGENCY"
- "DUE TO ATFM INITIATIVES IN (location)"

5. ATFM Message Types

5.1 ATFM messages can be readily categorized by identifying the primary objective to be achieved by each type of message. This section describes a number of ATFM message types and their application in achieving particular objectives.

Messages containing information to be shared prior to commencing ATFM restrictions

5.2 ATFM related information-sharing should be facilitated not only during the actual flow control but also (and more importantly) well prior to invoking the ATFM restrictions when the possibility of flow control arises. The following phrases will make clear the distinction between the ATFM messages and the information provided for situational awareness:

- "POSSIBLE TRAFFIC FLOW RESTRICTIONS";
- "CAPACITY RELATED INFORMATION".

5.3 Examples of messages sent prior to invoking ATFM restrictions follow:

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC… **POSSIBLE TRAFFIC FLOW RESTRICTIONS**… NARITA AIRPORT HAS CLOSED ONE RUNWAY AND STARTED SNOW REMOVAL".

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC… **CAPACITY RELATED INFORMATION**…NARITA AIRPORT HAS ENTERED THE STORM ZONE OF THE TYPHOON".

ATFM Operational Initiative Messages

5.4 ATFM operational initiatives communicate air traffic flow restrictions/objectives from one air navigation service provider to another. They follow the five module structure described earlier:

a) Who: The ATFM service unit being contacted followed by the ATFM service unit that is initiating the contact.

b) What: The ATFM objective to be achieved.

c) Where: The location of the ATFM objective to be achieved.

d) When: The time and/or duration of the ATFM objective to be achieved.

e) Why: The reason for the ATFM objective.

5.5 Examples of ATFM operational initiatives include:

- "FUKUOKA ATMC, THIS IS FAA COMMAND CENTER … REQUIRE 30 MINUTES IN TRAIL AT THE SAME FLIGHT LEVEL FOR ALL AIRCRAFT LANDING CHICAGO FROM 0800 UTC UNTIL FURTHER NOTICE DUE TO STATE AIRCRAFT ACTIVITIES".

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC… FL350 AND BELOW NOT AVAILABLE FOR AIRCRAFT OVERFLYING JAPANESE DOMESTIC AIRSPACE UNTIL 0900 UTC DUE TO EMERGENCY".

Reply to ATFM Operational Initiative Messages

5.6 The following phrases will be used for replying to ATFM initiative messages:

- "ACCEPT (operational initiative)";
- "AGREED TO (operational initiative)";
- "(operational initiative) IS ACCEPTABLE [DEPENDS ON THE DEMAND] (other pertinent information, if any)";
- "UNABLE (operational initiative) [DUE (reason)] (alternative proposed)".

5.7 Examples of replying to ATFM operational initiatives follow:

- "**AGREE TO** 30 MINUTES IN TRAIL AT THE SAME FLIGHT LEVEL ON PACOTS TRACKS 2 AND 3 FROM 1000 UTC UNTIL 1500 UTC".

- "**UNABLE TO** ACCEPT THE RESTRICTION FROM 1430 UTC DUE TO TRAFFIC VOLUME ON A590 UNTIL 1530 UTC, **PROPOSE** COMMENCE RESTRICTION FROM 1530".

Messages for the coordination of aircraft exempted from ATFM operational initiatives:

5.8 The following types of aircraft may be exempted from ATFM restrictions:

a) Aircraft in a state of emergency
b) Aircraft engaged in search and rescue missions
c) Aircraft operating for humanitarian reasons
d) Aircraft carrying the head of State or distinguished visitors of State
e) Aircraft carrying a patient who needs urgent medical treatment

5.9 The following phrases will be used for the coordination of aircraft which are exempt from ATFM restrictions:

- "REQUEST EXEMPTION FROM ATFM FOR (aircraft identification) [DUE (reason)]";
- "COORDINATION OF ATFM EXEMPTION FOR (aircraft identification) [DUE (reason)]".

5.10 Examples of messages requesting ATFM exemption follow:

- "FUKUOKA ATMC, THIS IS FAA COMMAND CENTER… **REQUEST EXEMPTION FROM ATFM**…UAL123 DUE PATIENT WHO NEEDS URGENT MEDICAL TREATMENT".

- "UAL123…EXEMPTION APPROVED".

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC… **COORDINATION OF ATFM EXEMPTION**… JA501A DUE OPERATING SEARCH AND RESCUE MISSIONS".

Messages providing information for the next coordination

5.11 If it is possible and appropriate, the expected time of next coordination should be forwarded with the ATFM messages:

- "I WILL CALL YOU AT (time) FOR FURTHER COORDINATION".

5.12 An example of a message with information for the next coordination follows:

- "FUKUOKA ATMC, THIS IS FAA COMMAND CENTER… REQUIRE 30 MINUTES IN TRAIL REGARDLESS OF FLIGHT LEVEL FOR ALL AIRCRAFT ON PACOTS TRACK 8 FROM 1000 UTC UNTIL FURTHER NOTICE DUE TO MILITARY ACTIVITY. **I WILL CALL YOU AGAIN AT 1100 UTC FOR FURTHER COORDINATION".**

Amendment Messages

5.13 The amendment of an ATFM message should be structured in a similar way to the initial message and include similar elements but with additional modifiers. These modifiers may include:

a) CHANGE
b) AMEND
c) REDUCE
d) INCREASE
e) DECREASE

5.14 Amendment messages should also identify which message is being amended, as several restrictions could be in place at one time. Examples of ATFM amendment messages include:

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC… WE HAVE **CHANGED** THE RESTRICTION ON TRAFFIC FLYING PACOTS TRACKS CHARLIE, ECHO AND FOXTROT FOR NARITA AIRPORT. WE NOW NEED 20 MINUTES IN TRAIL AT THE SAME FLIGHT LEVEL ON PACOTS TRACKS CHARLIE, ECHO AND FOXTROT FOR TRAFFIC LANDING NARITA FROM NOW UNTIL 0900 UTC".

- "FUKUOKA ATMC, THIS IS FAA COMMAND CENTER…WE HAVE **INCREASED** THE INBOUND RATE FROM 5 AIRCRAFT PER HOUR TO 10 AIRCRAFT PER HOUR FOR TRAFFIC BEYOND OAKLAND FIR UNTIL FURTHER NOTICE".

Cancellation Messages

5.15 The cancellation of an ATFM message should be structured in a similar way to the initial message and include similar elements but also contain a canceling word or phrase. It is normally not necessary to state the reason for the cancellation. A canceling word or phrase may include:

a) CANCEL
b) RESUME
c) RESUME NORMAL
d) RELEASE

5.16 Cancellation messages should also identify which message is being cancelled, as several restrictions could be in place at one time. An example of an ATFM cancellation message follows:

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC… **CANCEL** THE RESTRICTION ON TRAFFIC BEYOND THE FUKUOKA FIR AT THIS TIME. **RESUME NORMAL** TRAFFIC FLOW".

6. Active Listening

6.1 Although written ATFM messaging is able to be read and re-read to ensure understanding, because of the variety of ATFM information that may be exchanged verbally and the inability to prescribe phraseologies for every situation that will be encountered, **active listening** is encouraged. Active listening is a structured form of listening and responding that focuses the attention on the speaker. The listener must take care to attend to the speaker fully, and then repeats, in the listener's own words, what he or she thinks the speaker has said. The listener does not have to agree with the speaker; he or she must simply state what they think the speaker said. This enables the speaker to find out whether the listener really understood. If the listener did not understand, the speaker can explain further. Once the speaker and listener are clear as to the message, the listener should respond with agreement, acceptance or disagreement.

6.2 Active listening has several benefits. First, it forces people to listen attentively to others. Second, it avoids misunderstandings, as people have to confirm that they do really understand what another person has said.

7. Abbreviations

7.1 **Appendix 2** provides a sample list of abbreviations used that are not defined in the ICAO Doc. 8400 (PANS-ABC). Neighboring ATFM facilities may wish to develop a similar list of abbreviations which are frequently used in ATFM communications, and include them in a letter of agreement.

Appendix 1

EXAMPLES OF AIR TRAFFIC FLOW MANAGEMENT OPERATIONAL INITIATIVES

The following list contains the ATFM operational initiatives presently utilized by the United States Federal Aviation Administration. The list is provided for example purposes, it is not all-inclusive and does not preclude the innovation and application of other procedures that will result in improved ATFM service delivery.

Name	Description
Airborne holding	Planned holding of aircraft may be utilized. This is normally done when the operating environment supports holding and the weather conditions are expected to improve shortly; this ensures aircraft are available to fill the capacity at the airport.
Altitude	Utilized to segregate different flows of traffic, or to distribute the number of aircraft requesting access to a specified geographic region. ***a) Capping:*** Term used to indicate aircraft will be cleared to an altitude lower than their requested altitude until they are clear of a particular airspace. Capping may apply to the initial segment of the flight or for the entire flight. ***b) Tunneling:*** Term used to indicate traffic will be descended prior to the normal descent point at the arrival airport to remain clear of an airspace situation; e.g., holding.
Fix balancing	Assigning an aircraft a fix other than that in the filed flight plan in the arrival or departure phase of flight to equitably distribute demand.
Ground delay programs (GDP)	Aircraft are held on the ground in order prior to departure to manage capacity and demand at a specific downstream location. The purpose of the program is to limit airborne holding.
Ground stops (GS)	GS is a process that requires aircraft that meet specific criteria to remain on the ground. Since this is one of the most restrictive methods of traffic management, alternative initiatives should be explored and implemented if appropriate. GSs should be used: a) In severely reduced capacity situations (below most user arrival minimums, airport/runway closed for snow removal, or aircraft accidents/incidents); b) To preclude extended periods of airborne holding; c) To preclude sector/center reaching near saturation levels or airport grid lock; d) In the event a facility is unable or partially unable to provide ATC services due to unforeseen circumstances; and e) When routings are unavailable due to severe weather or catastrophic events.

Name	Description
Miles-in-trail (MIT)	The number of miles required between aircraft that meet a specific criteria. The criteria may be separation, airport, fix, altitude, sector, or route specific. MIT are used to apportion traffic into manageable flows, as well as to provide space for additional traffic (merging or departing) to enter the flow of traffic.
Minutes-in-trail (MINIT)	The number of minutes required between successive aircraft. It is normally used in a non-radar environment, or when transitioning to a non-radar environment, or when additional spacing is required due to aircraft deviating around weather.
Reroutes	Reroutes are ATC routings other than the filed flight plan. They are issued to: a) Ensure aircraft operate with the "flow" of traffic. b) Remain clear of special use airspace. c) Avoid congested airspace. d) Avoid areas of known weather where aircraft are deviating or refusing to fly.
Sequencing programs	These programs are designed to achieve a specified interval between aircraft; they may be software generated or determined by ATFM personnel. Different types of programs accommodate different phases of flight. ***a) Departure Sequencing Program (DSP):*** Assigns a departure time to achieve a constant flow of traffic over a common point. Normally, this involves departures from multiple airports. ***b) En route Sequencing Program (ESP):*** Assigns a departure time that will facilitate integration in the en route stream. ***c) Arrival Sequencing Program (ASP):*** Assigns fix crossing times to aircraft destined to the same airport.

Appendix 2

SAMPLE TABLE OF ABBREVIATIONS

The abbreviations listed here are those used by the FAA Command Centre (ATCSCC) and Fukuoka ATMC respectively that are not defined in the ICAO Doc. 8400 (PANS-ABC), and are provided only as examples. The shaded abbreviations are considered to be the common terms between the two centers.

ABBREVIATION	ATCSCC MEANING	ATMC MEANING
AAR	Airport Acceptance Rate	
ACID	Aircraft Identification	
ADL	Aggregate Demand List	
ADR	Airport Departure Rate	
ADZY	Advisory	
AIM	Aeronautical Information Manual	
ALTRV	Altitude Reservation	Altitude Reservation
ANP	Air Navigation Plan	
AOA	Office of the Administrator	
AOC	Airline Operations Center	
AP	Air Patrol	
APREQ	Approval Request	Approval Request
APVL	Approval	Approval
ARO	Airport Reservation Office	
ARTCC	Air Route Traffic Control Center	Air Route Traffic Control Center
ASM		Airspace Management
AT	Air Traffic	
ATCSCC	Air Traffic Control System Command Center	Air Traffic Control System Command Center
ATMC	Air Traffic Management Center	Air Traffic Management Center
ATMetC		Air Traffic Meteorological Center
ATO	Air Traffic Operations Program	
AUTODIN	Automatic Digital Network	
CARF	Central Altitude Reservation Function	
CCFP	Collaborative Convective Forecast Product	
CCWSU	Command Center Weather Service Unit	
CDM	Collaborative Decision Making	Collaborative Decision Making
CDR	Coded Departure Route(s)	Conditional Route
CDR	Continuous Data Recording	
CDT	Controlled Departure Time	

ABBREVIATION	ATCSCC MEANING	ATMC MEANING
CFR	Code of Federal Regulations (formerly FAR)	
CIWS	Corridor Integrated Weather System	
COMSEC	Communications Security System	
CR	Collaborative Routing	
CT	Select Flights Ground Delay Program	
CTA	Controlled Time of Arrival	
CTAS-TMA	Center TRACON Automation System Traffic Management Advisor	
CVRS	Computerized Voice Reservation System	
CWA	Central Weather Advisory	
CWSU	Center Weather Service Unit	
DARC	Direct Access Radar Channel	
DCCWU	ATCSCC Weather Unit	
DOTS	Dynamic Ocean Track System	Dynamic Ocean Track System
DP	Departure Procedure	
DSP	Departure Sequencing Program	
EDCT	Expected Departure Clearance Time	Expected Departure Clearance Time
EFAS	Enroute Flight Advisory Service	
EFTO	Encrypt For Transmission Only	
EOF	Emergency Operations Facility	
EOR	Emergency Operations Room	
EPS	Engineered Performance Standards	
ESCAT	Emergency Security Control of Air Traffic	
ETE	Estimated Time Enroute	Estimated Time Enroute
ETMS	Enhanced Traffic Management System	
EUCARF	European Central Altitude Reservation Facility	
FA	General Ground Delay Program	
FAA	Federal Aviation Administration	Federal Aviation Administration
FADT	Fuel Advisory Delay Time	
FCA	Flow Constrained Area	
FDMS		Flight Data Management System
FDPS		Flight Data Processing Section
FEA	Flow Evaluation Area	
FP	Flight Plan	
FPL	Full Performance Level	

ABBREVIATION	ATCSCC MEANING	ATMC MEANING
GA	General Aviation	
GAAP	General Aviation Airport Program	
GDP	Ground Delay Program	
GS	Ground Stop	
HARS	High Altitude Route System	
HDTA	High Density Traffic Airport	
IFCN	Interfacility Communication Network	
IFPFP	Individual Flight Plan From this Point	Individual Flight Plan From this Point
IFSS	International Flight Service Station	
INATS	Interruption of Air Traffic Service	
JCAB	Japan Civil Aviation Bureau	Japan Civil Aviation Bureau
LAA	Local Airport Advisory	
LADP	Local Airport Deicing Plan	
LOA	Letter of Agreement	Letter of Agreement
MAP	Monitor Alert Parameter	
MARSA	Military Assumes Responsibility for Separation of Aircraft	Military Assumes Responsibility for Separation of Aircraft
MEL	Minimum Equipment List	
MINIT	Minutes in Trail	
MIT	Miles in Trail	
MOS	Military Operations Specialist	
MTSAT	Multi-functional Transport Satellite	Multi-functional Transport Satellite
MVFR	Marginal Visual Flight Rules	
NADIN	National Airspace Data Interchange Network	
NAS	National Airspace System	
NAVAID	Navigational Aid	Navigation Aid
NFDC	National Flight Data Center	
NMCC	National Maintenance Coordination Center	
NOAA	National Oceanic and Atmospheric Administration	
NOM	National Operations Manager	
NOPAC	North Pacific	North Pacific
NOS	National Oceanographic Service	
NRP	National Route Program	
NTMO	National Traffic Management Officer	
NWS	National Weather Service	

ABBREVIATION	ATCSCC MEANING	ATMC MEANING
OAG	Official Airline Guide	
ODP		Oceanic Air Traffic Control Data Processing System
OPSNET	Operations Network	
OTG		Oceanic Track Generator
OTR		Oceanic Transition Route
PACMARF	Pacific Military Altitude Reservation Facility	Pacific Military Altitude Reservation Function
PACOTS	Pacific Organized Track System	Pacific Organized Track System
PMTC	Pacific Missile Test Center	
PO	Plan of Operation	
Pref Route	Preferential Route	
PT	Planning Team	
RA	Route Advisory	
RAA	Remote Airport Advisory	
ROT	Runway Occupancy Time	
SAA	Special Activity Airspace	
SOP	Standard Operating Procedure	
STMP	Special Traffic Management Program	
SUA	Special Use Airspace	
SVRW	Severe Weather	
SWAP	Severe Weather Avoidance Program	
TEC	Tower-Enroute Control	
TELCON	Telephone Conference	
TFM	Traffic Flow Management	
TIS	Traffic Information System	
TMC	Traffic Management Coordinator	Traffic Management Coordinator
TMCIC	Traffic Management Coordinator in Charge	
TMI	Traffic Management Initiative	
TMU	Traffic Management Unit	Traffic Management Unit
TSTM	Thunderstorm	
WSO	Weather Service Office	

INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE

ASIA/PACIFIC REGIONAL PERFORMANCE-BASED NAVIGATION IMPLEMENTATION PLAN

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ASIA/PACIFIC REGIONAL PERFORMANCE-BASED NAVIGATION IMPLEMENTATION PLAN

1. Executive Summary

1.1 This Asia/Pacific Regional PBN Implementation Plan has been produced in line with Resolution A 36/23 adopted by ICAO Assembly in its 36th Session held in September 2007 and Conclusion 18/52 adopted by APANPIRG/18. The Regional PBN Plan addresses the strategic objectives for PBN implementation based on clearly established operational requirements, avoiding equipage of multiple on-board or ground based equipment, avoidance of multiple airworthiness and operational approvals and explains in detail contents relating to potential navigation applications. The Plan envisages the conduct of pre- and post-implementation safety assessments and continued availability of conventional air navigation procedures during transition. The Plan also discusses issues related to implementation which include traffic forecasts, aircraft fleet readiness, adequacy of ground-based CNS infrastructure etc. Implementation targets for various categories of airspace for the short term (2008 – 2012) and for the medium term (2013 – 2016) have been projected in tabular forms to facilitate easy reference. For the long term (2016 and beyond) it has been envisaged that GNSS will be the primary navigation infrastructure. It is also expected that precision approach capability using GNSS and its augmentation system will become available in the long term.

2. Explanation of Terms

2.1 The drafting and explanation of this document is based on the understanding of some particular terms and expressions that are described below:

2.1.1 **Asia/Pacific Regional PBN Implementation Plan.** A document adopted by APANPIRG, often referred to as the "Regional PBN Plan", offering appropriate guidance for air navigation service providers, airspace operators and users, regulating agencies, and international organizations on the evolution of navigation capabilities as one of the key systems supporting air traffic management, and which describes the RNAV and RNP navigation applications that should be implemented in the short, medium and long term in the APAC Region.

2.1.2 **Performance Based Navigation** Performance based navigation specifies RNAV and RNP system performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in an airspace.

2.1.3 **Performance requirements.** Performance requirements are defined in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept. Performance requirements are identified in navigation specifications which also identify which navigation sensors and equipment may be used to meet the performance requirement.

3. Acronyms

3.1 The acronyms used in this document along with their expansions are given in the following list

ABAS	Aircraft-Based Augmentation System
AIS	Aeronautical Information Services
APAC	Asia and Pacific
APANPIRG	Asia/Pacific Air Navigation Planning and Implementation Regional Group
APCH	Approach
APV	Approach Procedures with Vertical Guidance
ATC	Air Traffic Control
Baro VNAV	Barometric Vertical Navigation
CNS/ATM	Communication Navigation Surveillance/Air Traffic Management

CPDLC	Controller Pilot Data Link Communications
DME	Distance Measuring Equipment
EMA	En-route Monitoring Agency
FASID	Facilities and Services Implementation Document
FIR	Flight Information Region
FMS	Flight Management System
GBAS	Ground-Based Augmentation System
GNSS	Global Navigation Satellite System
GRAS	Ground-based Regional Augmentation System
IATA	International Air Transport Association
IFALPA	International Federation of Air Line Pilots' Associations
INS	Inertial Navigation System
IRU	Inertial Reference Unit
PANS	Procedures for Air Navigation Services
PBN	Performance Based Navigation
PIRG	Planning and Implementation Regional Group
RASMAG	Regional Airspace Safety Monitoring Advisory Group
RCP	Required Communication Performance
RNAV	Area Navigation
RNP	Required Navigation Performance
SARP	Standards and Recommended Practices
SBAS	Satellite-Based Augmentation System
SID	Standard Instrument Departure
STAR	Standard Instrument Arrival
TMA	Terminal Control Area
VOR	VHF Omni-directional Radio-range
WGS	World Geodetic System

4. Introduction

Need for the regional PBN Implementation Plan

4.1 The Thirty-sixth Session of the ICAO Assembly held in Montreal in September 2007 adopted a Resolution to resolve that States and PIRGs complete a regional PBN implementation plan by 2009.

4.2 Recognizing that the PBN concept is now established, States should ensure that all RNAV and RNP operations and procedures are in accordance with the PBN concept as detailed in State letter AN 11/45-07/22 and the ICAO Doc 9613: PBN Manual for ensuring a globally harmonized and coordinated transition of PBN.

4.3 In view of the need for detailed navigation planning, it is advisable to develop a Regional PBN Plan to provide proper guidance to air navigation service providers, airspace operators and users, regulating agencies, and international organizations, on the evolution of navigation capabilities as one of the key systems supporting air traffic management, and which describes the RNAV and RNP navigation applications that should be implemented in the short and medium term in the APAC Region.

4.4 Furthermore, the Asia/Pacific Regional PBN Implementation Plan will contain the basic material serving as guidance for regional projects for the implementation of air navigation infrastructure, such as ABAS, SBAS, GBAS, GRAS, etc., as well as for the development of national implementation plans.

Roles of Navigation in supporting ATM operations

4.5 An "airspace concept" may be viewed as a general vision or master plan for a particular airspace. Based on particular principles, an airspace concept is geared towards specific objectives. Strategic objectives drive the general vision of the airspace concept. These objectives are usually identified by

airspace users, air traffic management (ATM), airports as well as environmental and government policy. It is the function of the airspace concept and the concept of operations to respond to these requirements. The strategic objectives which most commonly drive airspace concept are safety, capacity, efficiency, access, and the environment.

4.6 Navigation is one of several enablers of an airspace concept. Communications, ATS Surveillance and ATM are also essential elements of an airspace concept.

4.7 The PBN–concept specifies RNAV and RNP system performance requirements in terms of accuracy, integrity, availability, continuity and functionality needed for the proposed operations in the context of a particular Airspace Concept, when supported by the appropriate navigation infrastructure. In that context, the PBN concept represents a shift from sensor-based to performance-based navigation. Performance requirements are identified in navigation specifications which also identify the choice of navigation sensors and equipment that may be used to meet the performance requirements. These navigation specifications are defined at a sufficient level of detail to facilitate global harmonization by providing specific implementation guidance for States and operators.

4.8 Under the PBN concept, the generic navigation requirements are defined based on operational requirements. Thus, users may evaluate the available options. To ensure synchronization of investment and interoperability of the airborne and ground systems, the selection of the solution should be in consultation with aviation stakeholders, including international and domestic airline operators, air navigation service providers, and regulators. The solution selected should also be the most cost-effective one.

4.9 The development of the PBN concept recognized that advanced aircraft RNAV systems are achieving an enhanced and predictable level of navigation performance accuracy which, together with an appropriate level of functionality, allows a more efficient use of available airspace to be realized. It also takes account of the fact that RNAV systems have developed over a 40-year period and as a result there were a large variety of differing implementations globally. Identifying navigation requirements rather than on the means of meeting the requirements will allow use of all RNAV systems meeting these requirements irrespective of the means by which these are met.

Benefits of Performance-Based Navigation

4.10 The main benefits derived from the implementation of PBN are:

a) Increased airspace safety through the implementation of continuous and stabilized descent procedures using vertical guidance;
b) Reduced aircraft flight time due to the implementation of optimal flight paths, with the resulting savings in fuel, noise reduction, and enhanced environmental protection;
c) Use of the RNAV and/or RNP capabilities that already exist in a significant percentage of the aircraft fleet flying in APAC airspace;
d) Improved airport and airspace arrival paths in all weather conditions, and the possibility of meeting critical obstacle clearance and environmental requirements through the application of optimized RNAV or RNP paths;
e) Implementation of more precise approach, departure, and arrival paths that will reduce dispersion and will foster smoother traffic flows;
f) Reduced delays in high-density airspaces and airports through the implementation of additional parallel routes and additional arrival and departure points in terminal areas;
g) Reduction of lateral and longitudinal separation between aircraft to accommodate more traffic;
h) Decrease ATC and pilot workload by utilizing RNAV/RNP procedures and airborne capability and reduce the needs for ATC-Pilot communications and radar vectoring;
i) Increase of predictability of the flight path.

Goals & Objectives of PBN Implementation

4.11 APANPIRG, in its Eighteenth meeting (September 2007), discussed various issues related to an early implementation of PBN in the region. To facilitate coordination between States, a PBN Task Force was formed under Conclusion 18/52 and tasked to develop a harmonized regional PBN implementation plan.

4.12 The Asia/Pacific Regional PBN Implementation Plan has the following strategic objectives:

a) To ensure that the implementation of the navigation item of the CNS/ATM system is based on clearly established operational requirements.
b) To avoid undue equipage of multiple on board equipment and/or ground-based systems.
c) To avoid the need for multiple airworthiness and operational approvals for intra- and inter-regional operations.
d) To explain in detail the contents of the Regional Air Navigation Plan, relating to potential navigation applications.

4.13 Furthermore, the Asia/Pacific Regional PBN Implementation Plan will provide a high-level strategy for the evolution of the navigation applications to be implemented in the APAC Region in the short term (2008-2012) and medium term (2013-2016). This strategy is based on the concepts of Area Navigation (RNAV) and Required Navigation Performance (RNP) in accordance with ICAO Doc. 9613: *Performance Based Navigation Manual*, and will be applied to aircraft operations involving instrument approaches, standard departure (SID) routes, standard arrival (STAR) routes, and ATS routes in oceanic and continental areas.

4.14 The Regional PBN Plan was developed by the APAC States together with the international organizations concerned (including IATA and IFALPA)~~,~~ and is intended to assist the main stakeholders of the aviation community plan a gradual transition to the RNAV and RNP concepts. The main stakeholders of the aviation community that benefit from this Regional Plan are:

- Airspace operators and users.
- Air navigation service providers.
- Regulating agencies.
- International organizations.

4.15 The Regional PBN Plan is intended to assist the main stakeholders of the aviation community plan the future transition and their investment strategies. For example, airlines and operators can use this Plan to derive future equipage and additional navigation capability investments; air navigation service providers can plan a gradual transition for the evolving ground infrastructure. Regulating agencies will be able to anticipate and plan for the criteria that will be needed in the future.

4.16 Recognizing the safety benefits of PBN, the thirty-sixth session of the ICAO Assembly held in Montreal, September 2007 adopted a Resolution to resolve that States and PIRGs prepare ~~a~~ PBN implementation plans by 2009 to achieve:

a) Implementation of RNAV and RNP operations (where required) for en route and terminal areas according to established timelines and intermediate milestones; and
b) Implementation of APV (Baro-VNAV and/or augmented GNSS) for all instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2016 with intermediate milestones as follows: 30 per cent by 2010, 70 per cent by 2014.

The ICAO Assembly also urges that States include in their PBN implementation plan provisions for implementation of APV to all runway ends serving aircraft with a maximum certificated take-off mass of 5700 kg or more, according to established timelines and intermediate milestones.

Planning Principles

4.17 Planning for the implementation of PBN in the APAC Region shall be based on the following principles:

a) Pre- and post-implementation safety assessments will be conducted in accordance with ICAO provisions to ensure the application and maintenance of the established target levels of safety.
b) Continued application of conventional air navigation procedures during the transition period, to guarantee the operations by users that are not RNAV and/or RNP equipped.
c) The first regional PBN implementation plan should address the short term (2008-2012) and medium term (2013-2016) and take into account long term global planning issues.
d) Target date for preparation of the first regional PBN implementation plan is APANPIRG/19 (September 2007).

5. PBN Operational Requirements & Implementation Strategy

5.1 Introduction of PBN should be consistent with the Global Air Navigation Plan. Moreover, PBN implementation shall be in full compliance with ICAO SARPs and PANS and support relevant ICAO Global Plan Initiatives.

5.2 The ICAO Council accepted the second amendment to the Global Air Navigation Plan for the CNS/ATM System in November 2006. The approved plan has been renamed as Global Air Navigation Plan (Doc 9750). The relevant Global Plan Initiatives including implementation of performance based navigation (PBN) and navigation system have been included in the Global Plan. The introduction of PBN must be supported by an appropriate navigation infrastructure consisting of an appropriate combination of Global Navigation Satellite System (GNSS), self-contained navigation system (inertial navigation system) and conventional ground-based navigation aids.

5.3 The *Strategy for the Provision of Precision Approach, Landing & Departure Guidance Systems* and the *Strategy for Implementation of GNSS Navigation Capability* were reviewed and updated by the Eleventh meeting of CNS/MET Sub Group of APANPIRG in July 2007. The updated strategies were reviewed and adopted by APANPIRG as *Strategies for the Provision of Navigation Services* in its Eighteenth meeting held in September, 2007 under Conclusion 18/30.

Route Operations

5.4 As the routes structure and en-route operation are extensive and complicated in APAC – region, it is difficult to restructure and include the whole airspace in a single implementation plan for en-route operations.

5.5 Considering the traffic characteristics and CNS/ATM capability, en-route operations can be classified as Oceanic, Remote continental, and Continental en-route.

5.6 In principle, each classification of en-route operation (paragraph 5.5 above) should adopt, but not be limited to, a single RNAV or RNP navigation specification. This implementation strategy should be applied by implementing States in coordination with airspace users.

5.7 APANPIRG established the PBN Task Force to develop a PBN implementation plan for the Asia/Pacific Region and to address related regional PBN implementation issues. Accordingly, States are encouraged to work cooperatively bilaterally, multilaterally and with the PBN Task Force to ensure regional and sub-regional harmonization of en-route PBN implementation.

5.8 In areas where operational benefits can be achieved and appropriate CNS/ATM capability exists or can be provided for a more accurate navigation specification than that specified in this plan, States are

encouraged to introduce the more accurate navigation specification on the basis of coordination with stakeholders and affected States.

5.9 Similarly, in circumstances where affected States are agreeable to completing an implementation in advance of the timelines specified in this plan, early implementation is encouraged on the basis of coordination between affected States and airspace users.

TMA Operations

5.10 TMA operations have their own characteristics, taking into account the applicable separation minima between aircraft and between aircraft and obstacles. TMA operations also involve the diversity of aircraft, including low-performance aircraft flying in the lower airspace and conducting arrival and departure procedures on the same path or close to the paths of high-performance aircraft.

5.11 In this sense and as called for under APANPIRG Conclusion 18/53, States shall develop their own national plans for the implementation of PBN in sovereign TMAs. Such national plans should be based on the Asia/Pacific Regional PBN Implementation Plan, seek the harmonization of the application of PBN and avoid the need for multiple operational approvals for intra- and inter-regional operations. Applicable aircraft separation criteria should also be considered.

Instrument Approaches

5.12 States are encouraged to introduce PBN approaches that provide Vertical Guidance to enhance safety. Conventional approach procedures and conventional navigation aids should be maintained to support non-equipped aircraft during the transitional period.

5.13 During early implementation of PBN, IFR Approaches based on PBN should be designed to accommodate a mixed-equipage (PBN and non-PBN) environment. ATC workload should be taken into account while developing approach procedures. One possible way to accomplish this is to co-locate the Initial Approach Waypoint for both PBN and conventional approaches

6. Current Status & Forecast

APAC traffic forecast

6.1 Traffic forecasts have a special role to play in the planning and implementation processes; they represent the demand for future ATM. Global Air Navigation Plan (Doc 9750) requires that the Planning and Implementation Regional Groups (PIRGs) base their work on well developed traffic density forecasts. Guidance on the preparation of traffic forecasts is provided in *Manual on Air Traffic Forecasting* (Doc 8991). At the Asia/Pacific regional level, the traffic forecasting activities were started with the formation of ICAO Pacific Area Traffic Forecasting Group formed in 1991. The scope of the group was subsequently broadened to include Intra-Asia/Pacific traffic also and the group was renamed as Asia/Pacific Area Traffic Forecasting Group (APA TFG).

6.2 Report of the Fourteenth meeting of Asia/Pacific Area Traffic Forecasting Group (APA TFG/14) has been published as Doc 9915. Report includes medium term forecasts of air traffic in the Transpacific area and for selected Transpacific and Asia/Pacific city pair markets through 2012. Report also contains a long term forecast with a horizon to the year 2015 and the short term forecast for the period 2008 – 2010 and intermediate forecasts for each of the years 2015 and 2020.

6.3 The February 2008 forecast prepared by IATA for APAC traffic in respect of passenger, cargo, aircraft movements and new aircraft deliveries in the Regions is also provided in the Appendix B to this plan as reference.

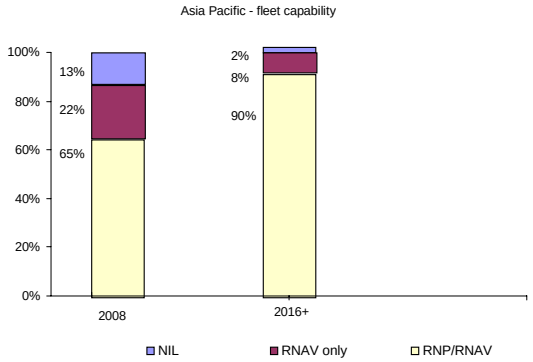
Aircraft fleet readiness status

6.4 2007 was a record year for Asia/Pacific airlines with 418 new aircraft deliveries and more than 1,000 new orders. The overall number of deliveries to Asia/Pacific based airlines in 2008 is expected to total 430 aircraft.

6.5 All major commercial aircraft manufacturers since the 1980's have included RNAV capabilities. The commercial aircraft currently produced incorporate an RNP capability.

6.6 One significant issue for PBN implementation today is directly related to the multitude of FMS installations and varying degrees of capabilities associated with the current fleet of RNAV aircraft. Specifically, there are numerous FMS systems installed in today's fleets, all with varying capabilities.

6.7 The diagram below displays a high level analysis based on fleet numbers from Ascend Online Fleets database March 2008 and RNAV/RNP classification by IATA.



CNS Infrastructure

Navigation infrastructure

Global Navigation Satellite System (GNSS)

6.8 Global Navigation Satellite System (GNSS) is a satellite-based navigation system utilizing satellite signals, such as Global Positioning System (GPS), for providing accurate and reliable position, navigation, and time services to airspace users. In 1996, the International Civil Aviation Organization (ICAO) endorsed the development and use of GNSS as a primary source of future navigation for civil aviation. ICAO noted the increased flight safety, route flexibility and operational efficiencies that could be realized from the move to space-based navigation.

6.9 GNSS supports both RNAV and RNP operations. Through the use of appropriate GNSS augmentations, GNSS navigation provides sufficient accuracy, integrity, availability and continuity to support en-route, terminal area, and approach operations. Approval of RNP operations with appropriate certified avionics provides on-board performance monitoring and alerting capability enhancing the integrity of aircraft navigation.

6.10 GNSS augmentations include Aircraft-Based Augmentation System (ABAS), Satellite-Based Augmentation System (SBAS), Ground-Based Augmentation System (GBAS), and Ground-based Regional Augmentation System (GRAS).

Other PBN navigation infrastructure

6.11 Other navigation infrastructure includes INS, VOR/DME, DME/DME, and DME/DME/IRU. These navigation infrastructures may satisfy the requirements of RNAV navigation specifications, but not those of RNP.

6.12 INS may be used to support PBN en-route operations with RNAV 10 and RNAV 5 navigation specifications.

6.13 VOR/DME may be used to support PBN en-route and STAR operations based on the RNAV 5 navigation specification.

6.14 Uses of DME/DME and DME/DME/IRU may support PBN en-route and terminal area operations based on RNAV 5, RNAV 2 or RNAV 1 navigation specifications. Validation of DME/DME coverage area and appropriate DME/DME geometry should be conducted to identify possible DME/DME gaps, including identification of critical DMEs, and to ensure proper DME/DME service coverage.

Surveillance infrastructure

6.15 For RNAV operations, States should ensure that sufficient surveillance coverage is provided to assure the safety of the operations. For RNP operations, surveillance coverage may not be required. Details on the surveillance requirements for PBN implementation can be found in the ICAO PBN Manual and ICAO PANS-ATM (Doc 4444), and information on the current existing surveillance infrastructure in APAC can be found in ICAO FASID tables.

Communication infrastructure

6.16 Implementation of RNAV/RNP routes includes communication requirements. Details on the communication requirements for PBN implementation can be found in ICAO PANS-ATM (Doc 4444), ICAO RCP Manual (Doc 9869), and ICAO Annex 10. Information on the current existing communication infrastructure in APAC can also be found in ICAO FASID tables.

7. Implementation Plan for Performance Based Navigation

ATM Operational Requirements

7.1 The Global ATM Operational Concept (Doc 9854) makes it necessary to adopt an airspace concept able to provide an operational scenario that includes route networks, minimum separation standards, assessment of obstacle clearance, and a CNS infrastructure that satisfies specific strategic objectives, including safety, access, capacity, efficiency, and environment.

7.2 In this regard, the following programmes will be developed:

a) traffic and cost benefit analyses
b) necessary updates on automation
c) operational simulations in different scenarios
d) ATC personnel training
e) Flight plan processing
f) Flight procedure design training to include PBN concepts and ARINC-424 coding standard
g) Enhanced electronic data and processes to ensure appropriate level of AIS data accuracy, integrity and timeliness
h) WGS-84 implementation in accordance with ICAO Annex 15
i) iuniform classification of adjacent and regional airspaces, where practicable
j) RNAV/RNP applications for SIDs and STARs

k) Coordinated RNAV/RNP routes implementation
l) RNP approach with vertical guidance

Short Term Implementation Plan

Route Operations

7.3 During the planning phase of any implementation of PBN routes, States should gather inputs from all aviation stakeholders to obtain operational needs and requirements. These needs and requirements should then be used to derive airspace concepts and to select appropriate PBN navigation specification.

7.4 In this phase, the application of RNAV 10 and RNP 4 navigation specifications is expected for Oceanic and Remote continental routes. Prior to implementation of RNP 4, States should consider air traffic demands, ATC workload, surveillance and communication capabilities and fleet readiness statistics, and consult all stakeholders.

7.5 For Continental routes, the application of RNAV 5 and RNAV 2 navigation specifications is expected. In the continental en-route areas of operation, States may choose to implement RNAV 2 routes to enhance efficiency of airspace usage and support closer route spacing, noting that appropriate communication and surveillance coverage must be provided. The RNAV 2 navigation specification can also be used in airspace~~,~~ where sufficient CNS capability is provided and there are operational benefits.

TMA Operations

7.6 In selected TMAs, the application of RNAV 1 in a radar environment can be supported though the use of GNSS or ground navigation infrastructure, such as DME/DME and DME/DME/IRU. In this phase, mixed operations (equipped and non-equipped) will be permitted.

7.7 In a non-radar environment and/or in an environment without adequate ground navigation infrastructure, the SID/STAR application of Basic-RNP1 is expected in selected TMAs with exclusive application of GNSS. In this phase, mixed operations (equipped and non-equipped) will be permitted.

Instrument Approaches

7.8 The application of RNP APCH with Baro-VNAV procedures is expected to be implemented in the maximum possible number of airports, commencing primarily with international airports. To facilitate transitional period, conventional approach procedures and conventional navigation aids should be maintained for non-equipped aircraft.

7.9 States should promote the use of APV operations (Baro-VNAV or augmented GNSS) to enhance safety and accessibility of RNP approaches.

7.10 The application of RNP AR APCH procedures should be considered in selected airports, where obvious operational benefits can be obtained due to the existence of significant obstacles.

Summary table & Implementation targets

Short Term (2008-2012)*		
Airspace	**Preferred Nav. Specifications**	**Acceptable Nav. Specifications**
Route – Oceanic	RNP 4	RNAV 10
Route – Remote continental	RNP 4	RNAV 10
Route – Continental en-route	RNAV 2, RNAV 5	
TMA – Arrival	RNAV 1 in radar environment and with adequate navigation infrastructure. Basic-RNP 1 in non-radar environment	
TMA – Departure	RNAV 1 in radar environment and with adequate navigation infrastructure. Basic-RNP 1 in non-radar environment	
Approach	RNP APCH with Baro-VNAV in most possible airports RNP AR APCH in airport where there are obvious operational benefits.	

Implementation Targets

- RNP APCH (with Baro-VNAV) in 30% of instrument runways by 2010 and 50% by 2012 and priority should be given to airports with operational benefits
- RNAV 1 SID/STAR for 50% of international airports by 2010 and 75% by 2012 and priority should be given to airports with RNP Approach
- Re-defining existing RNAV/RNP routes into PBN navigation specification by 2012
- Implementation of additional RNAV/RNP routes

*** Note:** Early completion of an implementation is encouraged within the timeframe on the basis of coordination between affected States and airspace users.

Medium Term Implementation Plan

Route Operations

7.11 Noting the current development of route spacing standards for RNAV 1, RNAV 2, RNP 2, in this phase, it is expected that the implementations of all existing RNAV/RNP routes are consistent with PBN standards. States are encouraged~~,~~ to harmonize their RNAV/RNP routes based on consistent PBN navigation specifications and separation standards. Implementations of additional RNAV/RNP routes are also encouraged.

7.12 With the utilization of ADS and CPDLC, the application of RNP routes in the Oceanic and Remote continental airspace in the APAC Region is expected. This will permit the use of smaller lateral and longitudinal separation, such as 30 NM based on the RNP 4 navigation specification. States should also consider the fleet readiness status during their planning.

7.13 Noting the current development of RNP 2 navigation specification, in this phase, the application of RNP 2 is expected for the continental en-route airspace with high air traffic density. Depending on the sufficiency of DME/DME coverage or GNSS availability, States may consider the use of RNAV 2 navigation specification.

7.14 In this phase, the establishment of a backup system in case of GNSS failure or the development of contingency procedures will be necessary.

TMA Operations

7.15 Noting the current development of Advanced RNP 1 navigation specification, in this phase, it is expected that the application of RNAV 1 or RNP 1 will be expanded in selected TMAs. The application of RNAV 1/RNP 1 will also depend on DME/DME infrastructure, GNSS availability and aircraft navigation capability. In TMAs of high air traffic complexity and movement, the use of RNAV 1 or RNP 1 equipments will be mandatory. In TMAs of less air traffic complexity, mixed operations will be permitted (equipped or non-equipped).

Instrument Approaches

7.16 In this phase, the extended application of RNP APCH with Baro-VNAV or APV in most airports is expected. These applications may also serve as a back-up to precision approaches and provide vertical guided approaches for the runways without precision approach capability.

7.17 The extended application of RNP AR Approaches is expected for airports where there are operational benefits.

7.18 The introduction of application of landing capability using GNSS and its augmentations is expected to guarantee a smooth transition toward high-performance approach and landing capability.

Summary table & Implementation targets

Medium Term (2013-2016)*		
Airspace	**Preferred Nav. Specification**	**Acceptable Nav. Specification**
Route – Oceanic	RNP 2**, RNP 4	RNAV 10
Route – Remote continental	RNP 2	RNAV 2, RNP 4, RNAV 10
Route – Continental en-route	RNAV 1, RNP 2	RNAV 2, RNAV 5
TMA – Arrival	Expand RNAV 1 or RNP 1 application Mandate RNAV 1 or RNP 1 approval for aircraft operating in higher air traffic density TMAs	
TMA – Departure	Expand RNAV 1 or RNP 1 application Mandate RNAV 1 or RNP 1 approval for aircraft operating in higher air traffic density TMAs	
Approach	Expansion of RNP APCH (with Baro-VNAV) and APV Expansion of RNP AR APCH where there are operational benefits Introduction of landing capability using GNSS and its augmentations	
Implementation Targets • RNP APCH with Baro-VNAV or APV in 100% of instrument runways by 2016 • RNAV 1 or RNP 1 SID/STAR for 100% of international airports by 2016 • RNAV 1 or RNP 1 SID/STAR for 70% of busy domestic airports where there are operational benefits • Implementation of additional RNAV/RNP routes		

*** Note 1:** In circumstances where affected States are agreeable to completing an implementation in advance of the timeline, early implementation is encouraged on the basis of coordination between affected States and airspace users.

** **Note 2:** Related CNS requirements and operational procedures for RNP 2 application in Oceanic Airspace are yet to be determined.

Long Term Implementation Strategies (2016 and beyond)

7.19 In this phase, GNSS is expected to be a primary navigation infrastructure for PBN implementation. States should work co-operatively on a multinational basis to implement GNSS in order to facilitate seamless and inter-operable systems and undertake coordinated research and development programmes on GNSS implementation and operation.

7.20 Moreover, during this phase, States are encouraged to consider segregating traffic according to navigation capability and granting preferred routes to aircraft with better navigation performance.

7.21 With the expectation that precision approach capability using GNSS and its augmentation systems will become available, States are encouraged to explore the use of such capability where there are operational and financial benefits.

8. Transitional Strategies

8.1 During transition to PBN, sufficient ground infrastructure for conventional navigation systems must remain available to serve non-equipped flights. Before existing ground infrastructure is considered for removal, users should be given reasonable transition time to allow them to equip appropriately to attain equivalent PBN-based navigation performance. States should approach removal of existing ground infrastructure with caution to ensure that safety is not compromised. Performance of safety assessments and consultation with users through regional air navigation planning processes will be necessary.

8.2 States should coordinate to ensure that harmonized separation standards and procedures are developed and introduced concurrently in all flight information regions along major traffic flows to allow for a seamless transition towards PBN.

8.3 States should cooperate on a multinational basis to implement PBN in order to facilitate seamless and inter-operable systems and undertake coordinated research and development programmes on PBN implementation and operation.

8.4 States are encouraged to consider segregating traffic according to navigation capability and granting preferred routes to aircraft with better navigation performance**,** taking due consideration of the needs of State aircraft.

8.5 States should encourage operators and other airspace users to equip with PBN-capable avionics. This can be achieved through early introductions of RNP approaches, preferably those with vertical guidance.

8.6 ICAO Asia-Pacific Regional Office should provide leadership supporting implementation and transition towards PBN.

9. Safety Assessment & Monitoring Requirements

Need for a safety assessment

9.1 To ensure that the introduction of PBN applications within the Asia/Pacific Region is undertaken in a safe manner, in accordance with relevant ICAO provisions implementation shall only take place following conduct of a safety assessment by the implementing State or group of States that demonstrates that an acceptable level of safety will be met. This assessment may also need to demonstrate that residual levels of risk associated with specific PBN implementations are acceptable. Additionally, after implementation ongoing periodic safety reviews shall be undertaken by the implementing State or group of States, where required, in order to establish that operations continue to meet acceptable levels of safety.

En-route safety assessment and monitoring

9.2 When considering en-route PBN implementations, the ICAO *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444, Chapter 5, Section 5.4) contains procedures and RNAV procedural separation minima for use in the separation of aircraft in the en-route phase. In some cases, these separation minima require specific RNP capabilities and are based on collision risk modelling which determines communications and surveillance requirements. However, this modelling does not include all operational and technical aspects and is dependent upon parameter values that may vary depending on the particular airspace where the separation minimum will be applied. Therefore, prior

to implementation, a system verification of sufficient duration and integrity must be performed to assess such parameters and conditions including weather deviations or other contingency events for the airspace concerned and to demonstrate that operational and technical requirements will be met.

9.3 APANPIRG has established the Regional Airspace Safety Monitoring Advisory Group (RASMAG) to facilitate the airspace safety monitoring aspects for implementations of reduced separation minima and CNS/ATM applications within the Asia and Pacific Regions. RASMAG has adopted the term En-route Monitoring Agency (EMA) to describe an organization providing airspace safety assessment, monitoring and implementation services for international airspace in the Asia/Pacific region to assist the implementation and operation of reduced horizontal (lateral and longitudinal) separation minima. To ensure regional harmonization of en-route safety assessment requirements and methodologies, implementing States are encouraged to work cooperatively with RASMAG who will provide guidance and technical assistance to States to support their en-route PBN implementations.

Undertaking a safety assessment

9.4 The implementing State or group of States shall ensure that a safety assessment and, where required, ongoing monitoring of PBN implementations are conducted. The implementing State or group of States may have the capability to undertake such activities or, in the case of en-route implementations, may seek assistance from an En-route Monitoring Agency. The latter course of action is preferred as an EMA can establish the necessary monitoring and data collection activity in an effective manner for the international airspaces in which the EMA holds responsibility.

9.5 In undertaking a safety assessment to enable en-route implementation of PBN, a State authority or EMA shall:

1) Establish and maintain a database of PBN approvals;
2) Pre-implementation - conduct safety and readiness assessments and, for international implementations, report results to RASMAG;
3) Post-implementation - maintain awareness of data link performance and monitor aircraft horizontal-plane navigation performance and the occurrence of large navigation errors (lateral and longitudinal), implement remedial actions as necessary and, for international implementations, report results to RASMAG;
4) Monitor operator compliance with State approval requirements after PBN implementation;
5) Initiate necessary remedial actions in any instances where PBN requirements are not met.

9.6 Detailed information relating to the international airspace jurisdiction, roles and responsibilities of regional EMAs is contained in the *Asia/Pacific En-route Monitoring Agency Handbook*, which is available from the ICAO Asia/Pacific Regional Office.

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Appendix A – CHANGES TO THE ASIA/PACIFIC REGIONAL PBN IMPLEMENTATION PLAN

Whenever a need is identified for a change to this document, the Request for Change (RFC) Form (see below) should be completed and submitted to the ICAO Asia and Pacific Regional Office. The Regional Office will collate RFCs for consideration by the Performance Based Navigation Task Force (CNS/MET Sub-group of APANPIRG).

When an amendment has been agreed by a meeting of the Performance Based Navigation Task Force then a new version of the PBN Regional Plan will be prepared, with the changes marked by an "|" in the margin, and an endnote indicating the relevant RFC, so a reader can see the origin of the change. If the change is in a table cell, the outside edges of the table will be highlighted; e.g.:

Final approval for publication of an amendment to the PBN Regional Plan will be the responsibility of APANPIRG.

PBN Regional Plan REQUEST FOR CHANGE FORM

RFC Nr:	

Please use this form when requesting a change to any part of this PBN Regional Plan. This form may be photocopied as required, emailed, faxed or e-mailed to ICAO Asia and Pacific Regional Office +66 (2) 537-8199 or icao_apac@bangkok.icao.int

1. SUBJECT:		
2. REASON FOR CHANGE:		
3. DESCRIPTION OF PROPOSAL: [expand / attach additional pages if necessary]		
4. REFERENCE(S):		
5. PERSON INITIATING:		**DATE:**
ORGANISATION:		
TEL/FA/X/E-MAIL:		

6. CONSULTATION		**RESPONSE DUE BY DATE:**	
Organization	**Name**	**Agree/Disagree**	**Date**
7. ACTION REQUIRE :			
8. PBN REGIONAL PLAN EDITOR		**DATE REC'D :**	
9. FEEDBACK PASSED		**DATE :**	

AMENDMENT RECORD

Amendment Number	Date	Amended by	Comments

Appendix B – IATA Traffic Forecast

"By 2010 Asia will be the largest single market for aviation" - IATA 27th Feb 2008. Globally predicted passenger traffic will rise by 4.9 per cent per year between 2007 and 2026, almost trebling in two decades as jet planes got bigger and more people flew on them. Meanwhile airfreight will rise by 5.8 per cent annually in the same period.The greatest demand will come from the Asia-Pacific region, where airlines will take delivery of 31 per cent of new planes in the next 20 years, compared with 24 per cent for Europe and 27 per cent for North America.

Passenger
Asia Pacific airlines saw a marginal drop in demand growth from 6.2 per cent in December 2007 to 5.7 per cent in January 2008. Currently, airlines in the region benefited from increased competitiveness due to the strong Euro and the booming economies of both India and China.

Cargo
Steady year-on-year airfreight growth of 4.5 per cent was recorded in January 2008. In the larger freight markets there is continued strength. Asia Pacific airlines saw demand increase 6.5 per cent, up from 6 per cent in December 2007, boosted by the booming economies in China and India.

For the period 2002-2020 aircraft movements are expected to increase at an annual growth rate of 5.4 per cent, to reach almost 294 thousand aircraft movements by the year 2020. Average annual growth rates of 6.5, 5.7 and 5.2 per cent are forecast for the periods 2005 - 2010, 2010-2015 and 2015 - 2020, respectively.

TRANSPACIFIC PASSENGER FORECAST			
Average Annual Percentage Growth Rates			
	Low	Medium	High
2005-2010	5.3	6.5	7.8
2010-2015	4.5	5.7	7.0
2015-2020	4.0	5.2	6.5
2002-2020	4.1	5.4	6.7

The Intra-Asia/Pacific passenger aircraft movements are expected to increase at an average annual growth rate of 4.6 per cent to the year 2020. The growth rates for the intermediate periods of 2005-2010, 2010-2015 and 2015-2020 are 5.0, 4.3 and 4.2 per cent, respectively.

INTRA ASIA /PACIFIC AIRCRAFT MOVEMENT FORECAST			
Average Annual Percentage Growth Rates			
	Low	Medium	High
2005-2010	3.6	5.0	5.5
2010-2015	3.1	4.3	5.2
2015-2020	3.1	4.2	5.2
2002-2020	3.3	4.6	5.6

New Aircraft Deliveries by Region
Record new aircraft orders were placed by the airline industry in 2005 – 2007. The large numbers of new orders represent strong confidence in the future prospects of the global airline industry. In its

latest forecast of aviation growth, European aircraft maker Airbus said the world's fleet of large passenger jets (of more than 100 seats) would double in the next 20 years to nearly 33,000. The greatest demand will come from the Asia-Pacific region, where airlines will take delivery of 31 per cent of new planes in the next 20 years, compared with 24 per cent for Europe and 27 per cent for North America.

New Aircraft Deliveries by Region	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012+**
	Existing						
Africa	**665**	**26**	**15**	**20**	**16**	**13**	**28**
Asia Pacific	**3,578**	**329**	**428**	**407**	**344**	**267**	**440**
Europe	**5,301**	**292**	**348**	**364**	**251**	**153**	**297**
Latin America/Caribbean	**1,031**	**93**	**91**	**45**	**66**	**43**	**65**
Middle East	**626**	**41**	**57**	**44**	**36**	**27**	**164**
North America	**6,987**	**240**	**293**	**309**	**222**	**163**	**412**
Total	**18,188**	**1,026**	**1,237**	**1,208**	**944**	**679**	**1,551**
Increase in Global aircraft fleet (%)	**4.2**	**4.9**	**4.6**	**4.9**	**3.4**	**2.4**	**2.4**

Appendix C - Reference documentation for developing operational and airworthiness approval

TO BE DEVELOPED.

Appendix D – Practical Example of tangible benefits

TO BE DEVELOPED.

SEACG/~~15~~16 — ACTION PLAN

IMMEDIATE: Action to be taken immediately after the conclusion of the meeting
MID-TERM: Action to be taken within six months
LONG-TERM: Action to be taken one year

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
~~1.~~	~~**Establishment of Safety Monitoring Agency (SMA) for Asia Region**~~	~~MID-TERM (RASMAG/9)~~	~~Singapore Regional Office~~	~~OPEN~~ COMPLETED	~~Raised at SEACG/11.~~ ~~MAAR provided details on planning to establish an SMA for the South-East Asia area.~~ ~~Singapore had informed RASMAG that it would undertake to provide the SMA services for reduced horizontal separation in the South China Sea area when the requirements for the establishment of the SMA are fulfilled.~~
~~2.~~	~~**Update on ADS/CPDLC Implementation Planning**~~	~~LONG TERM~~	~~FIT-SEA~~	~~OPEN~~ COMPLETED	~~Raised at SEACG/11.~~ ~~States to update SEACG/16 and/or FIT-SEA/9 on their ADS/CPDLC implementation plans with timelines for implementation.~~
~~3.~~	~~**Implementation of Radar Handover Procedures**~~ ~~States should identify areas where radar handover procedures can be applied at common FIR boundary, and implement the procedures.~~	~~LONG TERM~~	~~All SEA States~~	~~OPEN~~ COMPLETED	~~Raised at SEACG/10.~~ ~~SEACG/11 was advised that many States had introduced radar handover procedures. Some States identified areas where progress was still to be made and agreed to move towards radar handover procedures as soon as possible.~~ ~~States updated the radar coverage/services chart and the matrix presented at SEACG/10.~~

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
					~~SEACG/15 identified the applicable areas in the matrix of the radar handover procedures. Specific actions were also suggested at the meeting and are provided in the table in the report of SEACG/15.~~ ~~States to implement radar handover procedures, where possible. Report to SEACG/16.~~
~~4.~~1.	**Consideration of the Implementation of RNP 10 Routes and Reduced Horizontal Separation of 50 NM in Southeast Asia**	LONG TERM	SEACG	OPEN	Raised at SEACG/11. Ongoing implementation of RNP 10 routes as required and introduction of 50 NM separation. Identify areas suitable for RNP 4 and reduction of en-route separation to 30 NM. RNP-SEA/TF to undertake study of implementation. L642 and M771 implemented on 3 July 2008.
~~6.~~	~~**Identify the Airspace where RNP 10 or RNP 4 Routes Can Be Established and Reduced Horizontal Separation of 50 NM and 30 NM, Respectively, Can Be Applicable**~~	~~LONG TERM~~	~~SEACG~~	~~OPEN~~ CLOSED	~~Raised at SEACG/15.~~ ~~Identify areas suitable for RNP 10 or RNP 4 and reduction of en-route separation to 50 NM or 30 NM.~~ ~~Cf. Action Item 4 which is focused on the implementation~~

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
2	**Update the Progress on State Contingency Plan Development**	LONG TERM	STATES	OPEN	Raised at SEACG/16. States to develop and promulgate contingency plans according to Annex 11 – *Air Traffic Services* and update the progress to the SEACG/17.
3	**Report the Outcomes of Large Height Deviation (LHD) Investigations Undertaken by States**	LONG TERM	STATES	OPEN	Raised at SEACG/16 States to conduct Safety Management System investigations into LHDs with the objective of identifying and correcting causal factors. WP02 from the Monitoring Agency for Asia Region (MAAR) to the sixth meeting of the Western Pacific/South China Sea RVSM Scrutiny Group (WPAC/SCS RSG/6, April 2009) to be used as reference material. Outcomes of SMS investigations to be reported to SEACG/16 and RASMAG/11
4	**ATS Routes Developments**				
	ATS Route B214 NASAN – LADIS – AKSAG	LONG TERM	Lao PDR/ Viet Nam	OPEN	Raised at SEACG/16. Lao PDR and Viet Nam agreed to establish the route. Lao PDR to coordinate with Myanmar. Lao PDR and Viet Nam to implement.
	M756 Tan Son Nhat - ENREP	LONG TERM	Singapore/ Viet Nam	OPEN	Raised at SEACG/16. Singapore will look into the possibility. Singapore and Viet Nam establish the route.

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
	Vientiane (VTN) – Phnom Penh (PNH) through the Bangkok FIR	LONG TERM	Cambodia/Lao PDR/Thailand/ Viet Nam	OPEN	Raised at SEACG/16 Viet Nam proposed this direct route. Cambodia and Lao PDR supported the proposal at SEACG/16. Thailand will consider the proposal.
	Phucat (PCA) - BUNTA	MID-TERM	Viet Nam	OPEN	Raised at SEACG/16. Viet Nam to implement.
	ENDAX – Tacloban (TAC) – Kota Kinabalu	LONG TERM	Malaysia, Philippines	OPEN	Rasised at SEACG/16. Philippines in coordination with Malaysia will look into possibility in establishing the proposed route.
5	**Radar Data Sharing**	LONG TERM	Lao PDR/ Thailand	OPEN	Raised at SEACG/16. Lao PDR and Thailand agreed to share the radar data. Lao PDR and Thailand will further coordinate.
6	**Restrictions Imposed on Traffic Operating on A1 and M771**	MID-TERM	Hong Kong, China/Japan/ Singapore/ Thailand	OPEN	Raised at SEACG/16. Hong Kong China and Japan would bring the issue to the attention of Taibei Area Control Centre (ACC) at the East Asia ATM Coordination Group (EATMCG) in June 2009. Hong Kong, China agreed to regularly review the situation and Endeavour to place traffic regulation only as a last resort so as to minimize the impact on the upstream ACCs.

International Civil Aviation Organization | Organisation de l'aviation civile internationale | Organización de Aviación Civil Internacional | Международная организация гражданской авиации | منظمة الطيران المدني الدولي | 国际民用航空组织

Tel.: +1 (514) 954-8219 ext. 6199

Ref.: AN 13/60-09/23 6 April 2009

Subject: Global Air Traffic Management Forum on Civil/Military Cooperation (Montréal, 19 to 21 October 2009)

Action required: Nominations of participants to reach ICAO by 19 August 2009

Sir/Madam,

1. I have the honour to invite your Government/Organization to participate in a Global Air Traffic Management Forum on Civil/Military Cooperation to be held in Montréal, from 19 to 21 October 2009. The meeting is being convened by the International Civil Aviation Organization (ICAO) in partnership with the Civil Air Navigation Services Organisation (CANSO), European Organisation for the Safety of Air Navigation (EUROCONTROL), the International Air Transport Association (IATA) and the North Atlantic Treaty Organization (NATO) and supported by the Air Traffic Control Association (ATCA).

2. This global forum on civil/military cooperation is held in follow up to recommendations of the Eleventh Air Navigation Conference (Doc 9828, Rec. 1/2) concerning coordination with military authorities with a view to achieving enhanced airspace organization and management and as an integral supporting mechanism of the successful series of civil/military air traffic management summits instituted by the Air Traffic Control Association (ATCA). It is also in follow up to ICAO Assembly Resolution A36-13, Appendix O, *Coordination of civil and military air traffic* wherein States were asked to take appropriate action to coordinate with military authorities to implement a flexible and cooperative approach to airspace organization and management.

3. The Forum is intended to create awareness among civil and military policy makers and regulators, civil and military air navigation service providers (ANSPs) and civil and military airspace users, on the need to improve civil/military cooperation and coordination in support of an optimum use of airspace by all users.

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4. Presentations will be given by high-level civil and military aviation representatives from States and international organizations as well as representatives from the airline industry and ANSPs. New guidance material and best practices related to civil/military cooperation and the flexible use of airspace will be delivered and shared at the Forum. It is anticipated that discussions would result in actions to progress towards greater civil/military cooperation leading to a more optimized use of the airspace with a consequent reduction in the use of fuel and less impact on the environment. Prominent moderators and speakers will lead the discussions to facilitate a dynamic interaction between panellists and the audience.

5. All further information related to the Forum, including the draft programme, registration, fees, general information, exhibition opportunities, hotels and rates will be available soon on the Forum website at http://www.icao.int/gatm-civ/mil/ and will be updated periodically. Registration will be done on-line. We expect this event to draw a large audience, therefore, it is recommended that you make early travel arrangements and hotel reservations for the Forum.

6. I wish to inform you that the registration fee will be waived for up to two participants nominated by each State (either civil or military) for this event. All other attendees, except for invited speakers, will be required to pay a registration fee.

7. The participation of civil aviation and military officials at the decision-making level is essential at this Forum. Consequently, it is recommended that Civil Aviation Administrations inform and coordinate participation of their military officials as part of their State's delegation. I look forward to receiving the names and titles of your participating officials, their position and whether they are nominated for free participation or as paying participants. Please ensure that the letter of nomination is presented on the letterhead of your Administration or Organization. Your nomination should preferably be sent by e-mail to gatm_civ_mil@icao.int to reach Montréal no later than 19 August 2009.

8. I should also be grateful if you would advise me if your Government/Organization wishes to participate in the Forum, at your earliest possible convenience.

Accept, Sir/Madam, the assurances of my highest consideration.

Taïeb Chérif
Secretary General

ATTACHMENTS TO THE REPORT

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LIST OF WORKING AND INFORMATION PAPERS, AND PRESENTATIONS

FIT-SEA/9

WORKING PAPERS

WP/No.	Agenda Item	Title	Presented by
1	1	Provisional Agenda – FIT-SEA/9	Secretariat
2	3	ADS/CPDLC Equipage and ATS Status for the Operational Trials of ADS/CPDLC	Secretariat
3	5	Update FIT-SEA Task List	Secretariat
4	6	Data Link Implementation Table for Capacity Planning	Secretariat
5	2	Report of FIT-SEA CRA	Japan
6	4	FANS Operations Manual Ver. 6, Oceanic SPR Standard and Updated End-To-End Guidance Material	Secretariat
7	4	Global Operational Data Link Document (GOLD) Update and Action	Secretariat

INFORMATION PAPERS

IP/No.	Agenda Item	Title	Presented by
1	-	List of Tentative Working and Information Papers	Secretariat
2	-	Terms of Reference of FIT-SEA	Secretariat
3	2	Review of RASMAG List of Competent Airspace Safety Monitoring Organizations	Secretariat
4	2	Typical Problem Report	Japan
5	6	Summary Reports to APANPIRG of South-East Asia ATS Coordination Group, FANS Implementation Team, South-East Asia and South-East Asia RNP Implementation Task Force	Secretariat
6	6	The Status of FANS Data Link Services in the Manila Flight Information Region	Philippines
7	3	ADS/CPDLC Operational Implementation in Ho Chi Minh FIR	Viet Nam

PRESENTATION

Agenda Item	Title	Presented by
3	ATS Data Link System Performance/Operations Review	Singapore

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SEACG/16

WORKING PAPERS

WP/No.	Agenda Item	Title	Presented by
1	1	Provisional Agenda – SEACG/16	Secretariat
2	2	Outcomes of APANPIRG/19	Secretariat
3	2	Outcomes from RASMAG/10	Secretariat
4	4	The Sixth Meeting of the Western Pacific/South China Sea RVSM Scrutiny Group	Secretariat
5	4	Radar Coverage Chart of the South China Sea Area and the Status Matrix of Application of Radar Handover Procedures	Secretariat
6	4	Summary of the Fourth Meeting of South-East Asia Required Navigation Performance Implementation Task Force (RNP-SEAS/TF/4)	Secretariat
7	6	Review of the Asia and Pacific ATS Route Catalogue	Secretariat
8	9	Review Action Plan from SEACG/15	Secretariat
9	10	Outcomes of the 45th DGCA Conference	Secretariat
10	2	AIS Update from the First Meeting of ICAO AIS-AIM Study Group and the Fourth Meeting of Asia/Pacific AIS-AIM Implementation Task Force	Secretariat
11	4	Outcomes of ATFM Seminar/Workshop	Secretariat
12	4	The Extended CPDLC Connection over HF Communications − Manila FIR	IFALPA
13	5	First Meeting of ICAO Flight Plan & ATS Messages Implementation Task Force	Secretariat
14	10	Outcomes of AIS Automation/eTOD Seminar/Workshop	Secretariat
15	2	Outcomes from RASMAG/10	Hong Kong, China
16	6	More Efficient Routings in the South China Sea Airspace	IATA
17	6	More Efficient Routings in the South China Sea Airspace	IATA
18	6	More Efficient Routings in the South China Sea Airspace	IATA
19	6	More Efficient Routings in the South China Sea Airspace	IATA
20	4	Restrictions Imposed on Traffic Operating on RNAV Route M771 and Application of Large Scale Weather Deviation (LSWD) Procedures in the South China Sea (SCS) Area	Singapore

WP/No.	Agenda Item	Title	Presented by
21	7	Development of State Contingency Plan for Singapore FIR	Singapore
22	4	Safety Assessment on ATS Routes Crossing Vientiane FIR	Lao PDR
23	6	Proposals for Establishing and Revising ATS Routes	Viet Nam
24	4	Flow Control Restriction on A1/G86	Thailand
25	3	Review of the Draft Report of FIT-SEA/9	FIT-SEA/9 Rapporteur
26	6	More Efficient Routings from Phnom Penh FIR to South China Sea Airspace	Cambodia

INFORMATION PAPERS

IP/No.	Agenda Item	Title	Presented by
1	-	List of Tentative Working and Information Papers	Secretariat
2		- *Withdrawn* -	
3	4	Traffic Sample Data (TSD) State Letter	Secretariat
4	5	Summary of the Fourth Meeting of Asia/Pacific Performance Based Navigation Task Force	Secretariat
5		- *Withdrawn* -	
6	10	The Second Meeting of East Asia ATM Coordination Group	Japan
7	4, 5	Updates on ATS Activities in Viet Nam	Viet Nam
8	10	Continuous Descent Arrivals (CDA)	Japan
9	4	Upgrading of Brunei Darussalam’s ATM Surveillance System	Brunei Darussalam
10	10	AIDC Operational Trial between Republic of Korea and Japan	Japan

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