

# ***JCAB CRA Activities Since IPACG FIT/15***

IPACG FIT/16  
Fukuoka, Japan  
28 October, 2008

# **JCAB CRA Activities Since IPACG FIT/15**

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This presentation contains;

## **1. Statistic Analyses on System Performance**

- System Performance Analysis Data

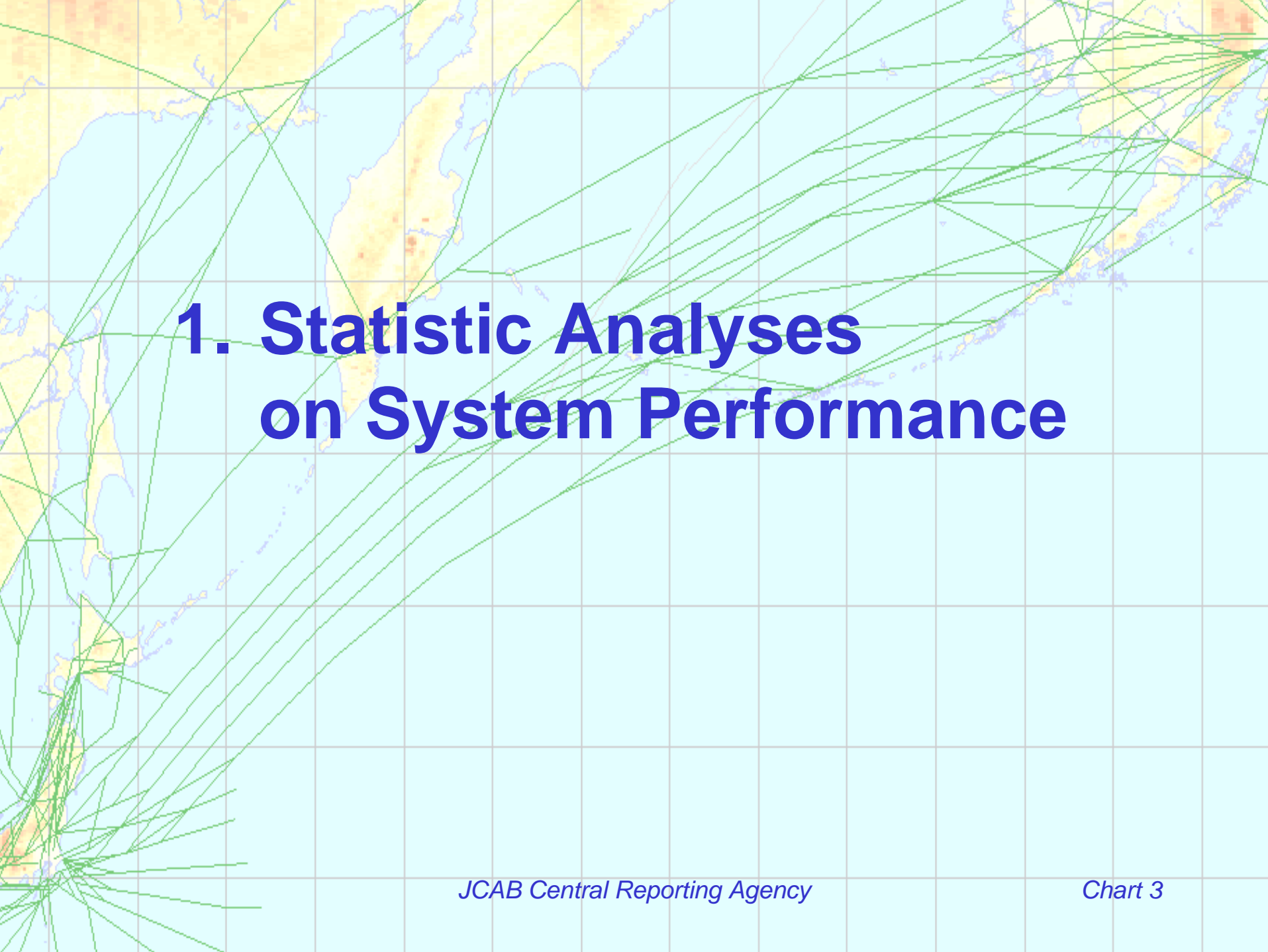
## **2. Problem Reports**

Since IPACG FIT/15

Reports proposed to be closed at IPACG FIT/16

Lessons Learned from Problem Reports

Specific reports

The background of the slide is a map of Southeast Asia, showing the Malay Peninsula, Sumatra, and the Indonesian archipelago. Overlaid on the map is a dense network of thin green lines representing flight paths or connections between various locations. The lines are most concentrated in the western part of the region, particularly around Sumatra and the Malay Peninsula, and fan out towards the east.

# **1. Statistic Analyses on System Performance**

# CPDLC System Performance

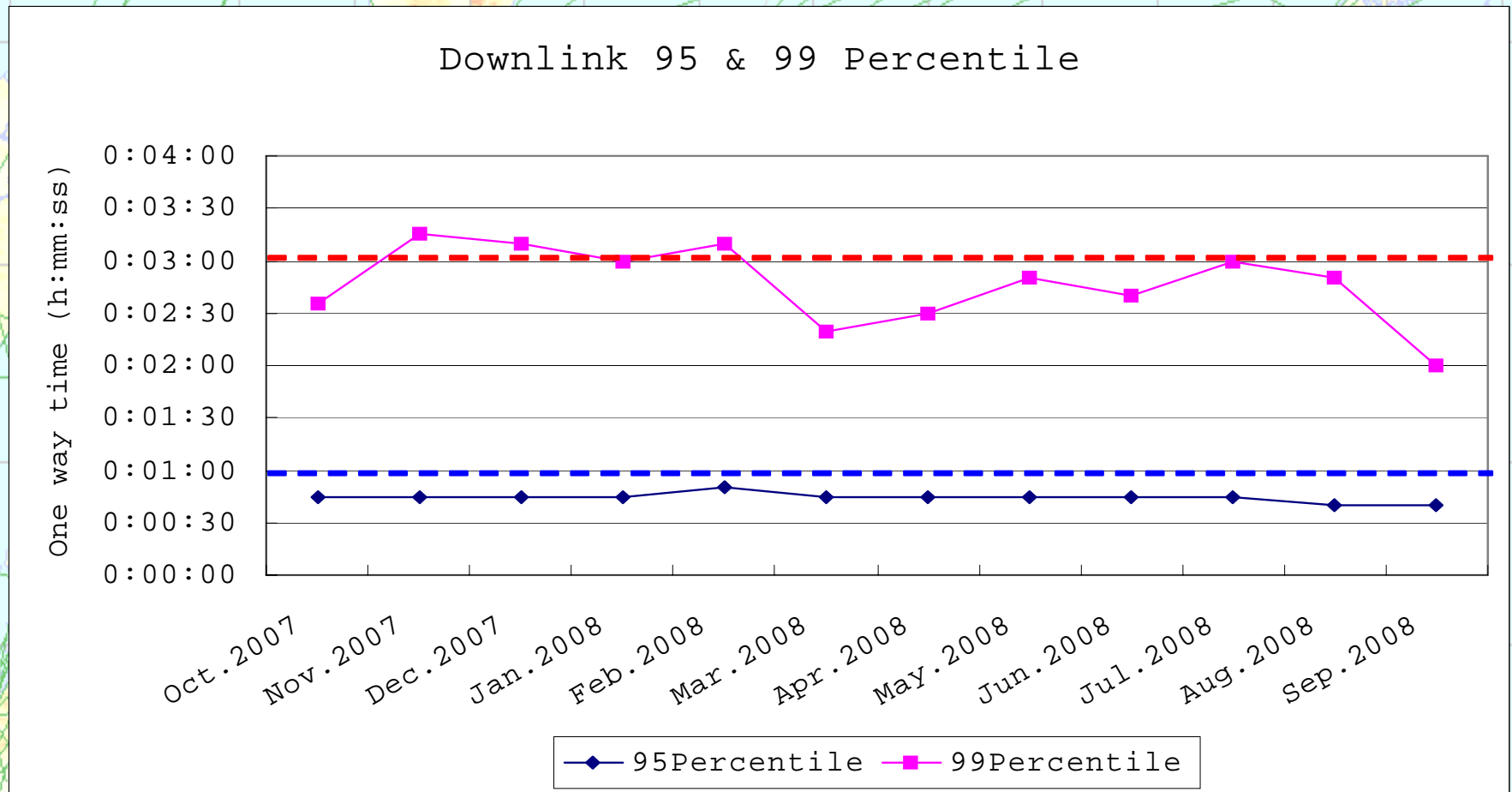
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- In this section, we provide CPDLC system performance on:
  - + CPDLC Down-link Performance
  - + CPDLC Up-link Performance
  - + CPDLC Up-link Message Success Rate
  - + Success Rate of Automatic-Transfer of CPDLC Connections to the Next ATSUs  
(Fukuoka ATM Center - Oakland & Anchorage ARTCC)

# CPDLC Down-link Performance

(One-way Trip Time:

Difference of time-stamps between the avionics and ground systems)



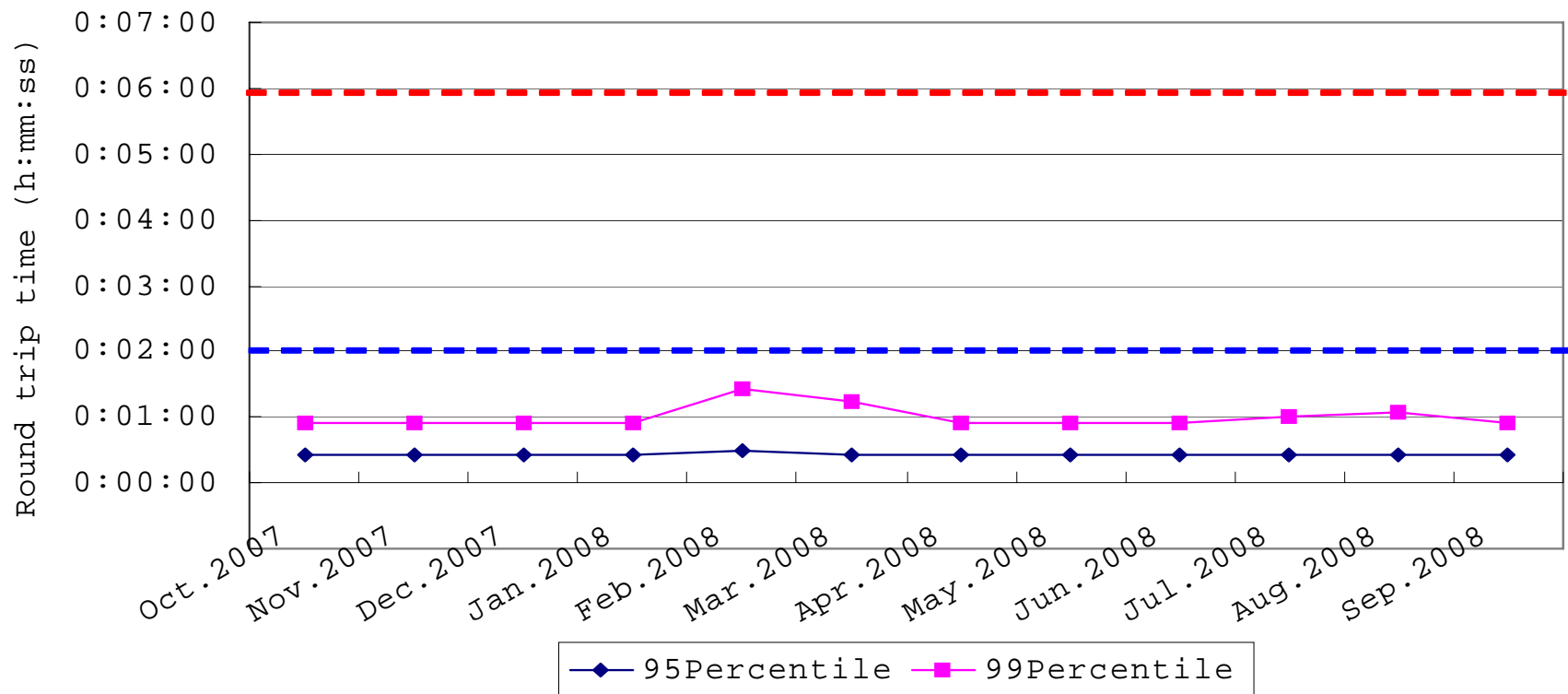


# CPDLC Up-link Performance

(Round Trip Time:

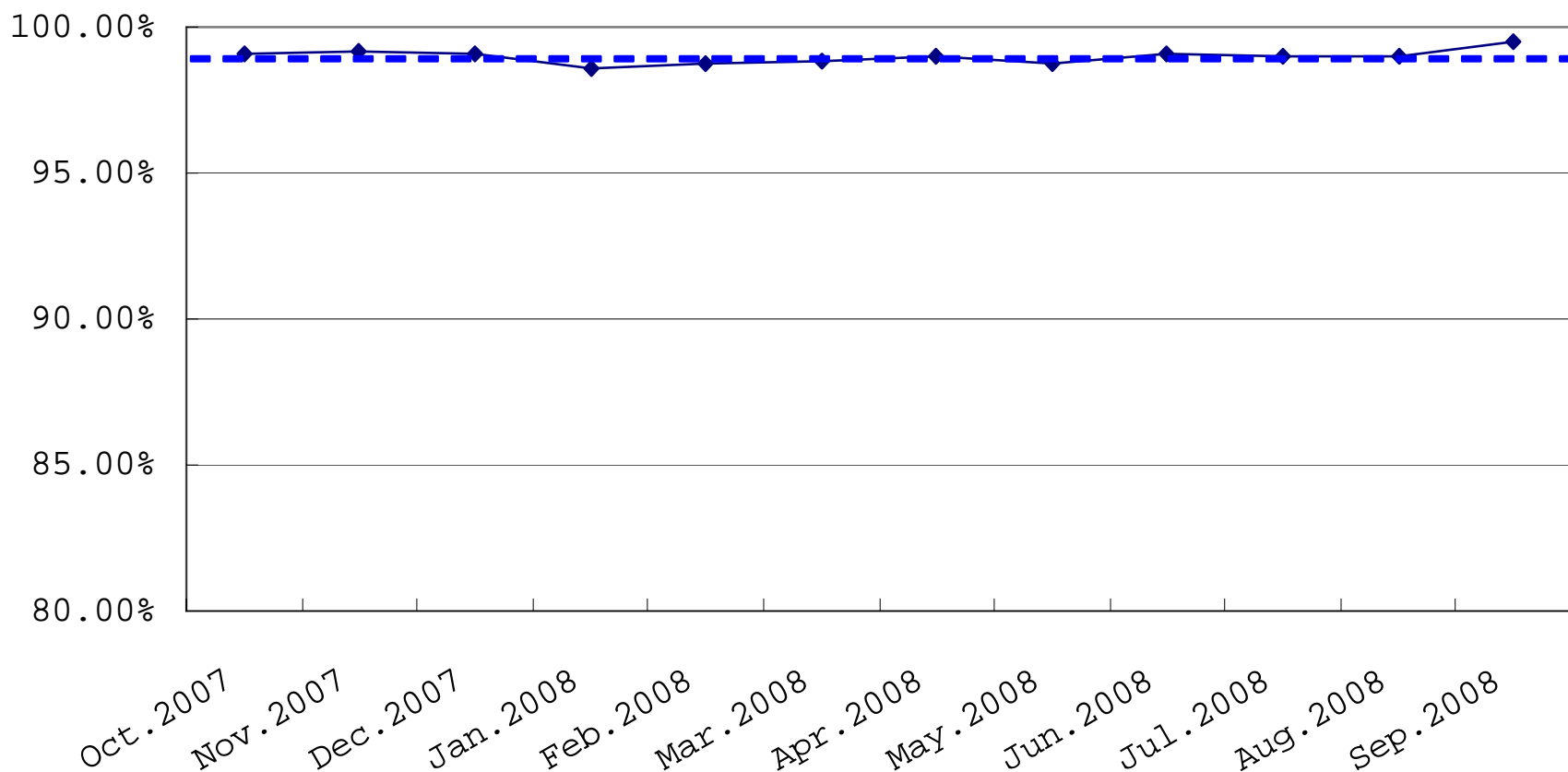
Transit-delay-time from time-stamp of up-link to receipt time of MAS)

Uplink 95 & 99 Percentile



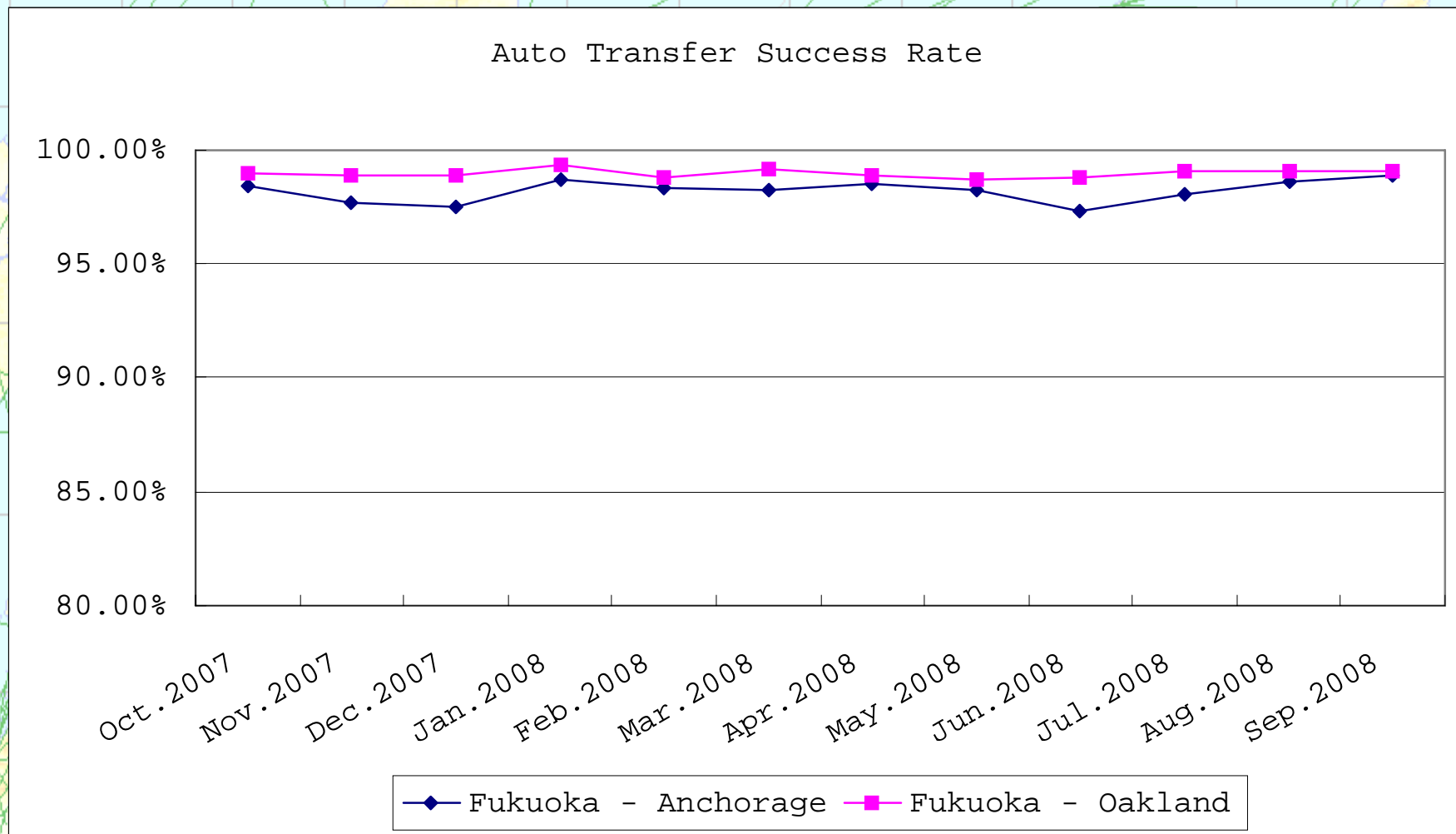
# CPDLC Up-link Message Success Rate

Uplink Success Rate




# Success Rate of Automatic-Transfer of Connections

## (From Fukuoka FIR to Anchorage/Oakland)





A map of the Pacific Ocean region, showing the western coast of North America, Central America, and the western coast of South America. The map is overlaid with a grid of latitude and longitude lines. Numerous green lines represent flight paths, originating from various points along the western coasts and converging towards the right side of the map, likely representing flight paths to or from a central hub or destination.

## 2. Problem Reports

# **JCAB CRA Activities Since IPACG FIT/15**

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- **Problem Reports Proposed for Closure**
  - To be closed at IPACG FIT/16
- **New Problem Reports**
  - Specific Reports

# PRs to be closed at IPACG FIT/16

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PR #	Problem Report Title	Air/ Ground	Comments/Notes/Description	Status	Discuss at FIT/16?
10442	ACARS message "MESSAGE CANNOT DELIVERED TO ATC DUE TO TROUBLE" was displayed on CDU.	Ground	ATSU Data link system up linked the message due to scheduled maintenance going on in the ATSU end system.	Ready	Y
10444	Unable to logon	Air	REG in the flightplan submitted to the ATSU was not correct.	Ready	Y

# Receipt of enigmatic ACARS message

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PR Number: 10442

PR Status: Ready for FIT (Technical)

Problem Report from Airline;

- An aircraft attempted to LOGON(AFN LOG ON) to an ATSU.
- The aircraft subsequently received following ACARS message.  
"MESSAGE CANNOT DELIVERED TO ATC DUE TO TROUBLE"
- Because of the fact that the FN-CON message was received by the ATSU during the 3 minute period of planned system outage, the ATSU data link system uplinked the above message to the aircraft avionics.

# LOG ON failure

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PR Number: 10444

PR Status: Ready for FIT (Procedural)

## Problem Report from ATSU;

- An aircraft repeatedly attempted to LOG ON (AFN log on) with an ATSU, but was unable to succeed in logging on.
- The ATSU rejected the FN\_CON (NO FPL) from the aircraft.
- The FN-CON that the aircraft downlinked to the ATSU did not coincide with that of the ATSU, which was caused by the incorrectly registered aircraft number filed by the airline.
- Airlines are expected to give heed to file correct FPL.



# New Reports since IPACG FIT/15(1)

PR #	Problem Report Title	Air/ Ground	Comments/Notes/Description	Status	Discuss at FIT/16?
10442	ACARS message "MESSAGE CANNOT DELIVERED TO ATC DUE TO TROUBLE" was displayed on CDU.	Ground	ATSU(Datalink system) uplinked the message due to scheduled maintenance on ATSU end system.	Ready	Y
10443	Unable to uplink	Air	The ATSU did not uplink EOS.	Waiting	Y
10444	Unable to logon	Air	REG in the flightplan submitted to the ATSU was not correct.	Ready	Y
10445	Unable to logon	Ground	Data link system rejected MAS via HF.	Open	Y
10446	Unable to logon	Ground	MED was not to be forwarded to DSPs.	Waiting	Y
10447	Repeated requests to make CPDLC position reports by ATSU	Air	ADS DIS(reason code =2) was downlinked.	Lesson	Y
10448	CPDLC CC was delayed	Air	Due to probable unstable air/ground data link communication, the aircraft avionics accumulated down link messages and delivered them when data link has become available.	Open	N
10449	Unable to establish datalink communication	Air	The probable cause is that the avionics had a loss of ADS event request.	Waiting	Y
10450	Unable to establish ADS contract	Air	The aircraft did not use SATCOM media where out of the VHF coverage.	Waiting	Y



# New Reports since IPACG FIT/15 (2)

PR #	Problem Report Title	Air/ Ground	Comments/Notes/Description	Status	Discuss at FIT/16?
10451	Incorrect ADS report received	Air	ADS waypoint change event report contained incorrect predict route group.(AIRBUS)	Waiting	N
10452	ADS waypoint change event report was not delivered to an ATSU	Air/ Ground	ATSU end system stopped uplinking ADS event request because ADS ACK timer expired.	Lesson	Y
10453	Data transmission delay	Ground	Due to DSP's re-injection	Open	Y
10454	Unable datalink communication	Air	The aircraft did not use SATCOM media where out of the VHF coverage.	Waiting	Y
10455	Data transmission delay	Air/ Ground	Due to unstable air/ground data link communication, the aircraft avionics accumulated down link messages and delivered them when data link has become available.	Open	N
10456	Unable to uplink	Ground	An ATSU received DR in response to a CR.	Lesson	Y
10457	Unable CPDLC log off	Ground	ATSU end system could not receive CPDLC DR because data link system rejected the DR via HF.	Lesson	Y
10458	Unable datalink auto transfer	Air	The pilot did not downlink WILCO in response to a [CONTACT + EOS].	Open	Y
10459	Disruption of position reports	Air/ Ground	ATSU end system could not receive position reports because data link system rejected messages via HF.	Open	Y
10460	Unable datalink communication	Air	The aircraft did not use SATCOM media where out of the VHF coverage.	Waiting	Y

# New Reports since IPACG FIT/15 (3)

PR #	Problem Report Title	Air/ Ground	Comments/Notes/Description	Status	Discuss at FIT/16?
10461	Unable to get ADS waypoint change event reports	Air	The probable cause is that the avionics had a loss of ADS event request.	Waiting	Y
10462	Unable datalink communication	Air/ Ground	Still under investigation	In progress	N
10463	Data transmission delay	Air	It remains possible that the aircraft was in the state of No-comm.	Open	N
10464	Unable to uplink	Air/ Ground	An ATSU received DR in response to a CR.	Lesson	Y
10465	Unexpected receipt of an ADS DIS	Air	The pilot probably turned off ADS function.	Lesson	Y
10466	Unable to use CPDLC	Air	The aircraft downlinked HX label.	Waiting	N
10467	Unable datalink communication	Air	The aircraft downlinked Q5 RJCT. Still under investigation	In progress	N
10468	Unable datalink communication	Air/ Ground	Still under investigation	In progress	N
10469	Unable datalink communication	Air/ Ground	Still under investigation	In progress	N
10470	Unable datalink communication and data transmission delay	Air/ Ground	Still under investigation	In progress	N

# New Reports since IPACG FIT/15 (4)

PR #	Problem Report Title	Air/ Ground	Comments/Notes/Description	Status	Discuss at FIT/16?
10471	Unable to get ADS waypoint change event	Air/ Ground	Still under investigation	In progress	N
10472	Unable to use ADS function	Air/ Ground	Still under investigation	In progress	N
10473	Unable datalink auto transfer	Air	The pilot did not downlink WILCO in response to a [CONTACT + EOS].	Open	Y
10474	Receipt of ADS DIS and unable datalink auto transfer	Air/ Ground	Still under investigation	In progress	N
10475	Unable to get ADS periodic report at instructed interval	Air/ Ground	Still under investigation	In progress	N
10476	Unexpected receipt of an ADS DIS(0)	Air/ Ground	Still under investigation	In progress	N

# Specific PRs (New)

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- Uplink failures.(PR10443,10456,10464)
- Usage of HF DL.(10445,10457,10459 )
- Repeated downlinks of ADS DIS.(10447,10465)
- No trace of SATCOM use. (10450,10454,10460)
- No downlink of WILCO messages.(10458,10473)
- Missing of an ADS event request.(10449,10461)
- No delivery of MED from avionics.(10446)
- No delivery of ADS waypoint change event report. (10452)
- Data transmission delay.(10453)



# Uplink failure

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PR Number: 10443,10456,10464

- In response of CR messages from ATSU, it received DR messages.
- Following the above, CPDLC was disconnected resulting in uplinking.
- Aircraft downlink function was effective due to the correct procedure(CR→CC) performed.
- Each case had provided only 10~30 second interval between ATC COMM OFF procedures and the following LOGON.
- The avionics system is designed to give rise to the reverse of downlinking order even when FN-CON is initiated first following ATC COMM OFF unless some dozens of second interval is provided.
- In case of performing disconnection manually with the ATSU, flight crews are expected to provide no more than 1 minute interval when initiating LOGON procedure following ATC COMM OFF.
- As far as PR10443 is concerned, CRASA intends to ask the ATSU the reason which may have caused to trigger the case due to non-delivery of END OF SERVICE.

<PR10443>

Time line →

Aircraft

02:53:24

02:53:39

DR

FN\_CON

02:54:34

CC

Position report

02:54:59

02:57:51

REQUEST HF FREQ

Connection Established!!

ATSU-B

FN\_AK

CR

DR

02:54

02:54

02:54

Displayed on ATC screen

Connection "not" Established!!



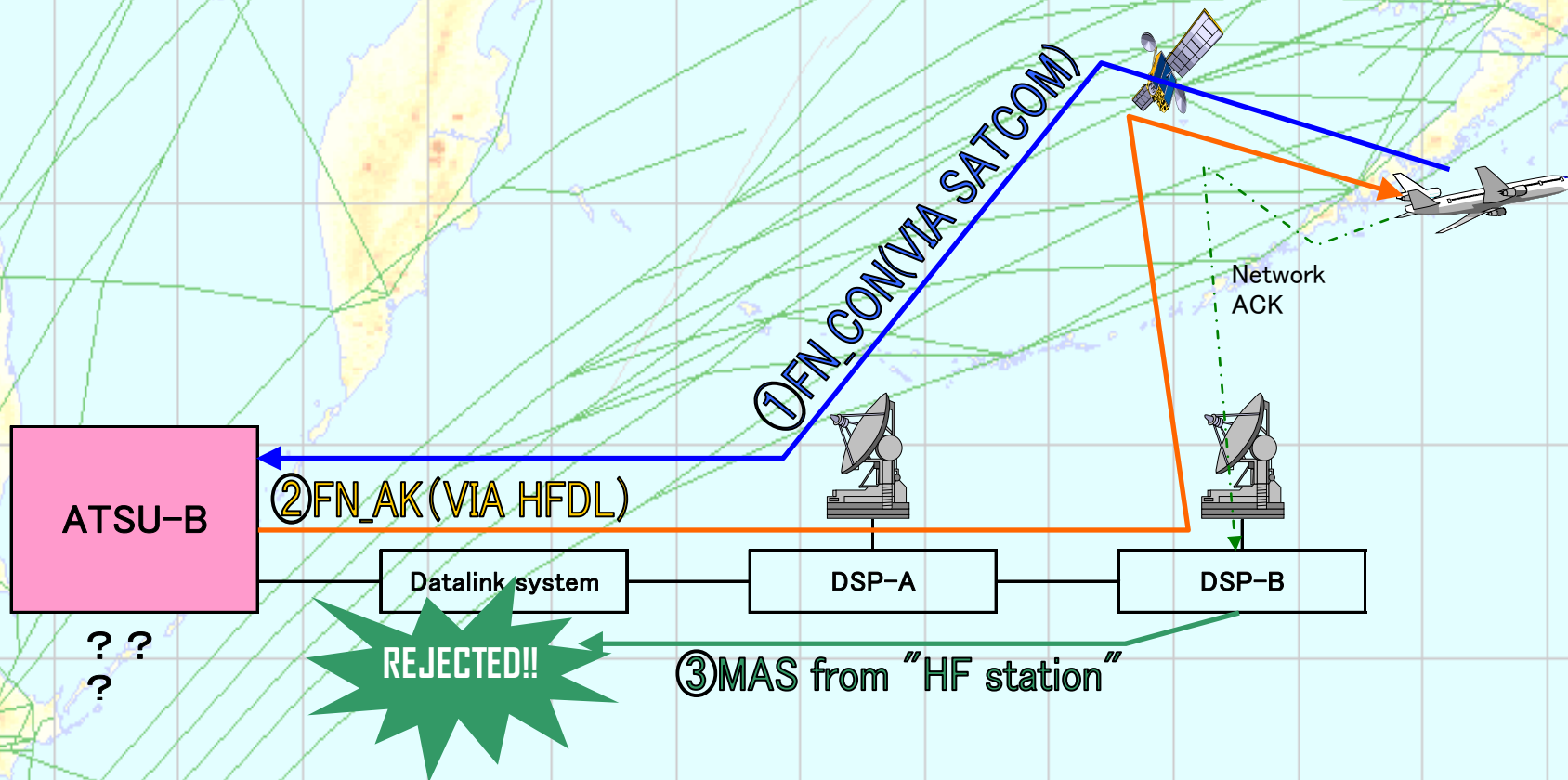
# Usage of HFDDL

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PR Number: 10445,10457,10459

- Messages downlinked via HFDDL were rejected by the data link system of the ATSU and failed to reach the ATSU end system.
- The use of HFDDL in the FIR is not approved( not available).
- 10445: Data link failure caused by the uplink via HFDDL and its MAS rejected at DLCS(Data Link Center System).
- 10457: DR downlinked via HFDDL was rejected and it failed to reach ATSU end system, resulting in the unsuccessful LOG OFF.
- 10459: CPDLC position report downlinked via HFDDL was rejected and it failed to reach the ATSU end system.
- The use of HFDDL in the FIR is not approved, which needs to be reminded among all the stakeholders concerned.

<PR10445>



# Baffling downlink of ADS DIS

PR Number: 10447,10465

- ADS DIS was downlinked abruptly, terminating ADS contract.
- PR10447 was submitted by an aircraft operator. 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 the ATSU in charge of the FIR, ADS was kept OFF and in response to ADS periodic request the aircraft sent ADS DIS(2).
  - When receiving an ADS request while ADS being OFF, the FMS downlinks the ADS DIS(2) according to its specifications.

# Aircraft did not utilize SATCOM

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PR Number: 10450,10454,10460

- These three PRs are related to the problem events that previously occurred when aircraft attempted to use VHF datalink without utilizing SATCOM even if they were out of VHF coverage.
- When they reached near VHF coverage boundary area, their communications became unstable and were disrupted.
- PR10454: The operator answered that at first the aircraft had trouble with its SATCOM equipment.
- PR10450,10460: Inquiries about these events have been sent to the operators concerned.



# WILCO was not downlinked

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PR Number: 10458,10473

- In response to CONTACT+EOS, no WILCO was downlinked and automatic transfer of datalink was not performed correctly.
- Both PRs stated that the aircraft downlinked a CPDLC position report at about the same time the CONTACT+EOS was uplinked. The position report was made about a compulsory reporting point where the aircraft passed several dozens of minutes before.
- It is probable that when the CONTACT+EOS was uplinked, the crew was being engaged in some CPDLC position reporting and did not downlink the WILCO.
- The downlinking of WILCO in response to the CONTACT+EOS is an indispensable procedure in making datalink transfer which needs to be disseminated amongst the parties concerned.

# No ACK to an ADS event request

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PR Number: 10449,10461

- No ACK returned in response to ADS event request, resulting in the ATSU being unable to acquire ADS waypoint change event report.
- Both PRs stated the fact that an ADS periodic request and an ADS event request were uplinked within a time frame of a minute.
- It is probable that the ADS event request was lost in the FMS.



# MED was not forwarded

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PR Number: 10446

- An aircraft was unable to use data link during its entire flight.
- According to communication log, no trace of data link usage was observed.
- It was revealed that the forwarding of MED was not correctly conducted.
- Further investigation is required of the relationship between the fact that the MED forwarding was not normal and the aircraft was unable to use data link.

# Unable to receive ADS waypoint change event report

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PR Number: 10452

- An ATSU reported that it could not receive ADS waypoint change event reports of an aircraft for two hours.
- The ADS ACK downlinked in response to an ADS periodic request was delayed for six minutes due to air/ground communication problem, causing the ATSU end system to stop uplinking ADS event request.
- The ATSU end system sets its timer 5 minutes for waiting ADS ACK in response to an ADS periodic request. When the ADS ACK is received within the 5 minutes, the system is designed to uplink an ADS event request.
- The 6 minutes' delay of an ADS ACK downlink caused the ATSU end system to stop uplinking ADS event request and resulted in the ATSU end system being unable to receive ADS waypoint change event report.
- The situation was restored by re-uplinking an ADS event request.

# CPDLC data transmission delay

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PR Number: 10453

- An ATSU reported that it received a CPDLC message about 30 minutes later.
- Temporary problem with a DSP communication process occurred.
- A DSP operator appears to have re-injected the CPDLC message about 30 minutes after it was actually downlinked.
- The problem event was notified to the DSP.

# Questions?

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