



CRA Activities in Fukuoka FIR

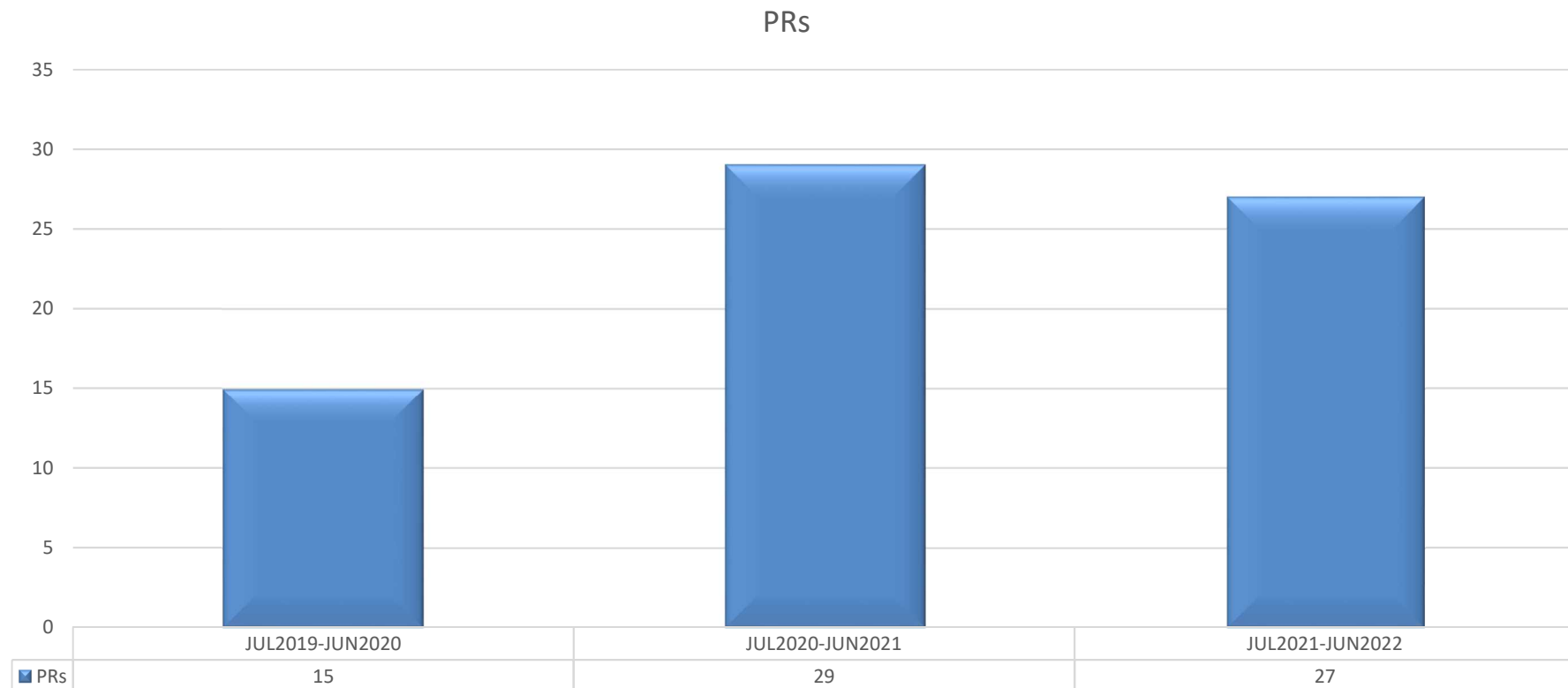
IPACG FIT/35
September 2023



Outline of FANS Problem Reports

Number of Problem Reports

From July 2021 to June 2022, 27 PRs were submitted to the CRA Japan.
16 of the 27 PRs are from operators, and the rest are from ANSP.

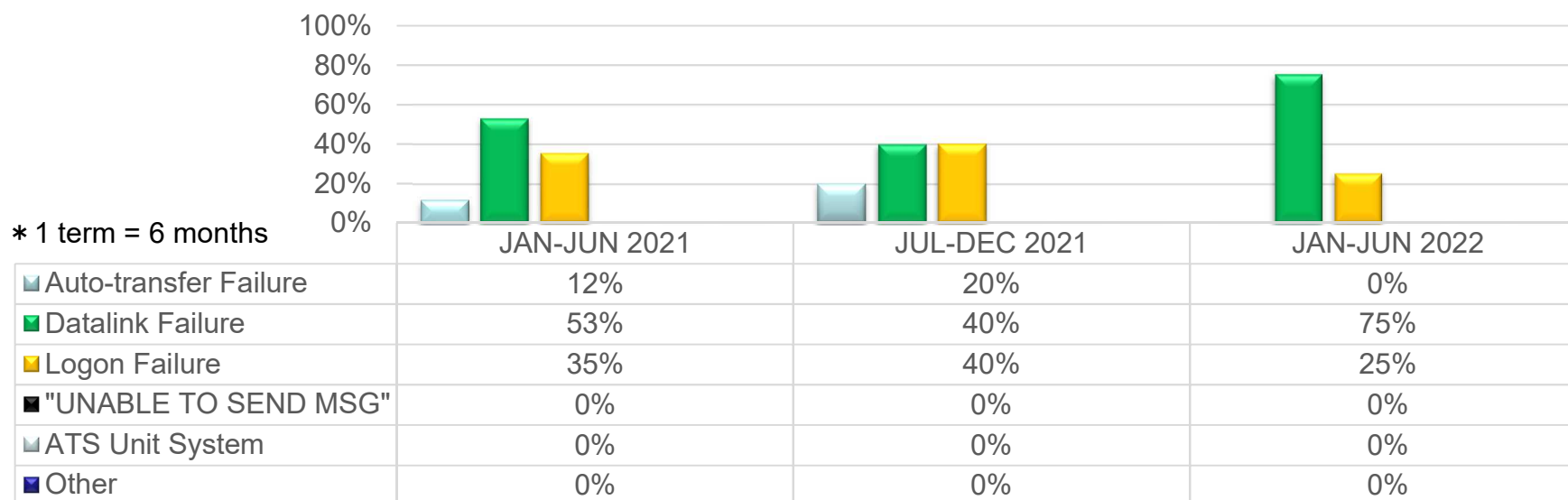


Problem classifications of PRs

◆ JUL2021-JUN 2022

Problem Classifications	Number	Rate
Auto-transfer Failure	3	11%
Datalink Failure	15	56%
Logon Failure	9	33%
Other	0	0%
TOTAL	27	100%

◆ 3 terms data



PRs by aircraft type

◆ JUL2021-JUN 2022

TYPE	Problem Classifications	Sub TTL	TTL	%
B744	Logon Failure	1	1	3.7%
B748	Logon Failure	2	9	33.3%
	Datalink Failure	6		
	Auto-transfer Failure	1		
B763	Logon Failure	1	4	14.8%
	Datalink Failure	2		
	Auto-transfer Failure	1		
B77W	Datalink Failure	1	1	3.7%
B788	Logon Failure	3	3	11.1%
B789	Auto-transfer Failure	1	2	7.4%
	Logon Failure	1		
OTHERS	Logon Failure	1	7	26.0%
	Datalink Failure	6		
GRAND TOTAL		27		100%

Examples of new PRs

(1) Auto-transfer Failure (#1395)

Reported by: Operator

Aircraft type: B763

Auto-transfer was not implemented when entering Fukuoka FIR from Oakland FIR. After initiated manual log off and log on to RJJJ again, the aircraft was able to successfully send “Position Report” and “Altitude Change Request”.

◆ STATUS : CLOSED

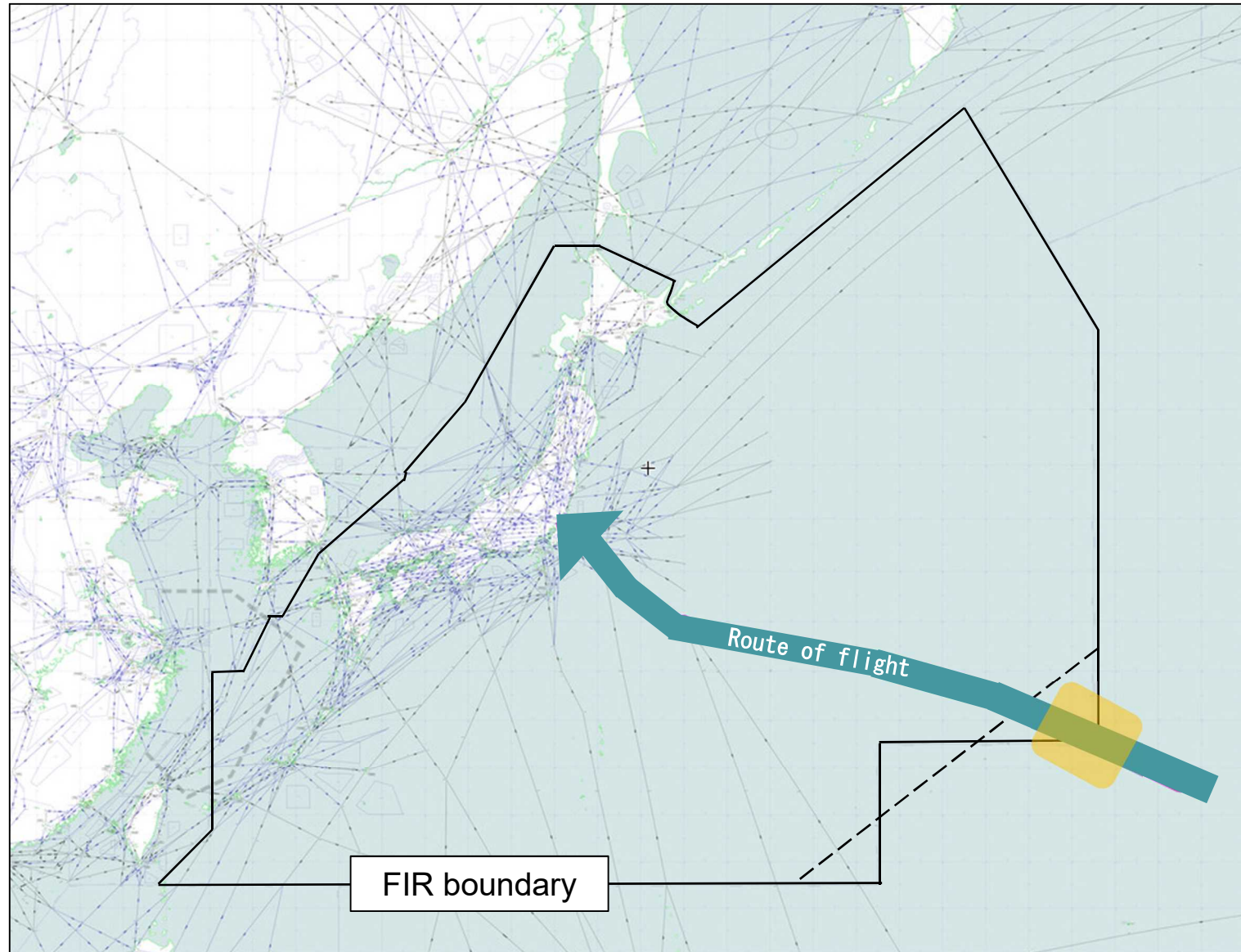
<aircraft information>

Route : PHNL - 25N170E - 29N160E - 30N150E - TONIK - G223 - BEGAD - Y817 - MENIX - Y813 - LUBLA - RJAA
Altitude : FL400
Ocean flight time: 0531~0835z

◆ Analysis:


- The aircraft did manually log off just after passing FIR boundary, but it was before the data link transfer to RJJJ was implemented.
- No reports of communication problems on that day.

Route



DEP : PHNL

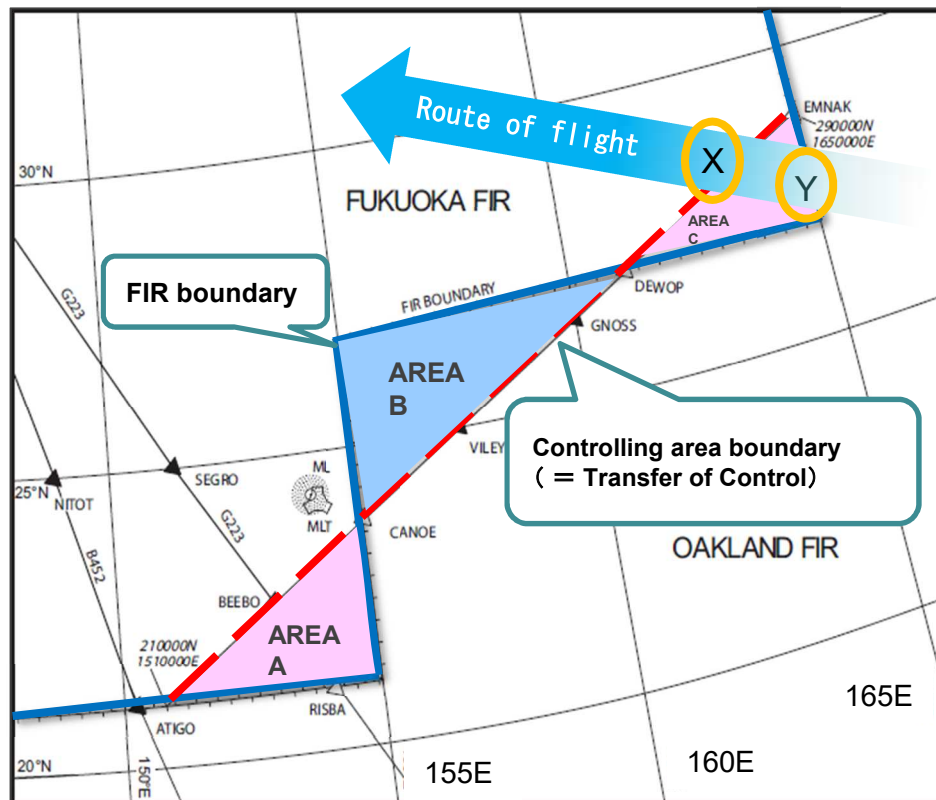
DEST: RJAA

 :
The point of Auto
transfer failure

The point of “Transfer of Control”

“FIR boundary” and “Controlling area boundary” are different

: Transfer of voice communication and current data authority is initiated at the controlling area boundary.



X : 2757N16253E
(=END SERVICE is uplinked immediately before this point)

ENR 2.2 OTHER REGULATED AIRSPACE

1. The area involved in the transfer of ATS responsibility

The control area is defined as a straight line from 210000N1510000E to 290000N1650000E over the existing FIR boundary between Fukuoka and Oakland FIR. The line over the existing FIR boundary creates three triangles defined as follows:

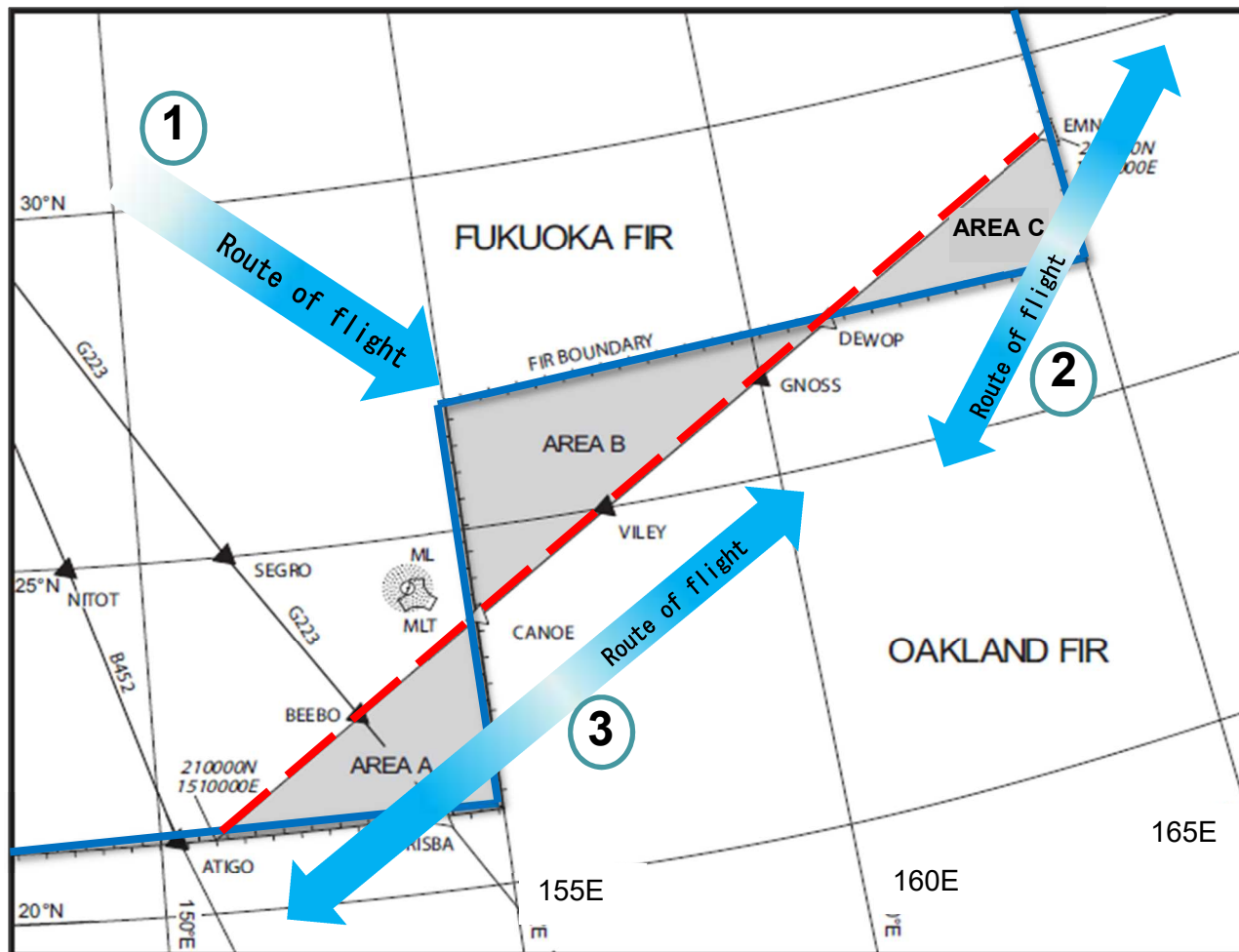
1.1

- (1) **Area A** (210000N1550000E , 210000N1510000E and 233139N1550000E to the point of beginning) is the airspace where **Oakland ARTCC provides air traffic control service in Fukuoka FIR.**
- (2) **Area B** (270000N1550000E , 270000N1610450E and 233139N1550000E to the point of beginning) is the airspace where **ATMC provides air traffic control service in Oakland FIR.**
- (3) **Area C** (270000N1650000E , 270000N1610450E and 290000N1650000E to the point of beginning) is the airspace where **Oakland ARTCC provides air traffic control service in Fukuoka FIR.**

Y : FIR boundary, but Oakland ARTCC is still in control.
(=Before Transfer of control)

Other points

This is the only point in the oceanic data link airspace where FIR boundary differs from the controlling area boundary.



【Each points】

①

AREA B is still controlling area of Fukuoka ATMC.
Transfer of control is initiated at the controlling area boundary.

② & ③

AREA A/C is controlling area of Oakland ARTCC.
Transfer of voice communication and current data authority is not required.

(2) Auto-transfer Failure (#1391)

Reported by: Operator

Aircraft type: B789

The current data authority of aircraft flying from Oakland ARTCC to Fukuoka FIR was transferred at 4700N17000E prior to FIR boundary 4508N16321E.

The aircraft couldn't receive a response from KZAK via HF voice communication, nor did it receive a response from RJJJ via CPDLC. After logging on to KZAK again, HF communication and CPDLC were established, and auto-transfer was implemented when entering Fukuoka FIR from Oakland FIR.

◆ STATUS: CLOSED

<aircraft information>

Route : KLAX - 47N170E - 44N160E - EMRON - OTR9 - AVBET - Y809 - SUPOK - RJAA

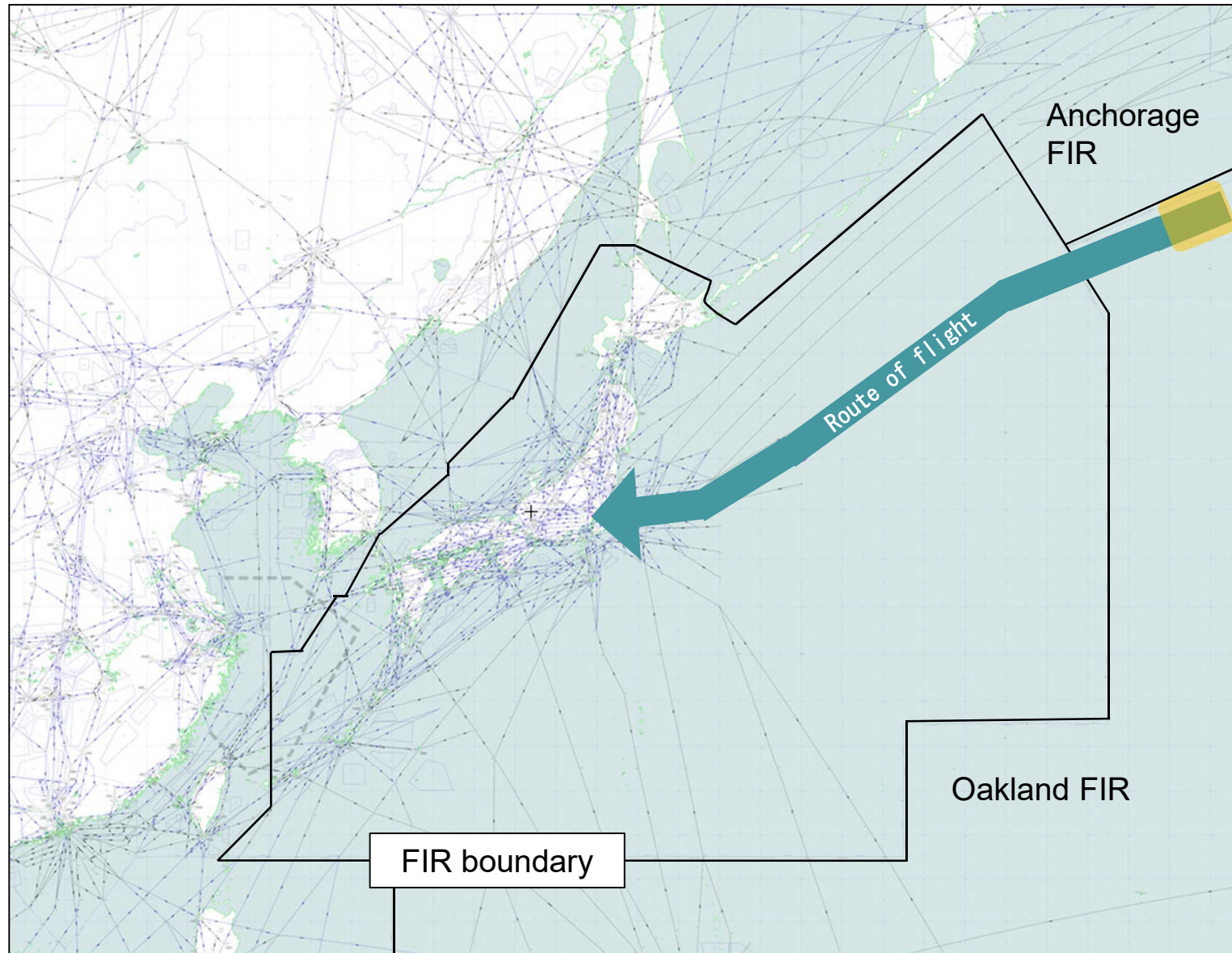
Altitude : FL390

Ocean fight time : 0546~0803z

◆ Analysis:


- FIR boundary ETA 0546z, transfer of CDA at 4700N17000E 0503z
- No equipment malfunction of the aircraft
- No reports of communication problems on that day.

Route of Flight

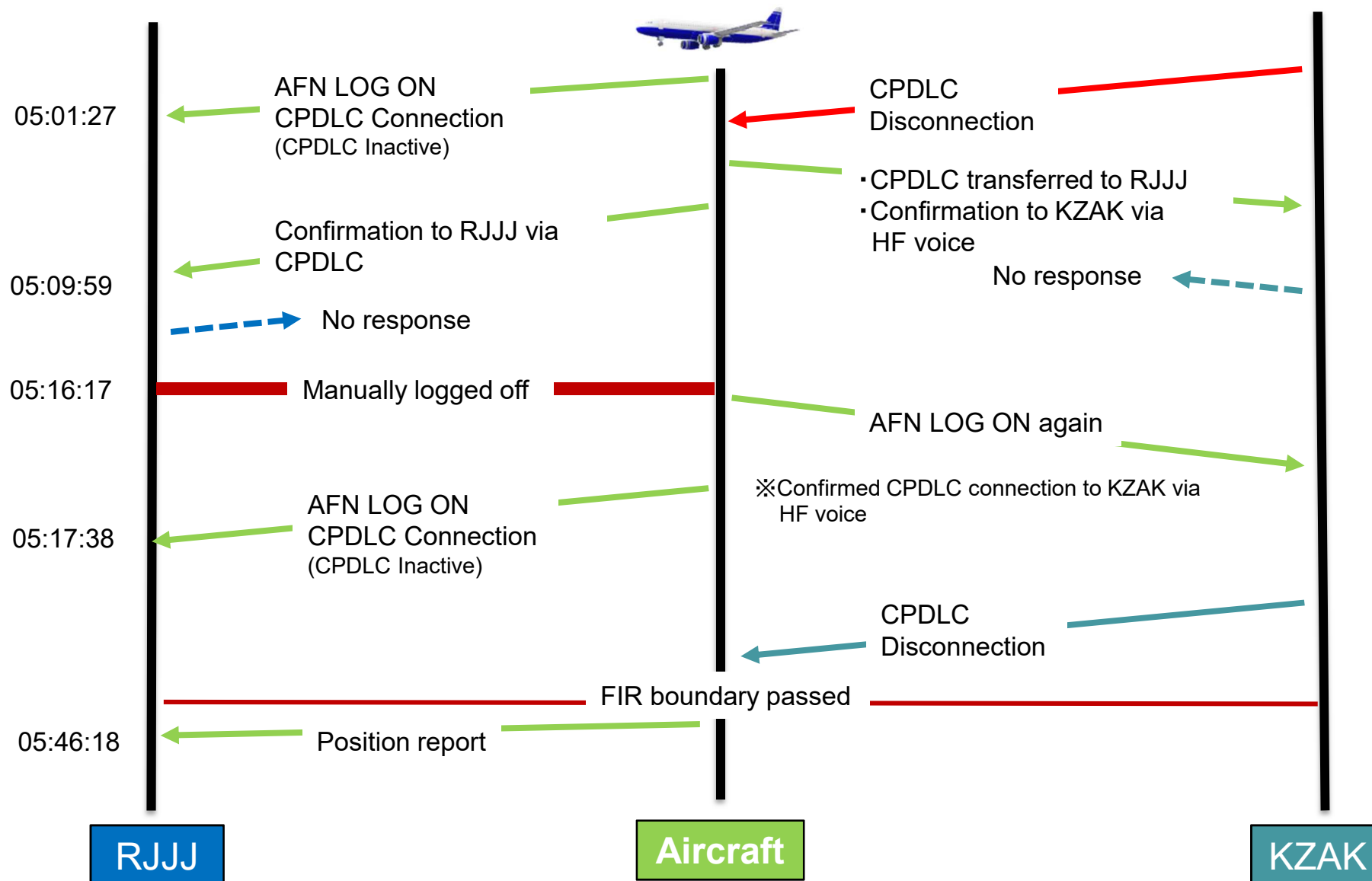


DEP : KLAX

DEST: RJAA

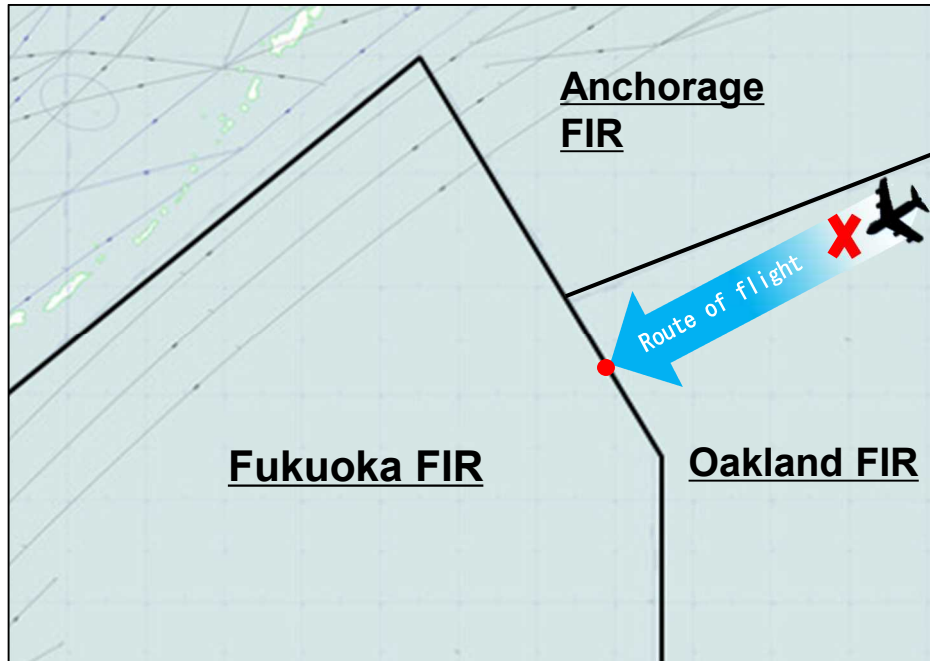
 :
The point of Auto
transfer failure

Operator communication transitions



Cause of early transfer of CPDLC authority

The cause was incorrect aircraft selection by ATCs.



: The controller intended to terminate the CPDLC connection with a different aircraft but instead the controller inadvertently terminated the CPDLC connection with this aircraft.

X : Position of transfer of CPDLC authority
4700N17000E

● : FIR boundary
4508N16321E

<Countermeasures for early transfer of CPDLC authority>

- Aircraft ➤
 - AFN log on again in the flying airspace and establish CPDLC connection.
 - Confirm if the communication should be transferred to next ATC facility after sending Position report and reconfirming present position.
- ATMC ➤ Similar events can occur within Fukuoka ATMC. For preventive measures, the details of the event are shared with ATCs.

(3) Logon Failure (#1408)

Reported by: Controller

Aircraft type: B789

Auto-transfer about aircraft flying on R220 from Anchorage ARTCC to Fukuoka FIR was not implemented, and AFN logon could not be established even after manually logging on. After several more manual AFN logon, a pilot spent 20 minutes to successfully complete AFN logon.

◆ STATUS: CLOSED

<aircraft information>

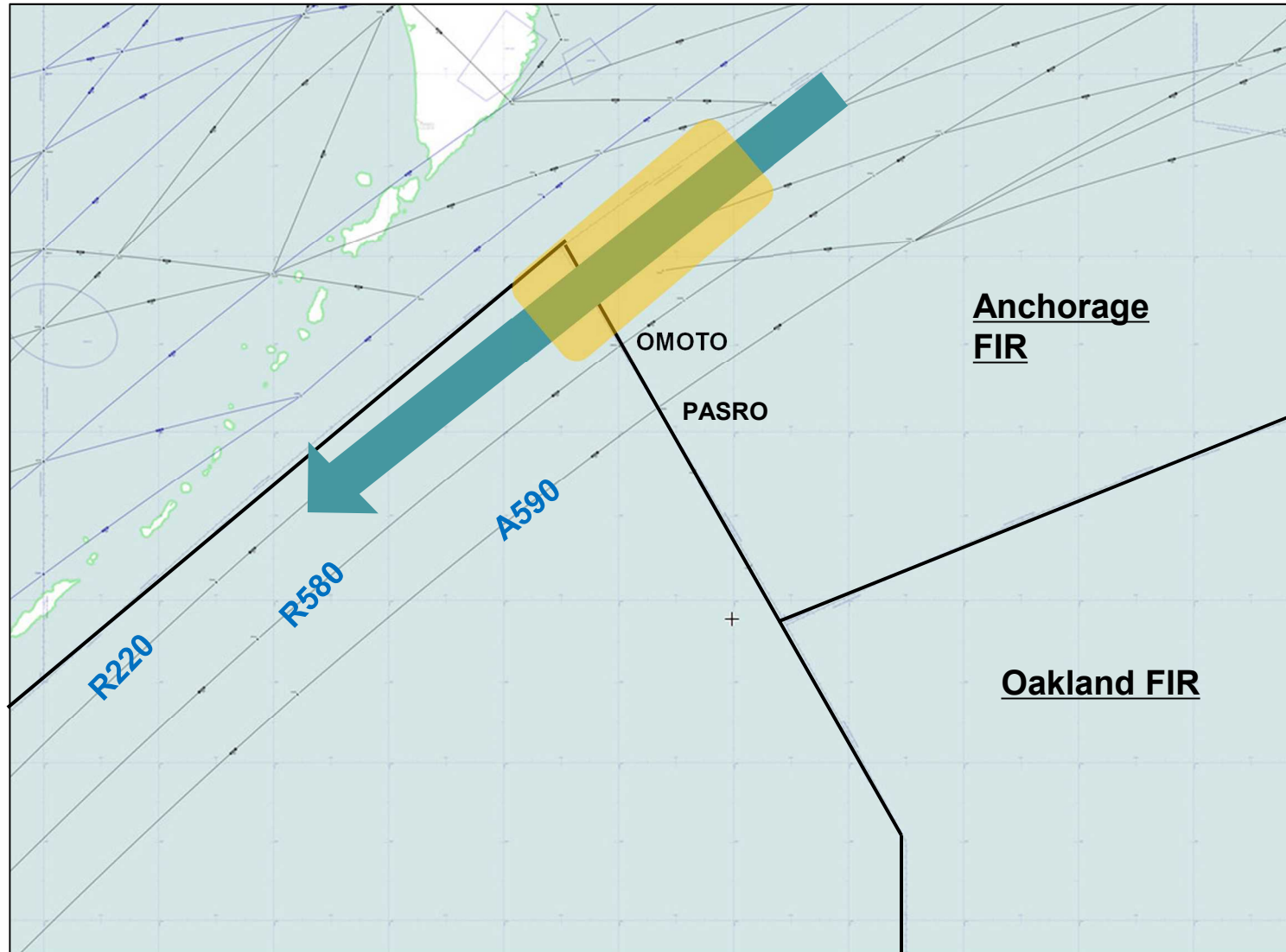
Route : KDFW ~ J804 NOODLE R220 NANAC Y810 OLDIV Y809 SUPOK RJAA

Ocean flight time : 0221~0413z

◆ Analysis:

- FIR boundary NIPPI ETA 0221z, but the time of successful AFN logon was 0242z.
- No equipment malfunction of the aircraft, and the aircraft had no communication problems the following day or later.
- No reports of satellite communication problems on that day.
- There was a failure report regarding DLCS, Data Link Center System, on that day.

Route of Flight



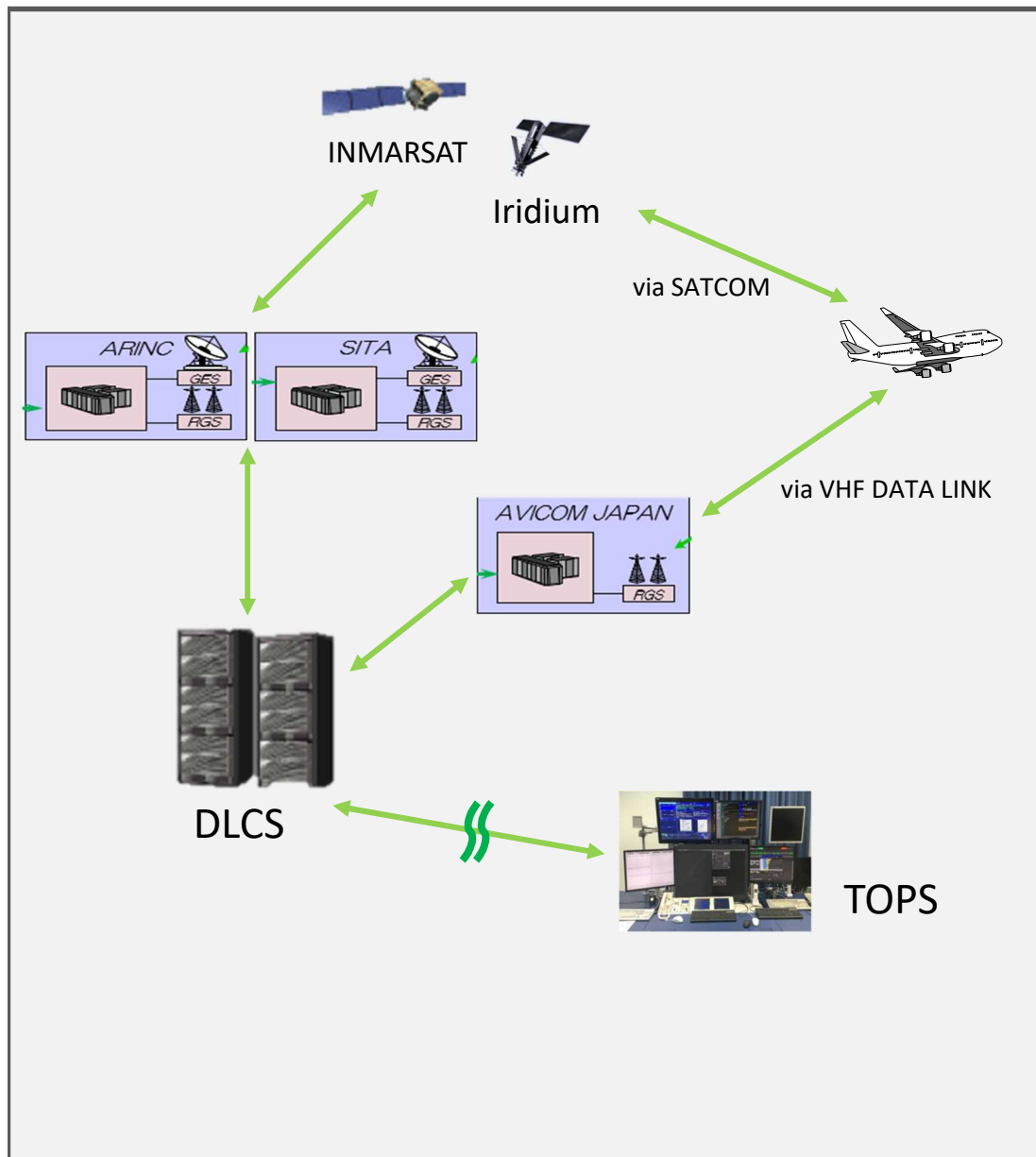
DEP : KDFW

DEST: RJAA



:
The point of
Auto transfer failure
&
Log on failure

Role and Impact of DLCS



◆ Roles and Features

- Data link reception device at JCAB (Japan Civil Aviation Bureau)
- All data link information passes through
- Directly connected to provider (ARINC, SITA, and AVICOM JAPAN)

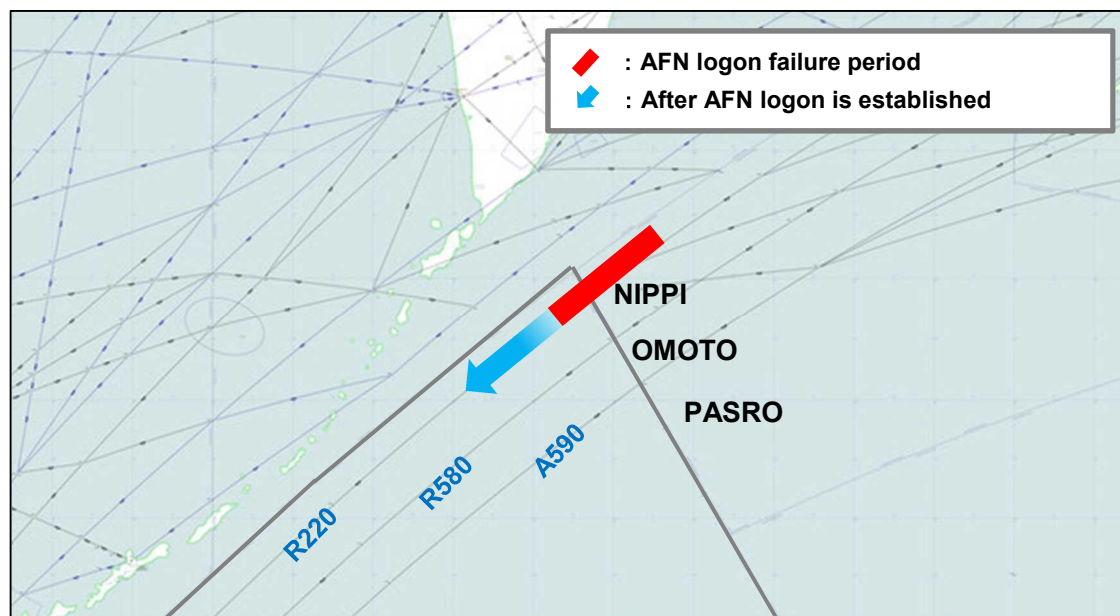
◆ Impacts of Failure

- All data link information will be disrupted
- The separation between aircraft with reduced separation minima using ADS-C is no longer available

The cause of AFN LOG ON Failure

The timing of AFN logon was during DLCS failure

- DLCS failure time : 0053 ~ 0342z.
- The time the aircraft successfully logged on was also 0342z.



Relevant Data

- ✓ Traffic volume in NOPAC has been gradually recovering.
- ✓ Approximately 85% of the flights in NOPAC are PBCS approval.
- ✓ Number of aircraft changed from data link to HF voice communication.
: 32 aircraft
- ✓ Number of aircraft entering the oceanic airspace without data link connection.
: approximately 70 aircraft

<Points of data link failure>

- The timing that controllers can detect the interruption of data link communications is
 - the timer for receiving Periodic ADS-C report timed out
 - the timer for receiving Message Assurance for CPDLC uplink message timed out
- Possible concentration on HF voice communications due to data link disruptions.
 - ATCs prioritizes HF voice message transmissions based on the situation.

Reporting address of PRs

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E-mail : cab-atmc-cra@gxb.mlit.go.jp

Central Reporting Agency Japan
JCAB Air Traffic Management Center