



ICAO

International Civil Aviation Organization

Eleventh Meeting of the FANS Interoperability Team – Asia  
(FIT-Asia/11)

Video Teleconference, 23 – 27 August 2021

---

## Agenda Item 2: Central Reporting Agency Reports

### FANS INTEROPERABILITY TEAM (FIT) CENTRAL REPORTING AGENCY (CRA) PROBLEM REPORT (PR) BRIEFING

(Presented by the Boeing CRA)

#### SUMMARY

*This paper describes investigation and disposition of submitted Air Traffic Services (ATS) data link problem reports (PRs) that are relevant to the Asia Region.*

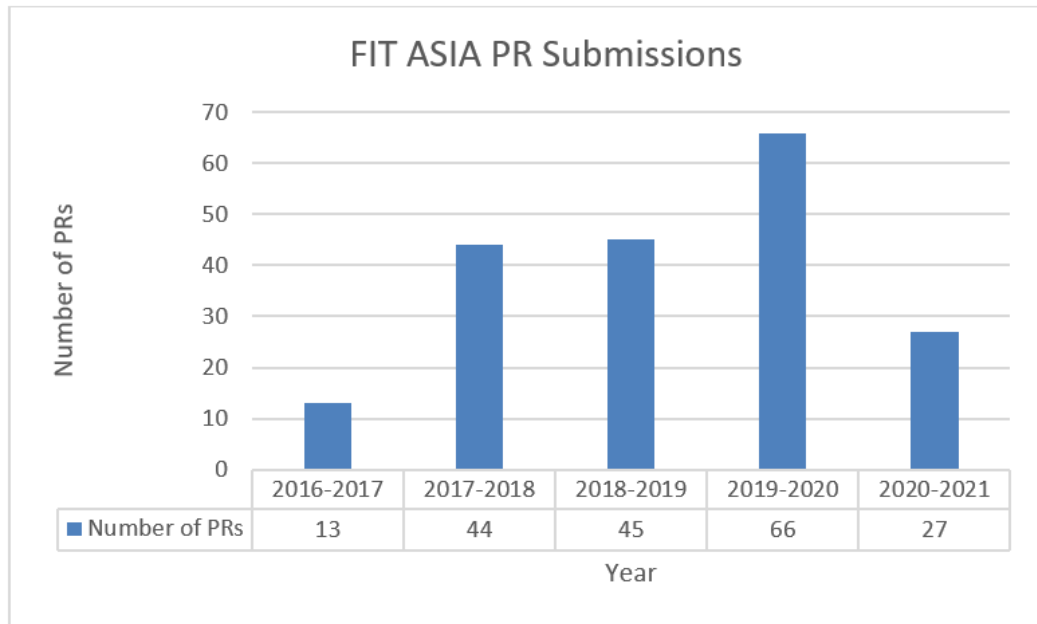
## 1. INTRODUCTION

1.1 ATS data link stakeholders may submit PRs for investigation via the <http://www.fans-cra.com/> website.

- Airways Corporation of New Zealand (ACNZ) graciously hosts and maintains this website.
- Stakeholders from multiple regions use this website, including the North Atlantic region (including certain areas of Europe and Canada); the South Pacific region; the North and Central Pacific region (except for the Fukuoka Flight Information Region [FIR]), and certain areas of the Asia region (including the South China Sea, Bay of Bengal, Indian Ocean, and Arabian Sea areas).

1.2 Between preparation of the previous PR briefing for the FIT ASIA/10 meeting held in August 2020 and preparation of this PR briefing, ATS data link stakeholders submitted 27 PRs via the website.

1.3 Figure 1 illustrates the number of PRs submitted per calendar year for the Asia region, starting in 2016.



**Figure 1**

1.4 The lower number of PRs submitted in the last 12 months is not surprising as there has been a dramatic decrease in air traffic, particularly international air traffic, due to the impact of the COVID-19 pandemic.

1.5 PR status definitions include the following:

- **RAISED:** The PR has been submitted by the originator but has not yet been processed by the DLMA
- **ACTIVE:** The DLMA has processed the PR and assigned it for investigation
- **OPEN:** The PR investigation is complete but some form of correction is required before it can be closed
- **OPEN – FIX AVAILABLE:** Corrective action has been implemented and fix is available for installation
- **CLOSED AS DUPLICATE:** The PR is closed because the problem is already tracked under another PR
- **CLOSED:** Corrective action has been implemented

1.6 PR type definitions include the following:

- **TBA:** To be assigned
- **AIR:** Avionics or flight crew issue
- **AIR – Procedural:** Flight crew issue
- **AIR – Technical:** Avionics issue
- **GROUND:** ATS unit system or controller issue
- **GROUND – Procedural:** Controller issue
- **GROUND – Technical:** ATS unit system issue
- **NETWORK:** CSP or SATCOM service provider issue

- **MULTIPLE:** Multiple types of issues
- **NONE:** Report is a non-problem

## 2. DISCUSSION

### Significant Problem Reports in the Asia Region

2.1 Since the FIT ASIA/10 meeting, the CRA has investigated the following significant PRs that occurred in the Asia region:

2.2 **3099-KS, OPEN/MULTIPLE.** CAA Singapore submitted a list of aircraft which did not meet the 95% RCP/RSP requirements. The data provided for this PR included 702 instances where the delays were larger than 180seconds. Analysis of this data showed multiple reasons for the message delay. The most common reason of the poor performance was due to media transitions when flying on the edge of VHF coverage. The CRA would like to emphasize the options for operators to reduce these types of transitions by optimizing their avionics configurations. This includes defining media region definitions to disallow VHF as well as implementing the RAT1 timer. Additional options are detailed in the FIT ASIA/9, WP3. Additionally, a significant portion of the delayed data was found to be due to B777 aircraft. The B777 aircraft had a known issue which delayed downlinks. This has since been fixed and B777 operators are encouraged to update to AIMS V17B or later.

2.3 **3114-KS, CLOSED/MULTIPLE.** CAA Singapore reported aircraft performance below 95% RSP over IGWI, TBH1 and XXP. In the data provided, 86 of the 223 total delayed reports had a total transit time of over 180seconds. The most significant reason for this was found to be due to flying on the edge of VHF coverage in the South China Sea. For issues reported with other stations, there was not enough data points available to determine a statistically significant cause. 100 data points has been the minimum with which we have been able to see a trend with. However, in practice, the CRA has found that on the order of 300-350 data points is needed to determine the actual cause of an issue.

2.4 **3131-GM, CLOSED AS DUPLICATE/AIR-TECHNICAL.** Nippon Cargo Airlines reported they were unable to establish connection with RPHI. The flight crew reported that the ATC LOGON page would not accept any of the data necessary for a successful logon. This is a known issue with the NG FMC which is installed on B747-8 and B747-400 aircraft. A fix for this issue is being incorporated in the next software update which is currently in the test phase. This PR was closed as a duplicate of 2892-KS which is the master PR tracking this issue.

2.5 **3154-GM, CLOSED/GROUND-TECHNICAL.** BOBASMA reported received an error downlink in response to an uplink. Analysis showed that the uplink included a CLIMB TO and MAINTAIN (UM20) element as well as a REPORT REACHING (UM175) element. The Airbus 350 avionics software rejected the uplink with an error downlink. This is per design due to the UM175 inclusion in the uplink. This element is not supported by the A350 avionics as per the GOLD recommendations.

2.6 **3158-MM, CLOSED/TBA.** BOBASMA reported receiving continuous error messages for a particular aircraft. Data analysis showed that this error on the ground system was most likely due to multiple failed ADS-C and CPDLC uplinks to the aircraft. The cause of the failed messages was due to the airplane crossing the Bay of Bengal westbound but not switching from VHF to SATCOM as it exited VHF coverage from the Andaman Islands. Boeing attempted to investigate further as to why the transition did not happen, however the aircraft operator did not provide the requested avionics logs. This PR was closed but a new PR will be opened if this issue is reported again.

2.7 **3169-SH, ACTIVE/Air-Technical.** AirNav Indonesia reported that no replies were received from a B747. Data analysis showed that the avionics had trouble maintaining a SATCOM link over Iridium for a period of about 15 minutes. During this time, the avionics could not acknowledge uplinks, and the network delivered NO ACK messages to WAAF indicating that uplinks could not be delivered. The cause of this SATCOM link problem cannot be determined, but the problem seemed to correct itself later in flight. The operator was contacted to ask if this aircraft has experienced further SATCOM difficulties. The more recent performance data for this tail in other regions looks nominal.

2.8 **3178-MM, CLOSED/MULTIPLE.** CAA Singapore reported less than 95% RSP performance over IGWI and XXA. Analysis of data indicates that the common cause for the cases of poor performance was not actually poor SATCOM (XXA and IGW1) performance, but rather poor VHF performance due to limited VHF coverage over the South China Sea. Avionics prefer VHF over SATCOM, so if the avionics attempt but fail to successfully send a downlink via VHF (when exiting VHF coverage or operating along the edge of VHF coverage) and accordingly revert to sending it via SATCOM, then the time necessary to attempt VHF and subsequently revert to SATCOM causes SATCOM performance to appear poor when it actually is not. The CRA would like to remind participants of FIT ASIA/9, WP03 which outlines methods to improve performance. Particularly, the CRA would like to emphasize the ACARS avionics "RAT1" timer that is intended to improve FANS performance during VHF-to-SATCOM transitions and is available in many avionics already. Additionally, the CRA noted that the data which CAA Singapore provided contains at least two pairs of duplicate downlink messages that should have been excluded from PBCS analysis per ICAO Doc 9869 (PBCS Manual) Second Edition.

#### Significant Problem Reports in Regions Outside Asia

2.9 Since the FIT ASIA/10 meeting, the CRA has investigated the following significant PRs that occurred in regions outside of Asia, which might be of interest to participants of FIT ASIA:

2.10 **3084-MH, OPEN/GROUND-TECHNICAL.** The CPDLC transfer from CZQX to EGGX failed because the End Service uplink from CZQX failed, due to a known problem; "aircraft unreachable while switching between Inmarsat Classic Aero GESs." The CSP delivered a MAS-fail; however Gander did not re-attempt the uplink. Gander is planning an update to their ground system to repeat failed uplinks. The CRA would like to remind participants that they should repeat uplinks if a MAS-fail is received.

2.11 **3107-KS, CLOSED AS DUPLICATE / MULTIPLE.** The avionics received the same UM123 SQUAWK message multiple times as the result of multi-path uplink delivery when the aircraft had a weak VHF connection. Two uplink attempts over VHF were successful, even though the avionics could not technically acknowledge them, as well as a SATCOM attempt. Some avionics (such as the Pegasus FMC on the 757 for this PR) does not identify duplicate messages when the same uplink is received over different media, and the crew responded WILCO several times.

2.12 **3113-MH, CLOSED/MULTIPLE.** CAA Singapore reported a B777 performing below 95% for RCP/RSP. Although there was not enough data points to come to a statistically significant conclusion for the cause of the poor performance, based on the available data, it was theorized that this was due to multiple reasons. The first being that the aircraft flight path took it over a region with poor VHF coverage resulting in multiple transitions to and from SATCOM. Additionally, the B777 was operating with older AIMS software which had a known issue with delayed messages which has since been fixed in AIMS-2, BPV 17C and later.

2.13 **3119-MM, OPEN / AIR – Technical.** The FAA received several erroneous downlinks from the 787 and 747-8. Upon investigation, Boeing and Honeywell determined that the 747-8 and 787 avionics sent invalid (truncated) CPDLC position reports (dm48) because they failed to properly convert the wind direction to the range from 1 to 360 integer degrees that the CPDLC syntax defines when the wind direction was between 0.0 and 0.9 degrees. Boeing and Honeywell will fix this problem in the next 787 CMF and 747-8 FMC software releases.

2.14 **2459-MM, CLOSED / AIR – Technical.** Fukuoka (and later Oakland Oceanic) reported receiving an invalid ADS-C timestamp of 3,600 seconds in the basic group from a 787. This problem was due to a 787 ADS-C application software fault that caused it to incorrectly round the ADS-C timestamp to 3,600 seconds (instead of back to 0 seconds) when the current time is between 3,599.938 seconds and 3,599.999 seconds after the current hour. Boeing and Honeywell fixed this problem in 787 CMF BPV6 software, which became available in September 2019 on new airplanes delivered from Boeing and became available in December 2019 for retrofit via a Service Bulletin.

#### Less Significant Problem Reports in the Asia Region

2.15 Since FIT ASIA/10, the CRA has investigated or received the following less significant new/updated PRs that occurred in the Asia region:

2.16 **3089-RP, CLOSED/MULT.** China RMA reported increase in HF usage by certain aircraft, even when operating in areas where other media coverage is readily available. In discussions with China RMA it was noted that the amount of aircraft utilizing HF media has decreased substantially and is no longer at a level of concern. Additionally, CAA Singapore reported that ARINC had notified them of a DSP configuration change which results in sending messages over to SITA for delivery prior to attempting HF delivery. As the performance has increased to an acceptable level, this PR has now been closed.

2.17 **3091-RP, CLOSED/TBA.** CAA Malaysia reported that during a CPDLC test with an aircraft, the flight crew attempted to logon to WMTT but was unable to establish connection. The registration ID for the aircraft was not provided and therefore no log analysis was able to be performed. However, the aircraft OEM reported that they believed the aircraft to be operating with an old version of CPDLC software.

2.18 **3093-MM, ACTIVE/GROUND-TECHNICAL.** CAA Malaysia reported losing connection with an aircraft while switching between the primary and backup systems during a test. In discussions with CAA Malaysia, they took the action to work with the ground system OEM to investigate further and resolve the problem.

2.19 **3100-RP, CLOSED AS DUPLICATE/TBA.** CAA Singapore reported RSP performance falling below 95% for multiple aircraft when operating on the BTH1 station, which should have sufficient coverage. While the data provided did show delayed reports, no single aircraft had enough data points to come to a valid conclusion. Additionally, a more recent PR was submitted for the same ground station. Therefore this PR is closed as a duplicate of the newer PR, 3121-KS.

2.20 **3108-SH, CLOSED/NON PROBLEM.** CAA Vietnam reported CPDLC outage during routine maintenance. This was closed as a non-problem as routing maintenance is not investigated by the CRA. No further issues have been reported by this center.

2.21 **3120-MH, CLOSED/MULTIPLE.** CAA Singapore reported a list of airframes that did not meet the 95% criteria for RCP/RSP for Jul-Sep, 2020. Based on the data available and known issues with certain avionics versions, it is believed that this poor performance is due to marginal VHF coverage in certain areas of the South China Sea. To alleviate this, operators are encouraged to ensure their avionics media preference settings have been optimized for SATCOM usage in that specific area along with upgrading to software which includes the new RAT1 timer.

2.22 **3121-KS, CLOSED/TBA.** CAA Singapore reported RSP performance falling below 95% for multiple aircraft during the Jul-Sep 2020 timeframe, while operating with the BTH1 station. The data provided had more than 220 delayed reports noted, over 85 different aircraft. However, most aircraft did not experience more than 5 delayed reports in the given time period so there was not enough data to come to a valid conclusion as to the cause. Of the aircraft with the highest number of delayed reports, it was noted that it occurred in the area just on the edge of coverage from the BTH1 station. It is theorized that the poor performance is caused by weak VHF signal in the aircraft flight path as well as potential need for avionics optimization. However, no firm conclusion can be made due to the low instance of reports for any given aircraft.

2.23 **3133-SH, ACTIVE/TBA.** Airport and Aviation Services Sri Lanka reported having both ADS and CPDLC connection disconnected. This PR is currently under investigation by Airbus.

2.24 **3147-MH, CLOSED/TBA.** Japan Air Navigation Service reported that while connected to CPDLC, a transfer was initiated and the avionics showed a new center. However, the transfer was not successful and instead both the active and next center indications cleared. Pertinent data was not able to be obtained in time for further analysis, however, based on the aircraft in question, it is believed that this was due to either the active center uplinking an NDA but disconnecting prior to sending the AFN CAD or the AFN CAD was uplinked but not received by the aircraft prior to the active center disconnecting. This PR will be closed but a new PR will be opened if there are further reports of similar behavior.

2.25 **3156-MH, CLOSED/TBA.** BOBASMA reported that an NDA was not generated. Pertinent data was not able to be obtained in time and therefore no further investigation was possible on this issue. This PR will be closed but a new PR will be opened if there are further reports of similar behavior.

2.26 **3157-MH, CLOSED/TBA.** BOBASMA reported that a CPDLC connection error was received, “Error 017”. Could not determine cause of issue with the data available. PR will be closed but a new PR will be opened if there are further reports of similar behavior.

2.27 **3176-RP, CLOSED/TBA.** CAA Singapore reported an aircraft which was not meeting 95% RCP/RSP performance for Jan-Mar 2021 period. The aircraft in question belongs to an operator that is not a PBCS stakeholder and we were not able to obtain any data to continue the investigation.

2.28 **3177-MM, ACTIVE/TBA.** CAA Singapore reported several aircraft which fell below 95% RCP using the XXP GES during Jan-Mar 2021 timeframe. No aircraft had enough data points to obtain a valid conclusion as to the cause of the delay. Additionally, it was not clear if the poor performance was really over SATCOM, or rather over VHF which caused the aircraft to transition to SATCOM which was actually performing well. Although the CRA was not able to determine a root cause of the overall performance degradation, INMARSAT is investigating two specific delays which occurred strictly via SATCOM.

2.29 **3191-CJ, CLOSED/AIR-TECHNICAL.** BOBASMA reported that a B737 was unable to logon to CPDLC. The data shows that the FMC was experiencing CPDLC issues earlier in the flight. Several valid messages were being rejected by the FMC including an End Service. The flight crew then manually terminated the connection later on. There is no subsequent logon seen in the data, therefore it is unclear if the avionics were not downlinking the message properly or if the crew did not attempt to logon due to the previous CPDLC issues they were experiencing on the flight. The crew then reset the FMC and reported ops normal.

2.30 **3192-CJ, ACTIVE/TBA.** BOBASMA reported that an A350 was unable to logon to CPDLC. This PR is currently under investigation by Airbus.

2.31 **3193-CJ, CLOSED/TBA.** An aircraft reported to BOBASMA that they were trying to logon to CPDLC but was unable to do so. The operator indicated that specific aircraft was not CPDLC capable and therefore no datalink log release authorization was given. The PR was closed as no further investigation is possible.

2.32 **3194-GM, ACTIVE/TBA.** BOBASMA reported receiving a “CLEARANCE REJECTED” message from an aircraft although the flight crew indicated they selected WILCO. Additionally the flight crew reported seeing a CPDLC error. The operator was contacted for log release authorization and did not receive a response. Additionally, the operator is not a PBCS charter stakeholder.

2.33 **3200-RP, ACTIVE/TBA.** BOBASMA reported a B777 aircraft was unable to logon. This PR is under investigation by the CRA.

2.34 **3201-RP, ACTIVE/TBA,** BOBASMA reported a GLF5 aircraft was unable to logon. This PR is under investigation by the CRA.

### **3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.