International Civil Aviation Organization

Twelfth Meeting of the FANS Interoperability Team – Asia (FIT-Asia/12)

Video Teleconference, 25 – 28 July 2022

Agenda Item 2: Central Reporting Agency Reports

CENTRAL REPORTING AGENCY (CRA) PROBLEM REPORT BRIEFING

(Presented by the CRA)

SUMMARY

This paper presents the investigation and disposition of Future Air Navigation System (FANS) problem reports (PRs) by the CRA that are of interest to FIT-Asia.

1. INTRODUCTION

1.1 FANS stakeholders may submit PRs via the http://www.fans-cra.com/ website.

1. Airways Corporation of New Zealand (ACNZ) graciously hosts and maintains the website.

2. The website is used for multiple regions, namely the Asia region (FIT-Asia), the South Pacific region (ISPACG FIT), the North and Central Pacific region (IPACG FIT), and the North Atlantic region (NAT TIG).

1.2 Between preparation of the FIT-Asia/11 PR briefing in August 2021 and preparation of this PR briefing in July 2022, the CRA investigated 16 new PRs which occurred in the Asia region.

1.3 **Figure 1** illustrates the number of PRs that occurred in the Asia region per calendar year starting in 2016. The total number of PRs for 2022 is a linear projection based on the number of PRs that occurred to date.

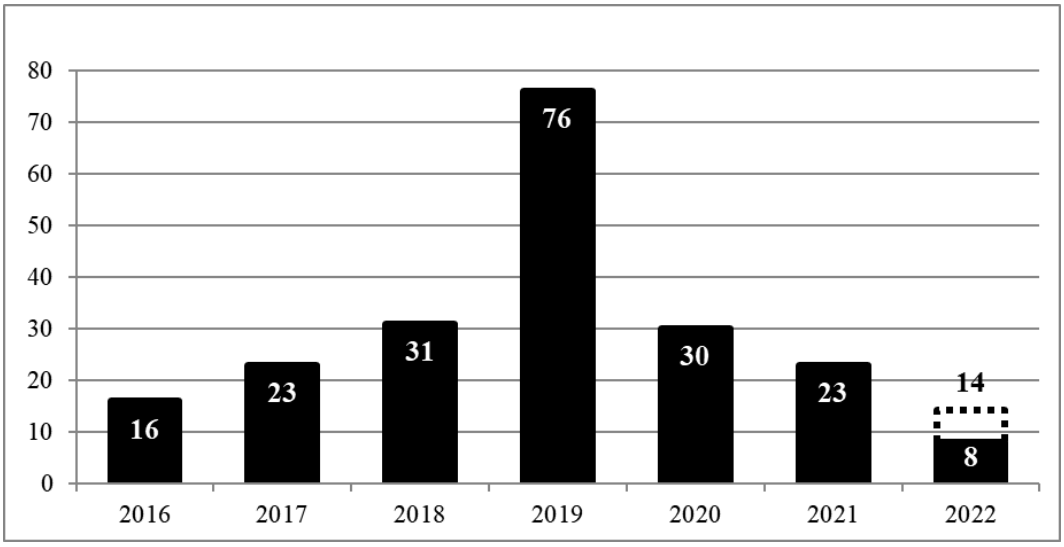

Figure 1 - PRs Per Year

1.4 PR status definitions include the following:

- **Raised**: The PR originator submitted the PR but the CRA has not yet processed it.
- **Active**: The CRA processed the PR and assigned it for investigation.
- **Open**: The CRA completed the PR investigation but some form of corrective action is required before the CRA can close it.
- **Open – Fix Available:** The appropriate stakeholder implemented corrective action and a fix is available for installation**.**
- **Closed As Duplicate**: The CRA closed the PR because it is already tracking the same problem with another PR.
- **Closed**: The appropriate stakeholder implemented corrective action.
- **Closed – Monitoring:** The CRA closed the PR because it cannot determine the corrective action. The CRA will monitor future PRs for any recurrences of the problem.

1.5 PR type definitions include the following:

- **TBA**: To be assigned.
- **Air – Procedural**: Flight crew issue.
- **Air – Technical**: Avionics issue.
- **Ground – Procedural**: Controller issue.
- **Ground – Technical**: ATS unit system issue.
- **Network**: Communication service provider or SATCOM service provider issue.
- **Multiple**: Multiple types of issues.
- **None**: Report is not a problem.

2. DISCUSSION

2.1 The CRA updated the status or progress of the following old PRs that occurred in the Asia region.

1. 3133-SH, Closed / Air – Technical. Airport and Aviation Services Sri Lanka reported that its CPDLC and ADS-C connections with a Sri Lankan Airlines Airbus A330 were unexpectedly terminated. Airbus indicated that the connections were terminated because the aircraft exited VHF datalink coverage when crossing the Bay of Bengal but SATCOM datalink was inoperative. Airbus requested additional data from the aircraft operator to investigate this problem but did not receive it.

2. 3192-CJ, Closed / Ground – Procedural. BOBASMA reported that a Singapore Airlines Airbus A350 flight crew indicated that a CPDLC connection with Chennai was not established as expected. Airbus determined that Kuala Lumpur did not terminate its CPDLC connection with the aircraft as the previous ATS facility, the flight crew manually terminated the CPDLC connection with Kuala Lumpur and performed an AFN logon to Chennai, and then Chennai established a CPDLC connection with the aircraft.

3. 3200-RP, Closed / Ground – Technical. BOBASMA reported that a DHL Boeing 777 flight crew indicated that a CPDLC connection with Chennai was not established as expected. ACARS message log analysis by the CRA indicated that Chennai did not attempt to establish a CPDLC connection with the aircraft following two AFN logons by the flight crew but that Chennai did establish a CPDLC connection with the aircraft following a third AFN logon by the flight crew.

2.2 The CRA investigated the following significant new PRs that occurred in the Asia region.

1. 3221-GM, Closed / Air – Technical. A Nippon Cargo Airlines Boeing 747-8 flight crew reported that a CPDLC connection with Manila was not established as expected. Boeing determined that this problem occurred because the aircraft did not use SATCOM datalink when it exited VHF datalink coverage, although it could not determine why the SATCOM problem occurred because SATCOM avionics logs were no longer available. The CRA notes that this PR is probably a duplicate of open PR 2241-RP for similar Boeing 747-8 SATCOM problems. Boeing and Collins are working to resolve these problems and request that aircraft operators which experience these problems report them to Boeing service engineering and Collins customer support with SATCOM avionics logs.

2. 3225-KS, Closed / TBA. BOBASMA reported that a Qatar Airways Airbus A350 flight crew indicated that a CPDLC connection with Chennai was not established as expected. Airbus was unable to investigate this PR because of a miscommunication regarding the CSP providing the ACARS message log. The aircraft operator – which is a PBCS Charter stakeholder but has special policies in place with the CSP – later clarified with the CSP that the CSP should provide ACARS message logs for its aircraft when requested by the CRA.

3. 3242-MM, Closed / Multiple. CAA Singapore reported that the RSP180 95% delivery time requirement was not met for multiple aircraft via Iridium SATCOM in the May to July 2021 period. ACARS message log analysis by the CRA showed no apparent causes for the poor performance other than limited VHF coverage over the South China Sea as described in PRs 3074-MM and 3178-MM. (In such areas, ADS-C reports and other downlink messages can be delayed when the avionics

attempt but fail to deliver the messages via VHF and then revert to delivering the messages via SATCOM, especially when the aircraft is operating on the edge of VHF coverage.) The CRA also noted that the FAA and JCAB reported good ADS-C performance by the involved aircraft in their airspace during the January to June 2021 period. Additionally, the CRA and Iridium determined that ADS-C report delays on 14 July 2021 were likely caused by the VPN problems described in PR 3223-MM.

4. 3243-MM, Open / Multiple. CAA Singapore reported that the RCP240 95% transaction time and RSP180 95% delivery time requirements were not met for a Singapore Airlines Boeing 777 during the June to August 2021 period. Boeing asked CAA Singapore several questions regarding the PBCS data and expects that 777 AIMS-2 Block Point Version 18 software (which is currently planned to become available in the second quarter of 2023) will resolve at least some of the apparent avionics problems.

5. 3338-MM, Active / Ground – Technical. BOBASMA reported that Chennai could not establish a CPDLC connection with a Turkish Airlines Boeing 787. ACARS message log analysis by Boeing indicated that the problem occurred because a CPDLC connection with Kolkata as the CDA was established at the time. Kolkata was still the CDA because the avionics correctly ignored a Disconnect Request (DR1) uplink from it per RTCA DO-258A / EUROCAE ED-100A Section 5.3.1.2. (Instead, the Kolkata should have sent a Data Transfer [AT1] uplink containing uM161 END SERVICE in order to terminate its CPDLC connection per ICAO Doc 10037, Global Operational Data Link [GOLD] Manual First Edition Section A.2.3.) Additionally, Boeing noted that multiple AFN logon attempts by the flight crew to Delhi failed because the AFN acknowledgement uplink messages from it contained an ATS facility designator that did not match the designator that the flight crew entered in the AFN contact downlink messages. (787 avionics require the designators to match, as ARINC Specification 622-4 Section 3.5.5.1 explains.) The CRA assigned this PR to BOBASMA to investigate further.

6. 3339-CJ, Closed / None. BOBASMA reported that Chennai sent a CPDLC uplink containing uM159 ERROR unrecognizedMsgReferenceNumber to an Air Atlantic Icelandic Boeing 747-400. The CRA determined that the problem occurred because the aircraft received a CPDLC uplink containing uM117 CONTACT via both VHF and SATCOM as it was exiting VHF datalink coverage, in turn because the CSP did not receive an acknowledgement from the aircraft to the uplink sent via VHF and accordingly sent the uplink again via SATCOM. The flight crew sent CPDLC downlinks containing dM0 WILCO in response to both uplinks, but when Chennai received the second downlink it responded by sending the CPDLC uplink containing uM159 ERROR unrecognizedMsgReferenceNumber because the first downlink had closed the CPDLC dialogue. The CRA closed this PR as a non-problem because it occurred due to the nature of wireless radiofrequency communications.

7. 3352-MM, Closed / Multiple. BOBASMA reported that delivery of an ACARS message assurance report timed out for a Singapore Airlines Boeing 747-400. ACARS message log analysis by the CRA indicated that SITA did not receive an ACARS acknowledgement downlink from the aircraft in response to a uM117 CONTACT uplink from Chennai because the aircraft was on the edge of VHF datalink coverage where the VHF link was unreliable and also because the aircraft was switching between SATCOM datalink satellites at the same time. The CRA accordingly recommends that Chennai follow the ICAO Doc 4444 (PANS-ATM) Section 14.3.8 guidance to resend a failed CPDLC uplink when appropriate.

Regarding the uM159 ERROR unrecognizedMsgReferenceNumber uplink from Chennai, even though SITA did not receive an ACARS acknowledgement downlink from the aircraft in response to the uM117 CONTACT uplink the aircraft did actually receive the uplink because the flight crew sent a dM0 WILCO downlink containing a message reference number (MRN) that matched the message identification number (MIN) in the uM117 CONTACT uplink. Given that the MRN in the dM0 WILCO downlink matched the MIN in the uM117 CONTACT uplink, the only potential explanation that the CRA is aware of is that Chennai may have closed the uM117 CONTACT uplink because the ACARS message assurance report timed out before it received the dM0 WILCO downlink.

8. 3387-MM, Active / TBA. A Starlux Airlines Airbus A321 flight crew reported that CPDLC authority was not automatically transferred from Manila to Ho Chi Minh. ACARS message log analysis by the CRA indicates that the transfer failed because Manila sent an uplink containing uM161 END SERVICE and uM159 ERROR commandedTermination, which the avionics correctly processed as an abnormal CPDLC connection termination request and accordingly terminated the CPDLC connections with both Manila and Ho Chi Minh. (In order to transfer CPDLC authority to Ho Chi Minh normally, Manila should have sent an uplink containing uM161 END SERVICE but not containing uM159 ERROR as ICAO Doc 10037, Global Operational Data Link [GOLD] Manual First Edition Section A.2.3 describes.) The CRA has assigned this PR to CAA Philippines to investigate further.

9. 3396-CJ, Closed as Duplicate / Air – Technical. A Nippon Cargo Airlines Boeing 747-8 flight crew reported that they could not log on to Ho Chi Minh. Boeing determined that this problem was caused by a known issue that prevents the flight crew from entering the origin and destination airport designators on the ATC LOGON/STATUS page. Boeing and Honeywell will resolve this problem in NG FMC Block Point 4.1 software, which is currently planned to become available in the first quarter of 2023. The CRA closed this PR as a duplicate of master PR 2892-KS.

2.3 The CRA investigated the following less-significant new PRs that occurred in the Asia region.

1. 3226-RP, Closed / TBA. BOBASMA reported that it was unable to establish CPDLC and ADS-C connections with a Singapore Airlines Airbus A350. The CRA could not investigate this PR because it was unable to obtain the ACARS message log.

2. 3227-RP, Closed / TBA. BOBASMA reported that it was unable to establish an ADS-C connection with a Sri Lankan Airbus A330, although it was able to establish a CPDLC connection with the aircraft. The CRA could not investigate this PR because it was unable to obtain the ACARS message log.

3. 3244-MM, Closed / TBA. CAA Singapore reported that the RCP240 95% transaction time and RSP180 95% delivery time requirements were not met for a Xiamen Airlines Boeing 787 during the April to June 2021 period. The CRA could not investigate this PR because CSP and avionics logs were no longer available when the PR was submitted. (CSP logs are generally available for 90 days and avionics logs for 30 days.) The CRA also noted that the FAA and JCAB reported good CPDLC and ADS-C performance by the involved aircraft in their airspace during the January to June 2021 period.

4. 3245-MM, Closed / TBA. CAA Singapore reported that the RCP240 95%

transaction time and RSP180 95% delivery time requirements were not met for a Nippon Cargo Airlines Boeing 747-8 during the April to June 2021 period. The CRA could not investigate this PR because CSP and avionics logs were no longer available when the PR was submitted. (CSP logs are generally available for 90 days and avionics logs for 30 days.)

5. 3340-CJ, Active / TBA. BOBASMA reported that Chennai was unable to establish a CPDLC connection with an Ethiopian Airlines Boeing 777. ACARS message log analysis by Boeing indicates that the problem occurred because the aircraft exited VHF datalink coverage when crossing the Bay of Bengal but SATCOM datalink was inoperative. Boeing is continuing to investigate this PR.

6. 3341-CJ, Active / TBA. BOBASMA reported that Chennai was unable to establish a CPDLC connection with a Lufthansa Airbus A340. Airbus is investigating this PR.

7. 3373-KS, Closed / None. Starlux Airlines reported three events when Airbus A321 avionics displayed "MONIT LOST" to flight crews for received uM118 AT [position] CONTACT [icaounitname] [frequency] conditional instructions. Airbus assessed these events and determined that they occurred by design because in each case all CPDLC connections were terminated and the avionics could no longer monitor the conditional instructions.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) promote expeditious resolution of Active and Open PRs.

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