International Civil Aviation Organization

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

Video Teleconference, 23 – 27 August 2021

Agenda Item 3: PBCS Developments and Implementation

FANS1/A CPDLC LATENCY TIMER VALUE

(Presented by Airways New Zealand)

SUMMARY

This paper proposes that a FANS1/A CPDLC Latency Timer value of 300 seconds as implemented in the North Atlantic region be adopted in the Asia-Pacific region for Oceanic airspace.

1. INTRODUCTION

1.1 Airways implemented the latency monitor on 21 June 2018 to support PBCS safety requirement #15 and mitigate the effects of late CPDLC uplink messages received at the aircraft. The timer value used in the Auckland Oceanic FIR is 300 seconds the same value as selected for use by the North Atlantic region.

1.2 This paper provides a brief summary of the reasons behind the selection of a 300 second timer value in the North Atlantic and proposes that this value is also adopted as a standard in the Asia-Pacific region.

2. DISCUSSION

2.1 The Oceanic Safety and Performance standard (DO-306) requires that the likelihood of occurrence of an undetected late or expired message shall be no greater than remote, and places safety requirement SR-15 on both the aircraft and ground systems: “When the end system receives a message whose time stamp exceeds ET_{TRN} the end system shall provide an appropriate indication”. ET_{TRN} is 210 seconds for RCP240 and 370 seconds for RCP400.

2.2 Development work for the implementation of the uplink latency monitor was primarily done by the NAT Uplink Timer Planning Team (ULT PT) and ICAO OPDLWG in 2017. ICAO OPDLWG had discussed the need for agreement on a single global standard for the message latency value to avoid the adoption of different values which may inject unnecessary hazard into an already complex situation. The original logic behind the selection of ETTRN, a round-trip calculation, as part of the definition of SR-15 is unknown. It was stated that although that logic may have been appropriate based on the information available at the time, considerable operational knowledge had been gained since the manual was published that should be taken into consideration. Although the group recognized that the PBCS manual identifies the ET_{TRN} as 210 seconds to support operations dependent upon RCP240 (as defined in DO-306), there were concerns that this value may not be suitable for the current data link environment and that setting the value too low may have a negative impact on workload for both controllers and flight crews.

2.3 The NAT ULT PT emphasised that the main priority of the implementation should be sufficient mitigation of the three identified hazards associated with safety requirement SR-15 ("detected late or expired message", "undetected late or expired message", "undetected spurious/inadvertent message delivery") and support of the resultant safety objectives, but that consideration must be made for the existing ATC procedures and automation that already mitigate the cases of these delayed messages within the RCP240 ET_{TRN} of 210 seconds.

2.4 In the NAT ULT PT, they considered the potential impact on ground system modifications to improve data link performance, such as the retry timers to address problematic transition areas. Network delays related to known transition areas in the NAT have been investigated and identified as a common reason for uplink message delivery failures, transfer failures, and connection issues. One of the solutions developed to mitigate this problem and improve system safety was automated re-tries within the logic in the ground system (as now recommended in the FANS Problem Solution Tracker). There was concern that using a value of 210 seconds could render the improvement ineffective. Ultimately it was concluded that the safest and most practical way forward was to trial a value of 300 seconds, which was projected as the minimum value that would prevent interference with the re-try timer.

2.5 Airways supports operations of a number of non-PBCS fleets that do not utilise operations that are dependent on RCP240. These fleets are not required to meet RCP240, and we consider that if they meet RCP400 then they may continue datalink operations. In this respect the use of a 300 second latency timer satisfies SR-15 for both RCP240 and RCP400 operations. We also note that at ICAO OPDLWG IATA proposed a clarification to Doc 9869 SR-15(AIR) that replaces the ET_{TRN} value with "a latency value as provided by the ANSP", with a similar clarification proposed for DO-350A Baseline 2 SPR.

2.6 Airways decided to implement a 300 second value for the latency uplink in our Oceanic airspace as we support the idea of one global standard, we agreed with the NAT ULT PT reasoning, and the 300 second latency timer value supports both RCP240 and RCP400 operations.

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; and

c) propose that a 300 second latency timer value is adopted for regional use in Asia Pacific.

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