International Civil Aviation Organization

THE FOURTH MEETING OF MODE S DOWNLINKED AIRCRAFT PARAMETERS WORKING GROUP (MODE S DAPs WG/4)

Video Teleconference, 29 – 31 March 2021

Agenda Item 6: Revision on the Roadmap on Mode S DAPs for APAC Region

PROPOSED DEFERRAL OF EHS MODE S FORWARD-FITMENT MANDATE

(Presented by IATA)

SUMMARY

This working paper seeks the readiness of APAC ANSPs to utilise Mode S DAPs and proposes a conclusion for deferral of the forward-fit mandate for (Enhanced) EHS Mode S if there is not region-wide preparedness for its implementation at that time.

1. INTRODUCTION

1.1. Discussions in recent years in multiple Working Group and Sub-Group meetings has evolved a Mode S roadmap for APAC which in 2020 endorsed a mandate for forward-fitment of (Enhanced) EHS Mode S from 1 January 2022.

1.2. Subsequent information has observed that some APAC ANSPs do not currently have Mode S capable radar and/or ATM systems, nor are planning to implement the capability by January 2022, and so would not be utilising EHS Mode S DAPS from the mandated date.

1.3. This could result in Airspace Users expending unnecessary fitment funds in a COVID-19 environment where financial survivability is a priority and cost minimization essential.

2. DISCUSSION

2.1. The third meeting of the Mode S DAPs Working Group in May 2020 discussed the proposed roadmap for implementation of Mode S in Asia and Pacific. The meeting recommended that the Working Group encouraged equipage of ELS Mode S by 1 Jan 2022 and forward-fit of EHS Mode S in the same year 1 Jan 2022.

2.2. The mandate would apply only for aircraft with a mass >5700kg or a speed >250kt.

2.3. The timeline was considered reasonable given that all new aircraft from Airbus and Boeing are being delivered equipped with at least (Elementary) ELS Mode S so that most, if not all, passenger aircraft are already Mode S capable. Option to upgrade to EHS Mode S is also available.

2.4. At SURICG5 meeting in September 2020, IATA expressed support for Mode S in general, however contended that the proposed timeframe of 1 January 2022 for retrofitting existing airframes

with Mode S transponders was a challenging target date to meet in normal circumstances and that now, compounded by the impact of the COVID crisis on airline finances, it would be even more challenging. As such, the meeting agreed to defer the discussion of retrofit of Mode S transponders to DAPs WG for further deliberation.

2.5. Subsequently the following Conclusion was adopted by APANPIRG/31:

> *That, States/Administrations in APAC Region be strongly encouraged to mandate that registered aircraft with a maximum certified take-off mass exceeding 5 700 kg or having a maximum cruising true airspeed capability greater than 250 knots, with a date of manufacture on or after 1 January 2022 be equipped with Mode S avionics compliant with Enhanced Surveillance (EHS).*

2.6. Since SURICG5 meeting, the impacts of COVID-19 have continued to severely affect the financial position of airlines. As a result, any additional costs, unless for immediate safety benefits, are being avoided.

2.7. There are also anecdotal reports that some APAC ANSPs will not possess the capability to utilise the DAPS from EHS Modes S from the proposed forward-fit mandate date and therefore some aircraft fitment would not have a region-wide use and benefit.

2.8. This paper asks the meeting to identify which APAC States will actively utilise the Mode S DAPs from EHS capability from 1 January 2022, and if not a majority of the States, nor will there be multiple connected capable FIRs, then for the meeting to reconsider the date of mandate for forward fitment.

2.9. Consideration should take into account whether current SSR in combination with ADS-B is already sufficient for current operation, and when will we realistically see those additional capabilities that can only be achieved with EHS and cannot be achieved with ADS-B or regular Mode S radar?

2.10. To continue with a mandate for enhanced systems capability that may not be used broadly from inception would not be a justifiable expense for Airspace Users, particularly during a global crisis and the current critical financial environment.

2.11. For those ANSPs with current Mode S capability, it is still encouraged that efforts be made to utilise the ELS Mode S capability that a large percentage of fleets in APAC already possess, and in particular to utilise Mode A code 1000 as the conspicuity code for Mode S so as to reduce reliance on the limited number of assigned Mode A codes.

2.12. A deferred mandate for EHS Mode S will permit ANSPs to move to new Mode S radar and ATM system capability at a manageable pace whilst also relieving some financial pressure from airlines in the short term to the current proposed mandate date. It is paramount that service providers and Airspace Users consult closely to ensure technology investment programs are aligned and for the benefit of all parties.

2.13. This Working Paper proposes the following Conclusion:

Draft Conclusion Mode S DAPs WG/4-X: Deferral of EHS Mode S forward-fitment mandate

That, if a significant number of APAC States will not actively utilise the Mode S DAPs from EHS capability from 1 January 2022, nor will there be multiple connected capable FIRs, then the mandate for forward-fitment of EHS Mode S be deferred to permit ANSPs and Airspace Users to progress to that technology as infrastructure roadmaps and financial budgets permit. Any proposed date should consider when near-pre-COVID traffic levels are forecast to have returned.

2.14. As an observation, the APAC Region has already recognized the efficacy of Mode S with important expectations in Section 7 from the Asia/Pacific Seamless ANS Plan (see Appendix A). These elements encourage the implementation of DAPs as an important safety/efficiency tool. However, the provisions from Section 7 of the Plan cannot be read in isolation, especially when it comes to mandates. Therefore, the provisions of Section 5 related to mandates are very relevant – particularly regarding the costs to be considered (first bullet of paragraph 5.36) and the need for the ANSP to provide a service benefit (fourth bullet) as soon as certain aircraft capability becomes mandatory. As some States are apparently not enabling full functionality of DAPS by their ANSPs, APANPIRG/31 Conclusion may be better stated that it only applied to States whose ANSP has enabled full functionality.

3. ACTION BY THE MEETING

3.1. The meeting is invited to:

a) note the information contained in this paper;

b) discuss any relevant matters as appropriate; and,

c) discuss and agree the following Conclusions:

<table>
<tr><td colspan="2">Draft Conclusion Mode S DAPs WG/4-X: Deferral of EHS Mode S forward-fitment mandate.</td></tr>
<tr><td>What: That if majority of APAC States will not actively utilise the Mode S DAPs from EHS capability from 1 January 2022, nor will there be multiple connected capable FIRs, then the mandate for forward-fitment of EHS Mode S be deferred to permit ANSPs and Airspace Users to progress to that technology as infrastructure roadmaps and financial budgets permit. Any proposed date should consider when near-pre-COVID traffic levels are forecast to have returned.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☒ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: Majority ANSPs may not intend to utilise the capability from 1 January 2022. Additionally, COVID-19 has continued to severely affect the financial position of airlines and so any small costs, unless for immediate safety benefits, are to be avoided.</td><td>Follow-up: ☒Required from States</td></tr>
<tr><td>When: 29-Mar-21</td><td>Status: Draft to be adopted by Subgroup</td></tr>
<tr><td colspan="2">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: Airspace Users</td></tr>
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APPENDIX A: Excerpts from Sections 5 and 7 of the ICAO Asia/Pacific Seamless ANS Plan

Airspace Equipage Mandates

5.36 From an operators' perspective, the following were important considerations:

- *Preparation Time: Operators need time to prepare for any mandated equipage requirement – if new equipment is involved, several years may be required to allow fitment to take place during normal airframe maintenance cycles.*
- *Cost Benefit: Operational improvements, including the use of new technologies or implementing ASBUs, need to provide operational benefits that outweighed the total cost of implementation and operation. This included the airspace user side of the equation. States/ANSPs should carry out studies of the costs and benefits for all stakeholders.*
- *Education and promulgation: States/ANSPs should work with local airlines and International Organizations to ensure industry and other stakeholders are educated and informed regarding upcoming aircraft equipage mandates very early in the planning process. Ideally, the dialogue should begin with user consultation pertaining to the selection of appropriate solutions. Once a decision has been made, user education should include briefings, media notifications as well as required AIS promulgation.*
- *Service Outcomes: States/ANSPs must ensure the service delivery efficiencies enabled by an aircraft equipage mandate are actually delivered operationally coincident with the implementation date of the mandate. If service delivery is delayed, any related aircraft equipage mandate should also be delayed accordingly. States/ANSPs should consider offering operational advantages to early adopters of the desired equipage or capability to offset costs. This would enable operators to make at least partial use of the mandated capability in advance of the mandated date.*
- *Harmonization: it is essential that States/ANSPs harmonize requirements with neighbours as far as practicable, including implementation dates.*
- *Regulatory considerations: it is essential that regulators are involved very early in the planning process. Experience shows that regulatory approvals are often a problem with the introduction of aircraft equipage mandated environments.*
- *High Seas: Where airspace over the High Seas is affected, States must ensure appropriate ICAO processes are followed, including amendments to the required ICAO provisions.*

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7.9 All Category T airspace supporting international aerodromes should require the carriage of an operable mode S transponder within airspace where Mode S radar services are provided to support ***ASUR-B0/3****.*

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*7.12 All Category R and S upper controlled airspace should require the carriage of an operable mode S transponder within airspace where Mode S radar services are provided to support **ASUR-B0/3**.*

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*7.27 ADS-B (using 1090ES), MLAT or radar surveillance systems should be used to provide coverage of all Category S airspace as far as practicable, and Category T airspace supporting international aerodromes, consistent with **ASUR-B0/1 – 2**. Data from ATS surveillance systems should be integrated into operational ATC aircraft situation displays (standalone displays of ATS surveillance data should not be used operationally).*

Note 1: ATM systems, including ATS surveillance systems and the performance of those systems, should support the capabilities of PBN navigation specifications and ATC separation standards applicable within the airspace concerned. Guidance on the performance of ATS communication and surveillance systems is available in ICAO Document Doc 10037 (Global Operational Data-link Document)

Note 2: ATC units with ADS-B where Category S and Category T airspace supporting high-density aerodromes may consider utilizing ADS-B for situational awareness and/or separation.

Note 3: ATC units operating within controlled airspace wholly served by Mode S SSR and/or ADS-B surveillance should implement the use of the standard non-discrete Mode A code 1000 for Mode S transponder equipped aircraft to reduce the reliance on assignment of discrete Mode A SSR codes and hence reduce the incidence of code bin exhaustion and duplication of code assignment.

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*7.30 Mode S surveillance and the use of Mode S Downlinked Aircraft Parameters (DAPS) should be enabled in all upper level Category S airspace and all Category T airspace servicing high density city pairs consistent with **ASUR-B0/3**. ATM automation system specifications should include the processing and presentation in ATC human-machine interfaces and decision support and alerting tools, the communications, navigation and approach aid indicators received in items 10 and 18 of FPL and ATS messages, where applicable, and the following Mode S or ADS-B downlinked aircraft parameters as a minimum:*

- *Aircraft Identification;*
- *Aircraft magnetic heading;*
- *Aircraft indicated airspeed or Mach Number; and*
- *Pilot selected altitude.*

Note1: DAPS may not be present in downlinked reports from some aircraft ADS-B applications.

Note 2: Downlinking of correct Aircraft Identification (Flight ID) enables automated coupling of ATS surveillance system information with the flight plan, and unambiguous ATC identification of aircraft. States should undertake comprehensive education programs to ensure pilots set the correct Flight ID. Guidance on the correct use of the aircraft identification function is provided in the ADS-B Implementation and Operations Guidance Document, available on the ICAO Asia/Pacific Regional Office website.