



ICAO

International Civil Aviation Organization

Twenty-Seventh Meeting of the Regional Airspace Safety  
Monitoring Advisory Group (RASMAG/27)

Video Teleconference, 22 – 25 August 2022

### Agenda Item 3: Reports from Asia/Pacific RMAs and EMAs

#### JASMA AKARA SAFETY IMPROVEMENT UPDATE

(Presented by JASMA)

##### SUMMARY

This paper presents background, progress, updates and proposals for the safety improvement plan for the AKARA – FUKUE Corridor.

## 1. INTRODUCTION

1.1 In 1983, International Civil Aviation Organization (ICAO) requested Japan, China and the Republic of Korea (ROK) to establish a direct route between Fukue, Japan and Shanghai, China through the ROK airspace (known as “AKARA – FUKUE corridor” thereafter). Since 1972 when Japan and China established diplomatic relations, flights between Japan and Shanghai, China had to detour around the ROK airspace resulting in a 172NM extra flight distance.

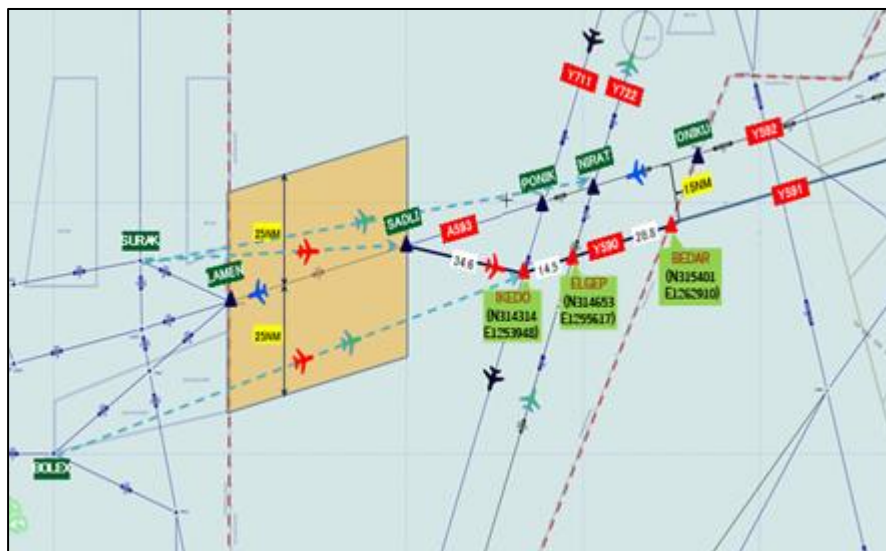
1.2 Under the 1983 AKARA-FUKUE corridor arrangement, Japan and China shared air traffic control (ATC) responsibilities in the ROK airspace on a limited number of flight levels (FL) of 240, 280 and 390 for westbound, and 250, 290 and 410 for eastbound. In 2007, the FL allocation scheme (FLAS) was changed to the current FL240, 280, 300 and 400 for the westbound, and FL250, 290, 310 and 390 for the eastbound. Other FLs are retained for use by ROK.

1.3 China, Japan and ROK agreed to an improvement plan with a phased approach in December 2020, and the plan was summarized as a consensus document. Then the consensus document was reported to the ICAO Headquarters for its endorsement. Under the agreement, Incheon Area Control Center (ACC) would assume ATC responsibility in the whole Incheon airspace by being dissolved the former special ATC operation for AKARA – FUKUE corridor, and a pair of uni-directional routes would be established effective from 25 March 2021 between Japan and ROK (Phase 1). The uni-directional routes were supposed to be extended into the Chinese airspace two months later (Phase 2), however, the Phase 2 has not been realized yet pending the agreement between China and ROK. In the meantime, the FLAS has been kept as they were by ROK and flights flying in the AKARA – FUKUE corridor are restricted to the limited number of FL, hindering efficient operations and existing potential of height deviation.

## 2. DISCUSSION

### Phase 1 Implementation

2.1 **Figure 1** shows the Air Traffic Service (ATS) route structure in Phase 1 which has been implemented since 25 March 2021, and Phase 1 is the current status.



**Figure 1:** ATS route structure of AKARA corridor in Phase 1

2.2 A new southern RNAV2 route, Y590, is established between SADLI and BEDAR in the Incheon Flight Information Region (FIR) and used for only eastbound traffic from China to Japan. Broken lines in the light blue mean flight routes expected via radar vector.

2.3 ATC responsibility of A593 between ONIKU and SADLI has been transferred from Japan to ROK, from Fukuoka ACC to Incheon ACC since Phase 1. On the other hand, FLAS, a special and unique altitude operation restricted to four FLs to eastward and westward, respectively, remains after the Phase 1 implementation.

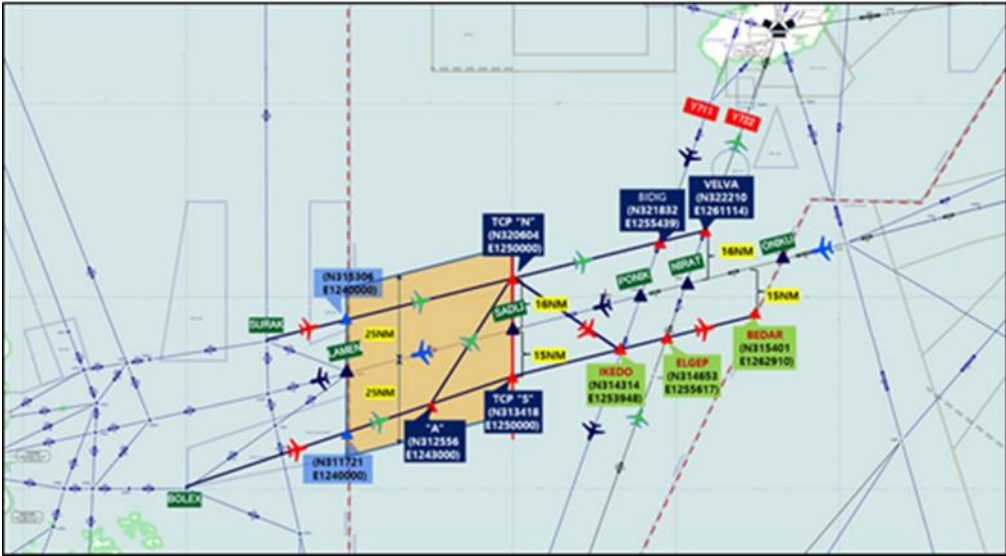
2.4 **Figure 2** shows FLAS operation in the AKARA – FUKUE corridor, eastbound flights operate on FL250, FL290, FL310, and FL390 and westbound flights operate on FL240, FL280, FL300, and FL400.



**Figure 2:** Flight Level Allocation Scheme (FLAS) in the AKARA Corridor

Phase 2 consideration

2.5 **Figure 3** shows the expected ATS route structure in Phase 2. A new northern RNAV2 route will be established between SURAK and VELVA. The southern RNAV2 route will be stretched to BOLEX, and two new routes will be established to connect the northern RNAV2 route and the southern RNAV2 route.



**Figure 3:** ATS route structure of AKARA corridor in Phase 2

2.6 The transition from Phase 1 to Phase 2 has been discussed between China and ROK. However, the latest and rescheduled transition date is not determined as of July 2022.

Discussion at the RASMAG/26 meeting

2.7 At the RASMAG/26 meeting in September 2021, JASMA presented **Table 1** which showed the result of a safety assessment in the AKARA – FUKUE corridor airspace conducted by JASMA and the Electronic Navigation Research Institute (ENRI), using fast-time simulation of traffic sample data (TSD) based on flight records between 0100 and 0700 UTC on 29 December 2019.

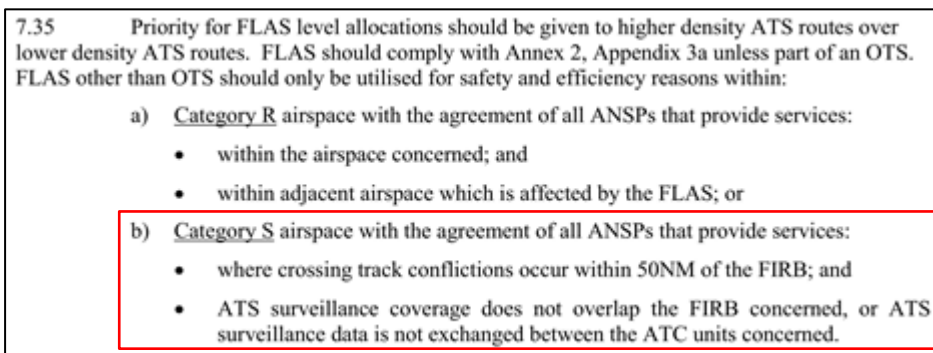
<b>AKARA Airspace</b>				
<i>(note: based on Dec 2019 traffic sample data)</i>				
<b>Source of Risk</b>	<b>Same &amp; Opposite Risk</b>	<b>Intersection Risk</b>	<b>Total Risk</b>	<b>Remarks</b>
<i>Technical Risk (only A593 with FLAS)</i>	$15.4 \times 10^{-9}$	$0.16 \times 10^{-9}$	$15.6 \times 10^{-9}$	<i>Past</i>
Technical Risk (Phase 1 with FLAS)	$0.03 \times 10^{-9}$	$0.23 \times 10^{-9}$	$0.26 \times 10^{-9}$	Current
Technical Risk (Phase 1 without FLAS)	$0.02 \times 10^{-9}$	$0.20 \times 10^{-9}$	$0.22 \times 10^{-9}$	
Technical Risk (Phase 2 with FLAS)	$0.01 \times 10^{-14}$	$0.17 \times 10^{-9}$	$0.17 \times 10^{-9}$	
Technical Risk (Phase 2 without FLAS)	<b><math>0.05 \times 10^{-15}</math></b>	<b><math>0.12 \times 10^{-9}</math></b>	<b><math>0.12 \times 10^{-9}</math></b>	<b><u>Best future</u></b>

**Table 1:** Result of fast-time simulation

2.8 JASMA also mentioned that, as shown in **Table 1**, the technical risk estimate might not have met TLS before Phase 1, and new parallel routes of A593 established as non-bidirectional routes would contribute to decreasing the technical risk estimates for the same and opposite directions significantly in Phase 1. Besides, JASMA stated elimination of FLAS would be contributed to further decreasing technical risk estimates for the reason that aircraft would have more opportunities to cross other aircraft with more than 1,000ft vertical separation if FLAS was eliminated.

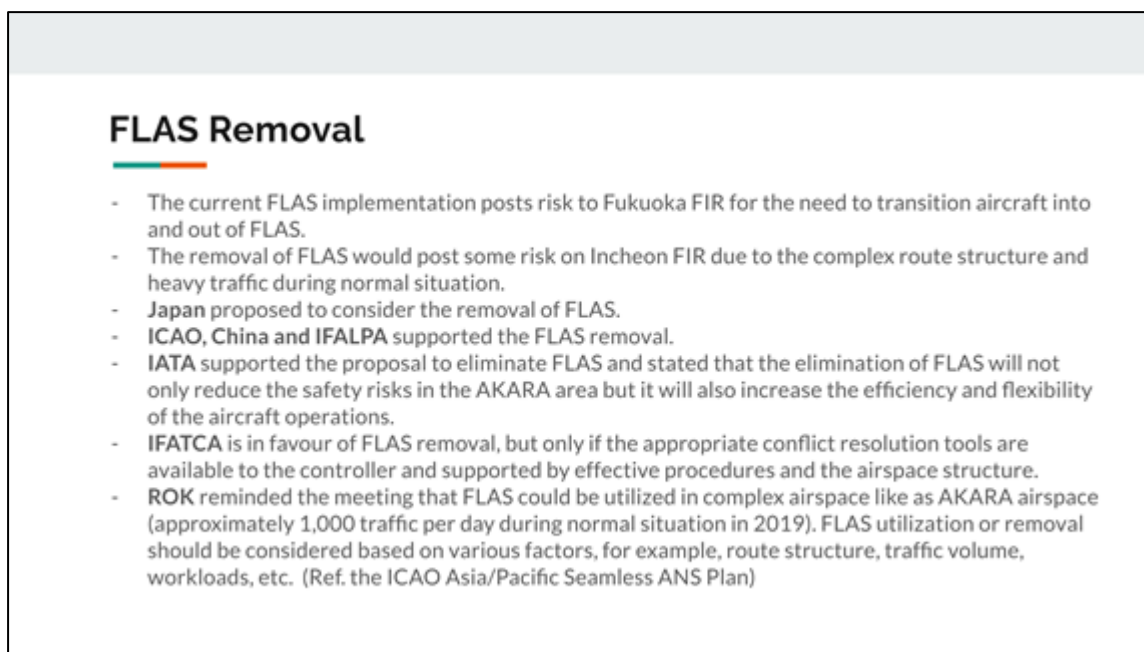
2.9 Based on the above evidence, JASMA proposed the elimination of FLAS in the AKARA – FUKUE corridor at the RASMAG/26 meeting.

2.10 ROK opposed the proposal and reminded of the performance expectations in paragraph 7.35 of the Asia/Pacific Seamless ANS Plan. ROK also stated, in the AKARA – FUKUE corridor airspace, there were some intersection points within 50 NM from the FIR boundary, and the Seamless ANS Plan was supporting the retention of FLAS in Category S airspace for safety and efficiency reasons where crossing track conflict occurred within 50NM of the FIR boundary and ATS surveillance coverage did not overlap the FIR boundary concerned.



**Figure 4:** Paragraph 7.35 of the Asia/Pacific Seamless ANS Plan V3.0

2.11 The RASMAG chairperson proposed holding the breakout session to discuss FLAS elimination and relevant matters. China, Japan and ROK, together with observers from other States and International Organizations, agreed and participated in the session. **Figure 5** shows a part of the discussion at the breakout session quoted from the final report of RASMAG/26.



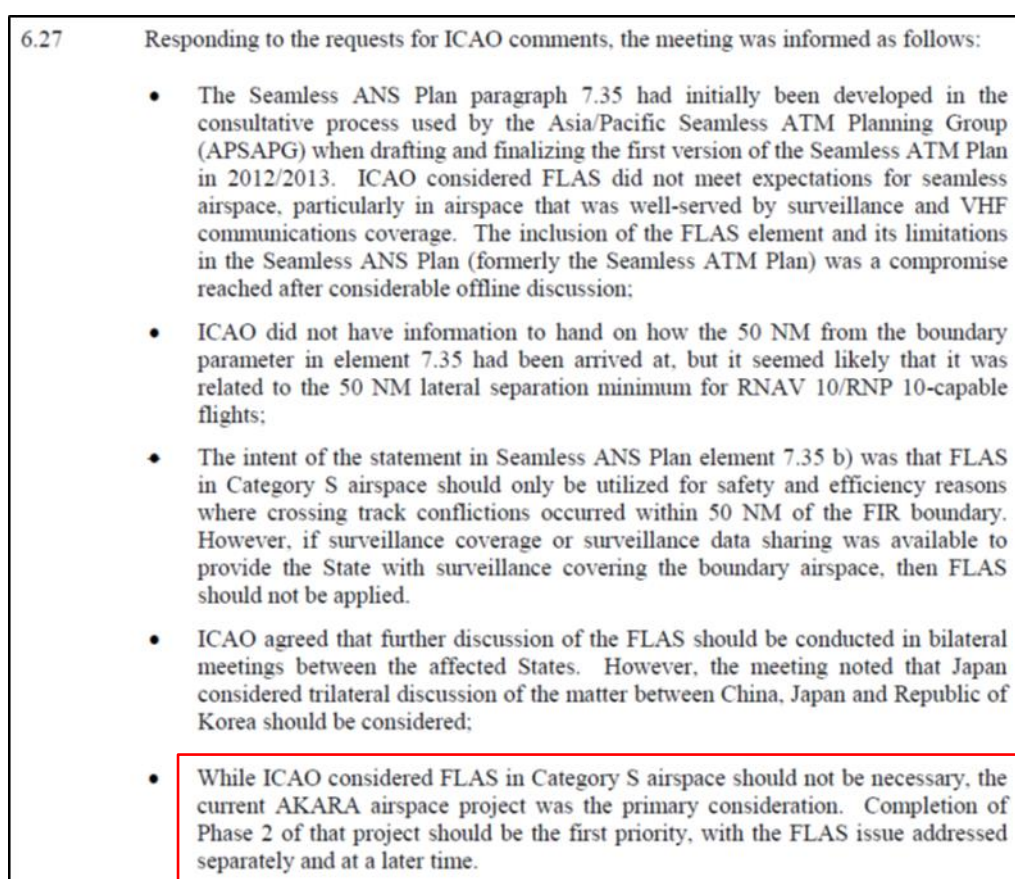
**Figure 5:** Discussion for FLAS Removal at the breakout session

2.12 The meeting could not come to a conclusion regarding JASMA/Japan’s proposal to remove FLAS during the breakout session and the plenary session.

#### Discussion at the ATM/SG/9 meeting

2.13 At the Ninth ATM Sub-Group (ATM/SG/9) meeting in November 2021, Japan recalled what ROK presented that the ADS-B establishment in all areas of Incheon FIR was completed on 20 May 2020 and ADS-B allowed air traffic controllers to identify more accurate data blocks and significantly improved blind area at the ATM/SG/8 meeting. Japan also asked ICAO to comment on the rationale for the Seamless ANS Plan 50 NM parameter for determining whether a FLAS should be implemented.

2.14 **Figure 6** shows the responding comments from ICAO, which are quoted from the final report of the ATM/SG/9 meeting.



**Figure 6:** Responding to comments from ICAO at the ATM/SG/9 meeting

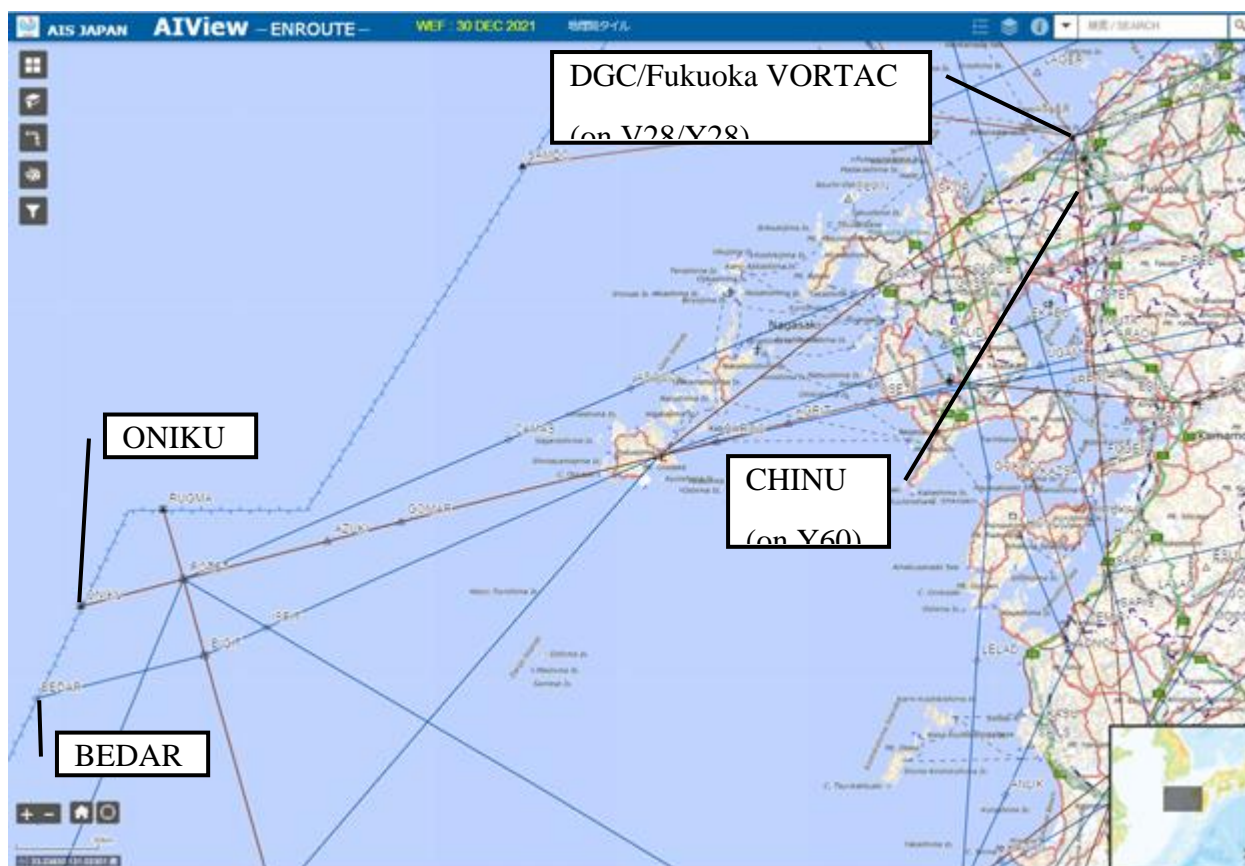
2.15 ICAO commented that FLAS in Category S airspace should not be necessary. Additionally, ICAO commented Phase 2 of that project should be the first priority, with the FLAS issue addressed separately and at a later time at the meeting.

#### Bilateral consideration and discussion between Japan and ROK

2.16 Japan and ROK conducted a bilateral consideration and discussion so that aircraft flying in the AKARA – FUKUE corridor airspace could be taking non-FLAS altitude, which would provide more preferred and efficient operation to aircraft operators and would contribute to decreasing the technical risk estimates.

2.17 Consequently, Japan and ROK agreed interimly that Fukuoka ACC and Incheon ACC conducted altitude coordination positively to assign non-FLAS altitude for aircraft desiring it if the altitude was not assigned to other aircraft.

2.18 Fukuoka ACC controllers plan to change the non-FLAS altitude of westward aircraft flying to the AKARA – FUKUE corridor airspace to a FLAS altitude by the aircraft reaches CHINU or DGC (Fukuoka VORTAC), which are approximately 200 NM before ONIKU, a waypoint of the east edge of the AKARA – FUKUE corridor airspace.



**Figure 7:** Location of waypoints to assign non-FLAS altitude

2.19 JASMA would like to stress that the aircraft should request it to Fukuoka ACC by the waypoints, CHINU or DGC if an aircraft flying at non-FLAS altitude desires to maintain the same altitude in the AKARA – FUKUE corridor airspace, to prevent the occurrence of the Large Height Deviation (LHD) at the Hot Spot B, within and around the AKARA – FUKUE corridor airspace.

2.20 Besides, JASMA would continue to monitor LHD occurrences around the AKARA – FUKUE corridor airspace cautiously and share the occurrence reports to relevant Regional Monitoring Agencies (RMAs), China RMA, the Monitoring Agency for Asia Region (MAAR) and the Pacific Approvals Registry and Monitoring Organization (PARMO).

#### Future Work Plan

2.21 Incidentally, the Civil Air Navigation Services Organisation (CANSO) Asia Pacific (APAC) offered the Japan Air Navigation Service (JANS), the ATS provider department in the Japan Civil Aviation Bureau (JCAB) to nominate the CANSO Global Safety Achievement Award 2021 as one of the most valuable cases for improving both safety and capacity.

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2.22 However, JANS sincerely declined the offer since the project of improving AKARA – FUKUE corridor was still in progress for the explicit and ultimate goal, and FLAS, a unique ATC operation, to restrict available altitude for aircraft remained.

2.23 CANSO APAC understood JANS's stance and remaining concerns, and accepted to await a time when the AKARA – FUKUE corridor issues would be fully resolved.

2.24 Japan recalls that it was agreed Phase 2 implementation would be conducted two months after implementing Phase 1, and ROK would consider assisting Japan in ensuring a fair and equitable use of optimum flight levels, in the consensus document on 25 December 2020.

2.25 Furthermore, it was commented that Phase 2 should be the first priority by ICAO at the ATM/SG/9 meeting.

2.26 Japan proposes to China and ROK to present and share the following information at the ATM/SG/10 meeting since this project has been endorsed by ICAO.

- a) The latest and updated schedule for Phase 2 implementation
- b) Significant technical and operational issues to resolve

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

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) discuss to move forward on Phase 2; and
- c) discuss any relevant matters as appropriate.

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