International Civil Aviation Organization

Twenty-Eighth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/28)

Bangkok, Thailand, 21 – 24 August 2023

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

JASMA HOT SPOT IDENTIFICATION

(Presented by JASMA)

SUMMARY

This paper presents a process to consider whether current and former Hot Spots relating to Fukuoka Flight Information Region (FIR) should be identified and classified as Hot Spot.

1. INTRODUCTION

1.1 It was informed that the process of identifying and monitoring the Large Height Deviation (LHD) Hot Spots had been developed informally over several years at the Twenty-Sixth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/26).

1.2 The Monitoring Agency for Asia Region (MAAR) presented a draft process for identifying, monitoring and removing LHD Hot Spots for the Regional Monitoring Agencies (RMAs) and En-route Monitoring Agencies (EMAs) in the Asia Pacific region at the Ninth Meeting of the RASMAG Monitoring Agencies Working Group (RASMAG/MAWG/9) in February 2022. Results of the experiment on the proposed Hot Spot identification process were also discussed and agreed to conduct as a trial at the meeting.

1.3 The Japan Airspace Safety Monitoring Agency (JASMA) has joined the trial and presented the result of JASMA's analysis regarding the former Hot Spot L where the Flight Information Region (FIR) boundary between Fukuoka and Khabarovsk FIRs at the RASMAG/27 meeting.

1.4 It was also noted that some contradictions might have appeared, and continuous analysis, consideration and discussion would be needed at the meeting.

2. DISCUSSION

Number of LHDs

2.1 JASMA has monitored current and former Hot Spots, Hot Spot B (AKARA airspace), Hot Spot D (Fukuoka Manila FIRs) and the former Hot Spot L (Fukuoka Khabarovsk FIRs), cautiously.

2.2 **Figure 1** shows the trend of the number of LHDs occurred at Hot Spot B in the AKARA airspace, relating to the Fukuoka Area Control Center (ACC) from 2018 to 2022.

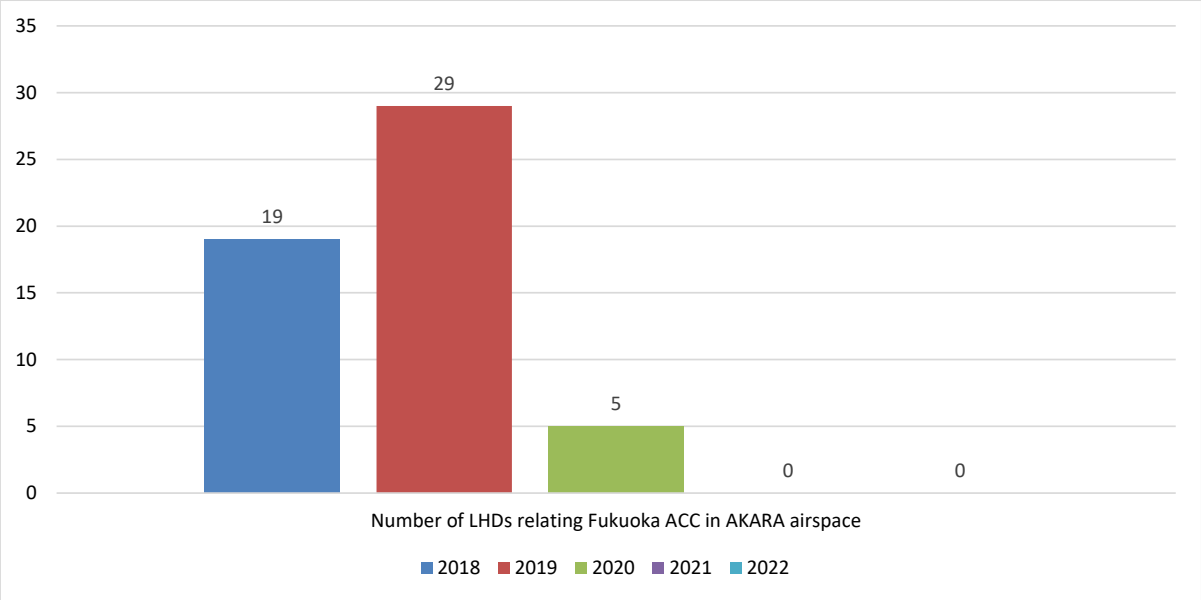

Figure 1: Number of LHDs relating to Fukuoka ACC in AKARA airspace

2.3 After Phase 1 implementation on 25 March 2021, there has been no LHD reported to JASMA. The main reason is that transfer information has been exchanged by the ATS Interfacility Data link Communications (AIDC) between Fukuoka ACC and Incheon ACC since Phase 1.

2.4 **Figure 2** shows the trend of the number of LHDs occurred at Hot Spot D, the FIR boundary between Fukuoka FIR and Manila FIR from 2018 to 2022. The trend has fluctuated and has not shown any characteristic tendency.

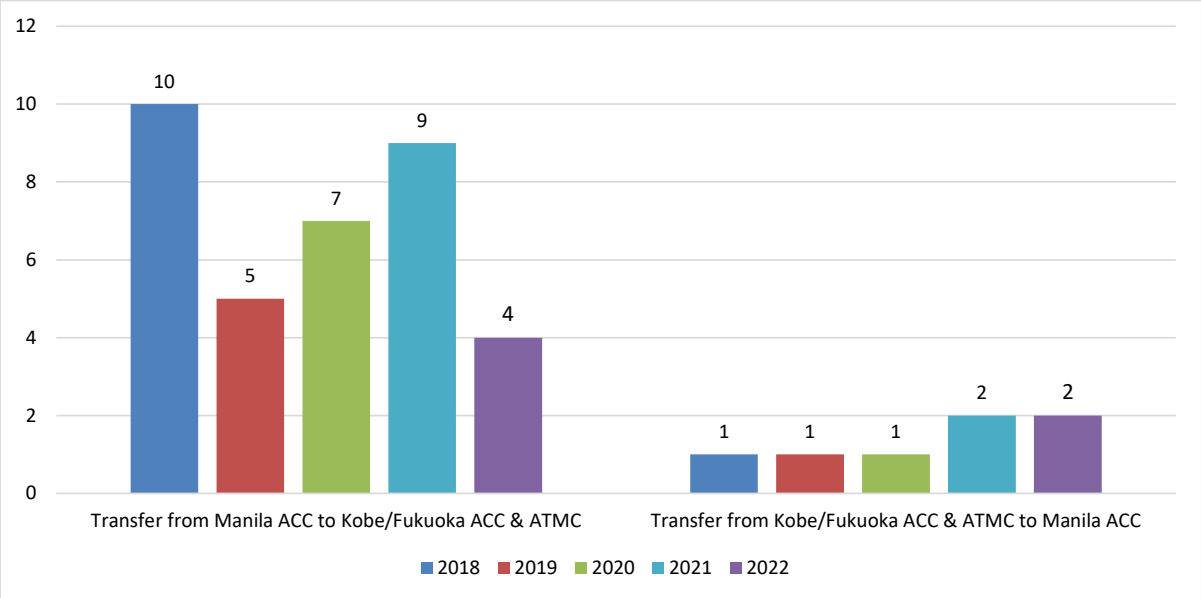

Figure 2: Number of LHDs at Hot Spot D

2.5 **Figure 3** shows the trend of the number of LHDs occurred at the former Hot Spot L along the FIR boundary between Fukuoka FIR and Khabarovsk FIR from 2018 to 2022. In 2022, there was no LHD reported to JASMA in the area.

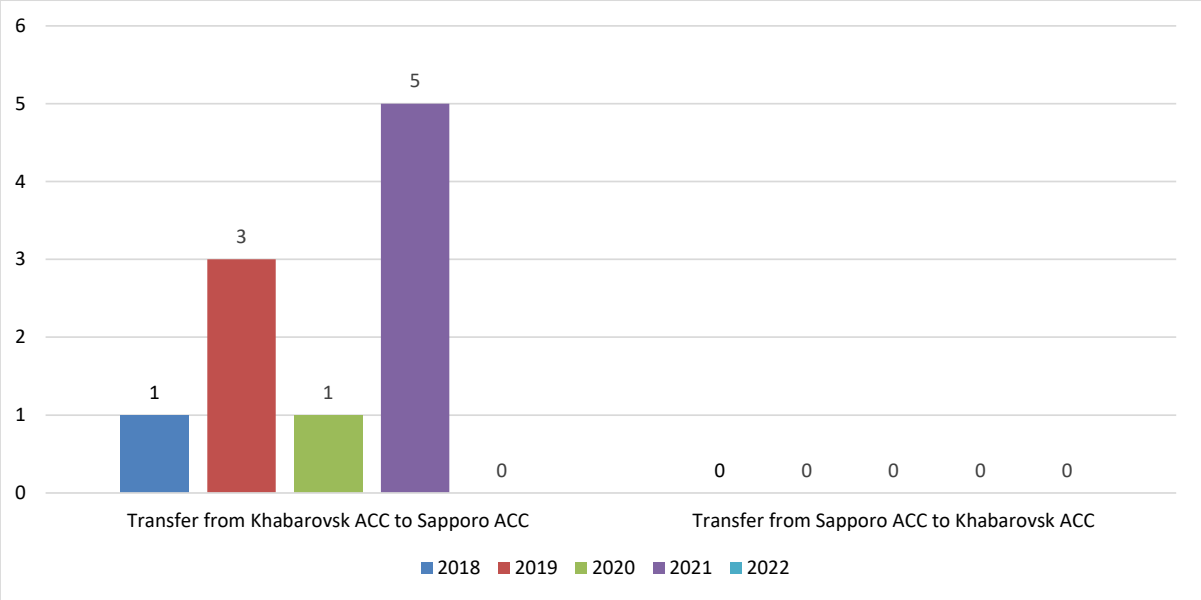

Figure 3: Number of LHDs at former Hot Spot L

Number of Clusters

2.6 **Figure 4** through **Figure 8** shows the LHD cluster maps identified in Fukuoka FIR from 2018 to 2022. The filled blue square symbols represent the LHD location in the RVSM stratum of Fukuoka FIR. The filled circle size means an LHD duration of 50 seconds or more. The circles and ellipses colored in light blue mean LHD clusters identified by JASMA.

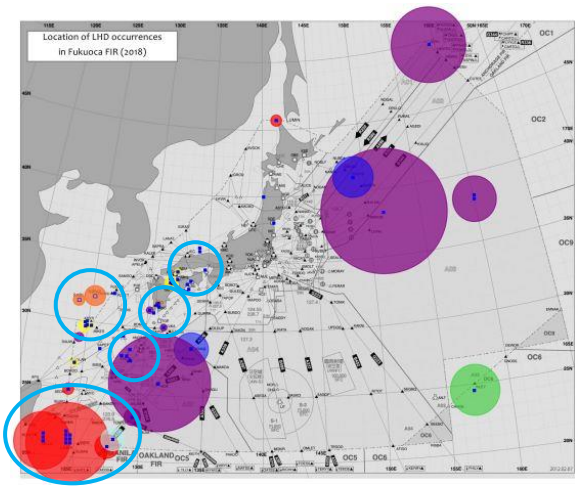

Figure 4: LHD cluster map in 2018 (5 clusters)

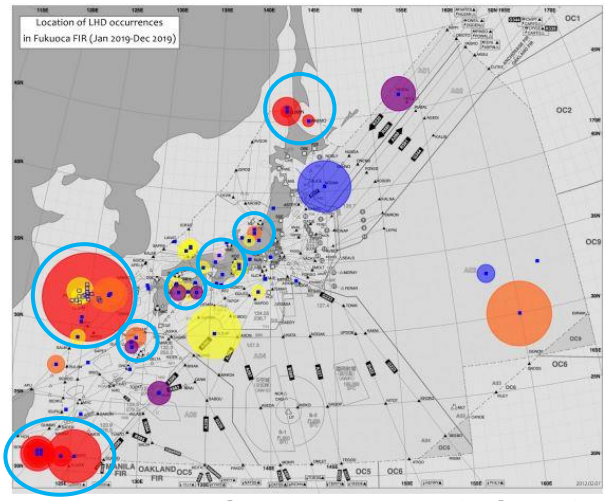

Figure 5: LHD cluster map in 2019 (7 clusters)

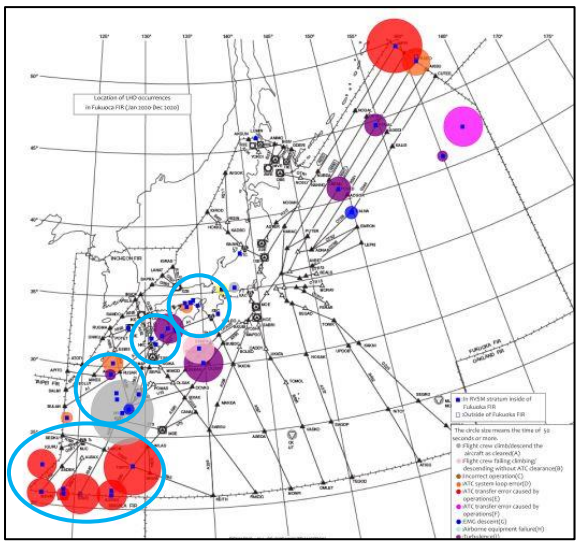

Figure 6: LHD cluster map in 2020 (4 clusters)

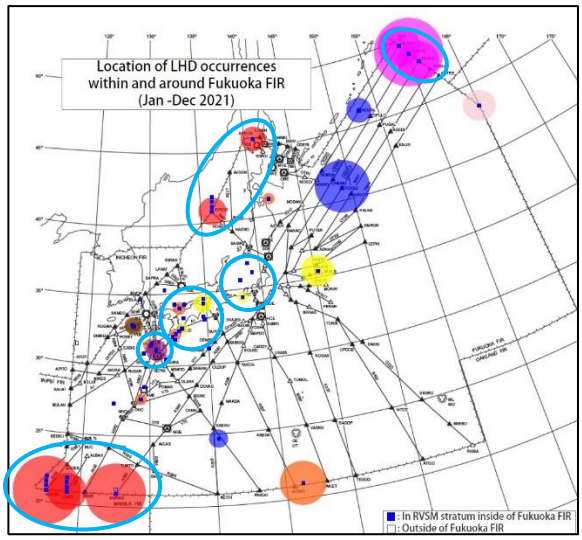

Figure 7: LHD cluster map in 2021 (6 clusters)

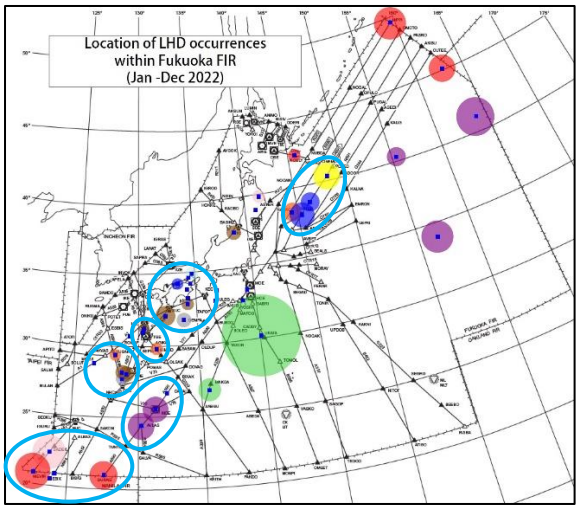

Figure 8: LHD cluster map in 2022 (6 clusters)

Hot Spot B Analysis

2.7 **Table 1** represents the "Number of Clusters" in **Figure 2** through **Figure 6**, "Number of LHDs" and "Operational Risk" in Fukuoka FIR from 2018 to 2022. Criteria of "Number of LHDs" and "Risk Estimates" are calculated by the draft process MAAR developed.

Fukuoka FIR	2018	2019	2020	2021	2022
Number of Clusters	5	7	4	6	6
Number of LHDs	64	64	42	56	45
Operational Risk ($x10^{-9}$ FAPFH)	10.16	11.04	11.38	9.35	4.67
Criteria: Number	10.67	8.00	8.40	8.00	6.43
Criteria: Risk Estimate ($x10^{-9}$ FAPFH)	1.69	1.38	2.28	1.34	0.67
Criteria: TLS ($x10^{-9}$ FAPFH)	5.00	5.00	5.00	5.00	5.00

Table 1: LHD profiles and Hot Spot criteria of Fukuoka FIR from 2018 to 2022

2.8 **Table 2** represents the results of the analysis and consideration for the east edge of Hot Spot B, the FIR boundary between Fukuoka and Incheon FIRs. 'Negative' means under the Hot Spot criteria and "Positive" means over the criteria.

East Edge of Hot Spot B (Fukuoka - Incheon FIRs)	2018	2019	2020	2021	2022
Number of LHDs	19	29	5	0	0
Criteria: Number	10.67	8.00	8.40	8.00	6.43
Hot Spot Risk (x10-9 FAPFH)	(Before Phase 1)	(Before Phase 1)	(Before Phase 1)	0.00	0.00
Criteria: Risk Estimate ($x10^{-9}$ FAPFH)	(Before Phase 1)	(Before Phase 1)	(Before Phase 1)	1.34	0.67
Criteria: TLS ($x10^{-9}$ FAPFH)	5.00	5.00	5.00	5.00	5.00
Result and Action by RASMAG meeting	Continue Monitoring (RASMAG/24 in 2019)	Continue Monitoring (RASMAG/25 in 2020)	Continue Monitoring (RASMAG/26 in 2021)	Continue Monitoring (RASMAG/27 in 2022)	Potential to non-Hot Spot (RASMAG/28 in 2023)
				Legend:	*Positive*	*Negative*

Table 2: Results of analysis and consideration on Hot Spot B

2.9 The number of LHDs and Hot Spot risk for the east edge of Hot Spot B in 2021 and 2022 meet the criteria. Although the traffic volume of the eastbound/westbound flights flying the east edge of Hot Spot B in December 2022 was approximately 33% of the volume in January 2020, which was a peak volume before the COVID-19 pandemic, the average number of daily flights in December 2022 was over 150 as shown in **Figure 9**.

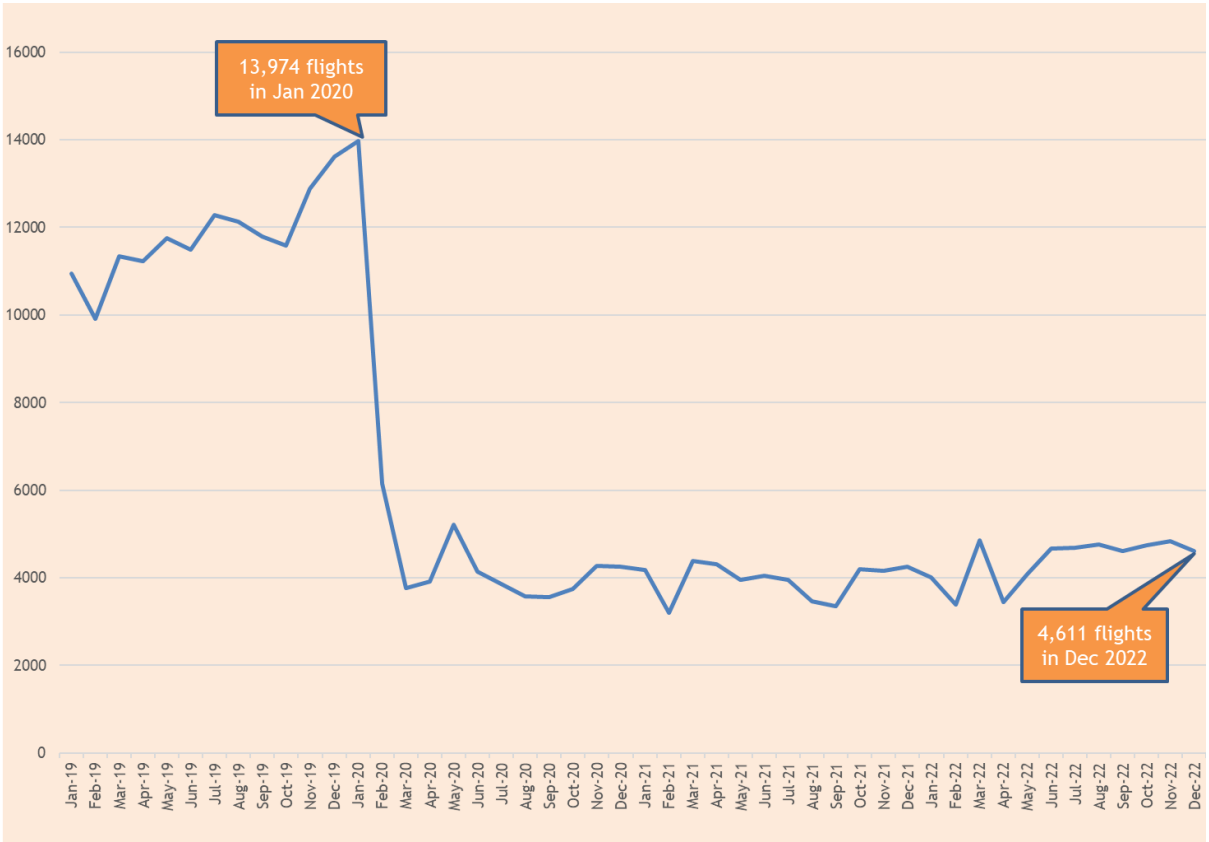

Figure 9: Monthly traffic volume of eastbound/westbound flights in AKARA airspace

2.10 As a result of the Hot Spot analysis and traffic volume, JASMA proposes identifying and reclassifying the area, the FIR boundary between Fukuoka FIR and Incheon FIR as "Potential to non-Hot Spot" at RASMAG/28 meeting.

Hot Spot D Analysis

2.11 **Table 3** represents the results of the analysis and consideration for Hot Spot D, the FIR boundary between Fukuoka and Manila FIRs. The number of LHDs in 2022 meets the criteria. However, the Hot Spot Risk in 2022 is over the criteria of 0.67 x 10^{-9}. Based on the result, JASMA proposes retaining the area, the FIR boundary between Fukuoka and Manila FIRs, as Hot Spot.

Hot spot D (Fukuoka - Manila FIRs)	2018	2019	2020	2021	2022
Number of LHDs	10	5	7	9	4
Criteria: Number	10.67	8.00	8.40	8.00	6.43
Hot spot Risk (x10-9 FAPFH)	7.71	4.70	3.85	5.95	1.70
Criteria: Risk Estimate ($x10^{-9}$ FAPFH)	1.69	1.38	2.28	1.34	0.67
Criteria: TLS ($x10^{-9}$ FAPFH)	5.00	5.00	5.00	5.00	5.00
Result and Action by RASMAG meeting	Continue Monitoring (RASMAG/24 in 2019)	Continue Monitoring (RASMAG/25 in 2020)	Continue Monitoring (RASMAG/26 in 2021)	Continue Monitoring (RASMAG/27 in 2022)	Continue Monitoring (RASMAG/28 in 2023)
				Legend:	*Positive*	*Negative*

Table 3: Results of analysis and consideration on Hot Spot D

Former Hot Spot L Analysis

2.12 **Table 4** represents the results of the analysis and consideration for former Hot Spot L, the FIR boundary between Fukuoka and Khabarovsk FIRs. The number of LHDs and Hot Spot risks from 2020 to 2022 meet both criteria. There is no potential for Hot Spots in the area.

Former Hot spot L (Fukuoka - Khabarovsk FIRs)	2018	2019	2020	2021	2022
Number of LHDs	1	3	1	5	0
Criteria: Number	10.67	8.00	8.40	8.00	6.43
Hot spot Risk (x10-9 FAPFH)	0.30	1.44	0.00	0.64	0.00
Criteria: Risk Estimate ($x10^{-9}$ FAPFH)	1.69	1.38	2.28	1.34	0.67
Criteria: TLS ($x10^{-9}$ FAPFH)	5.00	5.00	5.00	5.00	5.00
Result and Action by RASMAG meeting	Continue Monitoring (RASMAG/24 in 2019)	Potential to non-Hot Spot (RASMAG/25 in 2020)	Removed from Hot Spot list (RASMAG/26 in 2021)	non-Hot Spot (RASMAG/27 in 2022)	non-Hot Spot (RASMAG/28 in 2023)
				Legend:	*Positive*	*Negative*

Table 4: Results of analysis and consideration of former Hot Spot L

Trial Review

2.13 As JASMA's trial indicates, this procedure for Hot Spot analysis is beneficial for RMAs/EMAs to manage Hot Spots even though some detailed consideration and discussion, such as definition and standard of identifying a cluster or fluctuation of traffic volume, would be needed.

2.14 JASMA would like to express our appreciation that MAAR developed and shared the valuable scheme for managing Hot Spots and supported JASMA's analysis and consideration. Additionally, JASMA is ready to move forward to the next step conducting the procedure as an ordinary and standard procedure from trial.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss paragraphs 2.10 and 2.11; and

c) discuss any relevant matters as appropriate.

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