



ICAO

*International Civil Aviation Organization*

**Twenty-Sixth Meeting of the Regional Airspace Safety  
Monitoring Advisory Group (RASMAG/26)**

Video Teleconference, 20 – 23 September 2021

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**Agenda Item 5: Airspace Safety Monitoring Activities/Requirements in the Asia/Pacific Region**

**TREATMENT OF TCAS RA-RELATED LHDS (CATEGORY J AND K)**

(Presented by Chairperson)

**SUMMARY**

The Eight Monitoring Agency Working Group Meeting (MAWG/8) reviewed each RMA's treatment of TCAS (ACAS) RA-related Large Height Deviations (LHDs), aiming to standardize how each occurrence should be recorded and how to quantify its risk. A compiled a list of current practices is presented in this paper and will be further discussed in the next MAWG meeting. States are also to be reminded that any vertical deviations of magnitude 300 feet or more resulting from an aircraft manoeuvring according to a TCAS RA should be reported as an LHD.

**1. INTRODUCTION**

1.1 RASMAG/25 discussed the identification of Category J and K LHDs (deviations due to TCAS RA) in relation to the high number of TCAS RA Category J LHD events reported within the Fukuoka FIR. There were 27 such events reported in 2019, about 42% of the total. Of these 27 reports, 20 were deemed to be 'nuisance' RAs, while 7 were confirmed as being genuine.

1.2 Suspecting that the high number of such reports, when compared to other airspaces, might also be influenced by each RMA's different treatment of such reports, the RASMAG Chair agreed to further investigate this matter with the Monitoring Agencies Working Group (MAWG).

1.3 MAWG/8 reviewed each RMA's treatment of TCAS RA-related LHDs, aiming to standardize how each occurrence should be recorded and how to quantify its risk. However, the meeting could not come to a conclusion and agreed to continue the discussion later via e-mails. After the meeting, the Chair compiled a list of current practices and worked on a draft proposal, which will be discussed in details during the next MAWG meeting.

**2. DISCUSSION**

2.1 The following table summarizes the current practices that APAC RMAs use to handle TCAS RA related reports. The Chair also queried NAT CMA regarding their practice, which was also added to the table.

RMA	Record nuisance RAs as LHDs?	Record as LHDs when the deviations $\geq$ : (ft.)	Consider all (that fits the magnitude criteria) to have operational risk component?	Reference	Remarks
PARMO & NAARMO	Yes	300 (1 or more level crossed)	No, the RA maneuver itself is technical risk. A TCAS “save” can have an operational risk component through the trigger of that RA.	IP03 – MAWG/8	- Also further categorize the RAs into H (TCAS saves/genuine) and H1 (nuisance/caused by TCAS sensitivity) to keep track of each type
JASMA	Yes	300	No, Cat J is considered technical risk. Cat K is considered operational risk but JASMA rarely received any Cat K LHD reports.	WP08 – RASMAG/25 WP10 – RASMAG/25	- Also further categorize the RAs into genuine vs nuisance. Genuine RA is when the investigation result demonstrates that the ATC did not provide enough 1000-ft vertical separation.
MAAR	Yes	300	Yes	Current practice	- Also check whether the operational error that triggered the RA was an LHD. - Use the number of FLs crossed to estimate the operational risk component. - MAAR rarely receives Cat J and K reports.
AAMA	Yes	300	Yes	- Email explaining the process from AAMA - Rob Butcher’s presentation : Use of Barrier Model for Assessing Large Height Deviation Occurrences	- Duration is accounted until the ATC brought the system back from the ‘undesired state’*. To be conservative, this duration is computed as if the aircraft was at a whole FL.

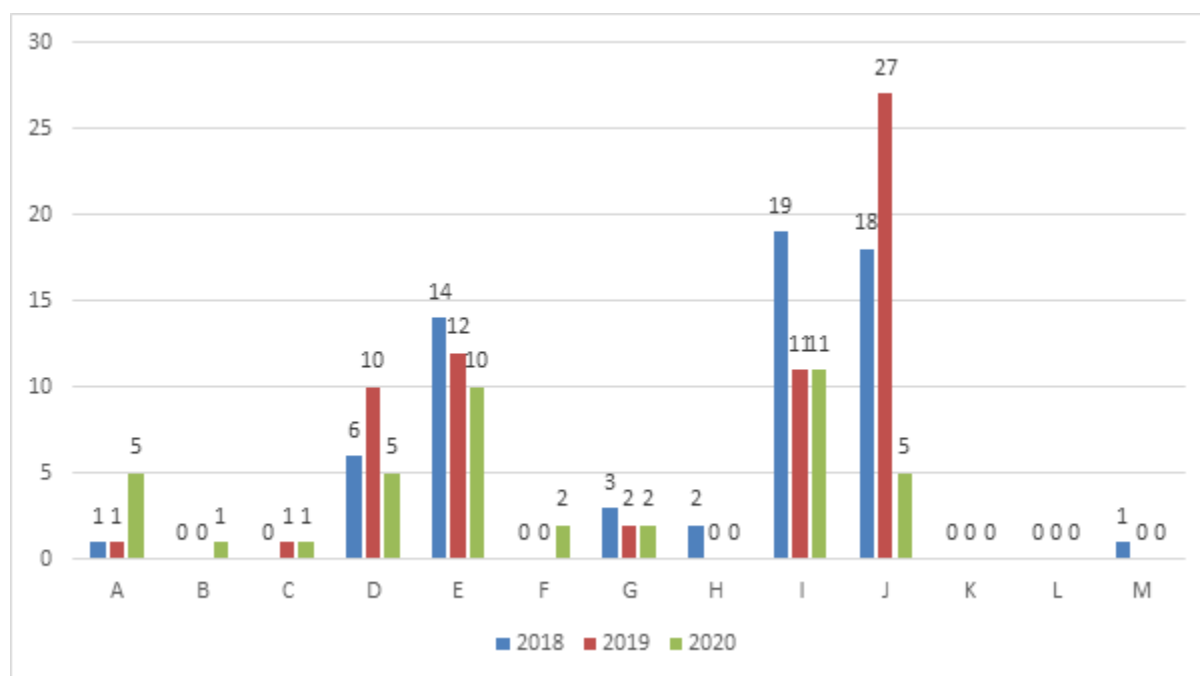
RMA	Record nuisance RAs as LHDs?	Record as LHDs when the deviations $\geq$ : (ft.)	Consider all (that fits the magnitude criteria) to have operational risk component?	Reference	Remarks
China RMA	Yes	300	No, Cat J is considered technical risk. Cat K is considered operational risk but China RMA never received any Cat K LHD reports.	WP06 – RASMAG/25	- China RMA rarely receives TCAS RA events. There were 4 Cat J events from 2016 to 2020. - No Cat J & K LHDs were reported in 2019's assessment.
NAT CMA	Yes	300	No, RA maneuvers are marked as technical errors** and therefore, considered technical risk.	E-mail reply from NAT CMA dated July 7 <sup>th</sup> , 2021	- It is not clear whether the equivalent of Cat K would also be marked as technical errors.

**\* Undesired state - an operational condition with the potential to reduce the margins of safety.**  
The undesired state is the point at which there is a loss of acceptable active control of operational risk (e.g. a situation where separation still exists but not by any planned action by a controller) and represents the failure of the suite of preventive controls to assure the safe management of the operations.

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<b>Technical error (TE)</b> if aircraft...	- is moved <i>by</i> turbulence, or - manoeuvred as a result of a TCAS RA, or - is moved by other environmental or mechanical factors (and the pilot is trying to maintain cleared FL).
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2.2 Given the compiled information above, especially in the second and third column, it can be assumed that the different treatments of TCAS RA reports do not have much influences on the high number of Cat J LHDs in Fukuoka FIR as reported by JASMA. A more significant factor seems to be the volume and density of the traffic in the Fukuoka FIR, especially in the continental airspace. The following chart shows the drastic reduction of Category J LHD in 2020, when the traffic level decreased due the travel restrictions during the pandemic.



2.3 However, the differences in the reporting culture of each State or even at the facility level can also influence the types and rates of operational errors that would be reported, depending on various factors such as the organizational culture, the risk perception of each individual and the benefit which could be gained from reporting as such. From MAAR’s experiences, a safety investigation of an occurrence at one unit might uncover another preceding occurrence such as a TCAS RA occurred at another unit before the aircraft transfer. However, the preceding TCAS RA event was never submitted.

Summary

2.4 The information presented in this paper is rather technical in nature. The draft proposal of the treatment of TCAS RA LHDs will be further discussed in the next MAWG meeting. However, questions and feedback from RASMAG participants are certainly welcomed.

2.5 States are to be reminded that any vertical deviations of magnitude 300 feet or more resulting from an aircraft manoeuvring according to a TCAS RA should be reported as an LHD. It is to be noted that airspace occurrences are reported to the RMAs so that they can assess the current risk of the airspace. It should not be perceived as a penalty or blame to any party.

**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.

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