



ICAO

International Civil Aviation Organization

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

Video Teleconference, 20 – 23 September 2021

Agenda Item 8: Any Other Business

ICAO 24-BIT ADDRESS VERIFICATION USING RVSM APPROVAL DATABASE

(Presented by MAAR)

SUMMARY

MAAR has started a trial process to verify ICAO 24-bit address and quality check other parameters as a by-product. This paper presents the results of these checks. The errors found were due to many factors. Some were due to aircraft within the same fleet being used interchangeably without changing the related attributes in the flight plans. Some were due to human typing errors. Some were due to the time lag of the RMAs' database. When discrepancies were found, MAAR will coordinate with the relevant RMAs and States so that the issues are resolved.

1. INTRODUCTION

1.1 Regional Monitoring Agencies (RMAs) share their RVSM approval database monthly; this data is called “RVSM Approval Snapshot.” The snapshots from all RMAs were then combined into one list (called “combined snapshot”), which then can be used to verify approval status from flight plans and Traffic Sample Data and produce a list of non-RVSM approved aircraft.

1.2 For height monitoring purposes, the RVSM approval data also contains ICAO 24-bit address that has been assigned to Mode-S capable aircraft by its State CAA. This information is used to map approval record with all ground-based height monitoring data.

2. DISCUSSION

2.1 In order to capture the most height monitoring measurements, ICAO 24-bit address downlinked from the aircraft has to match that in the RVSM approval record. Therefore, with assistance from an AEROTHAI engineer, MAAR started a trial process to verify ICAO 24-bit address and quality check other parameters as a by-product (FPLs from February, June – mid-August 2021). The process first maps flight plans received by AEROTHAI's flight data centre with RVSM approval records using aircraft registration. Then,

- if CODE/ is provided in Item 18, compares the ICAO 24-bit address from Item 18 CODE/ in the flight plan with the 24-bit address from the combined snapshot;
- compare operator codes from aircraft identification from flight plans to those in the combined snapshot (excluding GA flight plans); and
- compare aircraft type designators from flight plans to those in the combined snapshot.

Aircraft registrations were assumed to be correct from both sources. After the analysis, MAAR could verify that the assumption was true. The following paragraphs summarized the findings discovered from the results.

Mismatched ICAO Address Due to Incorrect Item 18 CODE/ in the Flight Plan

2.2 Most frequent cases in this category were due to the hex code in Item 18 CODE/ in the Flight Plan was incorrect, which usually happened with aircraft of the same type that maybe used interchangeably within its fleet.

2.3 The next most prevalent case was when the aircraft had been transferred to a new operator and assigned a new ICAO address. The new address was updated in the combined snapshot, but the hex code in Item 18 CODE/ was not updated.

2.4 Typographical errors in the hex code in Item 18 CODE/ were also found. The most common pairs are 0 and O, 3 and 8, B and 8, C and G, A and 8, A and 4, D and 0, which might be due to human errors.

Mismatched ICAO Address Due to Incorrect Address in RMAs' RVSM Approval Database

2.5 Most frequent cases were due to the lag time of the combined snapshot. Aircraft had been transferred to a new owner and assigned a new address; however, the combined snapshot used for comparison was not updated in time. This lag is inherent in the current arrangement and maybe managed by comparing the current snapshot with older flight plans.

2.6 Typographical errors were also found in RMAs' database. In MAAR's cases, some typos came with the F2 forms while some occurred during data entry into the database.

Mismatched Operator Code

2.7 Most frequent cases were due to the lag time of the combined snapshot in case of aircraft being transferred to the new owner. (Same as 2.5)

Mismatched Aircraft Type

2.8 In both flight plan and the RMAs' database, there were some incorrect aircraft designators, which typically were aircraft of the same family, but different variants. For example, B789 and B78X, B787 and B788, A20N and A320, A21N and A321.

Summary

2.9 After discovering the errors, MAAR corrected the information in MAAR's RVSM database as well as coordinated with the relevant RMAs and State CAAs to correct the data. There have been approximately 10 corrections made in RMAs' database so far. (MAAR has not yet tracked the changes in the flight plans.)

2.10 With this process in place, when discrepancies were found, MAAR will keep coordinating with the relevant RMAs and States so that the issues are resolved.

2.11 MAAR will continue this verification process since it will help support the future implementation of using Mode-S downlinked ACID as the primary means of target identification in the APAC region.

2.12 States are also urged to notify their RMAs of the changes (transferred/de-registered aircraft) in a timely manner to reduce the time lag in the approval combined snapshot.

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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