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**CAR/SAM Planning and Implementation Regional Group (GREPECAS) Twenty Second Scrutiny
Working Group Meeting (GTE/22)
Mexico City, Mexico, 26 to 30 September 2022**

Agenda Item 5: Other Business

LONG TERM HEIGHT MONITORING BURDEN

(Presented by NAARMO)

EXECUTIVE SUMMARY	
This information paper provides an assessment of the monitoring burden associated with the long-term height monitoring requirements for airframes for which the NAARMO is the responsible Regional Monitoring Agency (RMA). NAARMO approvals and global monitoring records as of 30 June 2022 were used to assess the monitoring burden.	
<i>Strategic Objectives:</i>	<ul style="list-style-type: none">• Strategic Objective 1 – Safety
<i>References:</i>	<ul style="list-style-type: none">• ICAO Doc 9937 - Operating Procedures and Practices for Regional Monitoring Agencies in Relation to the Use of a 300 m (1,000 ft.) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive, International Civil Aviation Organization, First Edition - 2010.• ICAO Annex 6 - Operation of Aircraft

1. Introduction

1.1 The North American Approvals Registry and Monitoring Organization (NAARMO), a service provided by the U.S. Federal Aviation Administration's William J. Hughes Technical Center, has served since 2003 as the regional monitoring agency (RMA) for the airspace covering the United States, Canada and Mexico.

1.2 As part of the duties of a Regional Monitoring Agency (RMA), outlined in ICAO Doc 9937 (Reference 1), the NAARMO performs regular checks of the operator compliance with State approval requirements within the North American airspace. The purpose of these checks is to identify non-approved operators and aircraft using the RVSM airspace to ensure the safety of the airspace.

1.3 This paper describes the process used by the NAARMO to identify airframes operating within RVSM airspace, FL290 to FL410 for which an RVSM approval could not be confirmed. This is accomplished through systematic process of matching air traffic movement data and airframe approval records. The results for December 2021 within RVSM are presented for Mexico and the contiguous United States.

1.4 To assess whether the ICAO Annex 6 Long Term Height Monitoring (LTHM) requirements (Reference 4) are met, NAARMO maintains a database of approvals and height monitoring history for aircraft registered within States under NAARMO responsibility (Canada, Mexico, and the United States). This paper provides an analysis of the current NAARMO monitoring burden based on the approvals contained within the NAARMO approvals database and global monitoring data available as of 30 June 2022.

2. Discussion

2.1 NAARMO Long Term Height Monitoring (LTHM) Burden Analysis

2.2 The NAARMO approvals database as of 30 June 2022 was examined to determine the current NAARMO monitoring burden. First, compiled the approvals for the countries under NAARMO responsibility (Canada, Mexico, and the United States). Subsequently, grouping the U.S. aircraft by Operator(s) derived from aggregating corresponding Designators in the Letters of Authorization (LOA). Then, each airframe having a current full RVSM approval was paired with the appropriate monitoring category by applying the most current version of the Minimum Monitoring Requirements (MMR) table (as of 17 June 2022) Any aircraft types missing from the current MMR table were assigned to MMR Category 3: RVSM Monitoring Non-Group Aircraft. Finally, each airframe was then paired to its last successful monitoring (if it exists) occurring within the past 2 years from 30 June 2020 to 30 June 2022. NAARMO is investigating the use of U.S. Flight Plan data as a tool to gauge monitoring compliance, particularly in the IGA Fleet

2.3 The total number of unique airframes identified as having a full RVSM approval from a state of registry under NAARMO responsibility as of 30 June 2022 was 23,093, with a resultant monitoring burden of 15,155 and a total of 837 aircraft not successfully monitored within the past two years (or 1,000 flight hours, whichever interval was longer). Table 2 provides a summation by State of Registry of airframes that require monitoring due to having no successful monitoring record within two years as of 30 June 2022.

Table 2. Summary of NAARMO monitoring burden

State	Total # of Approved Airframes	Resultant Monitoring Burden (# Airframes)	Total # of Airframes Not Monitored within two years as of 30/06/2022
CANADA	1557	878	300
MEXICO	529	209	22
US – Section 3	21,007	14,068	515
NAARMO Total	23,093	15,155	837

2.4 Each airframe having a current full RVSM approval was categorized under either Commercial or IGA operations. Table 3 presents NAARMO monitoring burden summaries by type of operator and State of Registry. To preserve the uniqueness of these airframes, each was grouped and counted under Commercial operations.

- As of 30 June 2022, there are 13,425 unique U.S. IGA airframes operated by 10,403 unique operators. The remainder of airframes to be monitored is 496 operated by unique operators.
- As of 30 June 2022, there are 7,582 unique U.S. Commercial airframes operated by 57 unique operators. The remainder of airframes to be monitored is 19.

Table 3. Itemized NAARMO monitoring burden

CANADA	Total # of Approved Airframes	Resultant Monitoring Burden (# Airframes)	Total # of Airframes Not Monitored within two years as of 30/06/2022
IGA	554	554	193
Commercial	1003	324	107
Total Canada	1,557	878	300
MEXICO	Total # of Approved Airframes	Resultant Monitoring Burden (# Airframes)	Total # of Airframes Not Monitored within two years as of 30/06/2022
IGA	23	23	2
Commercial	506	186	20
Total Mexico	529	209	22
US	Total # of Approved Airframes	Resultant Monitoring Burden (# Airframes)	Total # of Airframes Not Monitored within two years as of 30/06/2022
IGA	13,425	13,425	496
Commercial	7,582	643	19
Total US	21,007	14,068	515
NAARMO Total	23,093	15,155	837

2.10. Sampling of ASE by group allows the potential for specific airframes to remain unmonitored over long durations. IGA aircraft that take several years to complete 1,000 flight hours also will have longer periods between monitoring.

3. Conclusion

3.1 The meeting is invited to consider the potential impact of the estimated remaining burden.