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INFORMATION PAPER

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**CAR/SAM Planning and Implementation Regional Group (GREPECAS) Twenty First Scrutiny Working Group Meeting  
(GTE/21)**

Zoom Meeting, 23 – 26 August 2021

**Agenda Item 4: Other Business**

**NAARMO RVSM TRAFFIC COMPLIANCE MONITORING AND  
LONG TERM HEIGHT MONITORING BURDEN**

(Presented by NAARMO)

**EXECUTIVE SUMMARY**

This information paper provides an assessment of non-State-approved operators using the Reduced Vertical Separation Minimum (RVSM) airspace overseen by the North American Approvals Registry and Monitoring Organization (NAARMO) in New York West airspace. The assessment process is described and the results for period December 2020 are presented. It also 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 05 April 2021 were used to assess the monitoring burden

<i>Strategic Objectives:</i>	<ul style="list-style-type: none"><li>• Safety</li></ul>
<i>References:</i>	<ul style="list-style-type: none"><li>• ICAO Doc 9937 - Operating Procedures and Practices for Regional Monitoring Agencies in Relation to the Use of a 300 m (1000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive, International Civil Aviation Organization, First Edition - 2010.</li><li>• Summary of Discussions (RMACG/6), Cornwall, Canada, 6-10 June 2011: Task #10 "All RMAs conduct traffic scrutiny survey during the same time frame [December] in order to understand the magnitude of the situation."</li><li>• Summary of Discussion (RMACG/10), Bangkok, Thailand, 18 - 22 May 2015: Paragraph 3.2.33 "The meeting discussed the need of the fixed month for scrutiny activities as decided at the RMACG/6 meeting and agreed that with the maturity of most of the monitoring programs, and with most of the RMAs performing monthly verification of the approval status, it is not</li></ul>

	<p>necessary to fix a month for data collection, but it is of crucial importance the exchange of data between the RMAs to guarantee that all have the same correct information on approval status.”</p> <ul style="list-style-type: none"> <li>• ICAO Annex 6 - <i>Operation of Aircrafts</i></li> <li>• Long Term Height Monitoring (LTHM) <i>requirements</i></li> </ul>
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## 1. Introduction

1.1 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 Pacific and North East 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 At RMACG/6 it was decided that all RMAs would conduct a traffic scrutiny survey for their region of jurisdiction every December. (Reference 2) At RMACG/10 the requirement for a December traffic scrutiny survey was amended to allow the traffic scrutiny survey to be performed on any month. (Reference 3).

1.4 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 2020 within RVSM are presented for Mexico and the contiguous United States.

1.5 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 05 April 2021.

## 2. Discussion

2.1 The air traffic movement data used for the traffic scrutiny is obtained from the FAA’s Advanced Technologies & Oceanic Procedures (ATOP) system. This system archives information for each flight, including filed flight plans, reported positions, and communication messages between air crew and ATC. The ATOP records containing position and flight plan data are used for the traffic scrutiny.

2.2 Each entry in the traffic sample file containing observed operations within New York West airspace was compared with the collective approvals database as of April 2021 to determine the approval status of the airframe or operator/aircraft type combination. The entries for which no approval or an expired approval is found are output to a list for further verification.

2.3 The verification process involves the exploration of systematic reasons for removing entries from the list. These reasons include but are not limited to:

- lags in State notification of approval to the RMA
- lags in updates to the approvals database and the local version of ICAO Doc 8585
- mistakes and typographical errors in the original traffic data
- code-sharing and lease arrangements between airlines
- mistakes related to ICAO aircraft type codes in approvals
- entries that appeared in only one of the four quarters

2.4 Table 1 provides a summary of the results of the NAARMO traffic RVSM compliance survey for New York West airspace following the initial verification process. The results are listed alphabetically by RMA. This list contains a total of seven civilian non-approved operations from six States observed within RVSM airspace in New York West airspace.

Table 1. Summary of the non-approved operations from New York West airspace

RMA	STATE	REGISTRATION	AIRCRAFT TYPE	COUNT
<b>ARMA Total: 1</b>				
ARMA	Algeria	7TVPR	GLF4	1
<b>CARSAMMA Total: 2</b>				
CARSAMMA	Barbados	8PASD	GLF6	2
CARSAMMA	Venezuela	YV3507	A343	1
<b>NAARMO Total: 4</b>				
NAARMO	Canada	CGSMR	F2TH	1
NAARMO	Mexico	XAJLJ	H25B	2
NAARMO	Mexico	XARCE	H25B	1
NAARMO	United States	N711SW	GL7T	1
<b>Airframe Total: 7</b>				

2.5 Experience has shown that the primary systematic reason for failure to match operations and approvals is a delay in State notification of the approval status of some operators to the appropriate RMA. Thus, the importance of timely notification by States of operator approval status to RMAs is emphasized by these results.

## 2.6 NAARMO Long Term Height Monitoring (LTHM) Burden Analysis

2.7 The NAARMO approvals database as of 05 April 2021 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 August 2020) 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 05 April 2019 to 05 April 2021. NAARMO is investigating the use of U.S. Flight Plan data as a tool to gauge monitoring compliance, particularly in the IGA Fleet

2.8 The total number of unique airframes identified as having a full RVSM approval from a state of registry under NAARMO responsibility as of 05 April 2021 was 22,453, with a resultant monitoring burden of 14,781 and a total of 774 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 04 May 2021.

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 05/04/2021
<b>CANADA</b>	1453	880	134
<b>MEXICO</b>	670	324	56
<b>US – Section 3</b>	20,330	13,577	584
<b>NAARMO Total</b>	<b>22,453</b>	<b>14,781</b>	<b>774</b>

2.9 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 05 April 2021, there are 13,060 unique U.S. IGA airframes operated by 10,244 unique operators. The remainder of airframes to be monitored is 583 operated by unique operators.
- As of 05 April 2021, there are 7,270 unique U.S. Commercial airframes operated by 54 unique operators. The remainder of airframes to be monitored is 1.

Table 3. Itemized NAARMO monitoring burden

<b>CANADA</b>	<b>Total # of Approved Airframes</b>	<b>Resultant Monitoring Burden (# Airframes)</b>	<b>Total # of Airframes Not Monitored within two years as of 05/04/2021</b>
<b>IGA</b>	570	570	110
<b>Commercial</b>	883	310	24
<b>Total Canada</b>	<b>1,453</b>	<b>880</b>	<b>134</b>
<b>MEXICO</b>	<b>Total # of Approved Airframes</b>	<b>Resultant Monitoring Burden (# Airframes)</b>	<b>Total # of Airframes Not Monitored within two years as of 05/04/2021</b>
<b>IGA</b>	97	97	16
<b>Commercial</b>	573	227	40
<b>Total Mexico</b>	<b>670</b>	<b>324</b>	<b>56</b>
<b>US</b>	<b>Total # of Approved Airframes</b>	<b>Resultant Monitoring Burden (# Airframes)</b>	<b>Total # of Airframes Not Monitored within two years as of 05/04/2021</b>
<b>IGA</b>	13,060	13,060	583
<b>Commercial</b>	7,270	517	1
<b>Total US</b>	<b>20,330</b>	<b>13,577</b>	<b>584</b>
<b>NAARMO Total</b>	<b>22,453</b>	<b>14,781</b>	<b>774</b>

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 1000 flight hours also will have longer periods between monitoring.

### 3. Conclusion

3.1. The NARRMO is implementing a new process for the traffic compliance check. More frequent compliance checks will help identify repeat operations that file an RVSM approval without having an approval.

3.2. The meeting is invited to note and review the contents of the NAARMO traffic scrutiny work presented in this paper.