

RVSM and SMS: GAP Comparison

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The FAA-AIR has tasked the Center for General Aviation Research (CGAR) to contrast the content of certain RVSM documents with the Design and Manufacturing (D&M) SMS framework, Revision C. Excel Attachment 1 to this document includes said comparison.

The comparison uses the June 5, 2012, *D&M SMS FRAMEWORK: D&M Safety Management System (SMS) Framework, Revision C* for the DMSMS standard. Out of 37 documents identified, seven were found contain content for the RVSM GAP comparison:

1. AC 91-85, *Authorization of Aircraft and Operators for Flight in Reduced Vertical Separation Minimum Airspace*;
2. FAA Order 8400.1 CHG 27, Volume 4, Chapter 1, Section 5, *Aircraft Equipment and Operational Authorizations, Air Navigation, Communications, and Surveillance, Special Areas of Operation*;
3. *Dispatcher Guide for RVSM Operations (Rev 1, 13 March 2002)*;
4. *Job Aid: Part 91 Operator Application to Conduct RVSM Operations (10 May 2012)*;
5. *RVSM Web Page, Retrieved August 5, 2012*
(http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/enroute/rvsm/documentation/);
6. *RVSM Approval Process Events: US Operators (January 19, 2005)*; and
7. *TCAS II Operation in Reduced Vertical Separation Minimum (RVSM) Airspace (9 August 2004)*.

Of the 37 documents provided, only the seven listed documents were used for this GAP analysis.

The remaining 30 documents were considered to be elaborations of the other content, or prescriptive documents addressing details of compliance with the enumerated documents.

The following columns exist in Attachment 1:

- **(B) Full Node Outline Path.** This is the hierarchal path to the SMS framework node being compared. There will always be an entry in this column.
- **(F) Simple Node.** A textual abbreviation of the DMSMS framework node, with leading dashes to represent the indentation level of the node. When the node of the hierarchy in DMSMS Revision C was removed as “directional guidance,” the

code “\$DG” is used; when the node was removed as a duplicate, the code “\$Removed, duplicate” is used.

- **(H) Node Status.** Either “OK,” “REMOVED,” or “DG,” indicating the status of the DMSMS framework node.
- **(I-AJ) Three Columns per each of the seven enumerated items, as follows:**
 - **GAP Rating.** A numerical code indicating the amount of overlap between DMSMS and this RVSM document;
 - **Sections.** A semi-colon delimited list of sections that were found in the RVSM document to overlap with the DMSMS framework; and
 - **Notes.** Elaborations on the reason the GAP rating score was assigned.

The spreadsheet is color coded for readability. Also, there are some hidden columns which contain raw data used to build the final, unhidden columns.

The comparison was accomplished using the qualitative software package, NVivo, Version 10. First, the node structure of the DMSMS Framework was imported into NVivo’s node structure. Then, each RVSM document was reviewed and coded against the DMSMS node structure. If one node of the RVSM document being reviewed was applied to more than one node in the DMSMS framework, then it was coded multiple times. Upon completion of the coding process, an NVivo matrix query was run to summarize the coding counts of each RVSM document versus the DMSMS framework. Wherever no coding existed in the matrix query (i.e., a count of 0), a GAP rating of “5” was assigned. The textual content of each non-zero count in the matrix query was then reviewed, and the rubric in Table 1 was applied to determine a GAP rating along with notes explaining the rationale for the rating.

The inverse process—examining each item in each RVSM document node structure and then searching the DMSMS standard—was not accomplished.

Discussion

The process of comparing SMS and RVSM intends to represent an objective contrast of the two frameworks; however limitations of the approach inevitably introduce subjectivity. A group environment involving three to five subject matter experts in SMS and RVSM would help advance the present document to a more objective state.

Conclusions

A review of the coding reveals RVSM policy has many gaps when compared to the DMSMS framework. Most of the coverage comes from the AC 91-85, and this in the area of Safety Assurance (Component 3) contributed by paragraphs 8-12 of the AC. The next major contributor to the overlap comes from the RVSM web page, by reference to other documents. The detailed analysis of all the seven out of 37 RVSM documents was able to find some contribution to each of the four components of DMSMS; following safety assurance, the next greatest coverage was Safety Risk Management (Component 2), followed by Safety Policy (Component 1), and lastly, Safety Promotion (Component 4).

In the area of DMSMS Safety Policy, the sparse coverage of RVSM creates a wider gap when consideration is given to responsibilities of top management and an accountable executive. DMSMS places great emphasis upon the organizational structure of management to foster Safety Policy (Component 1) and to Promote Safety (Component 4). RVSM does not overtly express this organizational aspect.

Table 1

Rubric Describing Rating Scale

Rating	Rating Scale	Description
5	----- -----5	RVSM has large omissions in both scope of safety and scale compared to SMS. While RVSM may mention the area covered by SMS, it is nearly an empty comparison or complete gap.
4	----- ----4-	RVSM is lacking both in scope of safety and scale compared to SMS.
3	----- --3--	SMS and RVSM have equivalent scope of safety concepts. SMS scale exceeds that of RVSM.
2	----- -2---	SMS and RVSM have equivalent scale of concepts. SMS scope exceeds that of RVSM in the area of safety or as otherwise stipulated in comparison comments.
1	----- 1-----	SMS and RVSM safety scope and scale identical; SMS linguistic expression requires RVSM linguistic adjustment.
0	-----0-----	SMS and RVSM equivalent both in safety scope and scale.

Note: Ratings -1 through -5 are not yet defined, the future intent is to show where RVSM exceeds SMS.