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Program to monitor or verify aircraft height-keeping performance; Monitoring requirement exists worldwide for access to RVSM airspace

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Aerospace Management Systems Division

Reduced Vertical Separation Minimum (RVSM) Post-Certification Verification

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04 June 2019

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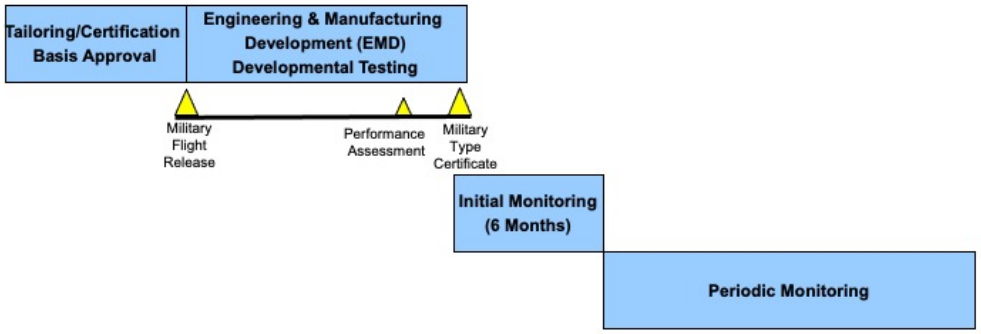
Topics

- RVSM Cert/Life-Cycle Process
- Compliance Phases
- Why RVSM Periodic Monitoring?
- Periodic Monitoring Requirements
- Periodic Monitoring Process
- ADS-B Monitoring
- RVSM Monitoring References
- Summary

RVSM Cert/Life-Cycle Process



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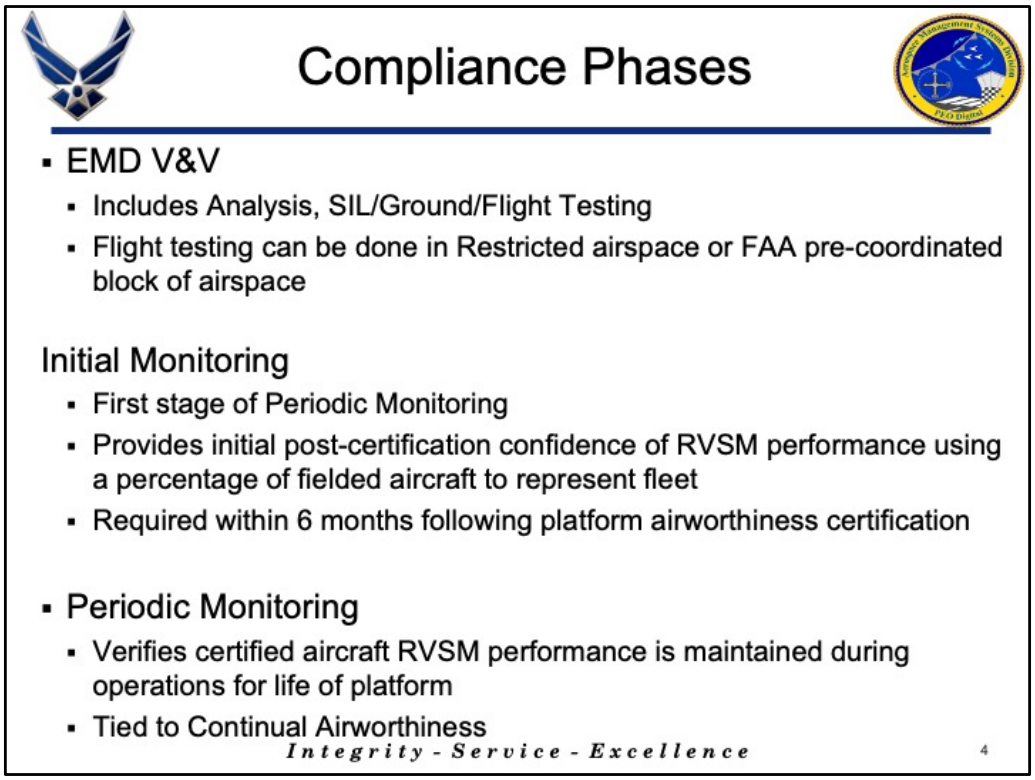


RVSM Minimum Monitoring Requirements tables can be found at: https://www.faa.gov/air_traffic/separation_standards/rvsm/documents/APP-B_MMR_as_of_7-21-2017.pdf

Why RVSM Periodic Monitoring?

- **Program to monitor or verify aircraft height-keeping performance**

- Over time RVSM primary performance parameters degrade
  - Barometric system accuracy
  - Autopilot hold
  - Alerting pilot when either of above fails
- Monitoring validates primary performance parameters of RVSM-certified aircraft
  - Consists of a specific process for life of aircraft following certification
    - Includes specific maintenance activity
- Monitoring requirement exists worldwide for access to RVSM airspace

Why RVSM Periodic Monitoring?

- RVSM Degradation Causes
  - Aircraft performance degrades over operational time from
    - Pitot tube and static port degradation
    - Imperfections in aircraft skin (skin waviness)
    - Barometric component drift over time
- Can result in Altimetry System Error (ASE) to fall outside of allowable values
  - Monitoring verifies if ASE is within allowable values
    - Action must be taken by operator if these limits are exceeded

Periodic Monitoring Requirements

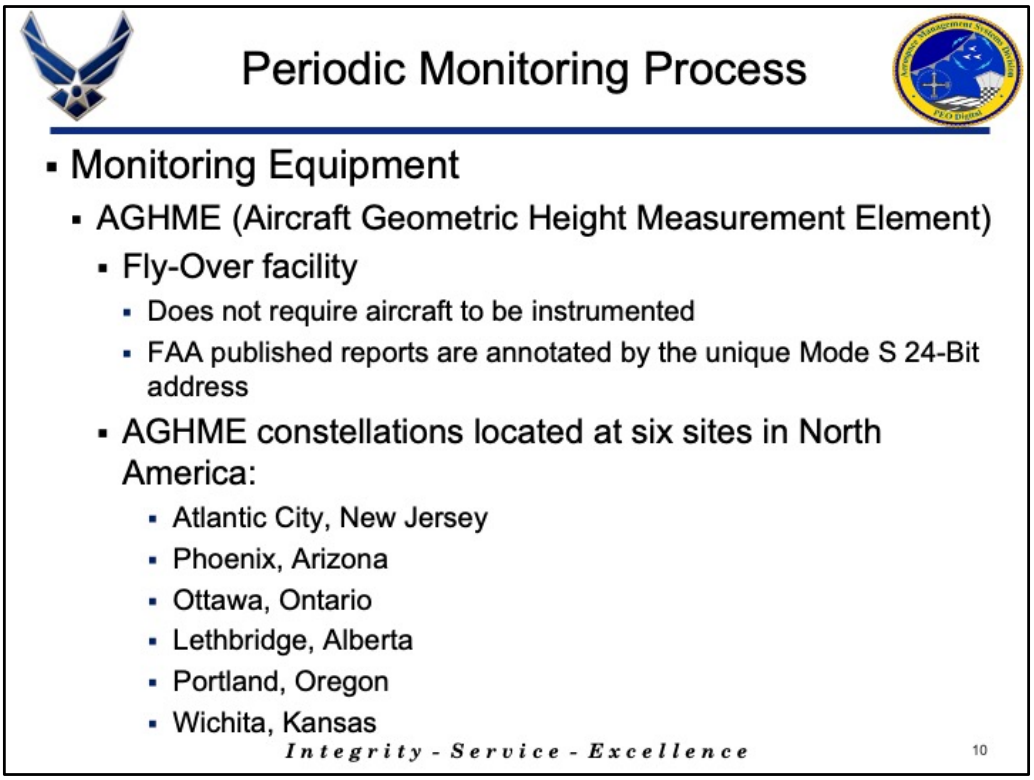
- RVSM Height Monitoring Plan
  - Required to demonstrate aircraft's ability to maintain ASE requirements of part 91, Appendix G
  - Documents process needed to verify ASE performance
    - Required when applying for RVSM certification
    - Elements of monitoring plan include:
      - Number and identification of aircraft to be monitored in each monitoring group;
      - Expected time frame for completion of monitoring requirements; and
      - Expected method for monitoring

Periodic Monitoring Requirements

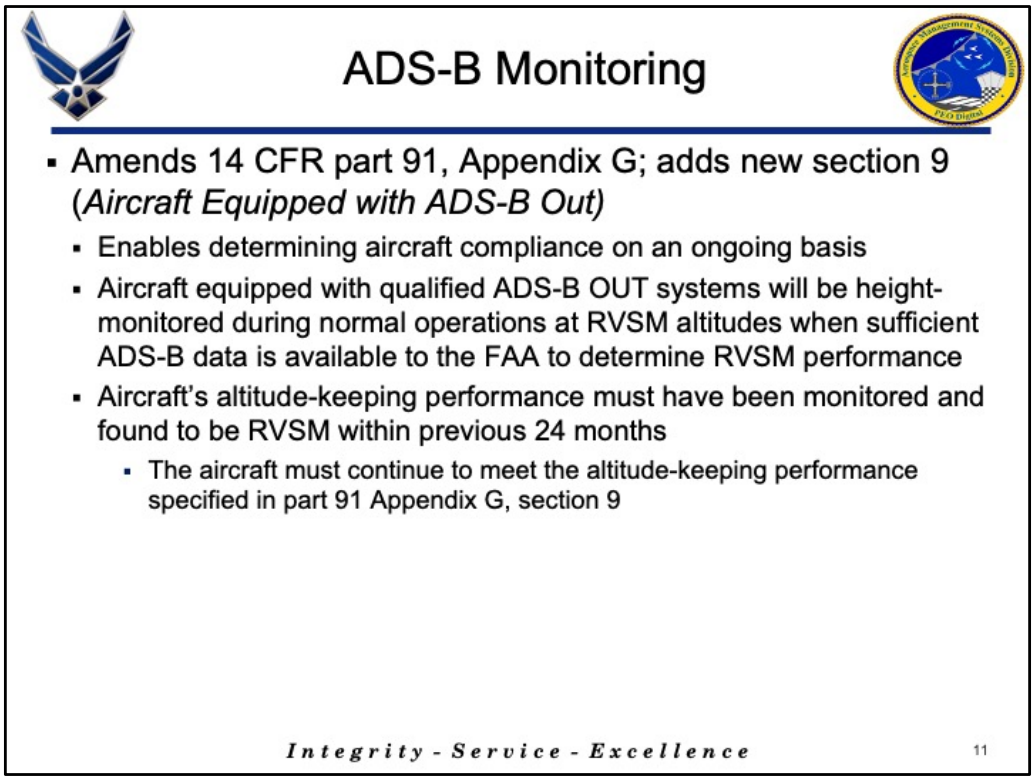
- Monitoring Implementation
  - Operators must conduct initial monitoring within six months of RVSM authorization receipt
  - Operators must **conduct monitoring every two years** or within intervals of 1,000 flight hours per aircraft, whichever period is longer
  - Operators not required to complete monitoring prior to being granted operational approval
  - Evidence of previous successful monitoring of aircraft transfers to new owner and may be used to meet monitoring requirements
  - When calculating 1,000 hour minimum recurring monitoring requirement:
    - Duration should be from last valid monitoring date on record
    - Flight Log book data should be sufficient

Periodic Monitoring Process

- Impact to MAJCOMs
  - **Operator (MAJCOM) should provide plan for participation in RVSM monitoring program**
    - Normally entails "check" of portion of operator's aircraft by an independent height-monitoring system
  - Height-keeping errors fall into two broad categories:
    - Errors caused by malfunction of aircraft equipment
    - Operational errors
  - **Operators who consistently commit errors of either variety may be required to forfeit authority for RVSM operations**
    - If problem is specific to one aircraft type, RVSM authority may be removed for the operator for that specific type



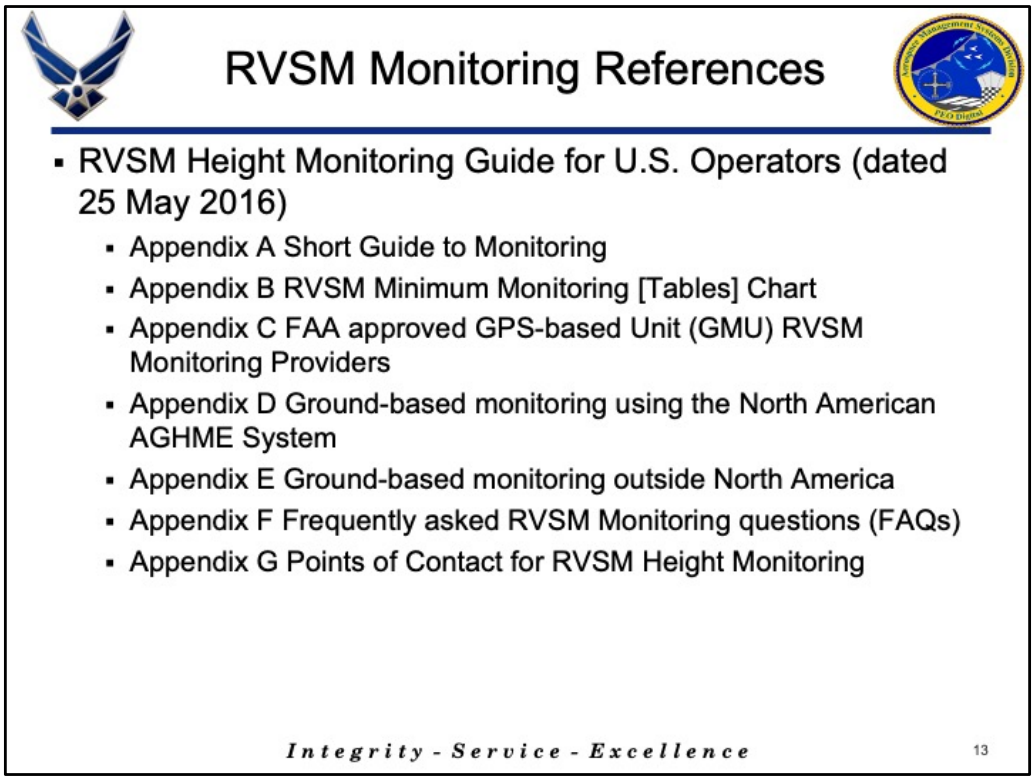
Reference for AGHME sites in North America: :
https://www.faa.gov/air_traffic/separation_standards/aghme/locations/



Reference for 14 CFR part 91, Appendix G, section 9:
https://gov.ecfr.io/cgi-bin/text-idx?gp=&SID=19b122d1544ac370a5bd6d76bb3eaef1&mc=true&tpl=/ecfrbrowse/Title14/14tab_02.tpl

ADS-B Monitoring

- Advantages of ADS-B Monitoring
  - FAA recognizes elimination of burden and expense of current RVSM application process for operators of aircraft equipped with qualified ADS–B Out systems
    - Meets altitude keeping equipment performance requirements
  - Eliminates operator's need for separate RVSM monitoring program and authorizations
  - Safer RVSM operations through recurring monitoring



RVSM Height Monitoring Guide for U.S. Operators (dated 25 May 2016)
https://www.faa.gov/air_traffic/separation_standards/rvsm/documents/FINAL_Montr_Proc_US_Opr_5-25-2016.pdf

Summary

- RVSM compliance
  - Required for access to airspace needed to accomplish mission
- Monitoring required
  - RVSM certification can be revoked without it
  - Monitoring identifies ASE violations needing correction
- Monitoring methods
  - AGHME Fly-Over
  - ADS-B
- Verification maintenance mandatory
  - Perform skin waviness maintenance to correct ASE violations
  - Ensure Baro system accuracy
- Work with operational command for testing
  - Prevents expensive over-testing

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