

What's Next in Aircraft Certification under 14 C.F.R. Part 36?

Presentation to:
Airport Noise Abatement Committee

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14 C.F.R. Part 36: “Noise Standards: Aircraft Type and Airworthiness Certification”

- Airplanes must meet Part 36 standards to receive new or revised U.S. operating certificates
 - Jets are categorized into Stages 1, 2, 3, and 4
- Certification is based on three measurements
 - Landing, sideline, and takeoff
- Uses Effective Perceived Noise Level (EPNL, in units of EPNdB), which includes a penalty for discrete pure tones

Evolution of Part 36 Stages for Jets 1969 to 2006

- 1969: Established initial Part 36 standards
 - Aircraft were certificated or uncertificated – no stages
- 1977: Increased stringency and introduced stages
 - “Stage 1” aircraft have never been shown to meet any noise standards (either by failing or never having been tested)
 - “Stage 2” aircraft meet original 1969 limits
 - “Stage 3” aircraft meet more stringent 1977 limits
- Congress required FAA to phase out Stage 1 and 2 jets
 - Stage 1 jets – mid-1980s
 - Stage 2 jets – January 1, 2001
- 2005: Added Stage 4 (effective January 1, 2006)
 - No Stage 3 phase out proposed to date

Part 36 is closely related to the International Civil Aviation Organization (ICAO) Annex 16

- ICAO categorizes jets into Chapters 1, 2, 3, and 4
 - Almost exactly the same as Stages 1, 2, 3, and 4
 - Standards have forced noise levels down over time
 - Stage 4 aircraft must be 10 EPNdB quieter than Chapter 3 standards summed across all three measurement locations

Newer jets are significantly quieter, whether large or small

Quieter jets relative to Stage 3 limits tend to fall into two groups: (1) relatively lightweight modern corporate and regional jets, and (2) large to very large modern air carrier and cargo aircraft.

Where do we go next?

- House version of FAA reauthorization includes phase out of Stage 1 and 2 corporate jets
 - Final act likely to include
- Likely to be pressure over time for a Stage 3 phase out
- Senate version establishes “Consortium for Continuous Low Energy, Emissions, and Noise” (CLEEN) research
 - Research objectives by 2016 include Certifiable 32 EPNdB reduction relative to Stage 4
- In the interim, ICAO is considering adoption of Stage 5 standards
 - Target date is 2020
 - U.S. would almost certainly follow suit
 - Multiple noise reductions under consideration (next slide)

Chapter 5 / Stage 5 alternatives

The International Civil Aviation Organization (ICAO) is considering five potential increases in stringency for Stage 5: 3, 5, 7, 9, or 11 EPNdB reductions in noise emissions (cumulative over all three measurement locations) compared to Stage 4 (which is 10 EPNdB quieter cumulatively than Stage 3).

What is on the distant horizon?

- NASA is considering dramatic changes in technology
 - E.g., “double-bubble” modified tube and wing with lifting body
- Similar in size to B737-800
 - Could be cumulative 40 to 60 EPNdB quieter
- 2030 – 2035 timeframe

Thank you for your attention.

Questions?