



Noise Certification Workshop

Certification & Re-certification

A Manufacturers' Perspective
Presented by ICCAIA

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Noise certification

A key element in aircraft design

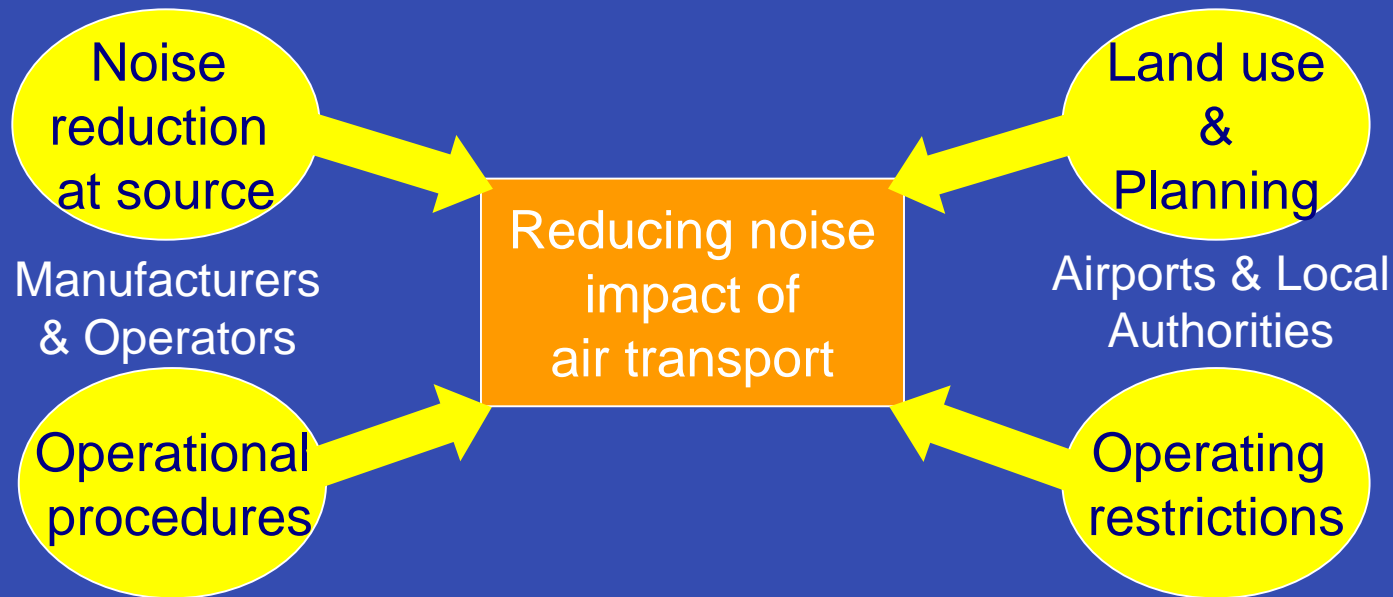
- ☀ Compliance with certification standards must be demonstrated prior to entry into commercial service of any aircraft model
- ☀ For many years the acoustic design goal at the launch of a given product has been based on the EPNL values established during the noise certification process.
- ☀ The targeted certification noise levels are part of the top-level aircraft requirements at the beginning of its development.

Noise certification

A unique means of measuring aircraft noise performance

- ☀ Manufacturers view the certification scheme as a unique quality-control criterion to qualify the design, development and production of an aircraft for its take-off and landing noise performance.
- ☀ The current scheme serves to achieve uniform methods for reduction of individual airplane type source noise
- ☀ When combined with other appropriate measures, it contributes to reducing the number of people exposed to significant levels of aircraft noise

Noise certification Contributes to the alleviation of airport noise problems



- ☀ Noise certification ensures noise reduction at source
- ☀ Operating restrictions according to the ICAO balanced approach are based on certificated noise levels

Noise certification

A unique means of measuring aircraft noise performance

- ☀ Continuous evolution of the noise demonstration process towards more accuracy and standardization
 - Improvements in understanding of the noise generation and propagation
 - Improvement of measurement techniques
 - Improvement of computation models sensitivity and physical representation
 - Accommodation of new technologies
 - Application of lessons learned

Chapter 4 Standard

- ☀ Applicable to all subsonic jets and transport category propeller-driven aeroplanes, including derivative versions for which the prototype airworthiness certificate application is accepted on or after 1st January 2006
- ☀ Not to be used as the basis for phase out of aircraft certified to an earlier Standard (e.g. Chapter 3)

What is Re-Certification?

Definition:

- ✱ Certification of an aircraft, with or without revision to noise levels, to a Standard different to that which it had been originally certified

Purposes of Noise Re-Certification

- ✱ Operational restrictions at many airports are based on the noise standard to which the aircraft is certified

- ✱ The adoption of Chapter 4 Standard led to:
 - Interest in the assessment of the existing aircraft against that new certification standard
 - Willingness to ensure that a consistent methodology is applied

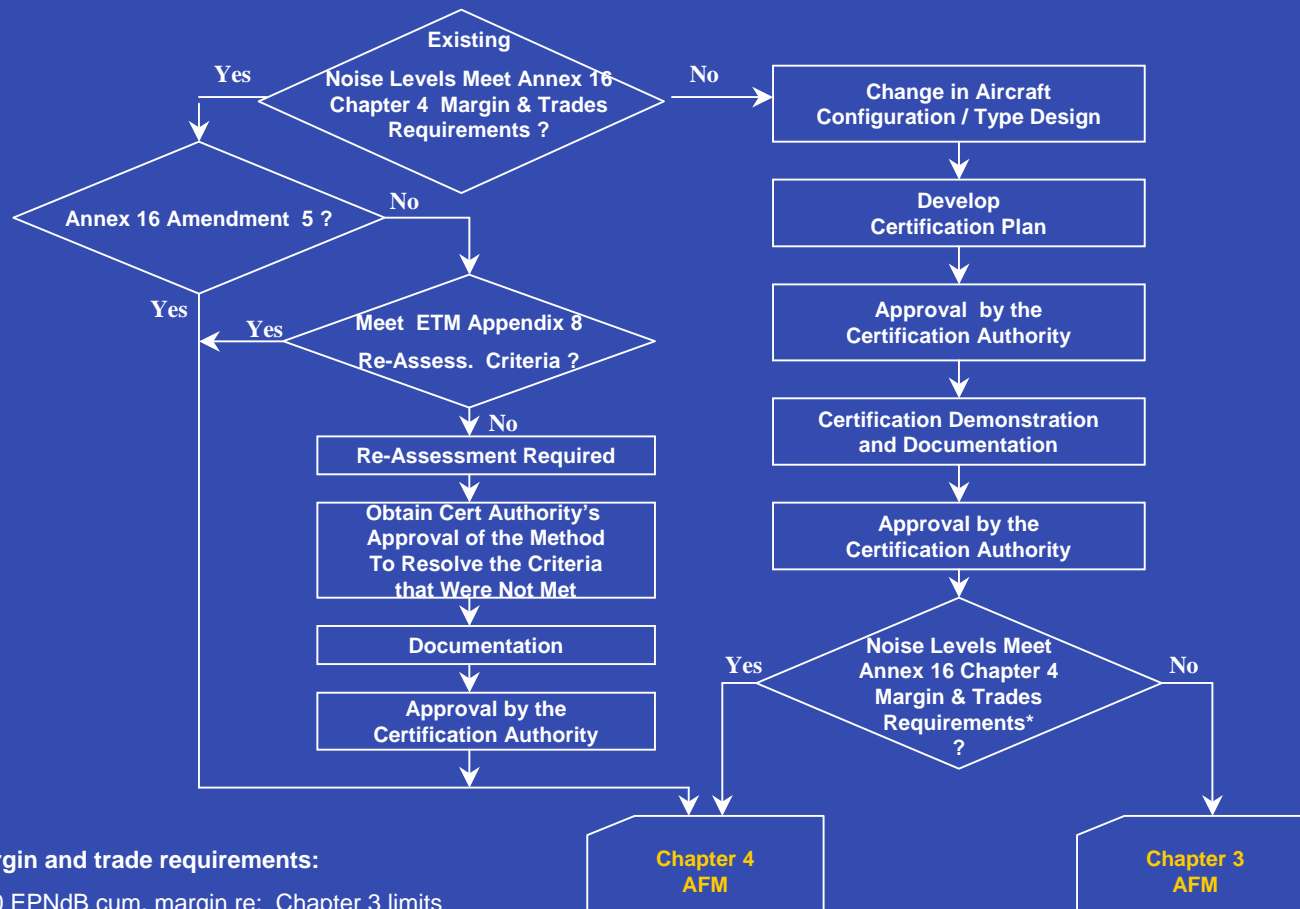
Why Re-Assessment Criteria?

- ☀ Many aircraft operators and manufacturers are interested in re-certifying their aircraft to increase equipment/asset value, in particular those previously certified to Chapter 3 that also meet the more demanding conditions of the Chapter 4 Standard
- ☀ Re-certification scheme should allow maintaining a consistent noise performance reference applicable to the entire civil air transport fleet

Re-assessment Criteria Objectives for Re-Certification Chapter 4

- ✱ Harmonization of requirements for demonstration of compliance of existing airplane noise levels with the Chapter 4 Standard
- ✱ Consistency of actions by all authorities in granting Chapter 4 noise certification status

Roadmap for Re-Certification from Ch. 3 to Ch. 4



*Chapter 4 margin and trade requirements:

- Minimum of 10 EPNdB cum. margin re: Chapter 3 limits
- Minimum 2 EPNdB at any two certification points
- No Trades

Re-Certification to Chapter 4 Standard

- ☀ Demonstrate better certificated noise level to improve operability of the fleet at a reasonable cost
- ☀ Capitalize on potentially advantageous future operational environment for Chapter 4 aircraft

Re-Certification to Chapter 4 Standard

☀ Examples:

- Optimisation of data analysis in accordance with latest amendments to the noise certification Standards (ICAO Annex 16 and FAR 36)
- Development of new noise data
- Changes to airplane's certified configuration
 - ☀ (Engine power, Flaps, etc.) in conjunction with operational limitation
 - ☀ Lower airplane maximum takeoff/landing weights
 - ☀ Implementation of noise reduction devices

Technological Advances in Noise Reduction

- ✱ Noise reduction technologies with broad applications continue to develop and mature
- ✱ A number of these technologies are suitable for implementation on certain existing aircraft
- ✱ Manufacturers are accordingly incorporating hardware changes in their products in pursuit of lower certification noise levels
- ✱ Certified noise levels of some Chapter 3 aircraft have been successfully reduced and now comply with Chapter 4 Standard

Re-certification scheme Conclusion

- ✱ Manufacturers consider noise certification as a unique and efficient means of measuring aircraft noise performance
- ✱ A new design standard must not be used to discriminate against existing aircraft
- ✱ Manufacturers have been supporting the development of the re-certification scheme

Re-certification scheme Conclusion

- ✱ Re-certification plans for a number of Chapter 3 aircraft types are in development
- ✱ Some Chapter 3 airplanes incorporate modifications with new noise reduction features to permit them to comply with the Chapter 4 Standard

