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**DRAFT REGULATORY IMPACT ANALYSIS,
INITIAL REGULATORY FLEXIBILITY DETERMINATION,
TRADE IMPACT ASSESSMENT, AND UNFUNDED MANDATES**

**NOISE CERTIFICATION STANDARDS FOR
SUBSONIC JET AIRPLANES AND
SUBSONIC TRANSPORT CATEGORY LARGE AIRPLANES**

**Notice of Proposed Rulemaking
(14 CFR Part 36)**

**OFFICE OF AVIATION POLICY AND PLANS,
OPERATIONS REGULATORY ANALYSIS BRANCH, APO-310**

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EXECUTIVE SUMMARY

This notice of proposed rulemaking would provide nearly uniform noise standards for subsonic transport category large airplanes and subsonic turbopowered airplanes certificated in the United States and in the Joint Aviation Authority (JAA) countries.

The proposals would more closely harmonize the flight test conditions, procedures and reporting requirements mandated by the provisions of subparts A and B, and Appendices A and B of part 36 with the corresponding provisions of the Joint Aviation Regulations (JAR) 36.

The proposed rule would make five substantive changes to the existing provisions of Subparts A, B, and C of part 36. It would replace existing Appendices A and B with proposed Appendix A, modify existing Appendix C and change its designation to Appendix B, and make minor editorial changes to Appendices G and H.

The FAA concludes that the proposed rule would be cost beneficial. Costs for this proposed rule would be \$436,800 (\$340,300 discounted) over a 10 year period; this total includes one-time costs to the FAA of \$58,500 (\$51,200 discounted). The proposed rule would provide the aviation industry \$10.99 million (\$7.72 million, discounted) in cost savings over 10 years.

The proposed rule would not have a significant impact on a substantial number of small entities. Adoption of the rule would be a positive step toward removing impediments to international trade. The proposed rule also does not contain a federal intergovernmental or private sector mandate that exceeds \$100 million in any year, therefore, the requirements of the Unfunded Mandates Reform Act of 1995 do not apply.

I. INTRODUCTION

This regulatory evaluation is performed in accordance with Executive Order 12866, which requires analysis of each regulation to determine the relationship of its benefits to costs. This evaluation examines the economic impact of this proposed rule that would harmonize the U.S. noise certification regulations with the European Joint Aviation Requirements (JARs) for subsonic jet airplanes and subsonic transport category large airplanes. The proposed changes would provide nearly uniform noise certification standards for airplanes certificated in the United States and in the European Joint Aviation Authorities countries.¹ The harmonization of the noise certification standards would simplify airworthiness approvals for import and export purposes. The proposed rule would make five substantive changes to the existing provisions of Subparts A, B, and C of part 36. It would replace existing Appendices A and B with proposed Appendix A, modify existing Appendix C and change its designation to Appendix B, and make minor editorial changes to Appendices G and H.

In addition to the benefit-cost analysis, this regulatory evaluation contains an initial regulatory flexibility determination, which analyzes the economic impact of the proposed regulatory changes on small entities, as required by the Regulatory Flexibility Act of 1980, as amended. This evaluation also contains an assessment of the effect of the proposed regulatory changes on international trade, as required by the Office of Management and Budget. Finally, this document contains an

¹ The member states of the JAA are: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.

Unfunded Mandate Assessment, as required by the Unfunded Mandates Reform Act of 1995.

II. BACKGROUND

In June of 1990, the Federal Aviation Administration (FAA) and the Joint Aviation Authority (JAA) agreed to harmonize their regulations. On October 17, 1995, the Aviation Rulemaking Advisory Committee (ARAC)² established the Federal Aviation Regulations/Joint Aviation Regulations Harmonization Working Group for Subsonic Transport Category Large Airplanes and Subsonic Turbojet Powered Airplanes (60 FR 53824). The Working Group was tasked with reviewing and harmonizing the applicable provisions of Subparts A, B, and C, and Appendices A, B, and C of part 36 and the corresponding applicable provisions of the Joint Aviation Regulation (JAR) 36. Appendices A, B, and C of part 36 specify the aircraft noise measurement and evaluation procedures, and noise levels necessary to demonstrate compliance with certification requirements for subsonic turbojet airplanes and subsonic transport category large airplanes. The Working Group was also asked to review the applicable provisions of Annex 16 issued by the International Civil Aviation Organization (ICAO). The thrust of the Working Group's efforts was to harmonize the content of the existing regulations.

² The FAA established the Aviation Rulemaking Advisory Committee (ARAC) (56 FR 2190 January 22, 1991; and 58 FR 9230, February 19, 1993) to provide industry input in the form of information, advice, and recommendations to be considered in the full range of FAA rulemaking activities.

After an extensive review, the Working Group formulated recommendations for resolving the differences and forwarded them to the appropriate oversight body for consideration and disposition. Recommendations for amending part 36 were forwarded to the ARAC.

III. THE PROPOSED RULE

Overview

Part 36 contains noise standards for aircraft type and airworthiness certification. For the purposes of part 36, noise is designated as the effective perceived noise level (EPNL) and is measured in units of effective perceived noise levels (EPNdB), commonly referred to as “decibels.” The proposed rule would make five substantive changes to the existing provisions of Subparts A, B, and C of part 36. It would replace existing Appendices A and B with proposed Appendix A, modify existing Appendix C and change its designation to Appendix B, and make minor editorial changes to Appendices G and H. The proposed changes can be grouped into three major categories: (1) substantive technical changes; (2) non-substantive technical and editorial revisions; and (3) redesignation of materials in existing Appendices A and B, and C into proposed Appendices A and B to more closely align part 36 and JAR 36 formatting.

The proposed Appendix A - Aircraft Noise Measurement and Evaluation, would combine existing Appendix A - Aircraft Noise Measurement, and existing Appendix B - Aircraft Noise Evaluation, into a single appendix. Under the

proposed harmonization changes, the proposed Appendix A would consist of some sections of the existing Appendices A and B that would be modified, replaced or deleted while other sections would contain updated requirements for measurement and analysis systems. Several items would be moved to a revised Advisory Circular (AC) 36-4C, which would replace the existing AC36-4B and contain significant changes in format and content. The proposed Appendix A would also contain a definitions section, make technical changes in required measurements, add new reporting items and modify correction procedures of test results.

The proposed Appendix B - Noise Levels for Transport Category and Jet Powered Airplanes Under Section 36.103, would replace existing Appendix C. The proposed Appendix B would leave some sections of the existing appendix unchanged, delete others, harmonize terminology to the international standard, change test procedures for propeller-driven large aircraft, and clarify and update test requirements.

The proposed rule would also remove several existing sections that should have been removed by previous amendments to part 36.

Section - by - Section Summary

Subparts A, B, and C, of part 36.

Section 36.1

Section 36.1(d)(3) is proposed to be removed. This section should have been removed by Amendment 36-10 (43 FR 28406, June 29, 1978), that redesignated section 36.1(d)(3) as section 36.1(d)(1)(iii).

In paragraph 36.1(f)(1), the terms “takeoff” and “sideline” are proposed to be replaced with the terms “flyover” and “lateral,” respectively. This change would harmonize the terminology based on the international standard.

Section 36.2

Section 36.2 is proposed to be removed. Section 36.2, currently requires that a noise certification applicant show compliance to the part 36 amendment that is in effect on the date of certification. This requirement was included in part 36 at a time when the FAA did not otherwise have the authority to prevent the issuance of a type certificate for an aircraft for which available and reasonable noise reduction design practices had not been incorporated. This FAA subsequently received this authority under the Noise Control Act of 1972; and therefore the retroactive requirements contained in section 36.2 are no longer necessary. This change would harmonize the applicability provisions of part 36 with those contained in section 1.7 of ICAO annex 16, Chapter 1. In addition to the removal of the special retroactive requirements of section 36.2, the FAA would make conforming changes to sections 21.17 and 21.101(a) of part 21 of this chapter.

Section 36.6

Five specifications are proposed to be added to the incorporated matter under section 36.6. These specifications are referred to underproposed section B36.3, which would update requirements for measurement and analysis systems to address the latest standards and equipment technology. Updated addresses for the International Electrotechnical Commission, American National Standards Institute, and FAA Regional Headquarters are proposed in section 36.6.

Section 36.101 and 36.103

Sections 36.101, Noise measurement, and 36.103, Noise evaluation would be replaced with a new section 36.101, Noise measurement and evaluation. The proposed section 36.101 reflects the proposal to replace existing Appendix A and Appendix B with proposed Appendix A. This change would more closely align part 36 and JAR 36 formats without any substantive change. Similarly, the FAA proposes to redesignate section 36.201 as section 36.103

Appendix C would be reserved.³ Appendix A would replace existing Appendix A and Appendix B. Appendix B would replace existing Appendix C.

Section A36.1 would provide an introduction and overview of the Appendix.

Section A36.2 would contain the noise certification test and measurements conditions. It describes the terrain where the test should be conducted and the

³ Appendix C would be reserved for editorial purposes only.

necessary atmospheric conditions. Most of this proposed section is derived from existing sections A36.1, A36.5 and A36.9. The weather conditions under which the tests must be conducted would be modified to allow a lower test day temperature limit, and change the relative humidity, and layering depth measurement parameters and the required weather recording time period.

Section A36.3 would update the requirements for the measurement of aircraft noise on the ground. It would amend and revise the current section A36.3. All the components of the sound pressure level measuring system and their specifications and use would be defined, including a sound calibrator, windscreen, microphone system, signal recording and conditioning devices, and one-third octave band analysis system. Reference ambient weather conditions including air temperature, static air pressure, and relative humidity would be added for specifying the performance of a measurement system.

Section A36.4 would require that three basic physical properties of sound pressure (level, frequency distribution, and time variation) be measured in units of EPNdB to evaluate the subjective effects of airplane noise on human beings. This section would include the calculations necessary to make these determinations and would also include a minor technical change in the calculations of perceived noise levels (PNL) by requiring the use of a more precise formula. As a result of this change, the term $10/\log 2$ would be included in the equation used to calculate PNL instead of the rounded off term (33.22). This change would further the standardization between part 36 and JAR 36.

Section A36.5 would outline the test data reporting requirements. These reporting requirements would include recording data on the test site, noise measuring equipment used, atmospheric conditions, airplane type and engine performance, and reference correction conditions. Section A36.5 would also require the reporting of several additional test items to the FAA. Information, if applicable, on the airplane's center of gravity, airbrake and propeller pitch angle, auxiliary power unit operation, pneumatic engine bleeds, and engine power at takeoff would be required to be reported since these configuration items could affect the airplane's noise signature. Engine performance parameters specifically related to large propeller driven airplanes would also be reported.

Section A36.6 would incorporate ICAO Annex 16 symbols and units into the existing nomenclature but would not result in any substantive technical change.

Section A36.7 would prescribe the procedures for determining the atmospheric attenuation of sound. It would replace the use of the current tables and graphs used for this determination with formulas that are more accurate for calculating the weakening of the volume of sound over distance. The use of equations would eliminate the minor differences which could arise from the use of tables and graphs.

Section A36.9 would prescribe the appropriate adjustments to the test noise data when test conditions are not identical to reference conditions. It would delete a data correction procedure that is no longer relevant as well as several other provisions and would make several other revisions. Current sections A36.11(a)(1)

and (2) would be deleted because the original distinction between allowable and required positive and negative correction procedures of test results is no longer relevant. Existing section A36.1 (b) (3) would also be deleted because it is obsolete. Other sections would be moved to the new AC 36-4C.

Section B36.1 would be a general statement that the noise level tests performed for transport category and jet powered airplanes must be in compliance with the standards prescribed in Appendix A or under approved equivalent procedures.

Section B36.3 would prescribe reference noise measurement points for lateral full-power, flyover and approach measurements. It would substitute current reference noise measurement terminology with international terms; “takeoff” would be replaced by “flyover” and “sideline” would be replaced by “lateral.” It would include a simplified test procedure for propeller-driven large airplanes. This procedure would eliminate the measurement difficulties currently encountered due to the directional nature of the noise from propeller-driven aircraft. Full power noise would be measured at a point (650 m) below the takeoff flight path rather than the current lateral measuring points which frequently result in significant differences in noise levels between the port and starboard sides of a propeller-driven airplane. This overflight measurement method would be an alternative to the current lateral method until 2002, when the overflight method would become mandatory. Text would be added to define and clarify reference points for noise measurements.

Section B36.4 would address differences in location between the reference and test measurement points. The existing section A36.1(b)(7) alternate sideline noise measurement procedure would be moved to the proposed AC 36-4C. A special requirement for propeller-driven aircraft to use symmetrically positioned microphones at each test measurement point would be added. This change would account for the asymmetric nature of propeller noise.

Section B36.5 would make only minor changes in format and wording to existing section C36.5. It would not change existing noise measurement/analysis procedures or noise limits.

Section B36.6 would retain the existing section C36.5(b) trade-off provision. Section B36.6 would also include minor wording changes to the text in existing section C36.5(b). Under the trade-off provision, the test noise levels may exceed the standards set for Stage 2, and 3 airplanes at one or two of the measurement points if the exceedances are not greater than 3 EPNdB in total, and if no one exceedance is greater than 2 EPNdB, and if the exceedances are completely offset by reductions at the other measurement point(s).

Section B36.7 would address takeoff and approach-reference procedures and replace existing sections C36.7 and C36.9. The proposed changes include the use of average engine performance to calculate takeoff thrust or power, and the use of full takeoff power for the lateral noise measurement for tests conducted after March 19, 2002.

Section B36.8 would address takeoff and approach test procedures. It would limit the magnitude of permitted corrections when adjusting for deviations between test weights and maximum certified weight by specifying a limitation on the EPNL adjustment. The EPNL adjustment would not be allowed to exceed 2 EPNdB for takeoffs and 1 EPNdB for approaches. It would also clarify and update the test airspeed tolerance requirements.

References to Appendices A, B and C that are contained in Appendices G and H would be amended to conform to the proposed redesignations.

IV. ANALYSIS OF COSTS

The FAA has analyzed the expected costs of this regulatory proposal for a 10-year period, from 2000 through 2009. As required by the Office of Management and Budget (OMB), the present value of this cost stream was calculated using a discount factor of 7 percent. All costs in this analysis are expressed in 1997 dollars.

Many of the changes in the proposed rule are either editorial or procedural in nature. These types of proposed revisions would not add any new requirements or impose costs. For example, Section A36.1 would give an overview of the Appendix, and hence, would not have any costs. Some sections would expand or clarify the intent of the proposed rule through reorganization, updated terminology, or clarified procedures, none of which would impose any new requirements or costs.

However, 38 of the proposed changes to part 36 entail changes which warranted further evaluation to determine whether they involve changes in criteria or could impose additional costs. A description of the changes to these sections is listed in the Appendix to this evaluation. The key factor in evaluating the proposed changes in criteria was assessing whether an applicant could pass the noise certification test under the proposed change but fail the test under the current rule or vice versa; indicating a change in the stringency of the existing standard.

Eight sections that would be removed by the proposed rule warranted further evaluation to ensure their deletion did not change the stringency of the standard. These will be discussed below.

Paragraph B36.9(e), which specifies that the duration time interval in the event that the value of PNL_{T(k)} at the 10 dB-down points is 90 PNdB or less, would be deleted. This provision was eliminated for applications made after September 17, 1971 by Amendment 36-5 (41 FR 35053, August 19, 1976). The text permitting the use of this provision has erroneously remained in part 36. Paragraph B36.9(f) would also be deleted. The text contained in section B36.9(f) was added to part 36 under the Amendment 36-5 to distinguish between the procedure for determining duration for applications made before and after September 17, 1971. This distinction would no longer be necessary if section B36.9(e) is deleted as discussed above.

Four of the deletions would be from existing Appendix A. Sections A36.5 (d) (3) addresses allowable background noise levels; amended A36.3.9.12 addresses the issue and references the FAA Advisory Circular where these procedures are found. Existing paragraphs A36.11(a) (1) and (2) address positive and negative adjustments to test results; and existing paragraph A36.1 (b) (3) addresses differences in ground height between the measuring point and the runway. These sections are no longer relevant given improvements in test equipment and the enhancement of data correction procedures since the time part 36 was originally promulgated. The deletion of these sections has no cost impact.

Two sections of existing Appendix C would also be removed by the proposed rule. Section C36.9 (d) requires that all engines must be operated at approximately the same power or thrust for the approach test. Under the proposal, this specific requirement would be removed, and instead governed by the proposed section A36.9.3.4 requirement that source noise adjustments be applied to account for any difference, between test and reference conditions, in engine parameters that affect engine noise (e.g., corrected low pressure rotor speed). There is no cost or stringency issue involved for this proposal.

The distinction made in existing section C36.7(b)(2), between the minimum cutback altitudes for airplanes having jet engines and those that do not have jet engines, would be removed. The minimum cutback altitude for airplanes that do not have jet engines would be the same as the existing section C36.7(b)(2) minimum cutback altitude for jet airplanes. Since the selection of the minimum cutback altitude is made considering the minimum safe altitude for cutback

initiation, there is no reason to distinguish between propeller-driven and jet airplanes. Further, it is the FAA's understanding that this change would not have a substantive effect in practice, since cutback initiation heights greater than 1,500 feet are generally chosen for propeller-driven airplanes. There is no cost impact involved for this proposal.

The FAA evaluated the remaining items to determine whether costs would be incurred, and examined the magnitude of those costs. The sections of the proposed rule with potential costs fall into four categories: (1) software costs, (2) additional testing procedures, (3) additional or new measuring provisions, and (4) additional reporting requirements. The following evaluation describes the estimated costs that could be incurred by persons seeking type certificates and standard airworthiness certificates for subsonic jet airplanes and subsonic transport category large airplanes.

IV. A. Software Costs

Five proposed provisions address the maintenance of the computer programs used to correct the "as-measured" test noise certification data to part 36 reference conditions. Such maintenance involves some administrative cost. However, as will be discussed below, four of these would have no cost impact:

- A36.4.3.1 would make a minor technical change for the equation for Perceived Noise Level (PNL) in proposed section A36.4.2.1 (current section B36.3(c)). The term $10/\log 2$ is included in the equation instead of the rounded-off term

(33.22). The difference between PNL values determined using the current and proposed equations is expected to be insignificant.

- Section A36.7.2 would incorporate the use of a multi-step formula as a substitute for the current charts and graphs. However, no change in software would be required and applicants that use the SAE ARP 866A tabular form, currently referenced, would not be required to switch to the equation form since they would give equivalent results.
- A36.9.3.2 This proposed section would incorporate JAR 36 symbols and units to describe the takeoff and approach profiles.
- A36.9.3.2.2 This proposal would change the procedure for calculating the adjustment for multiple peak values of PNLT by basing the adjustment on the corrected PNLT values rather than upon the effective perceived noise level as in existing paragraph B36.11(c). It would more clearly define the intent of the multiple peak correction.

These four provisions were reviewed with staff of the Volpe National Transportation Center. The staff at Volpe, which works under contract to the FAA and evaluates certification software, determined that these proposed changes would not constitute a significant cost to the Center. A similar review by the Working Group reached the same conclusion. Accordingly, the FAA has concluded that there would not be additional software costs from these four changes.

- Section A36.3.7.6 would specify that the instant in time at which a SLOW⁴ time weighted sound pressure level is characterized should be 0.75 seconds earlier than the actual readout time. The existing requirement specifies that the instant in time at which a readout is characterized shall be the midpoint of the average period. Implementation of the proposed change would require modifying the computer software used by the applicant to adjust the as-measured noise data to the part 36 reference conditions. The correct implementation software change must be verified by the FAA. The estimated time required for each applicant to implement the software change is 40 hours. The estimated time required by the FAA to verify correct implementation of the change is 20 hours. Based on the number of firms listed in the FAA's Designated Engineering Representative (DER) program, the FAA estimated that 39 applicants would incur this one-time cost. The estimated cost per applicant would \$3,400 (40 hours x \$85 per hour) or a total industry cost of \$132,600. The verification cost to the FAA is estimated at \$58,500 (20 hours x \$75 per hour x 39 applicants). The FAA estimates that these software costs would be incurred in the first 3 years of the 10 year period; the present value cost to the industry and the FAA would be \$116,000 and \$51,200, respectively.

The FAA requests comments on these conclusions and requests that all comments be accompanied by clear documentation supporting any proposed changes.

⁴ This is defined as "the exponential time averaging process of the data signal." A sound level meter will typically have two options for time-averaging a signal-namely, "FAST" and "SLOW" meter responses. These govern the rate of fluctuation of the meter's 'needle' when the sound signal is rapidly varying. The averaging time associated with the "slow" response option is greater than that for "fast" response. The "fast" response is extremely difficult to read on a meter when the sound is varying.

IV. B. Testing Costs

The following sections relate to the operating specifications of the test aircraft, none of which would have any cost impact:

- Section B36.7 (b) (1) would require that average engine take-off thrust or power be used from the start of take-off to a specified height above the runway. The current reference procedure does not specify a particular power setting. Thus, the proposed requirement to use “average engine” performance would preclude the use of “minimum engine” performance. Relative to minimum engine performance, average engine performance has the effect of increasing sideline noise, but decreasing flyover noise. Generally the differences tend to offset each other. Accordingly, the proposed change would not increase the stringency of the test. Most applicants currently use average engine performance. Furthermore, since almost all airplane models are also noise certified for foreign registry involving JAR 36 or ICAO Annex 16, which require the use of average engine performance, changing part 36 would have no direct cost impact.
- The takeoff reference speed requirement specified in existing section C36.7(e)(2) would be revised to be consistent with the takeoff reference speed contained in JAR 36 and Annex 16. The all-engine operating climb speed range (V₂+10 to V₂+20 kts) specified in proposed section B36.7(b)(4) represents the typical range of takeoff initial climb speeds seen in normal operation for most

airplanes. For some airplanes, this proposed change to part 36 could result in an increase of up to 10 knots in the noise certification reference takeoff speed relative to the existing part 36 reference takeoff speed requirements. For the affected airplanes, the increased takeoff speed could result in some noise level reduction at the sideline noise measurement point with a resulting increase in noise level at the takeoff noise measurement point, relative to the noise levels that would be achieved under the existing part 36 reference takeoff speed requirements. The FAA has found this to be acceptable because of this tradeoff, although it might not be a one-to-one tradeoff. This proposed change is not expected to have a cost impact.

Under the proposal, existing section C36.9(e)(1), reference approach speed, would be revised to incorporate the use of 1-g stall-based approach speeds by basing the approach noise certification reference speed on the reference landing speed (V_{REF}) that is used for the airworthiness certification. This proposal was taken from Notice 95-17, published on January 18, 1996 (61 FR 1260), in which the FAA proposed to redefine the reference stall speeds for transport category airplanes as the 1-g stall speed instead of the minimum speed obtained in the stalling maneuver. Under Notice 95-17, the definition of V_{REF} would be included under 14 CFR part 1. Notice 95-17 has not yet been issued as a final rule. This proposed change to section C36.9(e)(1) would also be consistent with an anticipated change to ICAO/Annex 16 that will be recommended by Working Group 1 of the ICAO Committee on Aviation Environmental Protection (CAEP) in conjunction with the current CAEP work program cycle. Under this proposed change, existing section

C36.9(e)(1) would be redesignated as section B36.7(c)(2). The proposed change is not expected to have any cost impact.

IV. C. Measurement Costs

The FAA has determined that ten proposed changes could affect the allowable test conditions and correction of test results to reference conditions. These ten are summarized below:

- Section A36.2.2(g) would change the requirement to obtain meteorological data to within 30 minutes of each noise test, an increase of 5 minutes from the current window. This additional flexibility would not affect the stringency of the test or increase cost, since it merely constitutes a “round-off” to achieve harmony with the JAR requirement.
- Section A36.9.1.1(d) would require that, for conventional airplane configurations, when differences between test and reference airspeeds exceed 15 knots (28km/h) true airspeed, then test data and/or analysis approved by the certifying authority would be used to quantify the effects of making such an airspeed adjustment on the resulting certification noise levels. The 15-knot speed limitation has been enforced by the FAA for a number of years in conjunction with the noise certification procedure that allows for several airplane weights to be certificated from a single noise certification flight test database. This 15-knot limitation is currently included in AC 36-4B. The Working Group concluded it was more appropriate to include this provision as a

requirement in part 36. Since the 15- knot provision has been in existence for a number of years there would be no cost impact from this change.

- Section A36.9.3.3.2 would define the speed correction term that is required by existing section A36.11(f)(1) as $10 \log (V/V_r)$, where V is the airplane test speed and V_r is the airplane reference speed. The term is already used internationally to account for the difference between test and reference air speeds, when the simplified method of data adjustment is used and therefore would have no cost impact.
- Section A36.2.2.3 would require the applicant to calculate layering depth parameters when the atmospheric sound attenuation coefficients that are present over the test day sound propagation path vary by more than the +0.5dB/100m permitted by part 36.⁵ When atmospheric layering is required during a test, Section A36.2.2.3 would set the layer depth to the propagation distance over which the atmospheric attenuation rate changes by not more than +/-0.5 dB/100m, with a minimum layer depth of 100 feet. Applicants have typically used the 100-foot layer depth for all past testing since it was a depth common for demonstrating compliance with both part 36 and JAR 36 requirements. The FAA has determined this change would have no cost or stringency impact.

⁵ The applicant may account for this exceedance by determining the atmospheric sound attenuation coefficients that exist within discrete segments along the sound propagation path and then use these attenuation coefficients in correcting the test day sound pressure level data to part 36 reference conditions. These segments are also referred to as atmospheric layers

- Section B36.4(b) would add a special requirement for propeller-driven airplanes that would require the placement of symmetrically positioned microphones at each and every test measurement point. However, most applicants already take advantage of FAA-approved equivalent test procedures that require only one set of symmetrical microphones for sideline noise measurements. These equivalent test procedures would be unaffected by this proposed change and most applicants would be expected to continue to use them. However, if more than a two-microphone array were used, the cost would have already been realized as part of the certification test performed under the specifications of JAR 36 or ICAO Annex 16. Industry sources estimate that there are currently six firms engaged in the noise certification of large propeller-driven airplanes and that all but one are foreign manufacturers that already incur this cost if they are not using the approved equivalent procedure. The domestic firm is a large entity that probably also already incurs this cost under the JAR specifications if it does not use the approved equivalent procedures. Therefore, changing part 36 would not result in increased costs for known applicants

However, an applicant choosing to use multiple pairs of microphones could incur additional costs ranging up to an estimated \$28,000 per test. These costs would involve an increase in the number of microphone systems, including cable, calibration, site surveys, and data recording, analysis and reporting. The FAA has calculated costs assuming that two domestic large-propeller applicants would conduct 4 tests meeting this requirement over the next 10 years. The total cost would be \$112,000, or \$79,200 discounted.

- Section B36.7 (b)(3) would revise the current sideline noise measurement standard contained in A36.1 (b) (2) to require, for tests conducted after March 19, 2002, that the lateral (sideline) noise level be calculated using full takeoff power throughout the noise measurement flight path. This change would eliminate the ability to employ a thrust cutback during the test. The requirement to use full takeoff power could potentially impact some existing airplane models ability to achieve certification. However, this interim time period during which either requirement is proposed to be permitted is intended to lessen the impact to these airplanes. Thus, the FAA concludes that there would be no cost impact from this proposed change.
- Section B36.8 (d) would limit the magnitude of correction permitted for adjusting the setting of the effective perceived noise level when there is a difference between the test weight of the aircraft and the final certification weight. The existing FAA rule bases the correction limit directly on the weight differences between the test and certification aircraft while Annex 16 bases the correction limit on noise level adjustment criteria. The purpose of each existing regulation is to control the testing parameters to help ensure the integrity of the final certification noise levels. Both limits essentially accomplish the same goal. The proposed limit has not previously constituted a hardship to those domestic firms that have been required to comply with it in conjunction with JAA certification of their aircraft. Adopting the proposed rule would not impose any additional cost.

- Section B36.8(f) addresses adjustment limits when equivalent procedures that differ from the reference procedures are used. Under the proposal, the limits remain unchanged, except that the amended requirements do not specify the inclusion of tradeoffs when comparing adjusted levels against the Appendix B noise levels, for the purpose of determining adjustment limits. Several interpretations are possible as to whether the proposal represents a more stringent or less stringent adjustment limitation compared with the existing limitation. The FAA believes that the proposed change to remove the tradeoff provision from the current limitation and therefore base the proposed limitation solely on the difference between the adjusted noise levels and the maximum noise levels in proposed B36.5 both meets the intent of the adjustment limitation and clarifies the ambiguity in its interpretation. The proposed change would also result in harmonization of the adjustment limitation with those in JAR 36 and ICAO Annex 16. This change is expected to have no cost impact.
- Section B36.8(g) would revise the test speed tolerance. It would change the current tolerance from an absolute range of plus or minus 3 knots to a 3 percent range of the average air speed between the 10dB-down points (the points before and after the maximum noise level occurs, where the noise is 10dB less than the maximum level) and would also provide criteria to reject the test flight due to atmospheric turbulence. This proposal would clarify and update the speed tolerance requirements based on extensive certification experience and reduce the possibility of multiple interpretations. It is expected to have no cost or stringency impact.

- Sections A36.4.5.2 and 36.4.5.4 would change the value of the correction factor, “d”, from 1.0 second to 0.5 seconds when used in the measurement of the duration of a sound incident. This change would have no practical impact on the determination of “d” since, in practice, the required calculation should almost always be that stated in existing section B36.9(d), not B36.9(a). The change would reflect technical correctness and would have no cost or stringency impact.

The FAA requests comments on each of these measurement cost changes and requests that all comments be accompanied by clear documentation supporting any proposed changes.

IV. D. Reporting Costs

Section A36.5 - Reporting of Data to the FAA.

Section A36.5.2 would require applicants to include test results in their noise certification compliance report. While part 36 currently does not specifically require applicants to submit a compliance report, it is a standard practice for applicants to do so, since applicants already address these data elements under JAR 36 or ICAO Annex 16. The addition of this provision would codify industry practice. Since the information is already provided, the FAA does not believe there will be additional costs to comply with this requirement. The FAA requests comments on this assumption and requests that all comments be accompanied by clear documentation supporting any proposed changes.

Section A36. 5.2.3 (c-f, h [2], j) would add new data elements to be reported to the FAA and would also specify that this data must be reported in the applicant's noise certification compliance report. The items to be added are: (1) the airplane's center of gravity; (2) airbrake positions and propeller pitch angles (if applicable); (3) whether auxiliary power units (APU), when installed, are operating; (4) conditions of pneumatic engine bleeds; and (5) for propeller-driven airplanes, engine performance and propeller rotational speeds. All of these new reporting requirements are test airplane operating configuration items that could effect the airplane's noise signature and are already a part of the international standard. Since most applicants already address these requirements under JAR 36 or ICAO Annex 16, and since the data is already reported to the FAA in the applicant's noise certification compliance report on a voluntary basis or is usually collected, minimal cost impact is expected. Additional labor costs for documenting data not previously reported are estimated to range from \$500 (5 hours x \$100 per hour) to \$2,000 (25 hours x \$80 per hour) per certification. These estimates are based on the number of additional items to be reported and on the assumption of a lower and upper range of required labor hour increases of 5 to 8 hours and 20 to 25 hours, respectively, at hourly labor rates that range from \$80 to \$100 per hour.

Based on FAA estimates, 14 noise certification projects involving flight tests are undertaken each year. Four of these projects are conducted among the 15 foreign firms that already comply with these proposed reporting requirements under JAR 36 or ICAO Annex 16 and thus would not incur additional reporting costs. Ten projects are conducted from among the 24 domestic firms engaged in flight testing and the FAA estimates that these firms would conduct 100 tests over the next 10

years. The FAA further estimates that some domestic firms would incur additional reporting costs of \$1,250 per test, based on the midpoint of the estimated additional labor costs. Domestic firms with a large international presence are estimated to conduct 40 of the 100 tests to be conducted over the next 10 years, based on the composition of the industry.⁶ Since these larger firms already frequently comply with the existing international reporting standard, the FAA estimates that only 10 of the 40 tests to be conducted by these firms would incur the additional reporting costs of \$1,250 each, or a total of \$12,500. The FAA estimates that of the 60 tests to be conducted by smaller domestic firms 24 tests would incur the additional reporting costs of \$1,250 per test or a total of \$30,000 over the next 10 years. Thus, the additional labor costs for reporting the additional information would total \$42,500 (\$30,000 plus \$12,500) for these affected firms.

However, it is possible that some applicants might accrue additional costs. If an applicant was required to invest in new instrumentation or data recording equipment to comply with these requirements, the estimated total reporting costs could increase to between \$5,000 and \$10,000 per test. This is based on a range of estimates and scenarios involving purchasing and installing additional instrumentation, and labor for adding recording capability, data analysis, etc. For example, one possible scenario would entail the purchase and installation of instrumentation hardware at \$4,200 (\$2,500 for hardware and \$1,700 for labor [20 hours x \$85 per hour]), plus the labor cost for adding recording capability and data recording/analysis at \$3,400 (40 hours x \$85 per hour) for a total of \$7,600 of

⁶ This is a conservative estimate since many of the smaller firms are principally engaged in the certification of aircraft from Stage 2 to Stage 3. This line of business will cease in the year 2000 when the conversion of Stage 2

additional cost. The FAA estimates that three domestic firms, one large and two small, would incur this additional cost of \$7,600 for each test and that each of these firms would conduct 4 tests for a total of 12 tests over the next 10 years at a total cost of \$91,200. Thus, the total additional reporting costs to the industry would be \$133,700, or \$93,900 discounted, based on the minimal additional reporting costs of \$42,500 (\$12,500 for larger firms and \$30,000 for smaller firms) and \$91,200 (\$30,400 for a large firm and \$60,800 for smaller firms) incurred by the firms requiring additional instrumentation/data recording.

IV. F. Summary of Increased Costs

The following table summarizes the estimated cost of changing the noise certification standards of part 36 and achieving greater harmonization with the JAA regulations.

Table 1: Total Cost of Proposed Changes to Part 36⁷

airplanes to Stage 3 must be completed. It is assumed that these firms will continue to be engaged in the noise certification business.

⁷ Note that the software cost would be a one-time only expense and that the measurement cost would only be incurred by large propeller-driven applicants. Foreign applicants would not incur additional reporting costs and only a portion of the domestic firms would incur this cost.

	Total Cost	Present Value
Software Costs		
Industry	\$132,600	\$116,000
FAA	\$58,500	\$51,200
Total Software Costs	\$191,100	\$167,200
Measurement Costs	\$112,000	\$ 79,200
Reporting Costs	\$133,700	\$ 93,900
Grand Total Costs	\$436,800	\$340,300
Total Industry Costs	\$378,300	\$289,100
Total FAA Costs	\$ 58,500	\$ 51,200

V. COST SAVINGS

Several of the proposed changes could result in cost savings to applicants, depending upon the current inventory of the applicant's test equipment and the particular weather circumstances of the flight test. However, given the uncertainty in the annual number and duration of flight tests, it is difficult to accurately quantify these savings. For example, Section A36.2.2.2 (b) would lower the minimum test temperature from 36 degrees Fahrenheit to 14 degrees Fahrenheit. This proposed change is based on technical data from extensive noise testing experience and is within the operational temperature limits of the noise measuring equipment. One of the largest cost elements of the test certification process is the cost associated with airplane down time; by extending the temperature range, down time could be minimized. Down time occurs when the test aircraft, crew, equipment and technicians are ready to commence testing but testing is delayed or postponed because the weather conditions specified in Section A36.2 are not met. While airplane noise testing is not normally planned for cold weather, circumstances may dictate that the test be conducted under conditions which could

take advantage of this new lower temperature. Under this circumstance, assuming various scenarios of daily temperature warming patterns that could result in reduced hours of airplane down time, an applicant might reduce the total on-site test time of a typical certification flight test conducted under these conditions by 10 to 15 percent.

As an example of the impact of permitting testing to be conducted at a lower temperature, assuming an on-site test time of 5 to 7 days to complete a typical certification flight test under these conditions, the applicant might reduce the total test time between half a day to one full day by testing during a time period when the lower temperature condition prevailed. Assuming a cost factor of \$150,000 to \$200,000 per day for larger planes and \$70,000 to \$140,000 per day for smaller airplanes, cost reductions per test made possible by this change in minimum test temperatures could range between approximately \$75,000 and \$200,000 for larger airplanes and manufacturers and between \$35,000 and \$140,000 for smaller airplanes and manufacturers. The number of such tests conducted under cold weather conditions might be, at most, one per applicant over a 10 year period. Some applicants might not encounter this situation during a 10 year period.

Based on the size of the firms listed in the Designated Engineering Representatives (DER) program, the FAA estimates that 25 larger applicants would each derive cost savings of \$137,500 per test and 14 smaller firms would save \$87,500 each per test, based on the mid-points of the estimated savings ranges. However, since it is possible that certain applicants may not encounter this situation in the 10-year period, the FAA has reduced the number of firms by two, one large and one small.

The estimated industry cost savings over ten years totals \$4.44 million, or \$3.12 million discounted. Comments on these estimates are invited; the FAA requests that all comments be accompanied by clear documentation supporting any proposed changes.

Proposed section B36.3 (a) includes a simplified test procedure that may be used in determining the sideline (lateral) noise level for propeller-driven large airplanes. This test procedure would allow the full power noise measurement to be obtained at a point (650m) below the takeoff flight path and thus eliminate the problems associated with obtaining this measurement from the conventional sideline site. According to industry sources, 40 to 45 fly bys per test could be eliminated, and between 2 and 8 microphone systems could be eliminated, depending on the size of the array used by the applicant. (Many applicants currently use a 2-microphone sideline array.) In addition to the significant savings resulting from the reduction in the number of fly-bys and the number of microphone systems, further cost savings could result from a reduction in site surveying and field set-up expenses in addition to the analysis and reporting savings that result from fewer fly-bys. The total cost savings of these changes are estimated at \$200,000 to \$350,000 per test for manufacturers of propeller-driven large airplanes. These estimates are based on a range of potential scenarios involving combinations of the above elements (the number of fly-bys and the number of microphones used, flight test costs, etc.). As an example, based on a reduction of 42 fly-bys, the midpoint of the estimated range, and an example cost of \$6,000 per fly-by, cost savings of \$252,000 would be realized. In addition, assuming a reduction of 4 microphone systems, including surveying, setup, recording analysis and reporting at an assumed cost factor of

\$7,000 per system, another \$28,000 (4 systems x \$7,000 per system) in savings would be realized, for a total savings of \$280,000 (\$252,000 plus \$28,000) per test under this example. Given the increasing demand for regional jets, and the financial status of manufacturers of large propeller-driven airplanes, the FAA estimates that no more than 10 tests would be conducted over the next 10 years and that the derived cost savings would total \$2.80 million based on a per test savings of \$280,000 or \$1.97 million discounted.

Industry sources estimate that cost savings of \$25,000 to \$50,000 per year for those applicants with considerable certification activity would be realized by the harmonization of testing, data measurement and analysis, reporting and documentation and other noise certification efficiencies. Industry sources also claim that these cost savings would be achieved by a reduction in the confusion and the multiple interpretations that lead to delays, duplicate effort and costly negotiation caused by the existing dual certification standards. The FAA estimates that 10 firms engaged in noise certification activities, each employing 10,000 or more workers, would each achieve cost savings of \$37,500 (the midpoint of the estimated savings) or \$375,000 annually for the industry. The estimated industry cost savings over ten years totals \$3.75 million, or \$2.63 million discounted. Comments on these estimates are invited; the FAA requests that all comments be accompanied by clear documentation supporting any proposed changes.

The following table summarizes the cost savings of the proposed rulemaking.

Table 2: Total Cost Savings of Proposed Changes to Part 36⁸

	B36.2.2.2	C36.3(a)	Efficiency	Total
	Savings	Savings	Savings	Savings
Savings	\$4,437,500	\$2,800,000	\$3,750,000	\$10,987,500
Present Value	\$3,116,500	\$1,965,600	\$2,633,000	\$ 7,715,100

The FAA has not been able to quantify other potential savings that may be made possible by the greater efficiencies and flexibility resulting from the uniformity that the proposed rule would provide. Industry comment is invited on the potential savings outlined above and others that have not been identified or quantified. The FAA would particularly appreciate specific cost savings data.

VI. BENEFITS

Currently, airplane manufacturers must satisfy both the FAA and the European noise certification standards in order to market their aircraft in both the United States and Europe. Meeting two sets of noise certification requirements raises the cost of developing a new transport category airplane, often with no increase in safety or environmental benefit. Adoption of these proposed changes to the noise certification standards of part 36 will foster international trade, lower the cost of aircraft development, and make the certification process more efficient.

VII. COST-BENEFIT ANALYSIS

⁸ Note that while the cost savings of B 36.2.2.2. would benefit all applicants, C36.3(a) cost savings would only be realized by large propeller-driven applicants and only the largest applicants would realize the

If the proposed rule becomes effective, U.S. noise certification procedures would be nearly uniform with the JAA procedures. This harmonization between the test conditions, procedures, and noise levels necessary to demonstrate compliance with certification requirements for subsonic jet airplanes and subsonic transport category large airplanes would result in significant cost savings without compromising the environmental benefits of the noise certification standards.

The proposed rule's cost savings, over ten years, (attributable to specific proposed changes to part 36) would be \$7.24 million, or \$5.08 million discounted. In addition, \$3.75 million, \$2.63 million discounted, would be derived from overall efficiencies attributable to the harmonization effort in achieving near uniformity of the FAA and JAA standards for a total savings of \$10.99 million, \$7.72 million discounted, which exceeds the proposed rule's cost of \$436,800 (\$340,300 discounted). Since the potential cost savings exceed the additional costs, the proposed rule would be cost beneficial.

VIII. INITIAL REGULATORY FLEXIBILITY DETERMINATION

The Regulatory Flexibility Act of 1980 (Act) establishes “ as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation.” To achieve that principle, the Act requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions.

Agencies must perform a review to determine whether a proposed or final rule will have a significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a regulatory flexibility analysis (RFA) as described in the Act.

However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the Act provides that the head of the agency may so certify and an RFA is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

Enactment of this proposal would impose costs of \$436,800 on the FAA and noise certification applicants over the ten year period, of which \$250,400 is estimated to be incurred by small applicants. Small applicants are firms employing 1,500 employees or fewer based on Small Business Administration guidelines. A review of the aircraft and engine manufacturers listed in the FAA’s Designated

Engineering Representatives program found that 14 of the firms met this criteria. The FAA has assumed that no more than two small applicants would elect to use multiple microphone systems to test large-propeller airplanes and each would incur measurement costs of \$56,000 each for a total cost of \$112,000. Additional reporting costs requiring additional instrumentation/data recording totaling \$60,800 over the ten year period would be incurred by 2 other small applicants or \$30,400 each. Additional labor costs for new reporting requirements totaling \$30,000 over the 10 year period would be incurred by 6 small applicants at a cost to each of these smaller applicants over the 10 year period of \$5,000. One-time software costs would be incurred by the 14 small applicants at a cost of \$3,400 each or a total of \$47,600 and for 4 of these firms this would be the only cost they would incur. The first-year cost to each of the 6 small applicants incurring both software and additional labor reporting costs would be \$4,650. In this case, the FAA has determined this would not be a significant cost to a substantial number of small noise certification applicants.

Therefore, the FAA has determined that this proposed rule would not have a significant economic impact on a substantial number of small entities.

Accordingly, pursuant to the Regulatory Flexibility Act, 5 U.S.C. 605(b), the Federal Aviation Administration certifies that this rule would not have a significant economic impact on a substantial number of small entities.

IX. INTERNATIONAL TRADE IMPACT ASSESSMENT

The Trade Agreement Act of 1979 prohibits Federal agencies from engaging in any standards or related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and where appropriate, that they be the basis for U.S. standards. In addition, consistent with the Administration's belief in the general superiority and desirability of free trade, it is the policy of the Administration to remove or diminish to the extent feasible, barriers to international trade, including both barriers affecting the export of American goods and services to foreign countries and barriers affecting the import of foreign goods and services into the United States.

In accordance with the above statute and policy, the FAA has assessed the potential affect of this proposed rule and has determined that it will impose the same costs on domestic and international entities for comparable services and thus has a neutral trade impact.

X. UNFUNDED MANDATES

Title II of the Unfunded Mandates Reform Act of 1995 2 U.S.C § 1501 (the UMR Act) , enacted as Pub.L 104-4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the

expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100 million or more (adjusted annually for inflation) in any one year. Section 204 (a) of the UMR Act, 2 U.S.C 1534 (a), requires a Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed “significant intergovernmental mandate.” A “significant intergovernmental mandate” under the UMR Act is any provision in a Federal agency regulation that would impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of \$100 million (adjusted annually for inflation) in any one year. Section 203 of the UMR Act, 2 U.S.C 1533, which supplements section 204 (a) , provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

This proposed rule does not contain a Federal intergovernmental or private sector mandate that exceeds \$100 million a year, therefore the requirements of the UMR Act do not apply.

APPENDIX

Appendix A - Part 36 NPRM Proposed Changes

NOISE CERTIFICATION STANDARDS for SUBSONIC JET AIRPLANES and SUBSONIC TRANSPORT CATEGORY LARGE AIRPLANES

Proposed Substantive Changes to Part 36	
1	Section 36.1(d)(3) would be removed. This section should have been removed by Amendment 36-10 (43 FR 28406, June 29, 1978), which redesignated section 36.1(d)(3) as section 36.1(d)(1)(iii).
2	In paragraph 36.1(f)(1), the terms “takeoff” and “sideline” would be replaced with the terms “flyover” and “lateral”, respectively. This change would harmonize the terminology based on the international standard.
3	Section 36.2, “Special retroactive requirements,” would be removed. Section 36.2 currently requires that a noise certification applicant show compliance to the part 36 amendment that is in effect on the date of certification. This requirement was included in part 36 at a time when the FAA did not otherwise have the authority to prevent the issuance of a type certificate for an aircraft for which available and reasonable noise reduction design practices had not been incorporated. This FAA subsequently received this authority under the Noise Control Act of 1972; accordingly the retroactive requirements contained in section 36.2 are no longer necessary. This change would harmonize the applicability provisions of part 36 with those contained in section 1.7 of ICAO annex 16, Chapter 1. In addition to the removal of the special retroactive requirements of section 36.2, the FAA would make conforming changes to sections 21.17 and 21.101(a) of part 21 of this chapter.
4	Five specifications would be added to the incorporated matter under section 36.6. These specifications are referred to under proposed section B36.3, which would update requirements for measurement and analysis systems to address the latest standards and equipment technology. Updated addresses for the International Electrotechnical Commission, American National Standards Institute, and FAA Regional Headquarters are proposed in section

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Proposed Substantive Changes to Part 36	
	36.6.
5	Sections 36.101, Noise measurement, and 36.103, Noise evaluation would be replaced with a new section 36.101. The proposed section 36.101 reflects the proposal to replace existing Appendix A and Appendix B with proposed Appendix A. This change would more closely align part 36 and JAR 36 formats without any substantive change. Similarly, the FAA proposes to revise section 36.201 and move it to section 36.103
6	In proposed section A36.2.2.2(b), the existing section A36.1(c)(2) minimum test temperature would be decreased from 36 degrees F (2.2 degrees C) to 14 degrees F (-10 degrees C)
7	Requirement to obtain meteorological measurements within "25 minutes" of each noise test measurement as provided in existing section A36.9(b)(3) would be changed to "30 minutes" in proposed section A36.2.2.2(g)
8	The layer depth specification contained in existing section A36.9(d)(3) would be changed in proposed section A36.2.2.3 from a maximum of 100 feet for each increment to the propagation distance over which the atmospheric attenuation rate changes by not more than +/-0.5 dB/100m, with a minimum layer depth of 100 feet (30 meters).
9	The existing section B36.3(c) PNL equation rounded off term (33.22) would be revised to the term $10/\log 2$ in proposed section A36.4.2.1(c).
10	Existing section B36.9(e), which specifies the noise time history upon which duration is based when the value of PNL(k) at the 10 dB-down points is 90 PNdB or less, would be deleted. The need for this change was justified under a previous amendment, but due to a regulatory processing error, the change was not correctly implemented in the final rule.
11	The text contained in existing section B36.9(f) was added to part 36 under the Amendment 36-5 to distinguish between the procedure for determining duration for applications made before and after September 17, 1971. This distinction is no longer necessary due to the proposed removal of section B36.9(e), and therefore section B36.9(f)

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	Proposed Substantive Changes to Part 36
	is also proposed to be removed under this notice of proposed rulemaking.
12	Proposed section A36.5 would specify that test data must be reported in the applicant's noise certification compliance report. This is voluntary at present.
13 2	Proposed section A36.5.2.5(c) would add center of gravity as a reporting requirement.
14	Under the proposed section A36.5.2.5(d) airbrake and propeller pitch angle also would be added as reporting items.
15	Proposed sections A36.5.2.5(e) and (f), would require reporting of whether the APU is operating, and reporting of conditions of pneumatic engine bleeds and engine power takeoffs.
16	Proposed section A36.5.2.5(j) would require reporting, and FAA approval, of any airplane modifications or non-standard equipment likely to affect the noise characteristics of the airplane.
17	Existing section A36.5(b)(5)(vi) requires that engine performance parameters related to noise generation must be reported. Proposed section A36.5.2.5(h)(1) would include the existing section A36.5(b)(5)(vi) reporting requirements and in addition section A36.5.2.5(h)(2) would include parameters specifically related to large propeller driven airplanes.
18	Existing section A36.5(d)(3) provision that does not permit an EPNL to be computed or reported from data from which more than four one-third octave bands in any spectrum within the 10 dB-down points have been excluded would be removed.
19	The reference to formulations and tabulations of SAE ARP 866A in existing section A36.9(c) would be shown in the proposed section A36.7.2 in terms of the actual formulation (equations).
20	The distinction between allowable/required positive and negative correction procedures contained in existing sections A36.11(a)(1) and (2) would be deleted from the proposed part 36.
21	Under the proposal existing section A36.1(b)(3) would be deleted. This section currently requires data corrections to adjust to reference conditions when the height of the ground at a noise measuring station differs

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Proposed Substantive Changes to Part 36	
	from that of the runway by more than 20 feet.
22	In order to further harmonization between 14 CFR part 36 and JAR 36, the symbols and figures used to describe the takeoff and approach profiles in existing 14 CFR part 36, sections A36.7, A36.11(b) and (c), respectively would be revised to incorporate the JAR 36 symbols and figures in proposed sections A36.9.3.2, A36.9.5 and A36.9.6.
23	Existing section B36.11(c) is proposed to be revised so that the adjustment for multiple peak values of PNL _T would be based upon the difference in corrected PNL _T values, rather than upon EPNL as in the existing part 36.
24	A correction term to account for the difference between test and reference airplane airspeeds, when the "simplified" method of data adjustment is used, would be added, under proposed section A36.9.3.3.2, to the duration correction (Δ_2). This speed correction term would be defined as $10 \log (V/V_r)$, where V is the airplane test speed and V_r is the airplane reference speed. This proposed change would serve to specify the speed correction that is currently identified as a requirement under existing section A36.11(f)(1).
25	Proposed section B36.3(a) would include a simplified (fixed height/centerline measurement) test procedure that may be used for propeller-driven large airplanes in demonstrating the sideline (lateral) noise certification level. As proposed, this procedure would be an alternative to the existing section C36.3(c) procedure until March 2002, after which time it would become the only procedure to demonstrate the sideline noise certification level.
26	In proposed section B36.4(b) a special requirement for propeller-driven airplanes would be added to require symmetrical microphone positions at each sideline noise measurement location. Existing section A36.1(a)(7) requires only one symmetrical microphone position.
27	Proposed section B36.7(b)(1) would require that "average engine" performance be used in defining takeoff thrust for reference takeoff procedures.
28	Under the proposal, section A36.1(b)(2) would be moved to section B36.7(b)(3) and revised to require that, for tests conducted after March 19, 2002, the lateral (sideline) noise level be demonstrated using full takeoff power throughout the takeoff flight path. Until then, the lateral noise level may be demonstrated using the existing

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	Proposed Substantive Changes to Part 36
	section A36.1(b)(2) procedure, under which both the takeoff (flyover) and sideline (lateral) noise certification levels are determined using a single reference flight path that may include a thrust cutback.
29	The existing section C36.9(d) requirement that all engines must be operating at approximately the same power or thrust for the approach noise test is proposed to be deleted.
30	Existing sections A36.1(d)(5) and (7) control takeoff and approach test weight deviations from the maximum weight requested for certification by requiring limitations on actual test weights relative to maximum certification weight. These limitations on the differences between test and final maximum certification weight help insure the integrity of the final certification results by indirectly limiting the magnitude of correction required between test and final certification EPNL's. Proposed section B36.8(d) would directly limit the magnitude of the correction by specifying a limitation on the EPNL adjustment that could be made when correcting between test weight and maximum certification weight.
31	The amounts of adjustment permitted under existing section A36.5(d)(5) when equivalent test procedures are different from the reference procedures would remain unchanged, except that the amended requirements in proposed section B36.8(f) would not specify that tradeoffs are permitted when comparing adjusted levels against the appendix C noise levels, for the purpose of determining adjustment limits
32	In proposed sections A36.4.5.2 and A36.4.5.4, the value of "d" would be changed from 1.0 sec to 0.5 sec (relative to existing sections B36.9(a) & B36.9(c)). This change is proposed to reflect current practice in the use of 0.5 sec data samples. The existing definition of "d" as "the time interval to the nearest 1.0s" is contradictory to this current practice, as well as to other regulatory text in these and other sections of part 36.
33	The exiting section C36.7(b)(2)(iv) cutback height distinction for airplanes not powered by jet engines is proposed to be deleted.
34	The existing section C36.7(e)(1) reference takeoff speed would be redefined in proposed section B36.7(b)(4) to be the all-engine operating take-off climb speed selected by the applicant for use in normal operation, which shall be at least V_2+10 knots but not greater than V_2+20 knots and which shall be attained as soon as practicable after

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Proposed Substantive Changes to Part 36	
	lift-off and be maintained throughout the take-off noise certification test.
35	The existing section C36.9(e)(1) reference approach speed ("1.3Vs+10 knots or the speed used in establishing the approved landing distance under the airworthiness regulations constituting the type certification basis of the airplane") would be redefined, under proposed section B36.7(c)(2), to be " $V_{REF} + 10$ knots ($V_{REF} + 19$ km/h)". V_{REF} is the reference landing speed that is used for the airworthiness certification.
36	Proposed section B36.8(g) would revise the test speed tolerance specified in existing section C36.7(e)(1) and C36.9(e)(3). Existing section C36.7(e)(1) specifies that takeoff tests must be conducted at the test day speeds ± 3 knots. Existing section C36.9(e)(3) specifies that a tolerance of ± 3 knots may be used throughout the approach noise testing. Proposed section B36.8(g) would specify that for take-off, lateral, and approach conditions, the airplane variation in instantaneous indicated airspeed must be maintained within $\pm 3\%$ of the average airspeed between the 10dB -down points. This is determined by the pilot's airspeed indicator. However, when the instantaneous indicated airspeed exceeds ± 3 kt (± 5.5 km/h) of the average airspeed over the 10dB-down points, and is determined by the FAA representative on the flight deck to be due to atmospheric turbulence, then the flight so affected would be rejected for noise certification purposes.
37	Proposed section A36.3.7.6 would specify that the instant in time by which a SLOW* time weighted sound pressure level would be characterized should be 0.75 seconds earlier than the actual readout time. Existing section A36.3(d)(6) specifies that the instant in time by which a readout is characterized shall be the midpoint of the average period. *See footnote in text for explanation.

Appendix A - Part 36 NPRM Proposed Changes

	Proposed Substantive Changes to Part 36
38	Proposed section A36.9.1.1 recognizes that airspeed has an effect on source noise which must be considered relative to the difference between test day airplane speed and the airplane reference flight profile speed. Thus, the proposed section would specify that, “in addition to the effect on duration, the effects of airspeed on component noise sources must be accounted for as follows: For conventional airplane configurations, when differences between test and reference airspeeds exceed 15 knots (28 km/h) true airspeed, test data and/or analysis approved by the FAA must be used to quantify the effects of the airspeed adjustment on resulting certification noise levels.”