Federal Aviation Administration – Regulations and Policies
Aviation Rulemaking Advisory Committee

Noise Certification Issue Area
Propeller-Driven Small Airplanes FAR/JAR Harmonization Working Group

Task 1 – Review Subpart A-B-C-D

Task Assignment

Aviation Rulemaking Advisory Committee

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of establishment of FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes.

SUMMARY: Notice is given of the establishment of a FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes for the FAA Aviation Rulemaking Advisory Committee (ARAC). This notice informs the public of the activities of the ARAC on noise certification issues.

FOR FURTHER INFORMATION CONTACT: Mr. Paul R. Dykeman, Assistant Executive Director for Noise Certification, Deputy Director, Office of Environment and Energy (AEE-2), 800 Independence Avenue, SW., Washington, DC 20591, Telephone: (202) 267-3577; FAX: (202) 267-5594.

SUPPLEMENTARY INFORMATION: The Federal Aviation Administration (FAA) established an Aviation Rulemaking Advisory Committee (ARAC) (56 FR 2190, January 22, 1991; and 58 FR 9230, February 19, 1993). One area of the ARAC deals with noise certification issues. These issues involve the harmonization of part 36 of the Federal Aviation Regulations (14 CFR part 36) with Joint Aviation Requirements (JAR) part 36, their associated guidance material including equivalent procedures, and the interpretation of the regulations. The FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes will forward recommendations to the ARAC, which will determine whether to forward them to the FAA.

Specifically, the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes is charged with reviewing the applicable provisions of subparts A and F, and appendices F and G of the 14 CFR part 36 and harmonizing them with the corresponding applicable provisions of JAR 36.

ARAC should consider the current international standards and recommended practices, as issued under the International Civil Aviation Organization (ICAO), Annex 16, Volume 1, and its associated Technical Manual, as the basis for development of these harmonization proposals. ARAC should also consider recommending a process whereby subsequent ICAO Annex 16 changes are properly incorporated into JAR and FAR 36.

If the ARAC determines that Notice of Proposed Rulemaking (NPRM), an Advisory Circular (AC), or both would be appropriate, those documents are to be submitted, in the format prescribed, to the FAA. The Working Group should make recommendations to the ARAC in the following manner.

Reports

(a) Recommend a work plan for completion of the task and subtasks, including the rationale supporting the plan, for consideration at the meeting of the ARAC to consider noise certification issues held following publication of this notice;

(b) Give a detailed conceptual presentation on the proposed recommendation to the ARAC before proceeding with the work stated in item (c) below;

(c) If considered appropriate, develop NPRM(s) proposing the revised rules for aircraft noise certification, a supporting economic and other required analyses, advisory and guidance material, and any other collateral documents the Working Group determines to be needed. Present these recommendations to the ARAC for further consideration and disposition; and

(d) Give a status report on the task at each meeting of the ARAC held to consider noise certification issues.

The FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes will be comprised of experts from those organizations having an interest in the tasks assigned. A Working Group member need not necessarily be a representative of one of the organizations of the ARAC. Individuals who have expertise in the subject matter and wish to become a member of the Working Group should write the person listed under the caption, **FOR FURTHER INFORMATION CONTACT**, expressing that desire, describing their interest in the task, and the expertise they would bring to the working group. The request will be reviewed by the ARAC Assistant Chair for Noise Certification and the Chair of the Working Group, and the individual will be advised if the request can be granted.

The Secretary of Transportation has determined that the formation and use of the ARAC are necessary and in the public interest, in connection with the performance of duties of the FAA. Meetings of the ARAC to consider noise certification issues will be open to the public, except as authorized by section 10(d) of the Federal Advisory Committee Act. Meetings of the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. No public announcement of Working Group meetings will be made.

Issued in Washington, DC, on April 25, 1994.

Paul R. Dykeman,

Assistant Executive Director for Noise Certification, Aviation Rulemaking Advisory Committee.

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[Notices]
[Page 53824-53825]
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DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration

Aviation Rulemaking Advisory Committee; Noise Certification Issues--Revised Task

AGENCY: Federal Aviation Administration (**FAA**), DOT.

ACTION: Notice of revised task assignment for the Aviation Rulemaking Advisory Committee.

SUMMARY: Notice is given of a change in the task assigned to and accepted by the Aviation Rulemaking Advisory Committee (ARAC). This notice informs the public of the activities of the ARAC.

FOR FURTHER INFORMATION CONTACT:
Mr. Paul R. Dykeman, Assistant Executive Director for Noise Certification, Deputy Director, Office of Environment and Energy (AEE-2), 800 Independence Avenue, SW., Washington, DC 20591, Telephone: (202) 267-3577; FAX: (202) 267-5594.

SUPPLEMENTARY INFORMATION: The Federal Aviation Administration (**FAA**) established an Aviation Rulemaking Advisory Committee (ARAC) (56 FR 2190, January 22, 1991; and 58 FR 9230, February 19, 1993) to provide advice and recommendations to the **FAA** Administrator, through the Associate Administrator for Regulation and Certification, on the full range of the **FAA**'s rulemaking activities with respect to aviation-related issues. This includes obtaining advice and recommendations on the **FAA**'s commitment to harmonize its Federal Aviation Regulations (FAR) and practices with its trading partners in Europe and Canada.

One area of the ARAC deals with noise certification issues. These issues involve the harmonization of part 36 of the Federal Aviation Regulations (14 CFR part 36) with Joint Aviation Requirements (JAR) part 36, their associated guidance material including equivalent procedures, and the interpretation of the regulations. The FAR/JAR Harmonization Working Group for Subsonic Transport Category Large Airplanes and Subsonic Turbojet Powered Airplanes will forward recommendations to the ARAC, which will determine whether to forward them to the **FAA**.

The Revised Task

This notice is to inform the public that the **FAA** has revised a task previously assigned to ARAC. The revised task has been accepted by ARAC. The **FAA** has asked ARAC to provide advice and recommendation on

the following revised task:

Specifically, the FAR/JAR Harmonization Working Group for Subsonic Transport Category Large Airplanes and Subsonic Turbojet Powered Airplanes is charged with reviewing the applicable provisions of subparts A, B, C, and D, appendices A, B, and C of the 14 CFR part 36 and harmonizing them with the corresponding applicable provisions of the 14 CFR 21 subpart D. Any recommendation on noise issues should consider harmonization with respect to corresponding JAR to the extent practicable. The **FAA** recommends that any proposed recommendations be coordinated among other working groups to ensure consistency in proposed regulatory language, advisory and guidance material, and any other collateral documents developed by the working groups.

ARAC should consider the current international standards and recommended practices, as issued under the International Civil Aviation Organization (ICAO), Annex 16, Volume 1, and its associated Technical Manual, as the basis for development of these harmonization proposals. ARAC should also consider recommending a process whereby subsequent ICAO Annex 16 changes are properly incorporated into JAR and FAR 36.

ARAC Acceptance of Revised Task

ARAC has accepted the revised task and has chosen to assign it to the FAR/JAR Harmonization Working Group for Subsonic Transport Category Large Airplanes and Subsonic Turbojet Powered Airplanes. The working group will serve as staff to ARAC to assist ARAC in the analysis of the assigned task. Working group recommendations must be reviewed and approved by ARAC. If ARAC accepts the working group's recommendations, it forwards them to the **FAA** as ARAC recommendations.

[[Page 53825]]

Working Group Activities

The FAR/JAR Harmonization Working Group for Subsonic Transport Category Large Airplanes and Subsonic Turbojet Powered Airplanes is expected to comply with the procedures adopted by ARAC. As part of the procedures, the working group is expected to:

(a) Recommend a work plan for completion of the task and subtasks, including the rationale supporting the plan, for consideration at the meeting of the ARAC to consider noise certification issues held following publication of this notice;

(b) Give a detailed conceptual presentation on the proposed recommendation to the ARAC before proceeding with the work stated in item (c) below;

(c) If considered appropriate, develop NPRM(s) proposing the revised rules for aircraft noise certification, a supporting economic and other required analyses, advisory and guidance material, and any other collateral documents the Working Group determines to be needed. Present these recommendations to the ARAC for further consideration and disposition; and

(d) Give a status report on the task at each meeting of the ARAC held to consider noise certification issues.

The Secretary of Transportation has determined that the formation and use of the ARAC are necessary and in the public interest, in connection with the performance of duties of the **FAA**. Meetings of the ARAC to consider noise certification issues will be open to the public,

except as authorized by Section 10(d) of the Federal Advisory Committee Act. Meetings of the FAR/JAR Harmonization Working Group for Subsonic Transport Category Large Airplanes and Subsonic Turbojet Powered Airplanes will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. No public announcement of Working Group meetings will be made.

Issued in Washington, DC, on October 10, 1995.

Paul R. Dykeman,

Assistant Executive Director for Noise Certification, Aviation Rulemaking Advisory Committee.

[FR Doc. 95-25677 Filed 10-16-95; 8:45 am]

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Recommendation

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

Table of Contents

1. Introduction

2. Harmonization of Regulations

3. Harmonization of Interpretive Material

4. Co-ordination of Recommended Changes

5. Jar 36, Change In Reference Sub Parts And Appendices

References

Appendix A: Summary of Required Harmonization

Appendix B: Technical Position Papers

Appendix C: Meeting Minutes

Appendix D: Membership List

Appendix E: Co-ordination Documents

Appendix F: Glossary of Abbreviations & Acronyms

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

1. INTRODUCTION

This document summarizes the work and recommendations to date of the ARAC Harmonization Working Group for Light Propeller Driven Aircraft (HWGLPDA) Noise. This working group was established, staffed and held its first meeting in Ottawa Canada, 15-16 September 1994. A work plan was established and is repeated here as:

1.1 The harmonization working group will identify a work program and ascribe priorities to individual tasks in order to accomplish the following:

> "Identify and confirm the differences between the Noise Certification Requirements of the American Federal Aviation Regulations and European Joint Airworthiness Requirements as applicable to Propeller Driven Airplanes and to draft proposed Notices of Proposed Rulemaking to FAR's and/or Notices of Proposed Amendment to JAR's that will accomplish harmonization of Part 36 Appendix G of the Federal Aviation Regulations (14 CFR Part 36) with Joint Aviation Requirements, JAR-36, Section 1, Sub Section C. In addition proposed changes aimed at achieving harmonization of guidance and interpretative material contained in the FAR Advisory Circular AC36-4B, FAA Policy Letters and JAR 36 Section 2 will be undertaken."

1.2 Work program output will be documents outlining proposals for changes to noise certification requirements and recommendations for guidance material that will result in harmonization between the subject bodies of regulation as well as their interpretation and implementation.

1.3 Proposals for changes to the noise certification requirements, guidance and interpretive material will be submitted to the JAR 36 working group and ARAC for approval and subsequent submission to the FAA and JAA for executive review.

1.4 Progress on the work of the harmonization working group will be reported periodically to the ARAC and JAR 36 working group.

A second meeting was held in Gatwick, UK 21-22 February, 1995. A third meeting was held 6-7 July, 1995 in Wichita, Kansas, USA. A fourth, ad hoc working meeting was held 14-15 November, 1995 in Frankfurt Germany.

All of the activity of this working group is summarized in this document. Appendix A contains a table that summarizes all of the items of regulation requiring harmonization. Appendix B contains a set of HWGLPDA Technical Position Papers (LPDA-TPP-xxx) documenting the recommendations for harmonization and a discussion of the reasons for harmonization in each case.

Appendix C contains the minutes of each of four meetings held so far. Appendix D repeats the committee membership list. Appendix E contains co-ordination documents.

The following sections are organized to present first the harmonization activity for actual items of regulation. Second, activity required for harmonization of interpretive material is discussed. Finally a section is included describing the process intended to co-ordinate the harmonization recommendations.

2. HARMONIZATION OF REGULATIONS

Reference Appendix A, table of regulation differences.

2.1 Item 1: Applicability, LPDA-TPP-012

Harmonization is not recommended. The applicability dates have all lapsed.

2.2 Item 2: Weight Limit, LPDA-TPP-003

Referenced TPP highlights that weight differences in the noise certification regulations are arbitrary and inconsistent. As such they could impose an economic burden for manufacturers producing aeroplanes over the limit in one body of regulation and under the limit in the other. Therefore harmonization is recommended and outlined. The change to harmonize affects ICAO Annex 16 and JAR 36. Co-ordination of this change has been started. See Appendix E for co-ordination documents.

2.3 Items 3 and 12: Microphone Height and Noise Limits, LPDA-TPP-006

It is recommended in referenced TPP that FAA adopt JAR/ICAO microphone location and configuration along with associated limits. Change will enhance the public good because it will provide a favorable economic approach to aid investigation of stringency requirements.

2.4 Items 4 and 5: Tape Calibration and Quality, LPDA-TPP-007

Harmonization not recommended because the differences between the requirements are small and the economic impact on test procedures is negligible.

2.5 Item 7: Pre/De-emphasis Recording, LPDA-TPP-012

Harmonization not recommended because applicable instrument standards are in the process of being revising.

2.6 Item 6: Meteorological Data, LPDA-TPP-005

Change to ICAO/JAR has been recommended. Recommended change will allow for increased flexibility in test procedures and will enhance the economic feasibility of testing. Co-ordination of this change has been started. See Appendix E for co-ordination documents.

2.7 Item 8: No Absorption Correction Window, LPDA-TPP-002

Change to FAR is recommended. Impact is economic since absence of harmonization could theoretically require two separate tests.

2.8 Item 9: Adjustments, Absorption Outside Test Window, LPDA-TPP-001

Change to FAR is recommended. Impact is economic since absence of harmonization could theoretically result in compliance with one body of regulation and not the other. This could require repeat testing.

2.9 Item 10: Power Adjustments, LPDA-TPP-004

Recommended harmonization will require an ~~addition~~ change to ~~JAR/ICAO~~ FAR. Impact is economic and harmonization will reduce economic burden of testing and enhance the public good because power settings will be clarified and defined. No co-ordination has been initiated.

2.10 Item 11: Reference Noise Level, LPDA-TPP-012

Harmonization not recommended. The differences are not significant.

2.11 Item 13: Power Variance, LPDA-TPP-008

Recommended harmonization will require a change to JAR. This will result in increased testing flexibility. Impact is economic.

2.12 Item 14: Power Definition, LPDA-TPP-009

Recommended harmonization will require a change to JAR/ICAO. The result will enhance the public good because it will result in a consistent application of JAR/ICAO by removing a possible ambiguity in the definition of take-off power.

2.13 Item 15: Helical Tip Mach No. Tolerance, LPDA-TPP-010

Recommended Harmonization will require a change to FAR. Impact is economic because it will increase flexibility allowed in testing.

2.14 Item 16: Sound Level Meter Settings, LPDA-TPP-011

Harmonization not recommended as the difference in wording between the two requirements has a negligible impact on economic and test procedures.

Table 1: Summary of Harmonization Items

Item	Justification	Regulation Impact	
		FAR	JAR/ICAO
1. Applicability	LPDA-TPP-012	No Harmonization Recommended	
2. Weight Limit	LPDA-TPP-003		X
3. Microphone Height	LPDA-TPP-006	X	
4. Pseudo-random pink noise cal for recordings	LPDA-TPP-007	No Harmonization Recommended	
5. Tape Quality	LPDA-TPP-007	No Harmonization Recommended	
6. Meteorological Data	LPDA-TPP-005		X
7. Pre/de-emphasis Recording	LPDA-TPP-012	No Harmonization Recommended	
8. No absorption correction window	LPDA-TPP-002	X	
9. Adjustments, absorption outside test window	LPDA-TPP-001	X	
10. Power adjustments	LPDA-TPP-004	X	
11. Reference noise level	LPDA-TPP-012	No Harmonization Recommended	
12. Noise limits	LPDA-TPP-006	X	
13. Power variance	LPDA-TPP-008		X
14. Power Definition	LPDA-TPP-009		X
15. Helical Tip Mach No tolerance	LPDA-TPP-010	X	
16. Sound Level Meter Settings	LPDA-TPP-011	No Harmonization Recommended	

3. HARMONIZATION OF INTERPRETIVE MATERIAL

Work is underway to harmonize available interpretive and advisory material. Reference 1 Appendix G Handbook and reference 2 JAR 36, Section 2, Advisory Material Joint (including notes contained in Section 1) will be reviewed by the working group. Members are compiling some documentation of test experience. When these activities are complete a document entitled, "Harmonization of Interpretive and Advisory Material for Light Propeller Driven Aircraft Noise Certification", will be assembled and made available to applicable certification agencies as recommendations and examples of approved test procedures.

4. CO-ORDINATION OF RECOMMENDED CHANGES

4.1 Review of Concept by ARAC

This document is submitted to ARAC chairman for review by appropriate ARAC members. ARAC will review Technical Position Papers and working group minutes. Working group chairs will co-ordinate with ARAC and working group membership until body of work is in order. At this point ARAC will co-ordinate with the FAA. JAA supports this working group and its work plan.

4.2 Changes to FAR's

All of the changes recommended to the FAR's are outlined in Section 2 and summarized in Table 1. The Technical Position Papers (TPP) outlining the reasons for the changes are all contained in Appendix B. Meeting minutes are all contained in Appendix C. This document will be forwarded to the FAA by ARAC after its review. FAA will review proposed changes and have an opportunity to make comments. When this is complete and satisfactory, the working group will meet to finalize required NPRM's with any FAA support that has been co-ordinated by ARAC.

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4.3 Changes to JAR's

JAR 36 is based on ICAO Annex 16. Therefore, changes recommended to JAR 36 are enabled through changes to ICAO Annex 16. Recommendations for change are instigated through the ICAO working group process. An additional process takes advantage of industry co-ordination with ICCAIA. Here, technical papers are submitted by ICCAIA into the ICAO forum. These processes have begun in some cases. Co-ordination documents are contained in Appendix E.

5. JAR 36, CHANGE IN REFERENCE SUB PARTS AND APPENDICES

The harmonization work done by this group and reported here was based on the best available regulatory material. However, the JAR 36 material was in the draft issue stages. The final version was released in November 1995.

During the draft issue stages of JAR 36, Sub Part C - Propeller Driven Aeroplanes not Exceeding 9000 Kg, reflected the standards of ICAO, Annex 16, Chapter 6 of Volume 1. Sub part D - Propeller Driven Aeroplanes not Exceeding 9000 Kg reflected the standards of ICAO Annex 16, Chapter 10 of Volume 1.

Similarly, Appendix 2 of the Drafts of JAR 36 applied to Sub Part C / Chapter 6 aeroplanes and Appendix 3, to Sub Part D / Chapter 10 aeroplanes.

However, at the first formal issue, the applicability of these sub parts and appendices has been changed to reflect the fact that ICAO Annex 16, Chapter 6 is now obsolete. The option for aeroplanes to comply with Chapter 6, rather than Chapter 10, expired on November 17, 1993.

There is, therefore, only one applicable Sub Part and one applicable Appendix in the first issue of JAR 36 and this reflects ICAO, Annex 16, Chapter 10 of volume 1.

The Sub Part for propeller driven aeroplanes not exceeding 9000 Kg is Sub Part C. The Appendix is Appendix 2.

Sub part D and Appendix 3 in the first issue now applies to helicopters.

All the work of the LPDA HWG has been based on draft issues of JAR 36, and all references in the Concept Paper and Technical Position Papers, apply to the draft issue standards.

For clarification, these changes are tablulated below.

Table 2: Comparison of applicable Sub Parts and Appendices between the drafts and first issue standards of JAR 36

	Draft Issues of JAR 36	First Issue of JAR 36
Application for C of A for the prototype accepted before November 17, 1988. (Chapter 6 of Annex 16, Vol 1).	Subpart C and Appendix 2.	No longer covered
Certificate of airworthiness for prototype or derived version accepted on or after November 17, 1988. (Chapter 10 of Annex 16, Vol 1) Compliance with Chapter 6 was optional until November 17, 1993.	Sub Part D and Appendix 3	Sub Part C and Appendix 2

References

1. "14 CFR Part 36 Appendix G Handbook", US Department of Transportation, Federal Aviation Administration, October 15, 1994.

2. Joint Aviation Requirements, "JAR-36 Aircraft Noise", 5th Draft, September 1995.

3. Code of Federal Regulations, Aeronautics and Space 14, Part 36, "Noise Standards: Aircraft Type and Airworthiness Certification", revised as of January 1, 1995.

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

Appendix A: Summary of Required Harmonization

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

Comparison of ICAO Annex 16 Chapter 10 and FAR Part 36 Appendix G for Propeller Driven Light Aeroplanes

Item	Chapter 10/Appendix 6	Appendix G
1. Applicability	C of A application after 19th November 1988 (10.1.1). Failures can be tested to Chapter 6 until 17 November 1993(10.1.2).	Aeroplanes tested after 22nd December 1988 (Appendix G table). no provision.
2. Weight limit	up to 9,000 Kg maximum take-off weight (10.1.1).	8,640 Kg max take-off weight, (G36.301(b)).
3. Microphone height	7 mm above a ground plate (Appendix 6, 4.4.1).	4ft above ground level (G36.107(a))
4. Pseudo-random pink noise cal for recordings.	relative output of each 1/3 octave band not more than 0.2 dB (Appendix 6, 4.4.2).	not defined
5. Tape quality	Variation in 10 KHz band of 30 secs of calibration signal at beginning and end of type not greater than 0.75 dB (Appendix 6, 4.4.3).	not defined
6. Meteorological data	collected at 1.2m (Appendix 6, 2.2.2(b),(c))	collected between 1.2m and 10m (G36.101(b)(6))
7. Pre/de-emphasis recording	no equivalent	G36.105(d)
8. No absorption correction window	Appendix 6, figure 6-2	lower temperature is 35.6 deg F (2.5 deg C compared with 2 deg C in Annex 16) (Fig G1)
9. Adjustments, absorption outside test window.	d(M) = 0.01 (Ht*alpha-0.2*Hr) Appendix 6, 5.2.2.(a)	not specified, G36.201(a)(4)(b) or d(M) = (alpha - 0.7)*Ht/1000
10. Power adjustments	d3=K3*log(Pr/Pt) Appendix 6, 5.2.2(d)	d3=17log(Pr/Pt) G36.201(d)(4)
11. Reference noise level	Appendix 6, 5.2.2, (Lamax)Ref=(Lamax)test+d(M)+d1+d2+d3	G36.201
12. Noise limits	Chapter 10, 10.4, 76 dB(A) up to 600 Kg and increasing at 9.83 dB(A) per doubling of noise until the limit of 88 dB(A) is reached and is constant up to 9000 Kg.	G36.301
13. Power variance	no equivalent	36.201(c)(2) allows for 5% power variation for aircraft with fixed pitch propellers.
14. Power Definition	Chapter 10, 10.5.2 could be interpreted to allow the use of a power setting other than take-off power or max continuous during the 2nd phase of the take-off.	FAR G36.111(2)(iv) clearly defines the power setting required.
15. Helical Tip Mach no tolerance	Appendix 6, 5.2.2(c) defines conditions under which no helical tip mach no correction is required.	FAR G36.201(c)(3) does not allow any tolerance in helical tip mach no.
16. Definition of Meter Settings	Appendix 6, 3 & 4.3	FAR G36.105(a) defines sound level meter settings.

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

ICAO Annex 16, Volume I and JAR 36 cross reference.

Item	ICAO Annex 16	JAR 36
1. Applicability	Chapter 10. 10.1.1 Chapter 10. 10.1.2	Sub Part D, JAR 36.300(a) Sub Part D, JAR 36.300(b)
2. Weight Limit	Chapter 10. 10.1.1	Sub Part D, JAR 36.300(a)
3. Microphone Height	Appendix 6; 4.4.1	Appendix 3; 4.4.1
4. Pseudo-Random pink noise cal for recording.	Appendix 6; 4.4.2	Appendix 3; 4.4.2
5. Tape Quality	Appendix 6; 4.4.3	Appendix 3; 4.4.3
6. Meterological Data	Appendix 6; 2.2.2(b),(c)	Appendix 3; 2.2.2(b),(c)
7. Pre/De-emphasis recording	No definition	No definition
8. No absorption correction window	Appendix 6; Fig 6-2	Appendix 3; Fig A3-2
9. Adjustments, absorption outside test window	Appendix 6; 5.2.2(a)	Appendix 3; 5.2.2(a)
10. Power Adjustments	Appendix 6; 5.2.2(d)	Appendix 3; 5.2.2(d)
11. Reference noise level	Appendix 6; 5.2.2	Appendix 3; 5.2.2
12. Noise limits	Chapter 10, 10.4	Sub Part D, JAR 36.330
13. Power variance	No definition	No definition
14. Power definition	Chapter 10, 10.5.2	Sub Part D, JAR 36.340(b)(2)
15. Helical tip mach no. tolerance	Appendix 6; 5.2.2(c)	Appendix 3; 5.2.2(c)
16. Definition of meter settings	Appendix 6; 3 & 4.3	Apendix 3; 3 & 4.3

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

Appendix B: Technical Position Papers

LPDA-TPP-001

Absorption Corrections

R L Howes

7/6/95

Applicable FAR: FAR 36, Appendix G, G36.201(d)(1)

Applicable JAR: JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 5.2.2

1. Recommendation

Adopt the absorption correction procedures outlined in JAR referenced above.

2. Background and Relevant Data

Both the JAR and FAR referenced above require correction for atmospheric absorption if test conditions are outside the limits specified. JAR 36, Section 1, Appendix 3, 5.2.2 defines this as:

$$\Delta(M) = 0.01(H_T\alpha - 0.2H_R) \qquad (1)$$

FAR 36, Appendix G, G36.201(d)(1) defines this correction as:

$$\Delta(M) = (\alpha - 0.7)\frac{H_T}{1000} \qquad (2)$$

3. Discussion

These calculations are based on a reference temperature of 15 deg C in the JAR case and 25 deg C in the FAR case.

The FAR method shown in equation (2) is based on a reference absorption coefficient that corresponds to a temperature other than the FAR reference temperature of 25 deg C.

Recommendation is made to adopt the JAR calculation including the 15 deg C reference temperature.

References

1. Aerospace Recommended Practice, ARP 866A, prepared by SAE Committee A-21, Aircraft Noise measurement, Revised 3-15-75.

2. Joint Aviation Requirements, JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 5.2.2.

3. Federal Aviation Requirements, FAR 36, Appendix G, G36.201(d)(1).

LPDA-TPP-002
Temperature/Humidity Test Windows
R L Howes and R Wilson

10/11/95

Applicable FAR: FAR 36, Appendix G, G36.201(b) and fig G1.

Applicable JAR: JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 5.2.2(a) and Fig A.3-2.

1. Recommendation

Adopt the test limits of JAR 36 referenced above.

2. Background and Relevant Data

These sections specify the temperature limits outside of which corrections to the measured data must be made. FAR 36 lower limit is 36.5 deg F (2.5 deg C) and JAR 36 lower limit is 35.6 deg F (2 deg C). To harmonize this it is recommended that the JAR limit of 35.6 deg F (2 deg C) which is consistent with ICAO wording, be adopted. Note also that all other limits shown in FAR 36, Figure G1 are consistent with the corresponding JAR limits.

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller-Driven Small Airplanes

LPDA-TPP-003

Harmonization Between the Maximum Take-off Weight of ICAO Annex 16 and the Airworthiness Regulations for Small Propeller Driven Aircraft of the American FAR and European JAR 23

R Wilson

March 1995

This Paper was formatted to meet the requirements for submission to the ICAO Committee on Aviation Environmental Protection Technical Issues Sub-group (Aeroplanes) and is attached.

The Paper was approved by the ICAO CAEP Working Group 1 at its meeting in Bonn in June 1995.

It was proposed for adoption into ICAO Annex 16 at CAEP 3 in Montreal in December 1995.

The proposal was accepted by CAEP 3.

LPDA-TPP-004
Power Adjustments
John F Bertolacci

August 8, 1995

Applicable FAR: FAR 36, Appendix G, G36.201(d)(4)

Measured sound levels in decibels must be corrected for engine power by algebraically adding an increment equal to-

$$\text{Delta}(3) = 17 \log (P_r / P_t)$$

Where P_r and P_t are the test and reference engine powers respectively.

Applicable JAR: JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 5.2.2(d)

Measured sound levels shall be adjusted for engine power by algebraically adding an increment equal to-

$$\text{Delta}_3 = K_3 \log (P_r / P_t)$$

Where P_r and P_t are the test and reference engine powers respectively obtained from the manifold pressure/torque gauges and engine rpm. The value of K_3 shall be determined from approved data from the test aeroplane. In the absence of flight test data and at the discretion of the Authority a value of $K_3 = 17$ may be used.

1. Recommendation

It is recommended that FAR 36, Appendix G, G36.201(d)(4) be revised as follows:

"Measured sound levels in decibels must be corrected for engine power by algebraically adding an increment equal to-

$$\text{Delta}(3) = K_3 \log (P_r / P_t)$$

Where P_r and P_t are the test and reference engine powers respectively obtained from the manifold pressure/torque gauges and engine rpm. The value of K_3 shall be determined from approved data from the test Airplane. In the absence of flight test data and at the discretion of the FAA a value of $K_3 = 17$ may be used."

2. Background and Relevant Data

The only technical difference between these two regulations is the power correction constant. The FAR regulation requires the use of 17 for this constant. The FAR regulation requires the use of 17 for this constant. This value was an average value derived from FAA tests on seven aircraft (Reference 1). The power correction constant from this data base had a variation from 1.5 to 39.3, and for the same aircraft the constant varied as much as 26.7 points (12.6 to 39.3). In another FAA report (Reference 2), the power correction factor derived from tests varied from -0.7 to 10.7 at the primary microphone site.

3. Discussion

Based on the wide variation of the test derived power correction factor on the eight aircraft tested, it is recommended that the JAR wording be adopted and the power correction constant be determined from approved data from the test aircraft but a value of 17 can be used at the discretion of the certification authority. This would also be more consistent with the way the Mach Number adjustment is determined.

References

1. FAA Report EE-83-1, "Noise Levels and Data Analyses for Small Prop-Driven Aircraft", dated August 1993

2. FAA Report EE-86-1, "Acoustic Flight of the Piper Lance", dated December 1986

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller-Driven Small Airplanes

LPDA-TPP-005

Differences in the Measurement Height from Meteorological Data

R Wilson

18th August 1995

This Paper was formatted to meet the requirements for submission to CAEP3 in Montreal in December 1995.

The proposal was accepted by CAEP3.

LPDA-TPP-005
DIFFERENCES IN THE MEASUREMENT HEIGHT FOR METEOROLOGICAL DATA

(Author - R Wilson)

18th August 1995

APPLICABLE: ICAO Annex 16, Appendix 6 and JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 2.2.2.

RECOMMENDATIONS FOR HARMONIZATION

ICAO Annex 16 Appendix 6, 2.2.2 should be amended to reflect the flexibility of FAR 36, Appendix G, G36.101 (b)(6) by adopting the FAR 36 wording.

ICAO Annex 16 Appendix 6, 2.2.2 (b) would then read: "... below 2°C."

ICAO Annex 16 Appendix 6, 2.2.2 (c) would then read: "... above 9 Km/h (5 kt) using a 30s average."

ICAO Annex 16 Appendix 6, 2.2.2 (d) would then read: "... points specified by the Authority; and ..."

A new ICAO Annex 16 Appendix 6, 2.2.2 (e) would add: "The meteorological measurements must be made between 1.2 m and 10 m above ground level. If the measurement site is within 1 nm of an airport meteorological station, measurements from this station may be used."

JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 2.2.2 should be similarly amended.

BACKGROUND & RELEVANT DATA

As presently published, there is a difference in the permitted measurement heights for Meteorological Data as specified by FAR 36, Appendix G, G36.101 (b)(6) and ICAO Annex 16 Appendix 6, 2.2.2 (b) and (c). JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 2.2.2 (b) and (c) is identical to ICAO Annex 16. The FAR allows for measurement between: "... 4 ft (1.2 m) and 33 ft (10 m) above ground level...." ICAO Annex 16 specifies "... at 1.2 m above the ground..."

LPDA-TPP-006
Microphone Height and Noise Limits
R L Howes and R Wilson
10/11/95

Applicable FAR: FAR 36, Appendix G, G36.107(a) and G36.301(b)

Applicable JAR: JAR 36, 5th Draft, Sept 1995, Section 1, Sub Part D, JAR 36.330 and Appendix 3, 4.4.1

1. Recommendation

Adopt JAR wording for both microphone position and configuration and associated noise limits.

2. Discussion

Considerations of microphone location and configuration and resulting noise limits are inter-related. This issue is not new. Much study and discussion has gone on. Technical papers summarizing analysis and test results comparing the microphone locations and configurations have been carried out and documented. See references [1]-[8].

The technical facts are that a microphone inverted over a metal plate at ground level affords a measurement not affected by variable ground reflections interacting with source radiation, which is in contrast with the 1.2m location.

A review of the two configurations will show that the effect of reflections from the metal plate is consistent and increases the measured levels by about 3 dB(A) when compared with a 1.2m configuration. Tests carried out with the 1.2m configuration show that the interaction with ground reflections is not consistent.

In the majority of cases the data acquired and analyzed in the course of establishing compliance with subject regulations can be a valuable tool for determining the physics controlling the noise radiation in specific cases. As such it is often used to determine effective changes and modifications. Using a data set from a 1.2m microphone introduces inconsistency and error which compromises this. The data obtained using the ground plane configuration provides a more consistent and reliable data base.

Social pressure for increased stringency is mounting. The need to respond to this pressure cannot be ignored. Any effective response must be based on a good understanding of the physics of noise from light propeller driven aircraft. Time, economy and available technology will no doubt dictate an experimental approach characterised by small and progressive improvements. Therefore it is more important than ever to be able to acquire consistent and reliable data without using a separate test setup. With the differences that exist today among bodies of regulations most manufacturers make two sets of measurements. Some even repeat the testing using each microphone measurement configuration. This imposes economic burdens associated with two microphone setups and/or repeatability issues if the test is conducted twice.

It is recommended that the JAR wording be adopted. This will require an adjustment to the current FAR limit to account for the reflection effect discussed. Although this may appear in some circles as decreased stringency, it is not. In the long term it will enable a quicker, more economic response to stringency issues and will assist with source noise reduction studies.

References -

1. DOT/FAA/EE-85-8, "1985 Small Propeller-Driven Aircraft Noise Test Program", preliminary report, dated October 1985.

2. CAEP/1-WP/14, Working Paper, Presented by Mr. Hierl, Fed. Rep. of Germany, Mar 19, 1986.

3. CAEP/1-WP/20, Working Paper, Presented by Mr. Cowling, UK, Apr 17, 1986.

4. CAEP/1-WP/21, Working Paper, Presented by Mr. Cowling, UK, Apr 17, 1986.

5. CAEP/1-WP/23, Working Paper, Presented by Mr. Cowling, UK, Apr 17, 1986.

6. CAEP/1-WP/40, Working Paper, Presented by Mr. Wesler, USA, May 13, 1986.

7. CAEP/1-WP/45, Working Paper, Presented by Mr. Cowling, UK, May 21, 1986.

8. CAEP/1-WP/48, Working Paper, Presented by Mr. Smith, ICCAIA, May 21, 1986.

LPDA-TPP-007
Calibration & Tape Requirements
R G Hund
8/29/95

Applicable FAR: FAR 36, Appendix G, G36.105(f) and Appendix A, A36.3(e)

Applicable JAR: JAR 36, 5th Draft, Sept 1995, Section 1, Appendix 3, 4.4.2 and 4.4.3

1. Recommendation

Harmonization/Regulation change is not required.

2. Background & Relevant Data

The Joint Aviation Requirements, Part 36, and the Federal Aviation Requirements, Part 36, if a tape recorder is used, require the same verification of the frequency response of each electrical system and similar frequency response tests of each reel of magnetic tape.

The differences between the JAR and FAR requirements for magnetic tape testing are the minimum duration of the calibration tone and the 1/3 octave bands evaluated.

JAR - "Each reel of magnetic tape ... carry a calibration signal consisting of at least a 15 second burst"...
"the level difference in the 10 kHz 1/3 octave band filtered levels ... is not more than 0.75 dB."

FAR - "Each reel of magnetic tape ... carry a calibration signal consisting of at least a 15 second burst" ...
"the difference between each 1/3 octave band exceeds 0.75 dB."

3. Discussion

The JAR and FAR magnetic tape validation test requirements can be satisfied by conducting the tape evaluation to meet both regulations with a negligible difference in cost.

The JAR requires that the calibration signal duration is 30 seconds instead of a minimum of 15 seconds.

The FAR requires evaluation of each 1/3 octave band instead of just the 10 kHz band.

Recommendation is that no changes to the FAR or to the JAR are required for Harmonization.

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller-Driven Small Airplanes

LPDA-TPP-008
Power Deviations Allowed
Carlos Latoni
July 17, 1995

Applicable FAR: FAR 36, Appendix G, G36.201(c)(2)

Applicable JAR: None

1. Recommendation

Add to the JAR, Section 1, Appendix 3, 5.2.1, the use of 5% power deviation for fixed pitch propeller as stated in FAR

2. Background & Relevant Data

The power/rpm variation on a fixed pitch propeller is affected by several factors, mainly aircraft pitch attitude, temperature and humidity. The rpm, which is directly related to power, is difficult to control during the climb out. The slight change in pitch attitude will result in an increase or decrease in rpm. It is, therefore, desirable to provide a tolerance to which no data correction is required for either power or propeller tip Mach Number. The JAR does not provide a tolerance to power deviations, where the FAR does for the reasons previously mentioned.

3. Discussion

The JAR 36, Section 1, Appendix 3, should be modified to incorporate the engine power and propeller tip mach number deviation as follows:

In 5.2.1(c)

Add item (a) The propeller is fixed pitch and the test power is within 5% of the reference.

In 5.2.1(d) add the following sentence:

5.2.1(d) ..... engine rpm. For fixed pitch propellers if the power is not within 5% of reference power. .....

LPDA-TPP-009
Power Definitions
Carlos Latoni
July 18, 1995

Applicable FAR: FAR 36, Appendix G, G36.111(2)(iv)

Applicable JAR: JAR 36, Section 1, Sub-Part D, 36.340 (b)(2)(iv)

1. Recommendation

Replace JAR 36, Section 1, Sub-Part D, 36.340(b)(2)(iv) with FAR 36, Appendix G, G36.111 (2)(iv) wording for the 2nd phase (segment) of the take-off portion.

2. Background & Relevant Data

Not applicable

3. Discussion

The JAR 36, Section 1, Sub-Part D, 36.340 (b)(2)(iv) can be interpreted to allow the use of a power setting other than take-off power or maximum continuous power during the 2nd phase of the take-off. The FAR clearly states take-off or maximum continuous power, which is consistent with FAR 23. JAR 36 which reads as follows is not specific and allows the authority to allow the use of lower power settings even if the propeller is of a variable pitch type.

(iv) The maximum power and RPM that can be continuously delivered by the engine or engines in this flight condition shall be maintained throughout the second phase (unless a lower limiting power is established by the Authority).

LPDA-TPP-010
Mach Tolerance
John F Bertolacci
August 9, 1995

Applicable FAR: FAR 36, Appendix G, G36.201(c)(3).

Applicable JAR: JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 5.2.2 (c)

1. Recommendation

It is recommended that FAR 36, Appendix G, G36.201(c) be revised to add a sub-section (3) as follows:

No adjustments for helical tip mach number variation need be made if the propeller helical tip mach number is:

1. At or below 0.70 and the test helical tip Mach Number is within 0.014 of the reference helical tip Mach Number.

2. Above 0.70 and at or below 0.80 the test helical tip Mach Number is within 0.007 of the reference helical tip Mach Number.

3. Above 0.80 and the test helical tip Mach Number is within 0.005 of the reference helical tip Mach Number. For mechanical tachometers, if the helical tip Mach Number is above 0.8 and the test helical tip Mach Number is within 0.008 of the reference helical tip Mach Number.

2. Background & Relevant Data

JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 5.2.2(c) allows additional latitude when correcting for helical tip Mach Number. If the test helical tip Mach Number falls within a certain tolerance of the reference helical tip Mach Number then no correction is required. No tolerance is defined under the referenced FAR.

3. Discussion

Attachment 1 contains an analysis for nine US manufactured aircraft which represent a good cross section of US propeller driven aircraft. Reference 1 contains the actual K2 values for each aircraft as well as the reference helical tip Mach Numbers. The data was analyzed assuming the M_T was equal to M_R reduced by the maximum tolerance based on the reference M_R.

The resulting corrections ranged from 0.09 to 0.70 dB(A), with an average of 0.44 dB(A) for all the samples. All the values are well within the tolerance of a Type 1 sound level meter as defined by Table 5 in Reference 2.

Reference

1. FAA Report EE-83-1, "Noise Levels and Data Analyses for Small Prop-Driven Aircraft", dated August 1983.

2. IEC Publication 651, "Sound Level Meters"

TPP 10, Attachment 1

TECHNICAL POSITION PAPER 10 WORK SHEET

LA=K2*LOG(MR/MT): JAR 5.2.2(c)

No.	Aircraft	K2 (Ref 1)	MR (Ref 1)	MT (Note 1)	LA (K2-Ref 1)	LA (K2-150)
1	C-170	70.2	0.715	0.708	0.2999	0.6409
2	PA-38	75.8	0.67	0.656	0.6952	1.3756
3	PA-28	148.2	0.772	0.772	0.5810	0.588
4	C-180	126.6	0.827	0.819	0.5345	0.6332
5	B-58P	143.6	0.841	0.833	0.5961	0.6226
6	C-414	148.9	0.824	0.816	0.6309	0.6356
7	KA-200	53.7	0.786	0.786	0.2068	0.5776
8	PA-42	76.6	0.758	0.758	0.3058	0.5988
9	C-441	21.6	0.708	0.708	0.0923	0.6409
	AVE.=	96.1333		AVERAGE=	0.4380	

NOTES:

1. MT = MR - .014; MR< .70; JAR 5.2.2 (c)(1): A/C No.2
   MT = MR - .007; MR< .70; JAR 5.2.2 (c)(1): A/C No.1, 3, 7, 8 & 9
   MT = MR - .005; MR< .80; JAR 5.2.2 (c)(3)
   MT = MR - .008; MR< .80; JAR 5.2.2 (c)(3) with mechanical tachometers A/C No. 4, 5 & 6

2. Ref 1 = FAA REPORT EE-83-1, "NOISE LEVELS AND DATA ANALYSES FOR SMALL PROP-DRIVEN AIRCRAFT", TABLES 10.1 AND 17.3

LPDA-TPP-011
Slow "A" Weighting
R G Hund
8/31/95

Applicable FAR: FAR 36, Appendix G, G36.105(e)

Applicable JAR: JAR 36, Section 1, Appendix 3,3 Noise Unit Definitions; JAR 36, Section 1, Appendix 3, 4.3 Sensing Recorking and Reproducing Equipment.

1. Recommendation

No harmonization recommended.

2. Background & Relevant Data

Both bodies of regulation require the subject meter setting. The wording differs between FAR and JAR.

3. Discussion

Even though the wording differs between the bodies of regulation, the intrepretation is the same.

LPDA-TPP-012
Items Not Harmonized
R L Howes and R Wilson
10/11/95

Applicable FAR: See text

Applicable JAR: See text

In Document 2a, Items 1, 4, 5, 7 and 11 were not recommended for harmonization. It was concluded that harmonization was not required for the following reasons:

Item 1: Applicability

The applicability dates listed have all lapsed making this issue moot.

Items 4 and 5: Tape Recording, Calibration and Quality

See LPDA-TPP-007

Item 7: Pre/De-Emphasis Recording

No harmonization is recommended here. The standards that describe the requirements for this type of equipment are in the process of being updated to take into account the technological benifits of newer digital instruments and data processing equipment.

Item 11: Reference Noise Level

This is already harmonized. The only difference is that JAR 36 summarizes the corrections to be applied in the form of an equation and FAR 36 simply states the requirement.

General -

There are instances in which certain numerical rounding differences cause values to deviate by a small amount between the bodies of regulation. These differences are not considered significant enough to warrant the efforts required to harmonize them, eg. FAR 36, Appendix G, G36.101(b)(2) specifies the lower test temperature limit as 2.2 deg C and JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 2.2.2(b) calls out 2 deg C.

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

Appendix C: Meeting Minutes

ICAO COMMITTEE ON AVIATION ENVIRONMENTAL PROTECTION
TECHNICAL ISSUES SUB-GROUP (AEROPLANES)
EIGHTH MEETING, 14 -15 MARCH 1995
SEATTLE, USA

Harmonisation between the Maximum Take-off Weight of ICAO Annex 16 and the Airworthiness Regulations for Small Propeller Driven Aircraft of the American FAR 23 and the European JAR 23

(Presented by the UK Member)

SUMMARY

There is an inconsistency in the maximum take-off weight specified by the European (JAR 23) and American (FAR 23) Airworthiness Regulations for "Small Propeller Driven Aircraft" and the Noise Regulations of ICAO Annex 16.

The maximum take-off weight specified by the Airworthiness Regulations is consistent between JARs and FARs :-

- **JAR 23 specifies : ".....8618 Kg (19000 lb) or less."**

- **FAR 23 specifies : ".....19000 lb or less."** No Kilogram equivalent is listed.

ICAO Annex 16 specifies a maximum weight of 9000 Kg. No Pounds equivalent is listed but for reference, **9000Kg is equivalent to 19842 lb** using the Internationally agreed conversion factor of 0.45359237 lb to 1 Kg.

No argument, or justification has been found for there to be a difference in the maximum take-off weight permitted by Noise Regulations of ICAO Annex 16 and the Airworthiness Regulations of JAR 23 and FAR 23.

In the interests of harmonisation it is therefore recommended that ICAO Annex 16 be amended to change all references to 9000 Kg to 8618 Kg; to be consistent with the maximum take of weight specified by the Airworthiness Regulations of JAR 23 and FAR 23.

1. INTRODUCTION

As a result of work by the FAR/JAR Harmonisation Working Group for Propeller Driven Small Aircraft, inconsistencies were identified between the maximum take-off weight specified by the European (JAR 23) and American (FAR 23) Airworthiness Regulations and the maximum take-off weight specified by the Noise Regulations applicable to this class of aircraft: FAR 36 Appendix G and JAR 36 Sub Sections B and C. JAR 36 reflects ICAO Annex 16 Chapters 6 and 10 respectively. The maximum take-off weights listed by these documents in the revision standards applicable on 1st March 1995 are:-

- **ICAO Annex 16/JAR 36 : 9000 Kg.** No Pounds equivalent is quoted but this equals **19842 lb** at the internationally agreed conversion rate of 0.45359237 lb to 1 Kg.

- **FAR 36 : 19000 lb.** A Kilogram equivalent of 8640 Kg is listed, but using the above conversion this is slightly in error and should read **8618 Kg.**

The Airworthiness Regulations, JAR 23 and FAR 23, are consistent with regard to maximum take-off weight, except for the preferred prime units listed:-

- **JAR 23.1 lists : ".....8618Kg (19000 lb) or less."**

- **FAR 23.3(d) lists : ".....19000 lb or less."** There is no Kilogram equivalent listed.

During committee discussion of the FAR/JAR Harmonisation Working Group for Propeller Driven Small Aircraft it was agreed that not only was it desirable to achieve harmonisation between JAR 36 and FAR 36, but that harmonisation of these two codes with the Airworthiness Regulations of JAR 23 and FAR 23 was also desirable.

2. DISCUSSION

Records show that the original maximum take-off weight of 12500 lb (5700 Kg), common to both the American and European Airworthiness Regulations for "Small Propeller Driven Aircraft", was increased by the FAA to 19000 lb (8618 Kg) by Amendment 23-34 to FAR 23, Effective February 17, 1987. This increase in maximum take-off weight, followed considerable debate and consultation, going back over many years, between the FAA, Industry and Interested Parties on how to cover the certification of "Commuter Type Aircraft" without having to comply with the more demanding FAR Part 25, the requirements for Large Transport Aircraft. Amendment 23-34 to FAR Part 23 introduced the Commuter Category which allowed both an increase in maximum take-off from 12500 lb to 19000 lb and an increase in the maximum number of passengers permitted from 9 to 19.

This approach by the FAA to problem of Certification of Commuter Category Aircraft was initially adopted by some individual European Airworthiness Authorities, but more importantly, it was adopted by JAA in the formulation of JAR 23.

With the exception that FAR Part 23 expresses maximum take-off weight in pounds only, with no kilogram equivalent, whereas JAR list kilograms with a (correct) pound equivalent, both Regulations list the same maximum take-off weight of 19000 lb/ 8618 Kg.

Because of the considerable history of debate and consultation between Airworthiness Authorities, Industry and other interested parties on the issue of an appropriate maximum take-off weight, which resulted in the agreement to adopt 19000 lb/8618 kg as a maximum take-off weight for Airworthiness Certification, no argument or justification can be found for a different maximum weight to be applied for Noise Certification. Therefore, the Noise Regulations should be amended to reflect the Airworthiness Limit. FAR Part 36 already reflects the Airworthiness maximum take-off weight by specifying 19000 lb. A minor clerical amendment is needed to correct the Kilogram equivalent from the present 8640 to

2. cont.d

8618 and to add the kg unit identifier which is not currently shown. This is a FAA domestic issue and FAA have been made aware of the error. As JAR 36 reflects ICAO Annex 16, a change to Annex 16 is needed to allow JAR 36 to be changed. ICAO Annex 16 should be amended to change all reference to 9000 kg to 8618 kg.

To ensure that no difficulties will be caused by changing ICAO Annex 16 a search has been made of aircraft bordering the maximum weight band effected i.e. 19000 lb/8618 kg to 19842 lb/9000 kg. Using as reference documents, FAA Advisory Circular AC No. 36-1F and the British General Aviation Manufactures and Traders Association (GAMTA) General Aviation Data Base, a list has been compiled of all propeller driven aircraft with maximum take-off weights of over16000 lb (7257 kg) but no greater than 25000 lb (11340 kg). Only 9 aircraft were found in this weight bracket. Figure 1 plots each of the 9 aircraft against a vertical weight scale. As can be seen from this figure, there is a considerable gap either side of weight band in question i.e. 19000 lb (8618 kg) to 19842 lb (9000 kg). In the lighter weight group of aircraft certificated to FAR 23, the heaviest is the CASA C212C at 17000 lb. If this or any of the other aircraft listed in the under 19000 lb group are developed to weights in excess of 19000 lb they will have to meet the Airworthiness Regulations of FAR/JAR 25 instead of FAR/JAR 23. This presents formidable problems and it was the opinion of the FAR/JAR Harmonisation Working Group for Propeller Driven Small Aircraft that this sort of development was most unlikely to take place. It is not an accident that there is a gap between the top end of the FAR/JAR 23 aircraft at 17000 lb and the bottom of the FAR/JAR 25 aircraft at 21000 lb. There are good practical considerations that result from the Airworthiness Regulations the steer manufacturers into this "jump" in weight

However, in the (extremely) unlikely event that an aircraft is increased in weight to over 19000 lb and hence into the FAR/JAR 25 Airworthiness Regulations the manufacturer will have to accept that he will have to comply with the appropriate Large Aircraft Noise Regulations. The remote chance of this arising and the penalty thus incurred, is considered a penalty worth paying in exchange for the benefits of harmonisation.

Similarly it was the opinion of the Group that it is most unlikely that a FAR/JAR 25 aircraft in the heavy group would be developed down to a lower weight. In the unlikely event of this happening the manufacturer could opt for the less onerous Noise Certification procedures for small aircraft

No conflict with the large aircraft Airworthiness Regulations of either FAR 25 or JAR 25 will result in changing ICAO Annex 16 to align it with the maximum take-off weight of both FAR23 and JAR 23.

3. RECOMMENDATION

In the interests of harmonisation it is recommended that ICAO Annex 16 be amended to change all references to 9000 Kg to 8618 Kg; to be consistent with the maximum take of weight specified by the Airworthiness Regulations of JAR 23 and FAR 23.

Subject: Meeting Minutes

Date: 20 October 1994

To: ARAC Propeller HWG Membership

From: R. Howes
R. Wilson

Attachments:
1. Agenda.
2. Attendee List.
3. Summary of Action Items.
4. Document List.
5. Revised Document 2, Document 2A.

Agenda is attached. Meeting followed agenda closely. Session began with introductions as indicated.

Reviewed agenda and no changes or additions were needed.

Began discussion on terms of reference (TOR). Discussion centered on what our working group would produce. It was decided that we would probably produce two documents, one for US agencies (NPRM) and one for European Agencies (NPA). It was further decided that more than one document could be submitted to each agency if timing, priorities and issues involved would benefit.

It was pointed out that harmonization really involved two areas. First, amendments to each of the bodies of regulation could be proposed (NPRM/NPA). Second, advisory material could be reviewed for harmonization. Mr Kearsey pointed out that JAR is tied closely with ICAO, Annex 16. This body of regulation involves the consensus of many nations. Therefore changes for harmonization instigated through the NPA process that would require changes to Annex 16 could take a long time. However, harmonization that could be effected through advisory material could be expedited. This was duly noted.

Messrs Kearsey and Depitre suggested that we might modify our current terms of reference (statement of purpose and execution) to include how we intend to execute our charter. We agreed to do this. Modified TOR is attached.

Established a document tracking system to keep track of supporting documents that are handed out. Document list is attached.

The first document entered was the agenda. The next two documents were lists of differences between FAR 36, Appendix G and ICAO Annex 16, Chapter 10. Document 2 was a list generated in the JAR 36 working group and presented at the third meeting in Paris, 2 December 1993. Document 3 was a list prepared by Mr Marsan and presented for the first time at this meeting.

Review of documents 2 and 3 was undertaken item by item and actions assigned. It was decided that the items in Document 2 covered everything in Document 3. Mr Latoni pointed out that neither document addressed the power variation differences allowed for aircraft with fixed pitch propellers. This item was added and revised Document 2A is attached.

Consensus was that a harmonization position could be generated on most items. Some items will need to be simply researched and coordinated. It was decided that Technical Position Papers (TPP) would be prepared where necessary. These are apparent in list of attached action items.

Following is a list of the items from Document 2A showing actions and relevant comments.

Doc 2A Item	Comments	Action Item
1. Applicability	No harmonization recommended	
2. Weight Limit	Discussion centered around coordination of the general cert requirements of FAR 23 and JAR 23. It was agreed that the maximum weight for noise cert should reflect those in these two codes.	4
3. Mic Height	Tabled for further consideration.	
4,5 & 7. Calibration and Tape Requirements	Combined and assigned to Ron Hund	9
6. Met Data	It was agreed that the flexibility allowed in FAR 36 was desirable.	8
8. Absorption correction window	Discussion revealed that this was possibly due to rounding error in unit conversion.	3
9. Absorption correction	This item needed some research. A TPP with a recommended position will be prepared and presented at the next meeting.	2
10. Power Adjustments	This item needed some research. A TPP with a recommended position will be prepared.	6
11. Ref Noise Level	No action required.	
12. Noise Limits	Tabled for further consideration.	
13. Power Deviations allowed	This item needed some research. A TPP with a recommended position will be prepared.	7

Began work on advisory material. It was determined that both codes were supported by a body of advisory material. JAA material was mostly appended to the body of regulation as notes in selected sections and in Section 2, Advisory Material, Joint (AMJ). Very little of the material in Section 2, JAR 36 applied to light propeller driven aircraft. FAA material is being consolidated in a noise reference manual currently under preparation.

Discussions indicated a need for attention to techniques for correcting helical tip Mach No. It was decided that this would be coordinated with the preparation of subject manual. It was further decided that parts of this manual could be effectively used in support of JAR. Mr Mellers of Slingsby agreed to go through the JAR and summarize the advisory notes contained for comparison to the FAA noise manual and presented as a TPP at the next meeting.

In closing it was agreed that harmonization could be recommended and documents submitted soon for most items. Therefore it was decided to meet again in February rather than December to give adequate time for research and preparation of TPP's with the intent that harmonization documents could be submitted as early as May 1995.

Next meeting is planned for 21-22 February 1995. It will be hosted by CAA and held in Gatwick, West Sussex, United Kingdom.

Robert L Howes
US Co-Chair

R Wilson
European Co-Chair

Attachment 3: Summary of Action Items

1. Draft a proposed schedule.
   Bob Wilson

2. Document 1, Item 9. Prepare a Technical Position Paper (TPP) on the differences in absorption correction factors and reference temperatures and recommend a harmonization position.
   Rob Howes

3. Document 1, Item 8. Review absorption correction windows and recommend a harmonization position.
   Mehmet Marsan

4. Document 1, Item 2. Prepare a TPP on the differences in gross weight cutoff values and recommend a harmonization position.
   Bob Wilson

5. Interpretive Item. Prepare a TPP on how the test time allowed before gross weight adjustments become necessary is defined in both bodies of regulation.
   Ron Hund

6. Document 1, Item 10. Prepare a TPP on power correction procedures and recommend a harmonization position.
   John Bertolacci

7. Document 1, Item 13. Prepare a TPP on the 5% power window allowed for fixed pitch propeller aircraft and recommend a harmonization position.
   Carlos Latoni

8. Document 1, Item 6. Recommend a NPA to JAR that will harmonize measurement height. Handle location in interpretative material.
   Bob Wilson

9. Document 1, Items 4,5 and 7. Summarize the differences between analog tape quality requirements and calibration procedures and report to committee.
   Ron Hund

10. Interpretative Item. Prepare a TPP on helical tip Mach Number correction issues and allowed margins. Co-ordinate this effort with Mehmet Marsan's efforts. Recommend a harmonization position.
    Rob Howes & Carlos Latoni

Attachment 4: Document List

Document 1 -
Meeting Agenda

Document 2
Comparison of ICAO Annex 16 Chapter 10 and FAR Part 36 Appendix G for propeller driven light aeroplanes.

Document 3
Mehmet Marsan regulation comparison labeled "comp.xls".

Document 4
Handbook for Aviation Rulemaking Advisory Committee (ARAC) and Working Group Members.

Document 5
Internal Operating Procedures for Support of the Aviation Rulemaking Advisory Committee (ARAC).

Document 6
Document entitled, "Group of experts on the Abatement of Nuisances caused by Civil Air Transport".

Attachment 5

Document 2A

Comparison of ICAO Annex 16 Chapter 10 and FAR Part 36 Appendix G for Propeller Driven Light Aeroplanes

Item	Chapter 10/Appendix 6	Appendix G
1. Applicability	C of A application after 19th November 1988 (10.1.1). Failures can be tested to Chapter 6 until 17 November 1993(10.1.2).	Aeroplanes tested after 22nd December 1988 (Appendix G table). no provision.
2. Weight limit	up to 9,000 Kg maximum take-off weight (10.1.1).	8,640 Kg max take-off weight, (G36.301(b)).
3. Microphone height	7 mm above a ground plate (Appendix 6, 4.4.1).	4ft above ground level (G36.107(a))
4. Pseudo-random pink noise cal for recordings.	relative output of each 1/3 octave band not more than 0.2 dB (Appendix 6, 4.4.2).	not defined
5. Tape quality	Variation in 10 KHz band of 30 secs of calibration signal at beginning and end of type not greater than 0.75 dB (Appendix 6, 4.4.3).	not defined
6. Meteorological data	collected at 1.2m (Appendix 6, 2.2.2(b),(c))	collected between 1.2m and 10m (G36.101(b)(6))
7. Pre/de-emphasis recording	not defined	G36.105(d)
8. No absorption correction window	figure 6-2	lower temperature is 35.6 deg F (2.5 deg C compared with 2 deg C in Annex 16) (Fig G1)
9. Adjustments, absorption outside test window.	d(M) = 0.01 (Ht*alpha-0.2*Hr) Appendix 6, 5.2.2.(a)	not specified, G36.201(a)(4)(b) or d(M) = (alpha - 0.7)*Ht/1000
10. Power adjustments	d3=K3*log(Pr/Pt) Appendix 6, 5.2.2(d)	d3=17log(Pr/Pt) G36.201(d)(4)
11. Reference noise level	(Lamax)Ref=(Lamax)test+d(M)+d1+d2+d3	
12. Noise limits	76 dB(A) up to 600 Kg and increasing at 9.83 dB(A) per doubling of noise until the limit of 88 dB(A) is reached and is constant up to 9000 Kg.	
13. Power variance	no equivalent	36.201(c)(2) allows for 5% power variation for aircraft with fixed pitch propellers.

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

21-22 February 1995
Gatwick, UK

Subject: Meeting Minutes

Date: 22 February 1995

To: ARAC Propeller HWG Membership

From: R Howes
R Wilson

Attachments:
1. Attendee List.
2. Summary of Action Items.
3. Document List.
4. Recommended format for Technical Position Papers (TPP's).
5. TPP list.
6. Errata.
7. Schedule.

Meetings followed agenda. No agenda changes were proposed. List of attendees is attached. Willem Franken of the Netherlands Rijksluchtvaartdienst sent his regrets as he had planned to attend.

Action items 1 through 13 were completed. Drafts of TPP's were presented and discussed.

The working group has reviewed and updated the required harmonization items, prepared draft TPP's, reviewed and discussed these TPP's and recommended a harmonization position. TPP's will be finalized, put in a standard format and submitted at the conclusion of our work as supporting material. NPRM's will be drafted for changes recommended to FAR 35. JAR 36 changes will be proposed by papers submitted to CAEP/ATISG.

Draft TPP for document 2A, item 9 (absorption correction factors and reference temperatures) was discussed. JAR position was recommended. Reference LPDA-TPP-001.

Draft TPP for document 2A, item 8 (absorption correction windows) was discussed. JAR position was recommended. Reference LPDA-TPP-002.

Draft TPP for document 2A, item 2 (gross weight categories) was discussed. FAA position was recommended. Reference LPDA-TPP-003. Regulations for heavy aircraft are

affected since they quote a lower limit. It was decided that LPDA-TPP-003 will be presented this March in Seattle at the next meeting of the CAEP/ATISG.

This will be done so that this recommendation can be entered into the ICAO process as soon as possible since a JAR change has been recommended. See action items 14, 15 and 16.

The two bodies of regulation were reviewed for their treatment of gross weight adjustments during testing. They were determined to be in harmony.

Draft TPP for document 1, item 10 (power correction procedure) was presented and discussed. JAR position has been recommended. Reference LPDA-TPP-004.

Draft TPP's for document 1, item 13 (5% power window allowed in FAR 36) and the interpretive issue on helical tip mach number corrections was presented and discussed. This issue is currently under review by ICAO/CAEP working groups and others. It was decided to draft a letter summarizing the concerns of this working group and submit it CAEP/ATISG and others. The major concern is that test procedures for determining a reasonable correction factor will be imposed that will not be practical or even possible in the case of small propeller driven aircraft with fixed pitch propellers.

Document 1, item 6 (measurement height for meteorological conditions) was discussed. FAA position has been recommended. Reference LPDA-TPP-005.

Draft TPP for document 1, items 4,5 and 7 (analog tape calibration and quality) was presented and discussed. It was pointed out that new standards are under consideration for digital recording techniques. It was decided to table this issue and Co-ordinate with the heavy aircraft working group. Reference action item 20.

The FAA position on temperature inversions was clarified. No temperature inversion is allowed during testing. The JAA position was also clarified. Decision to test in the presence of temperature inversion is left to the JAA representative at the test site. These positions are not in harmony. The JAA position is preferred. Reference action item 23.

A review of JAR interpretive notes was presented and experience with US noise documents was presented and discussed. Both of these discussions focused on how various bodies of regulation are interpreted. It was pointed out that there is a need to

harmonize interpretive material. Action items 26, 27 and 28 will be presented at the next meeting.

The next meeting is scheduled for 6-7 July 1995 in Washington DC at the FAA offices in the Department of Energy. Reservation information along with meeting agenda information will follow.

Robert L. Howes, US Co-Chair

Robert Wilson, European Co-Chair

Attachment 1: List of Attendees

Rob Howes	Cessna Aircraft
Dieter Pade	AOPA, Germany
Frank Weiblen	MT-Propeller
Alain Depitre	JAA/DGAC France
Peter Kearsey	JAA/CAA UK
Mehmet Marsan	FAA USA
Rick Bowerman	Hartzell Propeller
Bob Wilson	Pilatus Britten Norman
Barry Mellers	Slingsby Aviation
Graham Forbes	GAMTA
Guy Readman	JAA/CAA UK

Attachment 2: Summary of Action Items

Action Items generated at Ottawa Meeting, 15-16 Sep 1994:

1. Draft a proposed schedule.
   Bob Wilson.
   Complete.

2. Document 2A, Item 9. Prepare a Technical Position Paper (TPP) on the differences in absorption correction factors and reference temperatures and recommend a harmonization position.
   Rob Howes.
   Complete. JAR regulation proposed for harmonization. TPP will be finalized for submittal as supporting information.

3. Document 2A, Item 8. Review absorption correction windows and recommend a harmonization position.
   Mehmet Marsan.
   Complete. JAR window proposed for harmonization. TPP will be finalized for submittal as supporting information.

4. Document 2A, Item 2. Prepare a TPP on the differences in gross weight cutoff values and recommend a harmonization position.
   Bob Wilson.
   Complete. FAA cutoff values proposed for harmonization. TPP being finalized for presentation at next ATISG meeting and submittal as supporting information.

5. Interpretive Item. Prepare a TPP on how the test time allowed before gross weight adjustments become necessary is defined in both bodied of regulation.
   Ron Hund
   Complete. Regulations determined to be in harmony. No further action.

6. Document 2A, Item 10. Prepare a TPP on power correction procedures and recommend a harmonization position.
   John Bertolacci
   Complete. JAR regulation proposed for harmonization. TPP will be finalized and submitted as supporting information.

Attachment 2: Summary of Action Items (continued)

7. Document 2A, Item 13. Prepare a TPP on the 5% power window allowed for fixed pitch propeller aircraft and recommend a harmonization position.
   Carlos Latoni

   Complete. This procedure is being revamped by ICAO through its CAEP process. It was decided to submit a letter to the CAEP process documenting the concerns that have been raised in this working group.

8. Document 2A, Item 6. Recommend a NPA to JAR that will harmonize measurement height. Handle location in interpretative material.
   Bob Wilson.
   Complete. Decision has been made to finalize a TPP and recommend the FAA position be adopted. This item not appropriate for interpretive material. See action item 19 below.

9. Document 2A, Items 4,5 and 7. Summarize the differences between analog tape quality requirements and calibration procedures and report to committee.
   Ron Hund.
   Complete. Item tabled until some coordination with heavy aircraft group can occur. See action item 20 below.

10. Interpretative Item. Prepare a TPP on helical tip mach number correction issues and allowed margins. Co-ordinate this effort with Mehmet Marsans efforts. Recommend a harmonization position.
    Rob Howes
    Carlos Latoni
    Complete. This has been combined with action item 7 and will be covered as described there.

11. Interpretative Item. Clarify FAA position on temperature inversion conditions.
    Mehmet Marsan.
    Complete. FAA position was not in harmony with JAR. See action item 23 below.

12. Interpretative Item. Review JAR notes and summarize their content for review and comparison to FAA reference document on noise measurement.
    Barry Mellers.
    Complete.

Attachment 2: Summary of Action Items (continued)

13. Interpretative Item. Summarize experience in review US noise documents and document apparent differences in interpretative materials.
    Alain Depitre.
    Complete. See action items 26 and 27 below.

Action Items generated from Gatwick Meeting, 21-22 Feb 1995:

14. Supply gross weight information for industry aircraft to Bob Wilson. Mehmet Marsan.

15. Formalize TPP on certification weight limits so that it can be submitted to ATISG in Seattle March. Bob Wilson

16. Co-ordinate the attendance of a HWG member at the ATISG working group meeting in Seattle in Mar 95 to present our weight category harmonization recommendations. Rob Howes.

17. Co-ordinate our weight category harmonization position with the heavy aircraft working group, Ken Orth. Rob Howes.

18. Draft a letter to the ATISG outlining some of the concerns about handling aircraft with fixed pitch propellers when determining helical tip Mach Number correction factors. Rob Howes.

19. Prepare a TPP on measurement height requirements for determining meteorological conditions and have it ready for submittal to the ATISG in March 95. Bob Wilson.

20. Co-ordinate with heavy aircraft working group re tape calibration and quality issues and report back. Rob Howes.

Attachment 2: Summary of Action Items (continued)

21. Rework TPP on absorption correction procedures and prepare document for submittal as supporting information for the HWG final recommendation. Rob Howes.

22. Prepare a TPP on measurement microphone configuration and recommend a harmonization position. Rob Howes and Bob Wilson.

23. Petition the FAA to adopt the JAA wording regarding "anomalous" meteorological conditions. Mehmet Marsan.

25. Prepare a TPP on sound level meter measurement settings (fast vs slow) and recommend a harmonization position. Barry Mellers.

26. Co-ordinate the efforts of selected committee members to assemble descriptions of their measurement setups and test data acquisition practices and submit these to Bob Wilson and Barry Mellers for consideration in work under item 27 below. Rick Bowerman.

27. Prepare a TPP outlining interpretive material for ICAO Annex 16 and JAR 36, light propeller driven aircraft. This paper will consider data already compiled in draft form and under consideration by the FAA so that interpretative material will be harmonized. Draft will be reviewed for concurrence by JAA and FAA representatives. Bob Wilson and Barry Mellers.

Attachment 4: Recommended Format for Technical Position Papers.

Use the heading shown above without the date and location and include the following:

TPP No.

Title of working paper

Author

Date

Applicable FAR:

Applicable JAR:

1.0 Recommendation

2.0 Background and Relevant Data

3.0 Discussion

TPP No: Page ij of kk

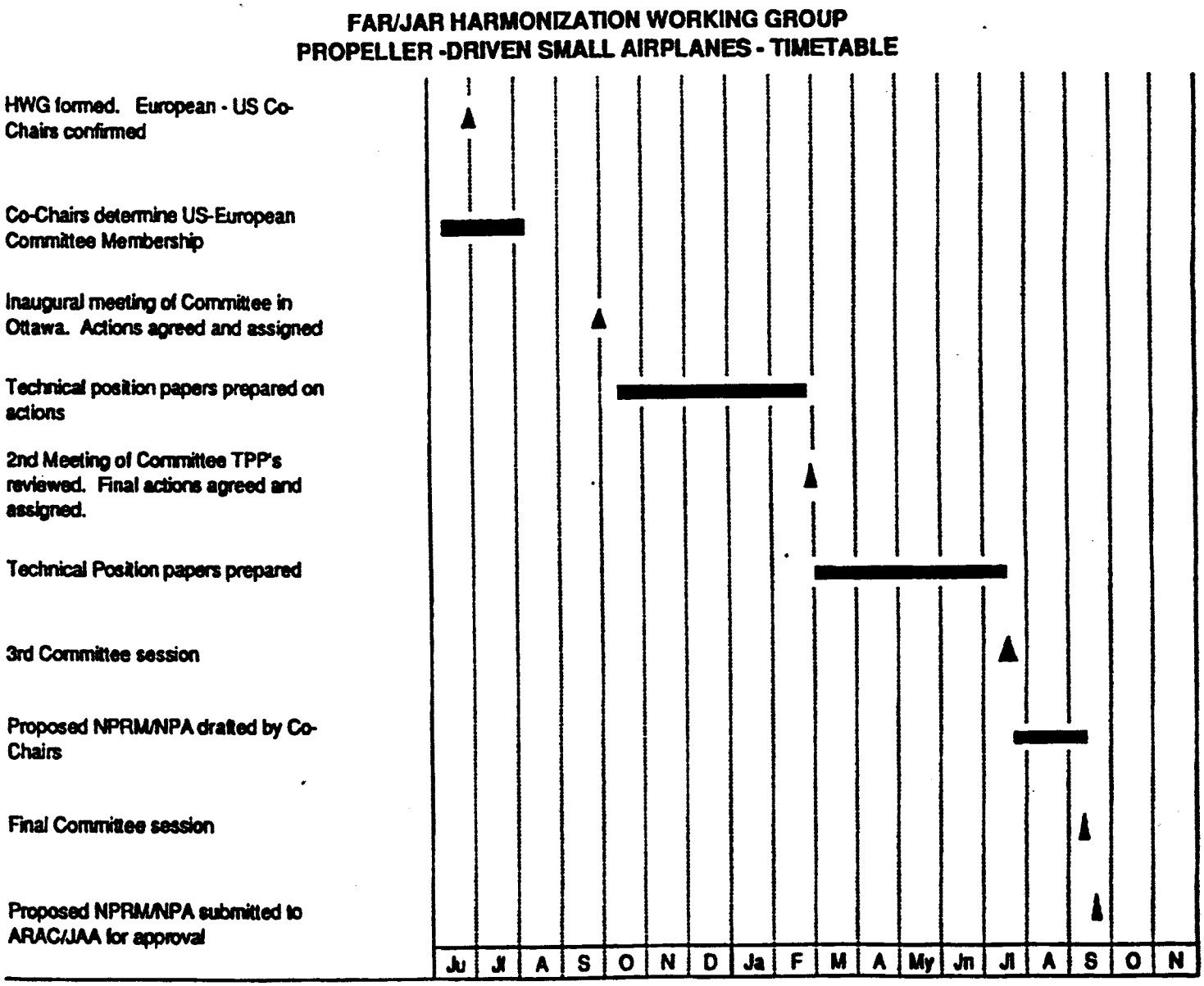
Attachment 5: List of Technical Position Papers

LPDA-TPP-001	Absorption Correction Factors and Reference Temperatures.
LPDA-TPP-002	Temperature/Humidity Test Windows.
LPDA-TPP-003	Gross Weight Categories.
LPDA-TPP-004	Power Correction Procedures.
LPDA-TPP-005	Measurement Heights for Determining Meteorological Conditions.
LPDA-TPP-006	Measurement Microphone Location and Orientation.

Attachment 6: Errata

1. Meeting minutes data 20 October 1994, Summary of action items, items 2 through 9 referred to Document 1. These items should have referred to document 2A.

Attachment 7: Schedule



Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

6-7 July 1995
Wichita, Kansas

Subject: Meeting Minutes

Date: 7 July 1995

To: ARAC Propeller HWG Membership

From: R. Howes

R. Wilson

Attachments:
1. Attendee List.
2. Summary of Action Items.
3. Recommended format for Technical Position Papers (TPP's).
4. TPP list.
5. Document List.
6. Schedule.

Third meeting of Propeller Driven Small Aircraft HWG was held in Wichita, KS 6-7 July 1995. List of attendees is attached. Apologies for absence are acknowledged from Barry Mellers, Dieter Pade, Graham Forbes, Frank Weiblen and Willem Franken.

A review of action items was conducted. New list was compiled and is attached.

Mehmet Marsan submitted a new schedule showing activites required to submit our recommendations to the FAA. Schedule is attached.

Requirements for drafting regulation changes were discussed. It was decided that the Co-Chairs will be briefed by the FAA legal staff in Washington. Briefing is tenatively scheduled for Tuesday, 11 July 1995.

LPDA-TPP-003, Gross Weight Categories, was submitted to ATISG and then to Working Group 1. It was agreed that this paper will be discussed at CAEP 3 in Montreal in December 1995.

Much discussion was devoted to the subject of making measurements for the purpose of calculating a correction factor for helical tip mach number. Action Item 27 was the result of this discussion.

Committee has decided to generate a final report. This document will contain all of the Technical Position Papers on the attached list. These papers will recommend harmonization positions where required and will present the technical justification. TPPs will be submitted in the attached format.

Interpretative material and selected certification experience will be compiled in an appendix to the committee's final report. This appendix will be submitted separately to the ATISG working group under an industry letter for consideration in their technical manuals. Appendix will also be submitted to FAA for consideration of Appendix G Handbook.

Agreement was reached to adopt the ICAO microphone position and to adjust levels to compensate for the physics of the new location. However, it was decided that a final review of industry data should be conducted to insure that there is no impact from the recommended harmonization.

Robert L. Howes
US Co-Chair

Robert Wilson
European Co-Chair

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

6-7 July 1995
Wichita, Kansas

Attachment 1: List of Attendees

Rob Howes	Cessna Aircraft
Alain Depitre	JAA/DGAC France
Peter Kearsey	JAA/CAA UK
Mehmet Marsan	FAA USA
Rick Bowerman	Hartzell Propeller
Bob Wilson	Pilatus Britten Norman
Carlos Latoni	Piper Aircraft
John Bertolacci	Fairchild Aircraft Inc
Ron Hund	Ratheon Aircraft Corp

Attachment 2: Summary of Action Items

Action Items generated at Ottawa Meeting, 15-16 Sep 1994:

1. Draft a proposed schedule.
   Bob Wilson.
   Complete.

2. Document 2A, Item 9. Prepare a Technical Position Paper (TPP) on the differences in absorption correction factors and reference temperatures and recommend a harmonization position.
   Rob Howes.
   Complete. JAR regulation proposed for harmonization. TPP will be finalized for submittal as supporting information.

3. Document 2A, Item 8. Review absorption correction windows and recommend a harmonization position.
   Mehmet Marsan.
   Complete. JAR window proposed for harmonization. TPP will be finalized for submittal as supporting information.

4. Document 2A, Item 2. Prepare a TPP on the differences in gross weight cutoff values and recommend a harmonization position.
   Bob Wilson.
   Complete. FAA cutoff values proposed for harmonization. TPP being finalized for presentation at next ATISG meeting and submittal as supporting information.

5. Interpretive Item. Prepare a TPP on how the test time allowed before gross weight adjustments become necessary is defined in both bodied of regulation.
   Ron Hund
   Complete. Regulations determined to be in harmony. No further action.

Attachment 2: Summary of Action Items (continued)

6. Document 2A, Item 10. Prepare a TPP on power correction procedures and recommend a harmonization position.
   John Bertolacci
   Complete. JAR regulation proposed for harmonization. TPP will be finalized and submitted as supporting information.

7. Document 2A, Item 13. Prepare a TPP on the 5% power window allowed for fixed pitch propeller aircraft and recommend a harmonization position.
   Carlos Latoni

   Complete. This procedure is being revamped by ICAO through its CAEP process. It was decided to submit a letter to the CAEP process documenting the concerns that have been raised in this working group.

8. Document 2A, Item 6. Recommend a NPA to JAR that will harmonize measurement height. Handle location in interpretative material.
   Bob Wilson.
   Complete. Decision has been made to finalize a TPP and recommend the FAA position be adopted. This item not appropriate for interpretive material. See action item 19 below.

9. Document 2A, Items 4,5 and 7. Summarize the differences between analog tape quality requirements and calibration procedures and report to committee.
   Ron Hund.
   Complete. Item tabled until some coordination with heavy aircraft group can occur. See action item 20 below.

Attachment 2: Summary of Action Items (continued)

10. Interpretative Item. Prepare a TPP on helical tip mach number correction issues and allowed margins. Co-ordinate this effort with Mehmet Marsan's efforts. Recommend a harmonization position.
    Rob Howes
    Carlos Latoni
    Complete. This has been combined with action item 7 and will be covered as described there.

11. Interpretative Item. Clarify FAA position on temperature inversion conditions.
    Mehmet Marsan.
    Complete. FAA position was not in harmony with JAR. See action item 23 below.

12. Interpretative Item. Review JAR notes and summarize their content for review and comparison to FAA reference document on noise measurement.
    Barry Mellers.
    Complete.

13. Interpretative Item. Summarize experience in review US noise documents and document apparent differences in interpretative materials.
    Alain Depitre.
    Complete. See action items 26 and 27 below.

Action Items generated from Gatwick Meeting, 21-22 Feb 1995:

14. Supply gross weight information for industry aircraft to Bob Wilson. Mehmet Marsan. Complete

15. Formalize TPP on certification weight limits so that it can be submitted to ATISG in Seattle March. Bob Wilson. Complete

16. Co-ordinate the attendance of a HWG member at the ATISG working group meeting in Seattle in Mar 95 to present our weight category harmonization recommendations. Rob Howes. Complete

Attachment 2: Summary of Action Items (continued)

17. Co-ordinate our weight category harmonization position with the heavy aircraft working group, Ken Orth. Rob Howes. Complete

18. Draft a letter to the ATISG outlining some of the concerns about handling aircraft with fixed pitch propellers when determining helical tip mach number correction factors. Rob Howes. Superceded by AI 27.

19. Prepare a TPP on measurement height requirements for determining meteorological conditions and have it ready for submittal to the ATISG in March 95. Bob Wilson. Complete

20. Co-ordinate with heavy aircraft working group re tape calibration and quality issues and report back. Rob Howes. Complete

21. Rework TPP on absorption correction procedures and prepare document for submittal as supporting information for the HWG final recommendation. Rob Howes. Complete

22. Prepare a TPP on measurement microphone configuration and recommend a harmonization position. Rob Howes and Bob Wilson. Superceded by AI 37.

23. Petition the FAA to adopt the JAA wording regarding "anomalous" meteorological conditions. Mehmet Marsan. Complete.

24. Prepare a TPP on sound level meter measurement settings (fast vs slow) and recommend a harmonization position. Superceded by AI 35. Barry Mellers.

25. Co-ordinate the efforts of selected committee members to assemble descriptions of their measurement setups and test data acquisition practices and submit these to Bob Wilson and Barry Mellers for consideration in work under item 27 below. Rick Bowerman. Superceded by AI 41.

Attachment 2: Summary of Action Items (continued)

26. Prepare a TPP outlining interpretive material for ICAO Annex 16 and JAR 36, light propeller driven aircraft. This paper will consider data already compiled in draft form and under consideration by the FAA so that interpretative material will be harmonized. Draft will be reviewed for concurrence by JAA and FAA representatives. Bob Wilson and Barry Mellers. Superceded by AI 41.

Action Items generated from Wichita meeting, 6-7 July 1995:

27. Measure and prepare an experimental data set showing the variation of helical tip Mach Number vs dB(A). Co-ordinate with selected industry experts and attempt to define an analytical version of the measured data. Have data ready for presentation at the Frankfurt meeting in Sept 95. Supercedes AI No. 18 above. Rob Howes.

28. Prepare LPDA-TPP-010 on the tolerance allowed by JAA in helical tip mach no. Make a harmonization recommendation. John Bertolacci.

29. Prepare a cover letter for LPDA-TPP-005 and submit it to Mike Smith of Rolls Royce as an industry position letter for consideration at the upcoming meeting of CAEP 3. Bob Wilson.

30. Prepare LPDA-TPP-007, Tape Calibration Requirements. Ron Hund.

31. Modify LDPA-TPP-001, Absorption Correction Factors and Reference Temperatures, and clarify units. Prepare TPP for submittal. Rob Howes.

32. Prepare a section for the committee's interpretive document outlining an interpretation of the requirements regarding temperature inversions from JAA. Bob Wilson.

33. Check with FAA in Washington to see if it makes any sense to exclude aerobatic aircraft from Appendix G requirements and possibly pick them up somewhere else. Mehmet Marsan.

Attachment 2: Summary of Action Items (continued)

34. Prepare a section for the committee's interpretive document outlining how altitude measurement and flight path verification are done using a camera. Rob Howes.

35. Prepare LPDA-TPP-011, SLM settings, to outline new wording for the JAR's that will specifically call out the SLM settings. Ron Hund.

36. Prepare LPDA-TPP-009, Power Definitions, so that power settings that are admissible are clearly defined in both sets of regulations. Carlos Latoni.

37. Prepare LPDA-TPP-006, Measurement Microphone Location and Orientation. Compile some industry data as part of the work. This supercedes AI No 22 above. Rob Howes and Bob Wilson.

38. Make parts of the European database on Chapter 10 test results available to the committee. Database will be on 3 1/2" floppy in Microsoft EXCEL format. Rob Howes and Bob Wilson will co-ordinate committee distribution. Alain Depitre.

39. Add some clarification to the Appendix G Handbook, 14 CFR Part 36, to spell out where reference conditions are measured, eg on the ground or at altitude. Make the revised wording available to Bob Wilson. Make an electronic copy of handbook available. Mehmet Marsan.

40. Contact GAMA and discuss whether any involvement in the International Co-ordinating Council of Aerospace Industries Association (ICCAIA) to promote the interests of general aviation would be appropriate. Rob Howes and Bob Wilson.

41. Co-ordinate committee inputs and compile an appendix for advisory material and submit to ATISG as background information and publication as ICAO advisory material. Supercedes AI No 26 above. Alain Depitre and Rick Bowerman.

42. Conduct a final review and compare JAR 36 and FAR 36 to insure that all harmonization issues have been addressed. Rob Howes and Bob Wilson.

Attachment 2: Summary of Action Items (continued)

43. Submit a report to the JAR 36 Study Group on committee progress. Bob Wilson.

44. All TPP's to be put in final committee format and submitted to committee chairs by 11 August 1995. All

Attachment 3: Recommended format for Technical Position Papers.

Use the heading shown above without the date and location and include the following:

TPP No.

Title of working paper

Author

Date

Applicable FAR:

Applicable JAR:

1.0 Recommendation

2.0 Background and Relevant Data

3.0 Discussion

TPP No: Page ij of kk

Attachment 4: List of Technical Position Papers

LPDA-TPP-001	Absorption Correction Factors and Reference Temperatures.
LPDA-TPP-002	Temperature/Humidity Test Windows.
LPDA-TPP-003	Gross Weight Categories.
LPDA-TPP-004	Power Correction Procedures.
LPDA-TPP-005	Measurement Heights for Determining Meteorological Conditions.
LPDA-TPP-006	Measurement Microphone Location and Orientation.
LPDA-TPP-007	Tape Calibration
LPDA-TPP-008	Power Deviations
LPDA-TPP-009	Power Definitions
LPDA-TPP-010	Helical Tip Mach No. Tolerances
LPDA-TPP-011	SLM Setup
LPDA-TPP-012	Items not Harmonized

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

6-7 July 1995
Wichita, Kansas

Attachment 5: Document List

Document 1
Meeting Agenda

Document 2A
Comparison of ICAO Annex 16 Chapter 10 and FAR Part 36 Appendix G for propeller driven light aeroplane.

Document 3
Mehmet Marsan regulation comparison labeled "comp.xls".

Document 4
Handbook for Aviation Rulemaking Advisory Committee (ARAC) and Working Group Members.

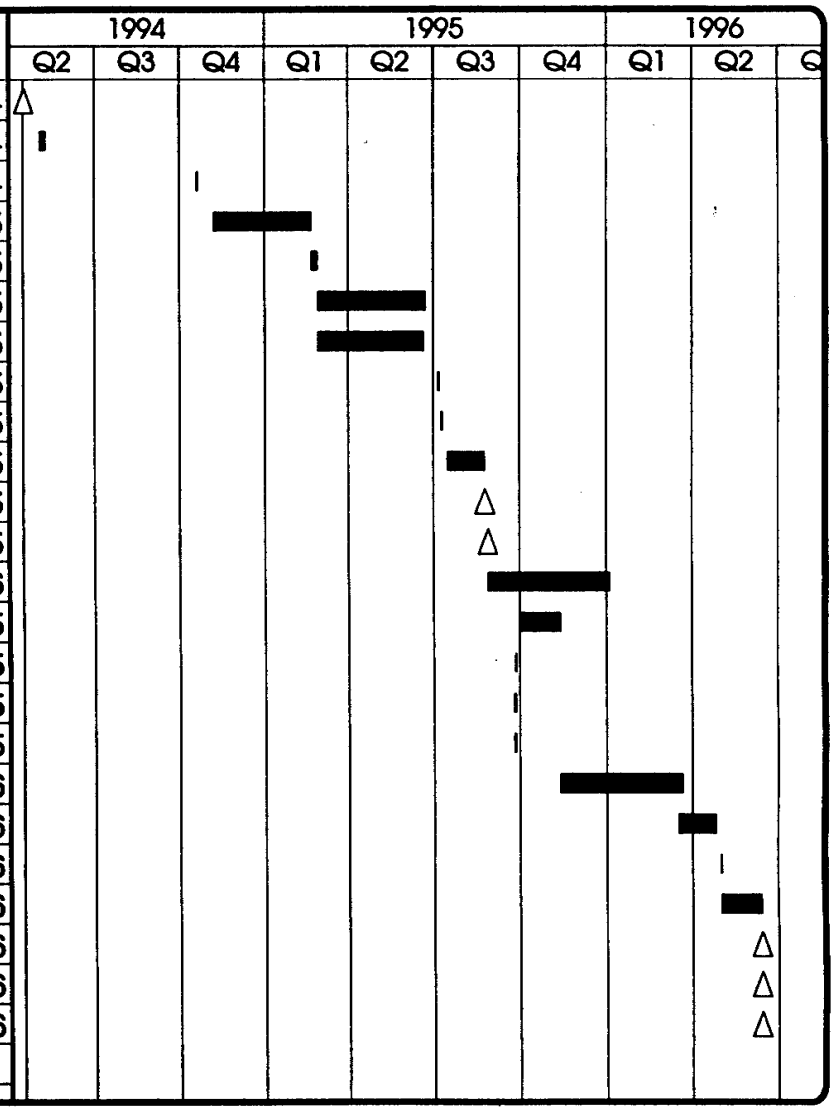
Document 5
Internal Operating Procedures for Support of the Aviation Rulemaking Advisory Committee (ARAC).

Document 6
Document entitled, "Group of experts on the Abatement of Nuisances caused by Civil Air Transport".

Document 7
List of technical position papers.

FAR/JAR Harmonization (Noise) under ARA

Row #	Task Name	Start	End
1	ARAC Establishes WG	Apr/16/94	Apr/16/94
2	Fed Reg Notice	May/04/94	May/10/94
3	1st Meeting (Ottawa)	Oct/20/94	Oct/21/94
4	Prepare Tech Positions	Nov/08/94	Feb/21/95
5	2d Meeting (Gatwick)	Feb/21/95	Feb/27/95
6	Update Position Papers	Feb/28/95	Jun/23/95
7	Comapre App G handbook	Feb/28/95	Jun/21/95
8	3d Meeting (Wichita)	Jul/06/95	Jul/07/95
9	ARAC Orientation by APM	Jul/10/95	Jul/10/95
10	Prepare Concept Paper	Jul/17/95	Aug/25/95
11	Submit Concept Paper to ARAC	Aug/25/95	Aug/25/95
12	Submit Concept Paper to GAMA	Aug/28/95	Aug/28/95
13	Draft NPRM	Aug/28/95	Jan/05/96
14	Drafting Support by APM	Oct/02/95	Nov/13/95
15	4th Meeting (Frankfurt)	Sep/26/95	Sep/27/95
16	AGC Guidance by AGC	Sep/25/95	Sep/27/95
17	APO Guidance by AEE	Sep/25/95	Sep/27/95
18	Reg Eval by APO	Nov/13/95	Mar/22/96
19	Legal Review by AGC	Mar/18/96	Apr/26/96
20	5th Meeting	May/01/96	May/02/96
21	Prepare Final NPRM	May/02/96	Jun/13/96
22	Submit to ARAC	Jun/13/96	Jun/13/96
23	Submit to JAR Study Group	Jun/13/96	Jun/13/96
24	Submit to GAMA	Jun/13/96	Jun/13/96



Printed: Oct/12/95
Page 13 of 13

Milestone △ Summary ▬
Fixed Delay - - - -

FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

14 - 15 November 1995
Frankfurt, Germany

Subject: Meeting Minutes From: R Wilson (European Co-Chair)

Circulation: All LPDA HWG Members

Meeting Host & Location: AOPA-Germany, Egelsbach, nr Frankfurt, Germany

Attachments:
1. Attendee List
2. Agenda
3. Draft 3 of Concept Paper
4. Action List

Agenda Item 1 - Apologies for Absence & General

The fourth meeting of the LPDA HWG was held at the AOPA-Germany Offices on the outskirts of Frankfurt, on 14th and 15th November 1995. The list of attendees is attached. Apologies for absence were received from: Graham Forbes, Rob Howes, Mehmet Marsan, Carlos Latoni, John Bertholacci and Ron Hund. As the FAA representative was unable to attend, this fourth meeting of the Working Group did not count as an ARAC recognised meeting.

Rick Bowerman deputised for Rob Howes as the US Co-Chair.

The draft agenda circulated before the meeting was agreed with one addition: to review the actions of the Wichita meeting. This was added as Agenda Item 5A.

Agenda Item 2 - Review & Approve Minutes of Wichita Meeting

The minutes of the Wichita meeting were accepted as an accurate record of the meeting. Several typographical errors were identified. The Chairman noted these and corrections will be made in the redraft of the Concept Paper.

Agenda Item 3 - Confirm the Position of Industry Committee Members

At the time of the meeting, it had been confirmed that two of the three European Industry Committee members: Bob Wilson for Pilatus Britten-Norman and Barry Mellers for Slingsby Aviation Ltd had authority to speak for their Companies. Copies of the letters of authorisation will be sent to the US Co-Chair. A summary of the authority of each industry committee member may be included in a future issue of the Concept Paper.

Agenda Item 3 - cont.d

The situation with regard to the two General Aviation representing organisations, GAMTA and AOPA is to be confirmed following consultation with a representation of their membership and management.

Note: Clarification of whether the Working Group's Industry Members had authority to speak for their respective companies, or whether they only spoke as individuals, was asked for by David Hilton, ARAC Joint Chair, when Rob Howes and Bob Wilson presented the Concept Paper, 1st Draft, to him and Bill Schultz of GAMA in October 1995.

Obviously, if the Committee's Industry representatives have the authority to speak for their Companies it increases the authority of the Committee.

Agenda Item 4 - Review & Agree Concept Paper

All attendees had been circulated Draft 1 of the Concept Paper, dated October 1995, prior to the meeting.

A preliminary copy of the 2nd Draft was circulated at the meeting. This replaces Section 1 through 4 and Appendix A. The other Appendices are not effected. A copy of the revised pages is shown as Attachment 3.

The revised Concept Paper was reviewed page by page. With the exception of minor changes to wording to add clarification (Paras 2.2 and 4.3 only) and correction of typographical errors, this revised Concept Paper was agreed unanimously except for changes arising from the review of the Technical Position Papers. Also it was recommended that a Glossary of abbreviations be added as Appendix F and that a list of the references in ICAO Annex 16 equating to those JAR 36 requirements identified for harmonization be added.

Bob Wilson volunteered to take on these two actions. **Action: Bob Wilson**

The review of the TPP's listed in Appendix B of the Concept Paper, is minuted below. Appendices C, D and E were reviewed page by page. There were no substantive changes arising, only typographical errors. Bob Wilson marked up a "Master Copy" with all errors identified.

FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

14 - 15 November 1995
Frankfurt, Germany

Agenda Item 5 - Review & Confirm Committee Support and Agreement for all TPP's prepared to date

All TPP's were reviewed in detail. Only those changes of substance are listed below. Numerous typographical errors and minor changes were identified. Bob Wilson marked up a Master Copy of Appendix B of the Concept Paper with all the changes.

It was recommended that a standard format of reference to FAR's and JAR's be adopted, following the example:

"Applicable FAR: FAR 36, Appendix G, G36.201(d)(1)"

"Applicable JAR: JAR 36, 5th Draft, September 1995, Section 1, Appendix 3, 5.2.2

Use of the words "para or section" before the final reference should be dropped throughout.

eg. ..... Appendix F, G36.201(d)(1) not .....Appendix F, para G36.201(d)(1)

It was also recommended that wherever "Mach Number" is referred to it should be spelt with a capital M and N.

TPP-003: Add note to cover sheet that approval was given to the recommendation of this TPP at the ICAO Working Group, Bonn Meeting in June 1995 and will be proposed for adoption into Annex 16 at CAEP3 in Montreal in December 1995.

TPP-006: Paragraph one of 2.0 says "See Reference 1 and 2". Only Reference 1 is listed. Peter Kearsey offered to look up the document reference of the ICAO work to be listed as Reference 2.

Several changes to the text to clarify and/or strengthen the case were proposed. These are listed on the "Master Copy" marked up at the meeting.

TPP-008: A proposal was made that this TPP be put on hold pending the outcome of CAEP3 when proposals which could impact on this subject will be tabled by ATISG. An appropriate note to this effect should be added to Section 2 of the Concept Paper. Action on Bob Wilson to discuss with Rob Howes and agree wording.

Agenda Item 5 - (cont.d)

TPP-009: This paper was accepted in principle but it was felt that the "Discussion" Section, Section 3 needed expanding to clarify the power setting concerns.

The point was made that if this paper could be amended quickly, it was still possible to get in on the Agenda for CAEP3. The best route would be via ICCAIA. Bob Wilson to discuss with Rob Howes the possibility of getting the paper amended quickly and whether to ask Mike Smith of ICCAIA to raise it at CAEP3. (An alternative ICCAIA approach could be via GAMA).

TPP-010: It was proposed that under "Applicable JAR", only the JAR 36 reference is needed and that the actual requirement should not be listed. This would be consistent with all other TPP's.

Under recommendation the words of JAR 36 should be used except for the differences between imperial and metric units.

The paper is "light" on data. Rob Howes has an Action (Action 27 from the Wichita Meeting) to provide more experimental data. This should be added to TPP-010.

TPP-011: It was proposed that this TPP be cancelled. It was pointed out at the meeting that there is a definition of "slow" and "fast" in JAR 36. Although the wording is different to that of FAR 36 it implies the same definition and therefore no harmonization is required. Bob Wilson to discuss with Rob Howes.

The JAR 36 (and equivalent ICAO Annex 16) references are:

JAR 36, Section 1, Appendix 3, 3 Noise Unit Definitions

JAR 36, Section 1, Appendix 3, 4.3 Sensing, Recording & Reproducing Equipment

ICAO Annex 16, Appendix 6, 3 and 4.3

A repercussion of cancelling TPP-011 is that Item 16 of Annex A and Table 1 of the Concept Paper also need deleting and the reference to TPP-011 and Item 16 deleted in Para 2.13.

Agenda Item 5 - (cont.d)

TPP-012: This needs amending to remove reference to Item 7 which TPP-012 says is covered by TPP-007. This is not the case, TPP-007 only addresses Items 4 and 5.

It is proposed that Item 7 be addressed by a new TPP, TPP-013. (It is believed harmonization is not required but this must be investigated to confirm. If harmonization is judged not to be necessary, then the words added as Section 2.4A will need to be added to the Concept Paper. (A proper section number with a re-shuffling of section numbers will be required.) **Action: Bob Wilson & Rob Howes**

On the assumption that the above changes (and the typographical corrections and minor errors marked up on the Master Copy at the meeting) are embodied, all committee members present approved the TPP's.

Agenda Item 5A - Review Actions of Wichita Meeting

The Action Items of the Wichita Meeting were reviewed. A few minor typographical errors were identified. Bob Wilson "marked up" a master copy for correction and inclusion in the next issue of the Concept Paper. **Action: Bob Wilson/Rob Howes**

A summary of the status of the Action Items is:

Action Item	Responsible	Status
27	Rob Howes	In work
28	John Bertholacci	TPP-010 issued. Action complete
29	Bob Wilson	Action complete
30	Ron Hund	TPP-007 issued. Action complete
31	Rob Howes	TPP-001 issued. Action complete
32	Bob Wilson	In work
33	Mehmet Marsan	Outstanding
34	Rob Howes	In work
35	Ron Hund	TPP-011 - under review
36	Carlos Latoni	TPP-009 issued but needs revising
37	Rob Howes & Bob Wilson	TPP-006 issued. Action complete
38	Alain Depitre	Information issued. Action complete
39	Mehmet Marsan	In work. (Electronic copy of hand-book made available to Bob Wilson)

Agenda Item 5A - cont.d

Action Item	Responsible	Status
40	Rob Howes & Bob Wilson	Action on-going. (Initiated)
41	Alain Depitre & Rick Bowerman	Ongoing
42	Rob Howes & Bob Wilson	Action complete
43	Bob Wilson	Action complete
44	All	Action complete

Agenda Item 6 - Review Status of Harmonization Issues Requiring Change to ICAO Annex 16

Following a review of harmonization issues requiring a change to ICAO Annex 16, a summary situation was agreed. With reference to Table 1 of the Concept Paper.

Item 2, Weight Limit and Item 6, Meteorological Data: Recommendation for change, to align with FAR 36 will be submitted to ICAO CAEP3 at Montreal in December 1995.

Item 13 Power Variance; The JAA representatives suggested that this item be put on hold pending the outcome of CAEP3 when proposals will be tabled by the ATISG which may have an effect on this issue. Action on P Kearsey to advise on the situation post CAEP3.

Item 14, Power Definition: It was felt by the meeting that the "Discussion" section of TPP-009 needed expanding to clarify the reasoning. If this could be completed before the start of CAEP3 it should be possible to get a recommendation for change tabled at CAEP3, by ICCAIA.

Action: R Wilson to discuss updating TPP-009 with R Howes and C Latoni

Item 16, Sound Level Meter Settings. See comments on TPP-011 above. Not a harmonization issue.

Agenda Item 7 - Working Sessions to Agree Format & Content of Advisory Material

R Wilson to draw up proposal based on the FAA Handbook.

Agenda Item 8 - Agree programme to review appropriate parts of FAR 36 & JAR 36 to cross check all harmonization issues have been identified

It was the opinion of the meeting that all harmonization issues within the scope of the Group, had been covered. The outstanding item is the advisory material. (Action down to Bob Wilson) A concern raised, was how to ensure any future changes to either code, could be controlled to ensure on going harmonization. It was agreed that R Wilson and R Howes would discuss this with ARAC and the JAR 36 Study Group.

Agenda Item 9 - Review and agree committees work task timetable/programme & Agenda Item 10 - Agree next (final?) meeting

It was agreed that the majority of the Group's work was complete. Outstanding tasks fell mainly to the Co-Chairs.

A Revised completion timetable needed to be agreed in discussion with ARAC/FAA.
Action: Bob Wilson/Rob Howes

A provisional date for a final meeting (if required) was set for 19-20 March 1996

FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

14 - 15 November 1995
Frankfurt, Germany

Attachment 1: List of Attendees

Bob Wilson	Pilatus Britten-Norman Ltd
Peter Kearsey	CAA/JAA UK
Barry Mellers	Slingsby Aviation Ltd
Rick Bowerman	Hartzell Propeller
Frank Weiblen	MT Propeller
Dieter Pade	AOPA-Germany
Willem Franken	RLD The Netherlands/JAA
Alain Depitre	DGAC/JAA

FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

14 - 15 November 1995
Frankfurt, Germany

Attachment 2: Agenda for Light Propeller-Driven Aircraft, Harmonization Working Group Meeting, 14th & 15th November 1995, Frankfurt, Germany

1. Apologies for absence

2. Review and approve minutes of Wichita meeting

3. Confirm position of Industry Committee Members: Do they have authority to speak for their respective companies or only as individuals (written confirmation on Company headed note paper is required.)

* 4. Review and agree the concept paper prepared by Rob Howes and Bob Wilson, and presented to ARAC in October 1995.

5. Review and confirm committee support and agreement for all TPP's prepared to date.

5A Review actions of Wichita Meeting.

6. Review status of harmonization issues requiring a change to ICAO Annex 16.

7. Working sessions to agree format and content of advisory material.

8. Agree programme to review appropriate parts of FAR 36 and JAR 36 to cross check all harmonization issues have been identified.

9. Review and agree committees work task timetable/programme.

10. Agree next (final?) meeting.

* Note: Prior to the meeting a copy of the concept paper was circulated to all committee members. This included a complete set of TPP's (and previous meeting minutes).

FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

14 - 15 November 1995
Frankfurt, Germany

Attachment 3: Draft 3 of Concept Paper

Draft 3 of Concept Paper is still in work and will be despatched in due course

FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

14 - 15 November 1995
Frankfurt, Germany

Attachment 4: Action List

A summary of the outstanding actions from the Wichita Meeting and the new actions arising from the Frankfurt meeting is listed below. Those Action Items from the Wichita Meeting that have been completed are not listed hence the gaps in the numbering.

Outstanding Actions from the Wichita Meeting

27 Measure and prepare an experimental data set showing the variation of helical tip mach number vs dB(A). Co-ordinate with selected industry experts and attempt to define an analytical version of the measured data. Have data ready for presentation at the Frankfurt Meeting in September '95. Supersedes AI No. 18. **Action - Rob Howes**

32 Prepare a section for the committee's interpretative document outlining an interpretation of the requirements regarding temperature inversions from JAA. **Action - Bob Wilson**

33 Check with FAA in Washington to se if it makes any sense to exclude aerobatic aircraft from Appendix G requirements and possibly pick them up somewhere else. **Action - Mehmet Marsan**

34 Prepare a section for the committee's interpretative document outlining how altitude measurement and flight path verification are done using a camera. **Action - Rob Howes**

35 Prepare LDPA-TPP-011, SLM settings, to outline new wording for the JAR's that will specifically call out the SLM settings. **Action - Ron Hund**

36 Prepare LDPA-TPP-009, Power Definitions, so that power settings that are admissible are clearly defined in both sets of regulations. **Action - Carlos Latoni**

39 Add some clarification to the Appendix G Handbook, 14 CFR Part 36, to spell out where reference conditions are measured, eg. On the ground or at altitude. Make the revised wording available to Bob Wilson. Make an electronic copy of handbook available. **Action - Mehmet Marsan**

40 Contact GAMA and discuss whether any involvement in the International Co-ordinating Council of Aerospace Industries Association (ICCAIA) to promote the interests of General Aviation would be appropriate. **Action - Bob Wilson/Rob Howes**

Appendix D: Membership List

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

Working Group Membership List

John Bertolacci
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Slingsby Aviation Ltd
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Dieter Pade, AOPA
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49 6103 42083 Fax

Frank Weiblen
MT Propeller
Germany
49 94 29 8433 Tel
49 94 29 8432 Fax

Bob Wilson, European Co-Chair
Pilatus Britten-Norman
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Mehmet Marsan (FAA Representative)
Office of Environment and Energy
Research and Engineering Branch
Washington, DC
202-267-7703 Tel
202-267-5594 Fax

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

Appendix E: Co-ordination Documents

FAX

To: Mr P R Kearsey - Guest

Company/Organisation: Marriott Hotel

Location: Long Beach

FAX NUMBER: 0101 310 425 2744 **Date:** 10.3.95

From: R Wilson **Page:** 1 of 5

PILATUS
BRITTEN-NORMAN
AIRCRAFT MANUFACTURERS
Bembridge, Isle of Wight
England PO35 5PR
Tel: 01983-872511
Telex: 86277/86866
Fax: 01983-873246

FAR/JAR Harmonization Working Group
Propeller-Driven Small Airplanes

Dear Peter

Please find attached the paper on Harmonization of Maximum Weight which you kindly agreed to present at the ATISG. If you have any queries or want any changes give me a call either at home or in the office.

In the event that you don't have my home number it is: 983 613145

Regards

Bob.

R Wilson
Technical Director

Appendix F: Glossary of Abbreviations & Acronyms

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

AC	Advisory Circular
ACJ	Advisory Circular Joint
AD	Airworthiness Directive
AECMA	Association Europeene des Constructeurs de Material Aerospatial
AI	Action Item
AMJ	Advisory Material Joint
ANCAT	Abatement of Nuisances caused by Civil Air Transport
AOPA	Aircraft Owners & Pilots Association
ARAC	Aviation Rulemaking Advisory Committee
ARP	Aerospace Recommended Practice
ATISG	Aircraft Technical Information Sub Group
CAA	Civil Aviation Authority
CAEP	Committee on Aviation Environmental Protection
CFR	Code of Federal Regulation (US)
DGAC	Direction Generale de L'Aviation Civile
FAA	Federal Aviation Administration (US Airworthiness Body)
FAR	Federal Aviation Requirements (now CFR)
GA	General Aviation
GAMA	General Aviation Manufacturers Association (US)
GAMTA	General Aviation Manufacturers & Traders Association (UK)
HWG	Harmonization Working Group
ICAO	International Civil Aviation Organisation

ICCAIA	International Co-ordinating Council of Aerospace Industries Association
IEC	International Electrotechnical Commission
JAA	Joint Aviation Authority (European Airworthiness Authority comprising 23 member states)
JAR	Joint Aviation Requirements. (Each part of the JAR's has a numeric suffix identical to that used for FAR's)
LPDA	Light Propeller Driven Aircraft
NPA	Notice of Proposed Amendment
NPRM	Notice of Proposed Rulemaking
RLD	Rijksluchtvaartdienst
SAE	Society of Automotive Engineers
SLM	Sound Level Meter
STNA	Service Technique de la Navigation Aerienne
TOR	Terms of Reference
TPP	Technical Position Paper

FAA Action

FAA Action – NPRM FAA-2000-7958

Federal Register

Friday,
August 5, 2005

Part IV

Department of Transportation

Federal Aviation Administration

14 CFR Part 36

Harmonization of Noise Certification Standards for Propeller-Driven Small Airplanes; Final Rule

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 36

[Docket No.: FAA–2003–15279; Amendment No. 36–27]

RIN 2120–AI25

Harmonization of Noise Certification Standards for Propeller-Driven Small Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This final rule amends FAA regulations regarding airplane noise certification standards. These changes are necessary to harmonize two technical items with international standards and provide uniform noise certification standards for airplanes certificated in the United States and Joint Aviation Authorities (JAA) countries. This amendment will simplify airworthiness approvals for import and export purposes. We anticipate that the changes to these two items will apply only to a small number of older-technology airplanes.

DATES: This amendment becomes effective September 6, 2005.

FOR FURTHER INFORMATION CONTACT: Mehmet Marsan, Office of Environment and Energy, AEE–100, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591; telephone (202) 267–7703; facsimile (202) 267–5594, e-mail *mehmet.marsan@faa.gov.*

SUPPLEMENTARY INFORMATION:

Availability of Rulemaking Documents

You can get an electronic copy using the Internet by:

(1) Searching the Department of Transportation's electronic Docket Management System (DMS) web page (*http://dms.dot.gov/search*);

(2) Visiting the FAA's web page at *http://www.faa.gov;* or

(3) Accessing the Government Printing Office's web page at *http://www.access.gpo.gov/su_docs/aces/aces140.html.*

You can also get a copy by sending a request to the Federal Aviation Administration, Office of Rulemaking, ARM–1, 800 Independence Avenue SW., Washington, DC 20591, or by calling (202) 267–9680. Make sure to identify the amendment number or docket number of this rulemaking.

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477–78) or you may visit *http://dms.dot.gov.*

Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. If you are a small entity and you have a question regarding this document, you may contact your local FAA official, or the person listed under **FOR FURTHER INFORMATION CONTACT.** You can find out more about SBREFA on the Internet at *http://www.faa.gov/avr/arm/sbrefa.cfm.*

Authority for This Rulemaking

The FAA's authority to issue rules regarding aviation safety is found in Title 49 of the United States Code. Subtitle I, Section 106 describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the agency's authority.

This rulemaking is promulgated under the authority described in Subtitle VII, Part A, Air Commerce and Safety, Section 44715, Controlling aircraft noise and sonic boom. Under that section, the Administrator of the FAA is charged with prescribing standards to measure aircraft noise and sonic boom and prescribing the regulations to control and abate aircraft noise and sonic boom. This regulation is within the scope of that authority because Title 14 part 36 of the Code of Federal Regulations (CFR) contains the FAA's noise standards and regulations that apply to the issuance of type certificates for all types of aircraft.

Background

This final rule completes the FAA's efforts to harmonize the regulations of 14 CFR Part 36 Appendix G, with International Civil Aviation Organization (ICAO) Annex 16, Volume I, Chapter 10, regarding propeller-driven small airplane noise certification. The FAA proposed these changes in the notice of proposed rulemaking (NPRM), ''Harmonization of Noise Certification Standards for Propeller-Driven Small Airplanes'' (68 FR 34256), published on June 6, 2003. In the NPRM, you will find a discussion of the current requirements and why they do not adequately address the noise certification standards for airplanes in keeping with U.S. obligations under the Convention on International Civil Aviation. In the NPRM, we also refer to the studies and reports we relied on in developing the proposed rule, and discuss each alternative that we considered and the reasons for rejecting the ones we did not propose.

The background material in the NPRM also contains the basis and rationale for these requirements and, except where we have specifically expanded on the background elsewhere in this preamble, supports this final rule. Discussions regarding the intent of the requirements may refer to the background in the NPRM without repeating it in this document.

History

Under 49 U.S.C. 44715, the Administrator of the FAA is directed to prescribe ''standards to measure aircraft noise and sonic boom; * * * and regulations to control and abate aircraft noise and sonic boom.'' On October 13, 1999, the FAA published a final rule (64 FR 55598) adopting noise certification standards for propeller-driven small airplanes. That rule, which harmonized the U.S. noise certification regulations with the European Joint Aviation Requirements (JAR) for propeller-driven small airplanes, resulted from a joint effort of the FAA, the JAA, and the Aviation Rulemaking Advisory Committee (ARAC). However, two technical items contained in Appendix G to Part 36 remained unharmonized with ICAO Annex 16, Volume I, Chapter 10. These two items were not harmonized at that time because the effect on exported older airplanes was not known. The two unharmonized items are as follows:

(1) Appendix G, section G34.111 allows the use of ''maximum continuous power'' during the second segment of the noise certification test flight path. Annex 16, Chapter 10, Section 10.5.2 defines ''power'' for the second segment as ''maximum power.'' Since ''maximum continuous power'' is typically lower than ''maximum power'' or ''takeoff power,'' as described in ICAO, this is considered unharmonized.

(2) Appendix G, section G36.201 specifies a simplified data correction procedure for fixed-pitch type propellers if the engine test power is within 5 percent of the reference power. However, ICAO Annex 16, Volume I, Chapter 10 does not have a corresponding simplified data correction procedure.

In keeping with U.S. obligations, it is the FAA's policy to comply with ICAO

Standards and Recommended Practices to the maximum extent practicable. The FAA is revising part 36 to make the requirements the same as the propeller-driven small airplane noise certification regulations of Annex 16, Volume I, Chapter 10. The Annex 16 version better represents the intent of the original noise certification standards, which was to certify propeller-driven small airplanes at takeoff power. This final rule completes the FAA's efforts to harmonize part 36 Appendix G and Annex 16.

Related Activity

The European Aviation Safety Agency (EASA) was established July 15, 2002, and assumed authority to conduct certification of aircraft, engines and parts on September 28, 2003. The EASA will eventually absorb all JAA functions and activities, including the JAA's rulemaking harmonization activities. Since this rulemaking action is a result of FAA/JAA harmonization efforts, we anticipate that it will be incorporated into the EASA's requirements as well.

Discussion of Comments

The FAA received comments from three commenters on the proposed rule. All three commenters oppose the adoption of this final rule. However, as discussed below, we made no changes to the rule based on these comments.

Comment: One commenter disagreed with the statement in the summary section of the NPRM that states that the revisions to these two unharmonized technical items would apply only to a small number of older-technology airplanes. The commenter states that the majority of the world's small airplanes are based in the United States, and believes that all of these airplanes are potential candidates for retrofit.

FAA reply: While the U.S. small airplane fleet is large, the FAA has no information to suggest that a significant number of airplanes are candidates for engine or propeller retrofits. The FAA believes the only airplanes that would be affected are those undergoing a voluntary retrofit that have time-limited engines; based on past experience this is a very small number. Further, among the airplanes that are retrofitted, compliance with this part 36 amendment would only be required if the retrofit results in an acoustical change. Section 21.93(b) defines acoustical change as any voluntary change in type design of an aircraft that may increase the noise level of an aircraft.

Comment: Two commenters state that it would be detrimental to the safe operation of airplanes if they cannot be noise certificated at engine power levels lower than takeoff power.

FAA reply: The FAA disagrees that it would be unsafe for airplanes to operate at an engine power level lower than takeoff power. The FAA believes the commenters fear losing the operational performance level between maximum continuous power and takeoff power, because they often operate in that range, but do noise certification at the maximum continuous power level. The FAA is not advocating operation at an unsafe power level, only that noise certification should not be conducted at a level consistently lower than the usual operating power. The rule is being changed to harmonize the standards and close this loophole, which does not exist under ICAO Annex 16. Operators will still have the option of maintaining takeoff power and rpm for as long as the airplane's airworthiness limitations permit, after which maximum continuous power and rpm must be maintained.

Comment: One commenter states that, in the background section of the NPRM, the FAA discussed the 14 CFR Part 36 amendments, but did not discuss any of the recent power testing changes made in ICAO Annex 16 Chapter 10. The commenter states that in June 2000, the JAA approved a small airplane of European design, manufacture, and certification, using a maximum-continuous power rating. This would mean that the European authorities were not complying with their own regulations at that time.

FAA reply: All JAA countries use ICAO Annex 16, Volume I as their environmental standard. Individual JAA member countries may file differences with ICAO from Volume I, and these differences are listed in Volume I. Germany was the only JAA member country that filed differences with the ICAO on defining power during testing. Our understanding is that Germany recently realized it would be the only country not harmonized on this standard and changed its rule to remove the difference with ICAO Annex 16. At present, there are no differences in defining power during testing.

Paperwork Reduction Act

Under the provisions of the Paperwork Reduction Act of 1995, there are no current or new requirements for information collection associated with this final rule.

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with ICAO Standards and Recommended Practices to the maximum extent practicable. The FAA has reviewed the corresponding ICAO Standards and Recommended Practices and has identified no differences with these regulations other than those directly addressed by the rule change.

Executive Order 12866 and DOT Regulatory Policies and Procedures

Proposed changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (19 U.S.C. 2531–2533) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, this Trade Act requires agencies to consider international standards and, where appropriate, that they be the basis for U.S. standards. Fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of $100 million or more annually (adjusted for inflation).

The Department of Transportation Order DOT 2100.5 prescribes policies and procedures for simplification, analysis, and review of regulations. If it is determined that the expected cost impact is so minimal that a rulemaking does not warrant a full evaluation, this order permits a statement to that effect along with the basis for that determination to be in the preamble. In this case, a full regulatory evaluation cost benefit evaluation need not be prepared. Such a determination has been made for this rule. The reasoning for that determination follows.

The FAA has determined that this rule will increase the harmonization of the U.S. Federal regulations with the ICAO Standards and Recommended Practices and will impose, at most, negligible costs. Because the costs and benefits of this action do not make it a ''significant regulatory action'' as defined in the Order, we have not prepared a ''regulatory impact analysis.'' Similarly, we have not prepared a full ''regulatory evaluation,'' which is the written cost/benefit analysis ordinarily

required for all rulemaking under the DOT Regulatory and Policies and Procedures. We do not need to do a full evaluation where the economic impact of a rule is minimal.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) establishes ''as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statues, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to the regulation.'' To achieve that principle, the RFA requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The RFA covers a wide-range of small entities, including small business, not-for-profit organizations and small governmental jurisdictions.

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 agency determines that it will, the agency must prepare a regulatory flexibility analysis as described in the RFA.

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 RFA provides that the head of the agency may so certify and a regulatory flexibility analysis is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

This final rule revises two technical items, which are the only remaining unharmonized items between part 36 Appendix G and the ICAO Annex 16, Volume I, Chapter 10, regarding the noise certification of small propeller-driven airplanes. Our assessment of this rulemaking indicates that its economic impact is minimal because these two items affect only airplanes with older-technology engines that are not required to undergo new noise certification, or are already noise certificated. Therefore, we certify that this action will not have a significant economic impact on a substantial number of small entities.

Trade Impact Assessment

The Trade Agreements Act of 1979 prohibits Federal agencies from establishing any standards or engaging in 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. The FAA has assessed the potential effect of this rulemaking and has determined that it will impose the same minimal costs on domestic and international entities and thus have a neutral trade impact.

Unfunded Mandates Assessment

The Unfunded Mandates Reform Act of 1995 (the Act) is intended, among other things, to curb the practice of imposing unfunded Federal mandates on State, local, and tribal governments. Title II of the Act requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in an expenditure of $100 million or more (adjusted annually for inflation) in any one year by State, local, and tribal governments, in the aggregate, or by the private sector; such a mandate is deemed to be a ''significant regulatory action.'' The FAA currently uses an inflation-adjusted value of $120.7 million in lieu of $100 million.

This final rule does not contain such a mandate. The requirements of Title II do not apply.

Executive Order 13132, Federalism

The FAA has analyzed this final rule under the principles and criteria of Executive Order 13132, Federalism. We have determined that this action will not have a substantial direct effect on the States, or the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government, and therefore does not have federalism implications.

Environmental Analysis

In accordance with FAA Order 1050.1E, the FAA has determined that this action is categorically excluded from environmental review under section 102(2)(c) of the National Environmental Policy Act (NEPA). This action is categorically excluded under FAA Order 1050.1E, Chapter 3, Paragraph 312f, which covers regulations ''excluding those which if implemented may cause a significant impact on the human environment.'' It qualifies for a categorical exclusion because no significant impacts to the environment are expected to result from its finalization or implementation and no extraordinary circumstances exist as prescribed under Chapter 3, paragraph 304 of Order 1050.1E.

Regulations That Significantly Affect Energy Supply, Distribution, or Use

The FAA has analyzed this rulemaking action under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). We have determined that it is not a ''significant energy action'' under the executive order because it is not a ''significant regulatory action'' under Executive Order 12866, and it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

List of Subjects in 14 CFR Part 36

Aircraft, Noise control.

The Amendment

■ In consideration of the foregoing, the Federal Aviation Administration amends Chapter I of Title 14, Code of Federal Regulations as follows:

PART 36—NOISE STANDARDS: AIRCRAFT TYPE AND AIRWORTHINESS CERTIFICATION

■ 1. The authority citation for part 36 continues to read as follows:

Authority: 42 U.S.C. 4321 *et seq.* 49 U.S.C. 106(g), 40113, 44701–44702, 44704, 44715, sec. 305, Pub. L. 96–193, 94 Stat. 50, 57; E.O. 11514, 35 FR 4247, 3 CFR, 1966–1970 Comp., p. 902.

■ 2. Amend Appendix G to part 36 by revising section G36.111(c)(2)(iv) to read as follows:

Appendix G to Part 36—Takeoff Noise Requirements for Propeller-Driven Small Airplane and Propeller-Driven, Commuter Category Airplane Certification Tests on or After December 22, 1988

Sec. G36.111 Flight Procedures

* * * * *

(c) * * *

(2) * * *

(iv) For airplanes equipped with fixed pitch propellers, takeoff power must be maintained throughout the second segment. For airplanes equipped with variable pitch or constant speed propellers, takeoff power and rpm must be maintained throughout the second segment. If airworthiness limitations do not allow the application of takeoff power and rpm up to the reference point, then takeoff power and rpm must be maintained for as long as is permitted by such limitations; thereafter, maximum continuous power and rpm must be maintained. Maximum time allowed at takeoff power under the airworthiness standards must be used in the second segment. The reference height must be calculated assuming climb gradients appropriate to each power setting used.

■ 3. Amend Appendix G to part 36 by revising section G36.201(c) to read as follows:

* * * * *

(c) No corrections for helical tip Mach number variation need to be made if the propeller helical tip Mach number is:

(1) At or below 0.70 and the test helical tip Mach number is within 0.014 of the reference helical tip Mach number.

(2) Above 0.70 and at or below 0.80 and the test helical tip Mach number is within 0.007 of the reference helical tip Mach number.

(3) Above 0.80 and the test helical tip Mach number is within 0.005 of the reference helical tip Mach number. For mechanical tachometers, if the helical tip Mach number is above 0.8 and the test helical tip Mach number is within 0.008 of the reference helical tip Mach number.

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Issued in Washington, DC, on July 28, 2005.

Marion C. Blakey,

Administrator.

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