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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2001-9636; Amendment No. 25-109]

RIN 2120-AH26

Airspeed Indicating System Requirements for Transport Category Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This action amends the airworthiness standards for transport category airplanes concerning the airspeed indicating system. It adds airspeed indication requirements for speeds greater than and less than the speed range for which airspeed indication accuracy requirements currently apply; a requirement that airspeed indications not cause the pilot undue difficulty between the initiation of rotation and the achievement of a steady climbing condition during takeoff; and a requirement to limit the effects of airspeed lag. This amendment eliminates regulatory differences between the airworthiness standards of the U.S. and the Joint Aviation Requirements of Europe, without affecting current industry design practices.

DATE: Effective [Insert date 30 days after date of publication in the Federal Register.] January 13, 2003

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SUPPLEMENTARY INFORMATION:

Availability of Rulemaking Documents

You can get an electronic copy using the Internet by taking the following steps:

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

(2) On the search page type in the last four digits of the Docket number shown at the beginning of this document. Click on "search."

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You can also get an electronic copy using the Internet through the Office of Rulemaking's web page at http://www.faa.gov/avr/arm/nprm.cfm?nav=nprm or the Federal Register'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.

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. Any small entity that has a question regarding this document may contact their local FAA official, or the person listed under FOR FURTHER INFORMATION CONTACT. You can find out more

about SBREFA on the Internet at our site, http://www.gov/avr/arm/sbrefa.htm. For more information on SBREFA, e-mail us at 9-AWA-SBREFA@faa.gov.

BACKGROUND

What Are the Relevant Airworthiness Standards in the United States?

In the United States, Title 14, Code of Federal Regulations (CFR) part 25 contains the airworthiness standards for type certification of transport category airplanes. Manufacturers of transport category airplanes must show that each airplane they produce of a different type design complies with the appropriate part 25 standards. These standards apply to:

- airplanes manufactured within the U.S. for use by U.S.-registered operators, and
- airplanes manufactured in other countries and imported to the U.S. under a bilateral airworthiness agreement.

What Are the Relevant Airworthiness Standards in Europe?

In Europe, Joint Aviation Requirements (JAR)-25 contains the airworthiness standards for type certification of transport category airplanes. The Joint Aviation Authorities (JAA) of Europe developed these standards, which are based on part 25, to provide a common set of airworthiness standards within the European aviation community. Twenty-three European countries accept airplanes type certificated to the JAR-25 standards, including airplanes manufactured in the U.S. that are type certificated to JAR-25 standards for export to Europe.

What is "Harmonization" and How Did it Start?

Although part 25 and JAR-25 are similar, they are not identical in every respect. When airplanes are type certificated to both sets of standards, the differences between part 25 and JAR-25 can result in substantial added costs to manufacturers and operators. These added costs, however, often do not bring about an increase in safety. In many cases, part 25 and JAR-25 may contain different requirements to accomplish the same safety intent. Consequently, manufacturers are usually burdened with meeting the requirements of both sets of standards, without a corresponding increase in the level of safety.

Recognizing that a common set of standards would not only benefit the aviation industry economically, but also preserve the necessary high level of safety, the FAA and the JAA began an effort in 1988 to "harmonize" their respective aviation standards. The goal of the harmonization effort is to ensure that:

- where possible, standards do not require domestic and foreign parties to manufacture or operate to different standards for each country involved; and
- the standards adopted are mutually acceptable to the FAA and the foreign aviation authorities.

The FAA and JAA have identified many significant regulatory differences (SRD) between the wording of part 25 and JAR-25. Both the FAA and the JAA consider "harmonization" of the two sets of standards a high priority.

What is ARAC and What Role Does it Play in Harmonization?

After beginning the first steps towards harmonization, the FAA and JAA soon realized that traditional methods of rulemaking and accommodating different administrative procedures was neither sufficient nor adequate to make noticeable progress towards fulfilling the harmonization goal. The FAA then identified the Aviation Rulemaking Advisory Committee (ARAC) as an ideal vehicle for helping to resolve harmonization issues, and, in 1992, the FAA tasked ARAC to undertake the entire harmonization effort.

The FAA had formally established ARAC in 1991 (56 FR 2190, January 22, 1991), to provide advice and recommendations on the full range of the FAA's safety-related rulemaking activity. The FAA sought this advice to develop better rules in less overall time and using fewer FAA resources than previously needed. The committee provides the FAA firsthand information and insight from interested parties on potential new rules or revisions of existing rules.

There are 74 member organizations on the committee representing a wide range of interests within the aviation community. Meetings of the committee are open to the public, except as authorized by section 10(d) of the Federal Advisory Committee Act.

The ARAC sets up working groups to develop recommendations for resolving specific airworthiness issues. Tasks assigned to working groups are published in the Federal Register. Although working group meetings are not generally open to the public, the FAA invites participation in working groups from interested members of the public who have knowledge or experience in the task areas. Working groups report directly to

the ARAC, and the ARAC must accept a working group proposal before ARAC presents the proposal to the FAA as an advisory committee recommendation.

The activities of the ARAC will not, however, circumvent the public rulemaking procedures; nor is the FAA limited to the rule language "recommended" by ARAC. If the FAA accepts an ARAC recommendation, the agency continues with the normal public rulemaking procedures. Any ARAC participation in a rulemaking package is fully disclosed in the public docket.

What Did the FAA Propose?

In Notice No. 01-05, the FAA proposed to revise § 25.1323 to add the additional airspeed system indication requirements of JAR 25.1323(c)(2), (3) and (4) (66 FR 26948, May 15, 2001).

JAR 25.1323(c)(2) and (c)(3), which the FAA proposed to adopt as a new §§ 25.1323(d) and (e), respectively, require the indicated airspeed to change perceptibly and in the same sense in certain speed regimes. The speed regimes where this requirement applies are the low speed regime from the stall warning speed to 1.3 V_S, and in the high speed regime from V_{MO} to $V_{MO} + 2/3(V_{DF}-V_{MO})$. At speeds below the stall warning speed and speeds above $V_{MO} + 2/3(V_{DF}-V_{MO})$, the indicated airspeed must not change in an incorrect sense. In other words, the indicated airspeed must not show a decrease in airspeed when the calibrated airspeed is increasing.

JAR 25.1322(c)(4), which the FAA proposed to adopt as a new § 25.1323(f), states that between the initiation of rotation and the achievement of a steady climbing condition during takeoff, there must not be an airspeed indication that would cause the pilot undue difficulty. The FAA considers an airspeed indication that would affect the

average pilot's ability to maintain the intended takeoff flight path and takeoff speed profile as an airspeed indication that would cause undue difficulty. An example of such an airspeed indication would be a significant pause or variation in the rate of change in airspeed caused by the diminishing effect of the ground on the airflow pattern around the airplane as the airplane climbs away after takeoff.

In addition, a new requirement was proposed concerning airspeed lag. With the advent of electronic instruments in the cockpit, the pneumatic signals from the pitot and static sources are processed and digitized in the Air Data Computer (ADC) and then filtered and transported to the cockpit display. Data processing and filtering cause a time lag in displaying the airspeed on the cockpit display. This can be an important consideration in the airspeed indicating system calibration during ground acceleration. As stated in § 25.1323(b), the calibration for an accelerated takeoff ground run must determine the "system error," which is the relation between indicated and calibrated airspeeds. The system error is the sum of the pneumatic lag in the pressure lines, airspeed lag due to time lags in processing the data, and static source position error.

Airspeed lag, which results in airspeed indication errors when the airspeed is changing, can be a safety issue during takeoff, because the airspeed is changing rapidly. Airspeed lag may result in the pilot rotating the airplane for takeoff at a speed higher than the scheduled rotation speed, resulting in an increased takeoff distance. For an aborted takeoff, airspeed lag may result in the pilot initiating the abort at a speed higher than that used in determining the accelerate-stop distance. A new § 25.1323(g) was proposed to ensure that the effect of airspeed indicating system lag would not introduce significant indicated airspeed bias during takeoff or significant errors in takeoff or accelerate-stop

distances. In general, an airspeed indication error of 3 knots or an error of 100 feet in the takeoff or accelerate-stop distances would be considered significant under § 25.1323(g).

The FAA considers adding these requirements to part 25 necessary to harmonize part 25 with JAR-25 to ensure correct indication of changes in airspeed, and to codify current FAA policy. The JAA intends to revise JAR-25 in accordance with the harmonization goal. The JAA distributed Notice of Proposed Amendment (NPA) 25F-324, "Airspeed Indicating System," for comment on January 1, 2002. The NPA proposals are expected to be included in Change 16 to JAR-25, anticipated to be published on March 1, 2003.

Adoption of this amendment is intended to benefit the public interest by standardizing the requirements, concepts, and procedures contained in the U.S. and European airworthiness standards without reducing, but potentially enhancing, the current level of safety.

What is the Effect of the Revised Standard Relative to the Current Regulations?

The revised standard increases the level of safety relative to 14 CFR part 25 by incorporating the additional JAR requirements. The additional requirement regarding airspeed lag codifies current FAA policy.

What is the Effect of the Revised Standard Relative to Current Industry Practice?

Since industry practice is to comply with both the FAR and the JAR, the revised standard neither adds any new or different objective to the current regulations, nor does it change the way that any current certification practice is applied. Instead, the intent of the new paragraphs is to clarify and codify the way that the FAA and JAA have traditionally applied the related rules.

What Other Options Were Considered and Why Were They Not Selected?

Various options regarding the split between rule and advisory material were discussed. The FAA considers the option chosen to best achieve the safety objective while ensuring flexibility in the means of compliance. The other options that were discussed are described below, along with the reasons for not selecting them.

The ARAC working group considered incorporating the JAR Advisory Material-Joint (ACJ) 25.1323(c)(2) and (c)(3) for the proposed speed requirements into the rule. The working group decided that adopting the JAR ACJ as the regulatory standard would be too prescriptive and would preclude the use of other means of compliance that could be found acceptable. The FAA agrees with the working group's determination.

Another consideration was to include quantitative limits on the allowable level of airspeed bias and takeoff/accelerate-stop distance errors in the proposed airspeed lag requirement. The ARAC working group concluded, and the FAA agrees, that the "one size fits all" approach would not be appropriate because a specified speed bias may be a significant safety issue for one airplane type and not for another. Also, the FAA's ability to evaluate and approve alternative compliance approaches may be more difficult to consider if the standard consists of prescriptive, quantitative values.

Finally, the ARAC working group considered retaining the airspeed lag policy as policy only and not including it as a regulatory standard. The working group determined that this means of compliance did not have a specific regulatory standard against which it was applied. The FAA agrees with the working group's determination that a regulatory standard is necessary to assure that future certifications continue to consider airspeed lag issues.

Adopting this rule eliminates an identified SRD between the wording of part 25 and JAR-25, without affecting currently accepted industry design practices. The FAA expects more consistent interpretations of the rules and improved relations between regulatory authorities by eliminating this SRD.

Is Existing FAA Advisory Material Adequate?

The FAA plans to revise Advisory Circular (AC) 25-7A, "Flight Test Guide for Certification of Transport Category Airplanes," to identify an acceptable means of compliance with the JAR requirements that have been added to § 25.1323(c). The revision will add the means of compliance currently accepted by the JAA as one acceptable means of showing compliance with these requirements. The FAA plans to incorporate the changes in the next update of AC 25-7A.

AC 25-7A already contains adequate advisory material concerning the airspeed lag issue. Accordingly, no revision is required to the AC to address the airspeed lag issue.

What Comments Were Received in Response to the Proposal?

Two commenters responded to the request for comments in Notice No. 01-05. Both agree not only with the proposal, but also with the goal of harmonization to reduce the differences between part 25 and JAR-25. One of the commenters provided additional specific comments, as discussed below.

The commenter notes that the proposed rule harmonizes § 25.1323 at JAR-25 Change 14, Orange Paper 96/1, and states that in order for harmonization to be fully achieved, the rule should have been harmonized with Change 15.

The FAA agrees. As noted in the preamble of Notice No. 01-05, harmonization with JAR-25 Change 15 depended on separate FAA rulemaking that was underway at that time. The other rulemaking has now been completed, having been adopted as Amendment 108 to part 25. Therefore, the term "1.3 V_S" in § 25.1323(d) has been changed to "1.23 V_{SR}" in this final rule to conform to the reference stall speed basis adopted by Amendment 108. Similar speed references in § 25.1323(c) were revised accordingly by Amendment 108.

The commenter also points out that the preamble to Notice No. 01-05 contains an incorrect reference to a speed of "2/3 ($V_{DF} - V_{MO}$); this should be "V_{MO} + 2/3 ($V_{DF} - V_{MO}$)." The FAA concurs and the comment is duly noted.

What Regulatory Analyses and Assessments Has the FAA Conducted?

Executive Order 12866 and DOT Regulatory Policies and Procedures

Executive Order 12866, Regulatory Planning and Review, directs the FAA to assess both the costs and benefits of a regulatory change. We are not allowed to propose or adopt a regulation unless we make a reasoned determination that the benefits of the intended regulation justify its costs. Our assessment of this amendment indicates that its economic impact is minimal. Since its costs and benefits 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 "regulatory evaluation," which is the written cost/benefit analysis ordinarily required for all rulemaking proposals under the DOT Regulatory and Policies and Procedures. We do not need to do the latter analysis where the economic impact of a proposal is minimal.

Economic Evaluation, Regulatory Flexibility Determination, Trade Impact Assessment, and Unfunded Mandates Assessment

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs each Federal agency to 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. section 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 Agreements Act also requires agencies to consider international standards and, where appropriate, use them as the basis of U.S. standards. And fourth, the Unfunded Mandates Reform Act of 1995 (Public Law 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).

In conducting these analyses, FAA has determined that this rule:

- has benefits that do justify its costs, is not a "significant regulatory action" as defined in the Executive Order, and is not "significant" as defined in DOT's Regulatory Policies and Procedures;
- will not have a significant impact on a substantial number of small entities;
- reduces barriers to international trade; and

- does not impose an unfunded mandate on state, local, or tribal governments, or on the private sector.

The DOT Order 2100.5, "Regulatory Policies and Procedures," prescribes policies and procedures for simplification, analysis, and review of regulations. If it is determined that the expected impact is so minimal that the rule does not warrant a full evaluation, a statement to that effect and the basis for it is included in the regulation. We provide the basis for this minimal impact determination below. We received no comments that conflicted with the economic assessment of minimal impact published in the notice of proposed rulemaking for this action. Given the reasons presented below, and the fact that no comments were received to the contrary, we have determined that the expected impact of this rule is so minimal that the final rule does not warrant a full evaluation.

Currently, airplane manufacturers must satisfy both the 14 CFR and the European JAR standards to certificate transport category airplanes in both the United States and Europe. Meeting two sets of certification requirements raises the cost of developing a new transport category airplane, often with no increase in safety. In the interest of fostering international trade, lowering the cost of airplane development, and making the certification process more efficient, the FAA, JAA, and airplane manufacturers have been working to create, to the maximum possible extent, a single set of certification requirements accepted in both the United States and Europe. This final rule results from the FAA's acceptance of an ARAC harmonization working group's recommendation, including the group's determination that the requirements of this rule will not impose additional costs to U.S. manufacturers of part 25 airplanes.

Specifically, this rule revises the airspeed indicating requirements of § 25.1323 to: (1) add airspeed indication requirements for speeds greater than and less than the speed range for which airspeed indication accuracy requirements currently apply; (2) require that airspeed indications not cause the pilot undue difficulty between the initiation of rotation and the achievement of a steady climbing condition during takeoff; and (3) codify current FAA policy concerning airspeed lag. We consider that this rule will neither reduce nor increase the requirements beyond those that are already met by U.S. manufacturers to satisfy European airworthiness standards.

As this rule neither increases nor decreases certification requirements beyond those already in existence, we have determined there will be no additional cost associated with this rule to part 25 manufacturers. We have not tried to quantify the benefits of this amendment beyond identifying the expected harmonization benefit. This amendment eliminates an identified SRD between the wording of part 25 and JAR-25. The elimination of the SRD will provide for a more consistent interpretation of the rules and, thus, is an element of the potentially large cost savings of harmonization.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA), 5 U.S.C. 601–612, directs the FAA to fit regulatory requirements to the scale of the business, organizations, and governmental jurisdictions subject to the regulation. We are required to determine whether a proposed or final action will have a "significant economic impact on a substantial number of small entities" as defined in the Act.

If we find that the action will have a significant impact, we must do a "regulatory flexibility analysis." If we find, however, that the action will not have a significant

economic impact on a substantial number of small entities, we are not required to do the analysis. In this case, the Act requires that we include a statement that provides the factual basis for our determination.

We have determined that this amendment will not have a significant economic impact on a substantial number of small entities for two reasons:

First, the net effect of the proposed rule is minimum regulatory cost relief. The amendment requires that new transport category aircraft manufacturers meet just the "more stringent" European certification requirement, rather than both the United States and European standards. Airplane manufacturers already meet or expect to meet this standard, as well as the existing part 25 requirement.

Second, all United States manufacturers of transport category airplanes exceed the Small Business Administration small entity criteria of 1,500 employees for aircraft manufacturers. Those U.S. manufacturers include:

- The Boeing Company,
- Cessna Aircraft Company,
- Gulfstream Aerospace,
- Learjet (owned by Bombardier Aerospace),
- Lockheed Martin Corporation,
- McDonnell Douglas (a wholly-owned subsidiary of The Boeing Company),
- Raytheon Aircraft, and
- Sabreliner Corporation.

No comments were received that differed with the assessment given in this section. Since this final rule is minimally cost-relieving and there are no small entity manufacturers of part 25 airplanes, the FAA Administrator certifies that this rule will not have a significant economic impact on a substantial number of small entities.

International Trade Impact Analysis

The Trade Agreement Act of 1979, 19 U.S.C. et seq., prohibits Federal agencies from engaging in any standards or related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards.

In accordance with that statute, we have assessed the potential effect of this final rule and have determined that it is consistent with the statute's requirements by using European international standards as the basis for U.S. standards.

Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act of 1995 (the Act), 2 U.S.C. 1531-1538, 1571, 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 a $100 million or more expenditure (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 considered to be a "significant regulatory action."

This final rule does not contain such a mandate; therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

What Other Assessments Has the FAA Conducted?

Executive Order 13132, Federalism

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

Paperwork Reduction Act

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), we have determined there are no 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 International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. We have determined there are no ICAO Standards and Recommended Practices that correspond to these regulations.

Environmental Analysis

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental impact

statement. In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(j), this rulemaking action qualifies for a categorical exclusion.

Energy Impact

The FAA has assessed the energy impact of this final rule in accordance with the Energy Policy and Conservation Act (EPCA), Public Law 94-163, as amended (42 U.S.C. 6362), and FAA Order 1053.1. We have determined that this final rule is not a major regulatory action under the provisions of the EPCA.

Regulations Affecting Intrastate Aviation in Alaska

Section 1205 of the FAA Reauthorization Act of 1996 (110 Stat. 3213) requires the Administrator, when modifying regulations in Title 14 of the CFR in a manner affecting intrastate aviation in Alaska, to consider the extent to which Alaska is not served by transportation modes other than aviation, and to establish such regulatory distinctions as he or she considers appropriate. Because this final rule would apply to the certification of future designs of transport category airplanes and their subsequent operation, it could affect intrastate aviation in Alaska. Because no comments were received regarding this regulation affecting intrastate aviation in Alaska, we will apply the rule in the same way that it is being applied nationally.

Plain Language

In response to the June 1, 1998, Presidential memorandum regarding the use of plain language, the FAA re-examined the writing style currently used in the development of regulations. The memorandum requires Federal agencies to communicate clearly with the public. We are interested in your comments on whether the style of this document is clear, and in any other suggestions you might have to improve the clarity of FAA

communications that affect you. You can get more information about the Presidential memorandum and the plain language initiative at http://www.plainlanguage.gov.

List of Subjects in 14 CFR Part 25:

Aircraft, Aviation safety, Reporting and recordkeeping requirements

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends part 25 of Title 14, Code of Federal Regulations, as follows:

PART 25 - AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

1. The authority citation for part 25 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701-44702, and 44704.

2. Amend § 25.1323 by redesignating paragraphs (d) through (f) as paragraphs (h) through (j), and adding new paragraphs (d) through (g) to read as follows:

§ 25.1323 Airspeed indicating system.

* * * * *

(d) From 1.23 V_{SR} to the speed at which stall warning begins, the IAS must change perceptibly with CAS and in the same sense, and at speeds below stall warning speed the IAS must not change in an incorrect sense.

(e) From V_{MO} to $V_{MO} + 2/3\ (V_{DF} - V_{MO})$, the IAS must change perceptibly with CAS and in the same sense, and at higher speeds up to V_{DF} the IAS must not change in an incorrect sense.

(f) There must be no indication of airspeed that would cause undue difficulty to the pilot during the takeoff between the initiation of rotation and the achievement of a steady climbing condition.

(g) The effects of airspeed indicating system lag may not introduce significant takeoff indicated airspeed bias, or significant errors in takeoff or accelerate-stop distances.

(h) Each system must be arranged, so far as practicable, to prevent malfunction or serious error due to the entry of moisture, dirt, or other substances.

(i) Each system must have a heated pitot tube or an equivalent means of preventing malfunction due to icing.

(j) Where duplicate airspeed indicators are required, their respective pitot tubes must be far enough apart to avoid damage to both tubes in a collision with a bird.

Issued in Renton, Washington, on December 3, 2002.

Ali Bahrami
Acting Manager
Transport Airplane Directorate
Aircraft Certification Service

Certified to be a True Copy
Bonnie Fritts
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