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**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

14 CFR Part 25

[Docket No. FAA-2001- 9633-1; Notice No. 01-03]

ED  
5/8/01

**RIN:** 2120- AH29

Electrical Cables

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

**ACTION:** Notice of proposed rulemaking.

**SUMMARY:** The Federal Aviation Administration proposes to amend the airworthiness standards for transport category airplanes concerning electrical cables. This proposal would harmonize part 25 and JAR-25 requirements concerning cable installations and clarify the cable design requirements ensuring that the designer considers the critical conditions, routings, and markings of a proper installation. Adopting this proposal would eliminate regulatory differences between the airworthiness standards of the U.S. and the Joint Aviation Requirements of Europe, without affecting current industry design practices.

**DATES:** Send your comments on or before [Insert date 60 days after date of publication in the Federal Register.]

**ADDRESSES:**

Address your comments to Dockets Management System, U.S. Department of Transportation Dockets, Room Plaza 401, 400 Seventh Street SW., Washington, DC 20590-0001. You must identify the docket number FAA-2001- 9633 at the beginning of your comments, and you should submit two copies of your comments. If you wish to receive confirmation that the FAA has received your comments, please include a

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self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. FAA-2001-9633." We will date-stamp the postcard and mail it back to you.

You also may submit comments electronically to the following Internet address:  
<http://dms.dot.gov>.

You may review the public docket containing comments to this proposed regulation at the Department of Transportation (DOT) Dockets Office, located on the plaza level of the Nassif Building at the above address. You may review the public docket in person at this address between 9:00 a.m. and 5:00 p.m., Monday through Friday, except Federal holidays. Also, you may review the public dockets on the Internet at <http://dms.dot.gov>.

**FOR FURTHER INFORMATION CONTACT:** Stephen Slotte, FAA, Airplane and Flight Crew Interface Branch, ANM-111, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, WA 98055-4056; telephone 425-227-2315 facsimile 425-227-1320, e-mail [steve.slotte@faa.gov](mailto:steve.slotte@faa.gov).

**SUPPLEMENTARY INFORMATION:**

**How Do I Submit Comments to this NPRM?**

Interested persons are invited to participate in the making of the proposed action by submitting such written data, views, or arguments, as they may desire. Comments relating to the environmental, energy, federalism, or economic impact that might result from adopting the proposals in this document are also invited. Substantive comments should be accompanied by cost estimates. Comments must identify the regulatory docket number and be submitted in duplicate to the DOT Rules Docket address specified above.

All comments received, as well as a report summarizing each substantive public contact with FAA personnel concerning this proposed rulemaking, will be filed in the docket. The docket is available for public inspection before and after the comment closing date.

We will consider all comments received on or before the closing date before taking action on this proposed rulemaking. Comments filed late will be considered as far as possible without incurring expense or delay. The proposals in this document may be changed in light of the comments received.

### **How Can I Obtain a Copy of this NPRM?**

You may download an electronic copy of this document using a modem and suitable communications software from the FAA regulations section of the Fedworld electronic bulletin board service (telephone: 703-321-3339); the Government Printing Office (GPO)'s electronic bulletin board service (telephone: 202-512-1661); or, if applicable, the FAA's Aviation Rulemaking Advisory Committee bulletin board service (telephone: 800-322-2722 or 202-267-5948).

Internet users may access recently published rulemaking documents at the FAA's web page at <http://www.faa.gov/avr/arm/nprm/nprm.htm> or the GPO's web page at <http://www.access.gpo.gov/nara>.

You may obtain a copy of this document by submitting 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. Communications must identify the docket number of this NPRM.

Any person interested in being placed on the mailing list for future rulemaking documents should request from the above office a copy of Advisory Circular 11-2A, "Notice of Proposed Rulemaking Distribution System," which describes the application procedure.

## **BACKGROUND**

### **What Are the Relevant Airworthiness Standards in the United States?**

In the United States, the airworthiness standards for type certification of transport category airplanes are contained in Title 14, Code of Federal Regulations (CFR) part 25. 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, the airworthiness standards for type certification of transport category airplanes are contained in Joint Aviation Requirements (JAR)-25, which are based on part 25. These were developed by the Joint Aviation Authorities (JAA) of Europe 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 very 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 additional costs to manufacturers and operators. These additional costs, however, frequently 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, although the level of safety is not increased correspondingly.

Recognizing that a common set of standards would not only benefit the aviation industry economically, but also maintain 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 a number of 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 initiating 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 appreciable progress towards fulfilling the goal of harmonization. The FAA then identified the Aviation Rulemaking Advisory Committee (ARAC) as an ideal vehicle for assisting in resolving 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 concerning 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 regarding potential new rules or revisions of existing rules.

There are 64 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 establishes 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 solicits participation in working groups from interested members of the public who possess 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 proceeds with the normal public rulemaking procedures. Any ARAC participation in a rulemaking package is fully disclosed in the public docket.

#### **What is the Status of the Harmonization Effort Today?**

Despite the work that ARAC has undertaken to address harmonization, there remain a large number of regulatory differences between part 25 and JAR-25. The current harmonization process is extremely costly and time-consuming for industry, the FAA, and the JAA. Industry has expressed a strong desire to conclude the harmonization program as quickly as possible to alleviate the drain on their resources and to finally establish one acceptable set of standards.

Recently, representatives of the aviation industry [including Aerospace Industries Association of America, Inc. (AIA), General Aviation Manufacturers Association (GAMA), and European Association of Aerospace Industries (AECMA)] proposed an accelerated process to reach harmonization.

#### **What is the “Fast Track Harmonization Program”?**

In light of a general agreement among the affected industries and authorities to expedite the harmonization program, the FAA and JAA in March 1999 agreed upon a method to achieve these goals. This method, which the FAA has titled “The Fast Track

Harmonization Program,” is aimed at expediting the rulemaking process for harmonizing not only the 42 standards that are currently tasked to ARAC for harmonization, but approximately 80 additional standards for part 25 airplanes.

The FAA initiated the Fast Track program on November 26, 1999 (64 FR 66522). This program involves grouping all of the standards needing harmonization into three categories:

**Category 1: Envelope** – For these standards, parallel part 25 and JAR-25 standards would be compared, and harmonization would be reached by accepting the more stringent of the two standards. Thus, the more stringent requirement of one standard would be “enveloped” into the other standard. In some cases, it may be necessary to incorporate parts of both the part 25 and JAR standard to achieve the final, more stringent standard. (This may necessitate that each authority revises its current standard to incorporate more stringent provisions of the other.)

**Category 2: Completed or near complete** – For these standards, ARAC has reached, or has nearly reached, technical agreement or consensus on the new wording of the proposed harmonized standards.

**Category 3: Harmonize** – For these standards, ARAC is not near technical agreement on harmonization, and the parallel part 25 and JAR-25 standards cannot be “enveloped” (as described under Category 1) for reasons of safety or unacceptability. A standard developed under Category 3 would be mutually acceptable to the FAA and JAA, with a consistent means of compliance.

Further details on the Fast Track Program can be found in the tasking statement (64 FR 66522, November 26, 1999) and the first NPRM published under this program, Fire Protection Requirements for Powerplant Installations on Transport Category Airplanes (65 FR 36978, June 12, 2000).

Under this program, the FAA provides ARAC with an opportunity to review, discuss, and comment on the FAA's draft NPRM. In the case of this rulemaking, ARAC suggested a number of editorial changes, which have been incorporated into this NPRM.

## **DISCUSSION OF THE PROPOSAL**

### **How Does This Proposed Regulation Relate to “Fast Track”?**

This proposed regulation results from the recommendations of ARAC submitted under the FAA's Fast Track Harmonization Program. In this notice, the FAA proposes to amend § 25.1353, concerning electrical cables.

### **What is the Underlying Safety Issue Addressed by the Current Standards?**

This requirement gives design requirements relating to the proper installation of aircraft electrical equipment, controls, wiring, cables, and storage batteries. The operation of any one unit or system of units must not affect the operations of any other electrical unit or system essential to the safe operation of the airplane.

### **What are the Current 14 CFR and JAR Standards?**

The current text of 14 CFR 25.1353 addresses the proper installation of electrical equipment, controls, wiring, cables, and storage batteries to prevent any hazardous effect on the airplane structure or essential systems.

There is no current text for 14 CFR 25.1353(d).

The current text of JAR-25.1353 contains an additional requirement in paragraph (d), which states:

*JAR 25.1353 Electrical equipment and installations*

*. . . (d) Electrical cables and cable installations must be designed and installed as follows:*

*(1) The electrical cables used must be compatible with the circuit protection devices required by JAR 25.1357, such that a fire or smoke hazard cannot be created under temporary or continuous fault conditions.*

*(2) Means of permanent identification must be provided for electrical cables, connectors and terminals.*

*(3) Electrical cables must be installed such that the risk of mechanical damage and/or damage caused by fluids, vapors, or sources of heat, is minimised.*

### **What are the Differences in the Standards and What Do Those Differences Result In?**

Section 25.1353(a), (b), (c) of part 25 does not address the aircraft installation design requirements of electrical cables. JAR 25.1353(d), however, provides very explicit aircraft installation design requirements for electrical cables.

### **What, If Any, Are the Differences in the Means of Compliance?**

Part 25 does not have a specific requirement for installation design requirements for electrical cables. However, installation designs approved under part 25 typically meet the JAR requirement. The JAR states specific requirements for cable installations that must be met. Installation designers, through experience, have adopted the practice of permanent identification, protection, and installation routing to minimize the risk of damage to electrical cables.

### **What Is the Proposed Action?**

The proposed action is to revise part 25 by adopting the text of JAR-25.1353(d) in its entirety. The proposed revision would specify a design action to be taken, and remove the possibility that a designer may not consider a critical installation design condition. It is in line with current best design practices.

### **How Does This Proposed Standard Address the Underlying Safety Issue?**

The new § 25.1353(d) would clarify the cable design requirements, in the same manner as the current JAR, by ensuring that the designer considers the critical conditions, routings, and markings of a proper installation.

**What is the Effect of the Proposed Standard Relative to the Current Regulations?**

The proposed standard is more stringent in that it adds a requirement that is not currently in § 25.1353. However, current industry practice is to comply with both standards.

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

The proposed standard would maintain the same level of safety since current industry practice is to comply with both standards.

**What Other Options Have Been Considered and Why Were They Not Selected?**

The FAA has not considered another option. The FAA considers the adoption of JAR 25.1353(d) in its entirety the most appropriate way to maintain the level of safety.

**Who Would Be Affected by the Proposed Change?**

The proposed standard is in line with current design practices and the effect of the change is considered to be minimal for aircraft operators, modification centers, service centers, and manufacturers.

**Is Existing FAA Advisory Material Adequate?**

There is no advisory material for either part 25 or the JAR. The FAA considers developing new advisory material to be unnecessary.

**What Regulatory Analyses and Assessments Has the FAA Conducted?**

**Regulatory Evaluation Summary**

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 effect 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 Act also requires the consideration of international standards and, where appropriate, that they be the basis of U.S. standards. And fourth, the Unfunded Mandates Reform Act of 1995 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, the FAA has determined that this proposal has benefits, but no substantial costs, and that it is not “a significant regulatory action” as defined in Executive Order 12866, nor “significant” as defined in DOT’s Regulatory Policies and Procedures. Further, this proposed rule would not have a significant economic impact on a substantial number of small entities, would reduce barriers to international trade, and would not impose an Unfunded Mandate on state, local, or tribal governments, or on the private sector.

The DOT Order 2100.5 prescribes policies and procedures for simplification, analysis, and review of regulations. If it is determined that the expected impact is so minimal that the proposed rule does not warrant a full evaluation, a statement to that effect and the basis for it is included in the proposed regulation. Accordingly, the FAA has determined that the expected impact of this proposed rule is so minimal that the proposed rule does not warrant a full evaluation. The FAA provides the basis for this minimal impact determination below.

Currently, airplane manufacturers must satisfy both part 25 and the European JAR-25 standards to certificate transport category aircraft 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 aircraft development, and making the certification process more efficient, the FAA, JAA, and aircraft 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. As explained in detail previously, these efforts are referred to as “harmonization.”

This proposal would harmonize § 25.1353 to the JAR by adopting JAR 25.1353(d) in its entirety. The JAR requirement states specific requirements for cable installations. This section clarifies the cable design requirements ensuring that the designer considers the critical conditions, routings, and markings of proper installations.

Industry practice is to use the JAR requirements for installation, and therefore, the addition of this language to part 25 will not add a burden to the manufacturers. Aircraft manufacturers currently use several approved standards or specifications to ensure that design and installation of electrical cables are in compliance with the JAR standards.

Standards used by the manufacturing industry, for example, are based on MIL-W-5088L or SAE ARP 5088 and FAA guidance material which includes AC 25-16 and AC 43.13-1B. These standards provide guidance for the design process from wire specification through the installation of wiring and wiring devices used in airplanes. (Wiring within that specification is defined as wires, cables, groups, harnesses and bundles, and their terminations, associated hardware, and support installed on aircraft.)

It is standard industry practice for aircraft and wiring manufacturers to test electrical cables before installation and the aircraft manufacturer also tests the electrical cables upon installation. Manufacturers are also using the JAR and § 25.1357 as a means

of ensuring that the electrical cables and wiring used are compatible with the circuit protection devices required by that regulation to prevent a fire or smoke hazard created under temporary or continuous fault conditions.

The FAA has concluded that, for the reasons previously discussed in the preamble, the adoption of these JAR requirements into 14 CFR part 25 is the most efficient way to harmonize these sections. Additionally, adopting this proposal would neither reduce nor increase the requirements beyond those that exist in the current FAA published regulations.

Thus, the FAA expects that there would be no additional costs to part 25 manufacturers, and the level of safety would be maintained. The FAA requests comments to the contrary, identifying additional testing, time, procedures, paperwork and cost estimates.

#### **Initial Regulatory Flexibility Determination**

The Regulatory Flexibility Act (RFA) of 1980, 50 U.S.C. 601-612, as amended, establishes “as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the sale of the business, organizations, and governmental jurisdictions subject to regulation.” To achieve that principle, the RFA requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions.

**Agencies must perform** a review to determine whether a proposed or final rule will **have a significant impact** on a substantial number of small entities. If the determination is that the rule 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.

The FAA considers that this proposed rule would not have a significant 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 proposed rule would require 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 14 CFR part 25 requirement.

Second, all U.S. transport-aircraft category manufacturers exceed the Small Business Administration small-entity criteria of 1,500 employees for aircraft manufacturers. The current U.S. part 25 airplane manufacturers include: Boeing, Cessna Aircraft, Gulfstream Aerospace, Learjet (owned by Bombardier), Lockheed Martin, McDonnell Douglas (a wholly-owned subsidiary of The Boeing Company), Raytheon Aircraft, and Sabreliner Corporation.

Given that this proposed rule is minimally cost-relieving and that there are no small entity manufacturers of part 25 airplanes, the FAA certifies that this proposed rule would not have a significant impact on a substantial number of small entities.

#### **International Trade Impact Assessment**

The Trade Agreement Act of 1979 prohibits Federal agencies from engaging in any standards or related activities that create unnecessary obstacles to the foreign

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

In accordance with the above statute and policy, the FAA has assessed the potential effect of the proposed rule and has determined that it supports the Administration's free trade policy because this rule would use European international standards as the basis for U.S. standards.

#### **Unfunded Mandates Reform Act**

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), codified in 2 U.S.C. 1532-1538, enacted as Public Law 104-4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100 million or more (adjusted annually for inflation) in any one year. This proposed rule does not contain a Federal intergovernmental or private sector mandate that exceeds \$100 million in any year; therefore, the requirements of the Act do not apply.

#### **What Other Assessments Has the FAA Conducted?**

##### **Executive Order 13132, Federalism**

The FAA has analyzed this proposed rule and the principles and criteria of Executive Order 13132, Federalism. The FAA has determined that this action would 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. Therefore, the FAA has determined that this notice of proposed rulemaking would not have federalism implications.

#### **Paperwork Reduction Act**

In accordance with the Paperwork Reduction Act of 1995 [44 U.S.C. 3507(d)], the FAA has determined there are no requirements for information collection associated with this proposed 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. The FAA determined that there are no ICAO Standards and Recommended Practices that correspond to this proposed regulation.

#### **Environmental Analysis**

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental assessment or environmental impact statement. In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(j), this rulemaking qualifies for a categorical exclusion.

#### **Energy Impact**

The energy impact of the proposed rule has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) and Public Law 94-163, as amended (43 U.S.C. 6362), and FAA Order 1053.1. It has been determined that it 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 proposed rule would apply to the certification of future designs of transport category airplanes and their subsequent operation, it could, if adopted, affect intrastate aviation in Alaska. The FAA, therefore, specifically requests comments on whether there is justification for applying the proposed rule differently to intrastate operations in Alaska.

### **Plain Language**

In response to the June 1, 1998, Presidential memorandum regarding the issue 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 communication 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 Proposed Amendment**

In consideration of the foregoing, the Federal Aviation Administration proposes to amend 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 § 25.1353 by adding paragraph (d) to read as follows:

§ 25.1353 Electrical equipment and installations.

\* \* \* \* \*

(d) Electrical cables and cable installations must be designed and installed as follows:

(1) The electrical cables used must be compatible with the circuit protection devices required by § 25.1357 of this part, such that a fire or smoke hazard cannot be created under temporary or continuous fault conditions.

(2) Means of permanent identification must be provided for electrical cables, connectors and terminals.

(3) Electrical cables must be installed such that the risk of mechanical damage and/or damage caused by fluids, vapors, or sources of heat, is minimized.

Issued in Renton, Washington, on May 3, 2001.



Lirio Liu Nelson  
Acting Manager  
Transport Airplane Directorate

Aircraft Certification Service