Federal Aviation Administration

FAR NPRM

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[Page 31830]

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
14 CFR Part 25
[Docket No. 24185; Notice No. 84-11]

Fire Protection Requirements for Cargo or Baggage Compartments

AGENCY: Federal Aviation Administration, DOT
ACTION: Notice of Proposed Rulemaking

SUMMARY: This notice proposes to upgrade the fire safety standards for cargo or baggage compartments in transport category airplanes by establishing new fire test criteria and by limiting the volume of Class D Compartments. These proposals are the result of research and fire testing and are intended to increase aircraft fire safety.

DATES: Comments must be received on or before October 8, 1984.
ADDRESS: Comments on this proposal may be mailed in duplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AGC-204), Docket No. 24185, 800 Independence Avenue SW., Washington, D.C. 20591, or delivered in duplicate to: Room 916, 800 Independence Avenue SW., Washington, D.C. 20591. Comments delivered must be marked: Docket No. 24185. Comments may be inspected in Room 916 weekdays, except Federal holidays, between 8:30 a.m. and 5:00 p.m. In addition, the FAA is maintaining an information docket of comments in the Office of the Regional Counsel (ANM-7), FAA, Northwest Mountain Region, 17900 Pacific Highway South, C-68966, Seattle, Washington 98168. Comments in the information docket may be inspected in the Office of the Regional Counsel weekdays, except Federal holidays, between 7:30 a.m. and 4:00 p.m.
FOR FURTHER INFORMATION CONTACT: Gary L. Killion, Manager, Regulations Branch (ANM-112), Regulations and Policy Office, Aircraft Certification Division, FAA, Northwest Mountain Region, 17900 Pacific Highway South, C-68966, Seattle, Washington 98168; telephone (206) 431-2112.
SUPPLEMENTARY INFORMATION:
Comments Invited

Interested persons are invited to participate in the proposed rulemaking by submitting such written data, views, or arguments as they may desire. Comments relating to the environmental, energy, or economic impact that might result from adoption of proposals contained in this notice are invited. Substantive comments should be accompanied by cost estimates. Commenters should identify the regulatory docket or notice number and submit comments in duplicate to the Rules Docket address specified above. All comments will be considered by the Administrator before taking action on the proposed rulemaking. The proposals contained in this notice may be changed in light of comments received. All comments will be available in the Rules Docket, both before and after the closing date for comments, for examination by interested persons. A report summarizing each substantive public contact with FAA personnel concerning this rulemaking will be filed in the docket. Commenters wishing the FAA to acknowledge receipt of their comments must submit with those comments a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 24185." The postcard will be date/time stamped and returned to the commenter.

Availability of NPRM

Any person may obtain a copy of this NPRM by submitting a request to the Federal Aviation Administration, Office of Public Affairs, Attention: Public Information Center, APA-430, 800 Independence Avenue SW., Washington, D.C. 20591, or by calling (202) 426-8058. Communications must identify the notice number of this NPRM. Persons interested in being placed on a mailing list for future NPRMs should also request a copy of Advisory Circular No. 11-2, Notice of Proposed Rulemaking Distribution System, which describes the application procedures.

Background

During the early post-World War II period, it was noted that adequate fire protection for cargo or baggage compartments included the factors of timely detection of the fire by a crewmember while at his station and prompt control of the fire when detected. Because the requirements for detection and extinguishment varied depending on the type and location of the compartment, a classification system was established. Three Classes were initially established and defined as follows:

Class A -- A compartment in which the presence of a fire would be easily discovered by a crewmember while at his station, all parts of which are easily accessible in flight. This is typically a small compartment used for crew luggage and located in the cockpit where a fire would be readily detected and extinguished by a crewmember. Due to the small size and location of the compartment, and the relatively brief time required to extinguish a fire, a liner is not needed to protect adjacent structure.

Class B -- A compartment with sufficient access in flight to enable a crewmember to effectively reach any part of the compartment with the contents of a hand fire extinguisher and that incorporates a separate, approved smoke or fire detection system to give warning at the pilot or flight engineer station. A Class B compartment is typically much larger than a Class A compartment and can be located in an area remote from the cockpit. Because of the larger size of the compartment and the greater time interval likely to occur before a fire would be controlled, a liner meeting the flame penetration standards of Section 25.855 and Appendix F of Part 25 must be provided to protect adjacent structure.

Class C -- As defined at the time of initial classification, any compartment that did not fall into either Class A or B was a Class C compartment. Class C compartments differ from Class B compartments primarily in that built-in extinguishment systems are provided for control of fires in lieu of crewmember accessibility. The volumes of Class C compartments in currently-used domestic jet transport airplanes range from 735 to 3,045 cubic feet.

Later, two additional classes were established and defined as follows:

Class D -- A compartment in which a fire would be completely contained without endangering the safety of the airplane or the occupants. A Class D compartment is similar to a Class C compartment in that both are located in areas that are not readily accessible to a crewmember. In lieu of providing fire detection and extinguishment, Class D compartments are designed to control a fire by severely restricting the supply of available oxygen. Because an oxygen-deprived fire might continue to smolder for the duration of the flight, the capability of the liner to resist flame penetration is especially important. The volumes of Class D compartments in currently used domestic jet transport airplanes range from 227 to 1,632 cubic feet.

Class E -- The main cargo compartment of an airplane used only for the carriage of cargo. Means must be provided to shut off the ventilating airflow to or within a Class E compartment. Like that of a Class D compartment, the capability of the liner to resist flame penetration is especially important.

Liner materials for Class B through E compartments are currently required to pass the forty-five degree test specified in Appendix F of Part 25. Flooring may serve as the bottom liner panel, provided the flooring material can also pass the forty-five degree tests.

No specific volume limits have been established for the various classes of compartments although, as noted above, Class A compartments have been envisioned as small, open compartments located in the cockpit area. In addition, the compartment volume and leakage rate are factors that must be considered in determining compliance with the objective requirements of Part 25 for Class D compartments.

Due to accessibility considerations, a compartment located below the main cabin must generally be either a Class C or D compartment. Cabin flooring utilized to protect adjacent structure from fire originating in a cargo or baggage compartment located above the floor cannot also serve as the lining for a compartment located below the floor.

Discussion

The FAA recently conducted a series of tests at its Technical Center to investigate the capability of three liner materials to resist flame penetration under conditions representative of actual cargo or baggage compartment fires. The tests were conducted using simulated Class C and D compartments. Although cargo or baggage is sometimes placed in compartments in pre-loaded containers, the tests were conducted with bulk-loaded unclaimed baggage because cargo or baggage is frequently bulk-loaded directly into the compartments in actual service. In conjunction with these tests, the FAA developed a method of testing liner materials utilizing a 2 gallons-per-hour kerosene burner. The materials tested -- fiberglass, Kevlar and Nomex -- comprise the primary liner materials currently used in domestic jet transport airplanes.

As a result of the tests, it was found that a fire could rapidly burn through Nomex or Kevlar under representative conditions. In addition to the fire hazards associated with the initial flame penetration, further suppression of the oxygen in the compartment would be hindered. This, in turn, could result in a fire of increased intensity. It was, therefore, concluded that improved standards are warranted for the sidewall and ceiling liner panels of all classes of cargo or baggage compartments that depend on liners for fire control. The new test methods proposed in this Notice, which are based on the test methodology developed at the FAA Technical Center, would provide such improved standards.

Considering probable flame path, the FAA has determined that it is not necessary for the materials used for bottom liner panels to meet the improved standards that would be required for other panels which might be exposed to direct flame impingement. Accordingly, bottom panel materials would only have to meet the forty-five degree test currently specified for all liner materials. Should any further testing or service experience indicate that improved standards are warranted for bottom liner panels, such standards would be proposed in a subsequent NPRM.

The tests conducted at the FAA Technical Center indicated that the intensity of a fire in a Class D compartment is dependent on compartment volume as well as the sum of compartment volume and the volume of leakage in a given period of time. In this regard, it was found that the intensity of a fire in a larger Class D compartment is much greater due to the total amount of oxygen available in compartments larger than approximately 1,000 cubic feet and beyond the capability of the liner to resist flame penetration. Accordingly, it is proposed in this Notice to limit the volume of a Class D compartment to a maximum of 1,000 cubic feet.

Economic Analysis and Regulatory Evaluation

I. Cost Benefit Analysis

A. Costs

The costs of the two rule changes proposed in this Notice would result primarily from the additional fuel consumed by the affected airplanes which, in turn, would result from the slight increases in airplane weight necessary to comply with the new standards. The airplanes that would be affected are those newly designed transport airplanes for which an application for type certificate is made on or after the effective date of the proposed rule changes. The precise number of airplanes that would be affected cannot be accurately predicted due to uncertainties in the number of future airplane designs and the number of airplanes of each design that will be produced. The costs of the proposed rule changes have therefore been estimated based on a cost comparison per airplane basis (unit basis) rather than a total cost impact basis.

According to data compiled recently by the National Aeronautics and Space Administration (NASA), each additional pound of weight added to a transport airplane would result in an average additional fuel consumption of about 0.006 gallon per airplane per hour. At an estimated fuel cost of $1.00 per gallon, each additional pound of weight added would therefore cost $0.006 per hour (or $15.00 per airplane per year based on an average yearly utilization of 2,500 hours).

Currently, fiberglass is the only material considered feasible for use as sidewall and ceiling panels of cargo or baggage compartments that is known to meet the more stringent flame penetration standards proposed in this Notice. This material is somewhat heavier than Kevlar or Nomex, the other two liner materials currently used in transport airplanes. According to data compiled by the FAA, Boeing achieved a weight savings of approximately 150 pounds in each Model 767 airplane by using Kevlar instead of fiberglass for the sidewall and ceiling panels. Because the Model 767 falls approximately in the middle of the size range of existing transport airplanes, the FAA has assumed for the purpose of this analysis that a typical affected transport airplane would incur an average weight penalty of approximately 150 pounds due to the need to use fiberglass liner materials in lieu of lighter alternatives, such as Kevlar or Nomex. This, of course, is based on the further assumption that no new light weight materials are developed which would meet the higher flame penetration standard; therefore, based on the assumed cost of $0.006 per pound of weight added, the weight penalty attributable to the more stringent flame penetration standards proposed in this Notice would cost approximately $0.90 per hour (or $2,250 per airplane per year).

Cargo or baggage compartments larger than 1,000 cubic feet in volume may currently be designed as Class C compartments with smoke or fire detection and fire extinguishment systems, or as Class D compartments. As proposed in this Notice, compartments of this size in affected airplanes would have to be designed as Class C compartments. The FAA estimates that an average weight penalty of 150 pounds per affected airplane would result from the installation of smoke or fire detection and extinguishment systems in the Class C compartments that, in the absence of this rule change, would have been designed as Class D compartments. Based on the assumed cost of $0.006 per pound per hour, the weight penalty attributable to this provision of the Notice would cost approximately $0.09 per hour per airplane per year (or a total additional cost of $1.80 per hour to comply with both provisions of this Notice). It must be noted, however, that relatively few existing transport airplanes have Class D compartments which are larger than 1,000 cubic feet in volume. The maximum volume of a Class D compartment ranges to as much as 1,003 cubic feet for the McDonnell Douglas DC-8; 1,585 cubic feet for the McDonnell Douglas DC-10; and 1,632 cubic feet for the Lockheed L-1011. There are currently no other airplanes in domestic use with Class D compartments that exceed 1,000 cubic feet in volume; therefore, assuming no major change in the size distribution of transport airplanes, a relatively small proportion of airplanes type certificated in the future is expected to be affected by the reduction in the maximum allowable volume of a Class D compartment to 1,000 cubic feet.

B. Benefits

The potential benefits of these proposals consist primarily of the avoided casualty costs which would have resulted from those aircraft fires which are expected to be prevented by the provisions of this Notice. Quantifying these benefits is somewhat difficult because most transport airplanes currently in service have liners constructed of fiberglass materials which meet the proposed higher standards and because relatively few have Class D compartments larger than 1,000 cubic feet in volume. (Test data suggest, however, that the hazard associated with Class D compartment that is larger and 1,000 cubic feet in volume is similar to that with liner materials which do not meet the proposed flame penetration standards.)

Of the three major transport airplane models currently in service with liner materials that do not meet the proposed flame penetration standards, only one has been in service for an extended period of time. This is the Lockheed Model L-1011 which uses Nomex as the liner material in its cargo and baggage compartments. The Model L-1011 has experienced one catastrophic fire, possibly related to the cargo compartment, in approximately 4.4 million total flight hours accumulated in worldwide operations since airplanes of this model entered service in 1972. (The specific origin or cause of this fire is the subject of considerable dispute. Indeed, litigation on the very issue is presently pending in the U.S. District Court for the Central District of California. For the limited purpose of this document, however, it will be assumed that the subject fire originated in the cargo compartment.) Using these assumptions, the limited service experience with the Model L-1011 suggests the possibility of a maximum rate of one catastrophic accident every 4.4 million hours for airplanes which do not comply with the proposals of this Notice. Using this rate (which is an extremely pessimistic assumption due to the limited data base from which it was derived), a newly type certificated airplane model with a production run of 1,000 airplanes and an average life of 60,000 hours per airplane (yielding a total exposure of 60 million flight hours for all airplanes produced under that type certificate), could be expected to experience a maximum of 13.6 cargo compartment fire accidents during its operational life.

A typical future accident might involve the loss of 100 persons and the airplane, resulting in total accident costs of $85 million. This is based upon a standard value of $850,000 per statistical fatality prevented (adjusted to 1983 dollars) as prescribed in Economic Values for Evaluation of Federal Aviation Administration Investment and Regulatory Programs, FAA Office of Aviation Policy and Plans, September 1981 (Report # FAA-APO-81-3), and an airplane value of $20 million. Airplanes which have recently received new type certificates sell for about $30 to $40 million each; therefore, $20 million is assumed to be a reasonable estimate for the price of a typical used airplane of the future. The cost of 13.6 cargo compartment fire accidents would be $1.2 billion, yielding an average of slightly more than $19 per hour over the 60 million total lifetime operating hours projected for all airplanes produced under one type certificate.

C. Comparison of Costs and Benefits

Using the typical $85 million accident scenario described above, less than one accident would have to be prevented during the 60 million hour service life of an affected airplane model for the average benefit to equal the average $0.90 per hour cost of the proposal to improve the flame resistance standards for liner materials. For those airplane models affected by the volume constraint on Class D cargo compartments, which would incur an additional cost of $0.90 per hour as a result of the weight of the detector and extinguisher systems, only 1.3 accidents would have to be prevented during the entire service life of the model for the average benefit to break even with the average cost of the proposal. This break-even accident rate, for an airplane model incurring the higher expected compliance costs, is still less than 10 percent of the 13.6 accidents which would be expected at the worst possible accident rate projected from the limited experience of an existing airplane model not in compliance with the proposals. It is reasonable to expect that in the absence of this rule change, an affected airplane model would experience between 1.3 and 13.6 major cargo compartment fire accidents (i.e., an accident rate somewhere between the relatively low break-even accident rate and the relatively high maximum accident rate) during the total operating experience of all airplanes produced under that type certificate, resulting in average costs which exceed the average cost (for all affected airplanes, including those affected by the volume constraint) of complying with this proposal. It is, therefore, expected that the changes associated with this rulemaking proposal would be cost-beneficial.

II. International Trade Impact Analysis

The proposal would have little or no impact on trade for both U.S. firms doing business in foreign countries and foreign firms doing business in the U.S. In the U.S., foreign manufacturers would have to meet U.S. requirements, and thus they would gain no competitive advantage. In foreign countries, foreign manufacturers could have some minor cost advantage if the foreign country did not require the improved design standards, but because the cost would be negligible compared to the new airplane cost there would be essentially no impact.

III. Regulatory Flexibility Act Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires agencies to review rules which may have a "significant economic impact on a substantial number of small entities."

The two Part 25 rule changes covered by the proposal would have no direct impact on small entities. FAA Order 2100.14, Regulatory Flexibility Criteria and Guidance (dated July 15, 1983), prescribes a standard for aircraft manufacturers which classifies a small entity as one with 75 or fewer employees. Only five firms in the U.S. (Boeing, Cessna, Gates Lear Jet, Lockheed and McDonnell Douglas) have manufactured large transport category airplanes and certificated them under Part 25 of the FAR. The smallest of the five manufacturers is Gates Lear Jet, with 6,500 employees. Thus, it is clear that those regulated today by Part 25 are large entities.

List of Subjects in 14 CFR Part 25

Air transportation, Aircraft, Aviation safety, Safety, Tires.

The Proposed Amendment

Accordingly, the FAA proposes to amend Part 25 of the Federal Aviation Regulations (FAR), 14 CFR Part 25, as follows:

PART 25 -- AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

1. By revising Section 25.855, paragraph (a-1), to read as follows:

Section 25.855 Cargo and baggage compartments.

* * * * *

(a-1) Class B through Class E cargo or baggage compartments, as defined in Section 25.857, must have a liner and the liner must be constructed of materials that meet at least the requirements set forth in Section 25.853(b), must be separate from (but may be attached to) the airplane structure, and must be tested as follows:

(1) Ceiling and sidewall panels must meet the test requirements of Part II of Appendix F of this Part or other approved equivalent methods.

(2) Bottom panels must be tested at a 45° angle in accordance with the applicable portions of Appendix F of this Part or other approved equivalent methods. In the course of the 45° angle test, the flame may not penetrate (pass through) the material during application of the flame or subsequent to its removal, the average flame time after removal of the flame source may not exceed 15 seconds, and the average glow time may not exceed 10 seconds.

* * * * *

2. By amending Section 25.857 by adding a new paragraph (d)(6) to read as follows:

Section 25.857 Cargo compartment classification.

* * * * *

(d) * * *

(6) The compartment volume does not exceed 1,000 cubic feet.

* * * * *

3. By amending Appendix F by revising the introductory paragraph designate it as Part I to read as follows:

Appendix F to Part 25

Part I. -- An Acceptable Test Procedure for Showing Compliance With Sections 25.853, 25.855, and 25.1359

* * * * *

4. By amending Appendix F by adding a new Part II to read as follows:
* * * * *
Part II. -- Test Method to Determine Flame Penetration Resistance of Cargo or Baggage Compartment Liners
(a) Criteria for Acceptance. (1) At least three sets of cargo or baggage compartment sidewall and ceiling panel specimens must be tested.
(2) Each specimen set tested must simulate the cargo or baggage compartment sidewall and ceiling panel for which the testing is performed.
(3) There must be no flame penetration of any specimen within 5 minutes after application of the flame source, and peak temperatures measured at 4 inches above the upper surface of a horizontal test sample must not exceed 400° F. The average flame time after removal of the flame source must not exceed 15 seconds, and the average glow time must not exceed 10 seconds.
(b) Summary of Method. This method provides a laboratory test procedure for measuring the capability of cargo or baggage compartment lining materials to resist flame penetration with a 2 gallon per hour kerosene burner fire source. A simulated cargo or baggage compartment sidewall and ceiling panel mock-up must be tested simultaneously (see Figure 1).
(c) Test Specimens. (1) The specimens to be tested must be two sections measuring 16 inches (406 mm) by 25 inches (635 mm).
(2) The specimens must be conditioned at 70° F, plus or minus 5° (21° C, plus or minus 2°) for at least 24 hours before testing.
(d) Test Apparatus. The arrangement of the test apparatus is shown in Figures 1 through 4 and must include the components described in this section. Minor details of the apparatus may vary, depending on the model of the burner used.
(1) Specimen Mounting Stand. The mounting stand for the test specimens consists of steel angles as shown in Figure 1.
(2) Test Burner. (i) The burner to be used in testing must--
(A) Be a modified gun type;
(B) Have an 80° spray angle nozzle nominally rated for 2.25 gallons per hour;
(C) Have a 12-inch (305 mm) burner extension installed at the end of the draft tube, with an opening 6 inches (152 mm) high and 12 inches (280 mm) wide, as shown in Figure 2; and
(D) Have a burner fuel pressure regulator that is adjusted to an operating gage pressure of 85 pounds per square inch for a 2.25 gallon per hour nominally rated 80° nozzle, delivering the 2.03 gallons per hour kerosene required for the test.
(ii) Burner models which have been used successfully in testing are the Lennox Model OB-32, Carlin Model 200 CRD, and Park Model DPL. The basic burner is described in FAA Powerplant Engineering Report No. 3A, Standard Fire Test Apparatus and Procedure for Flexible Hose Assemblies, dated March 1978; however, the test settings specified in this Appendix differ, in some instances from those specified in the report.
(3) Calorimeter. (i) The calorimeter to be used in testing must be a 0 to 15.0 Btu per Ft^2-sec. (0-17.0 Watts/cm^2) calorimeter mounted in a 6 by 12 inch (152 by 305 mm) by ¾ inch (19 mm) thick insulating block which is attached to a steel angle bracket for placement in the test stand during burner calibration, as shown in Figure 3.
(ii) Because crumbling of the insulating block with service can result in misalignment of the calorimeter, the calorimeter must be monitored and the mounting shimmed, as necessary, to ensure that the calorimeter face is in a plane parallel to the exit of the test burner cone.
(4) Thermocouples. The seven thermocouples to be used for testing must be 1/10-inch, ceramic sheathed, type K, grounded thermocouples with a nominal 30 American wire gage (AWG)-size conductor. The seven thermocouples must be attached to a steel angle bracket to form a thermocouple rake for placement in the test stand during burner calibration, as shown in Figure 4.
(5) Apparatus Arrangement. The test burner must be mounted on a suitable stand to position the exit of the burner cone a distance of 8 inches from the ceiling panel and 2 inches from the sidewall panel. The burner stand should have the capability of allowing the burner to be swung

away from the specimen set or otherwise allow burner warm-up, stabilization and calibration prior to application of flame to the specimen set.
(6) Instrumentation. A recording potentiometer or other suitable instrument with an appropriate range must be used to measure and record the outputs of the calorimeter and the thermocouples.
(7) Timing Device. A stopwatch or other device must be used to measure the time from application of the burner flame to flame penetration.
(e) Preparation of Apparatus. Before calibration, all equipment must be turned on and allowed to stabilize, and the burner fuel must be adjusted as specified in paragraph (d)(2).
(f) Calibration. To ensure the proper thermal output of the burner, the following test must be made:
(1) Place the thermocouple rake on the test stand as shown in Figure 4 at a distance of 8 inches (203 mm) from the exit of the burner cone to simulate the position of the test specimen set.
(2) Turn on the burner, allow it to run for 2 minutes for warmup, and adjust the burner air intake damper to produce a minimum temperature of 1700° F (927° C) on all thermocouples. Turn off the burner.
(3) Replace the thermocouple rake with the calorimeter (see Figure 3).
(4) Turn on the burner and ensure that the calorimeter is reading a minimum of 8.0 Btu per ft^2-sec. (9.12 $Watts/cm^2$). If the calorimeter does not read this, repeat steps in paragraphs (1) through (4) and adjust the burner air intake damper until the proper calorimeter reading is obtained.
(5) Turn off the burner and remove the calorimeter.
(g) Test procedure.
(1) Mount the thermocouple rake at a distance of 4 inches (102 mm) above the horizontal (ceiling) test specimen. The center thermocouple should be centered over the burner cone.
(2) Mount the test specimens on the test stand shown in Figure 1.
(3) When ready to begin the test, turn on the burner and allow it to stabilize. Simultaneously, rotate the burner to apply the flame to the specimens and start the timing device.
(4) Expose the test specimens to the flame for 5 minutes, or until flame penetration is observed and turn off the burner.
(5) Record peak temperature measured with a thermocouple rake.
(6) Record flame penetration or that no penetration has occurred.
(h) Test Report. The test report must include the following:
(1) A complete description of the materials tested including type, manufacturer, thickness or other appropriate dimensions, weight or density, etc.
(2) Observations of the behavior of the test specimens during test exposure, such as flame penetration, delamination of specimen, etc., including the time of such occurrence.
(3) The time for flame penetration, if any, for each of the three specimen sets tested (5 minutes or more for successful completion of the test).
(4) The peak temperature measured with the center thermocouple of the thermocouple rake for each of the three specimen sets tested.
(5) The average flame time after removal of the flame source and the average glow time.

(Secs. 313(a), 601 and 603 of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1354(a), 1421, and 1423); 49 U.S.C. 106(g) (Revised, Pub. L. 97-449, January 12, 1983); and 14 CFR 11.45.)

Note. -- For the reasons discussed earlier in the preamble, the FAA has determined that this regulation is not considered to be major under Executive Order 12291 or significant under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979); and it is further certified under the criteria of the Regulatory Flexibility Act that this rule will not have a significant economic effect on a substantial number of small entities, since none would be affected. A preliminary evaluation has been prepared for this regulation, has been placed in the docket, and is included, for the most part, in the preamble of this Notice in the section entitled "Economic Analysis and

Regulatory Evaluation." A copy of the complete evaluation may be obtained by contacting the person identified under the caption "FOR FURTHER INFORMATION CONTACT."

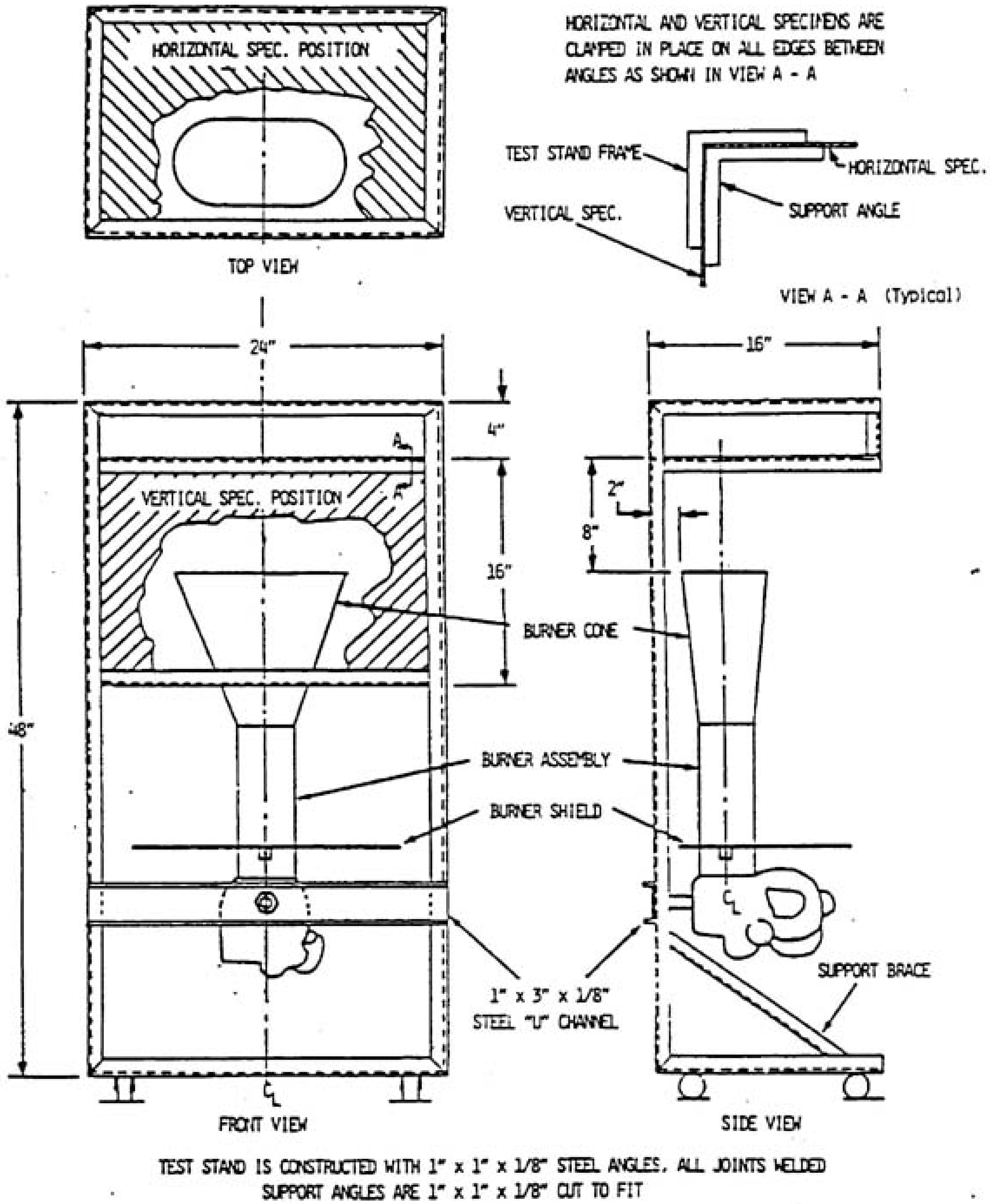

FIGURE 1. TEST APPARATUS FOR HORIZONTAL AND VERTICAL MOUNTING

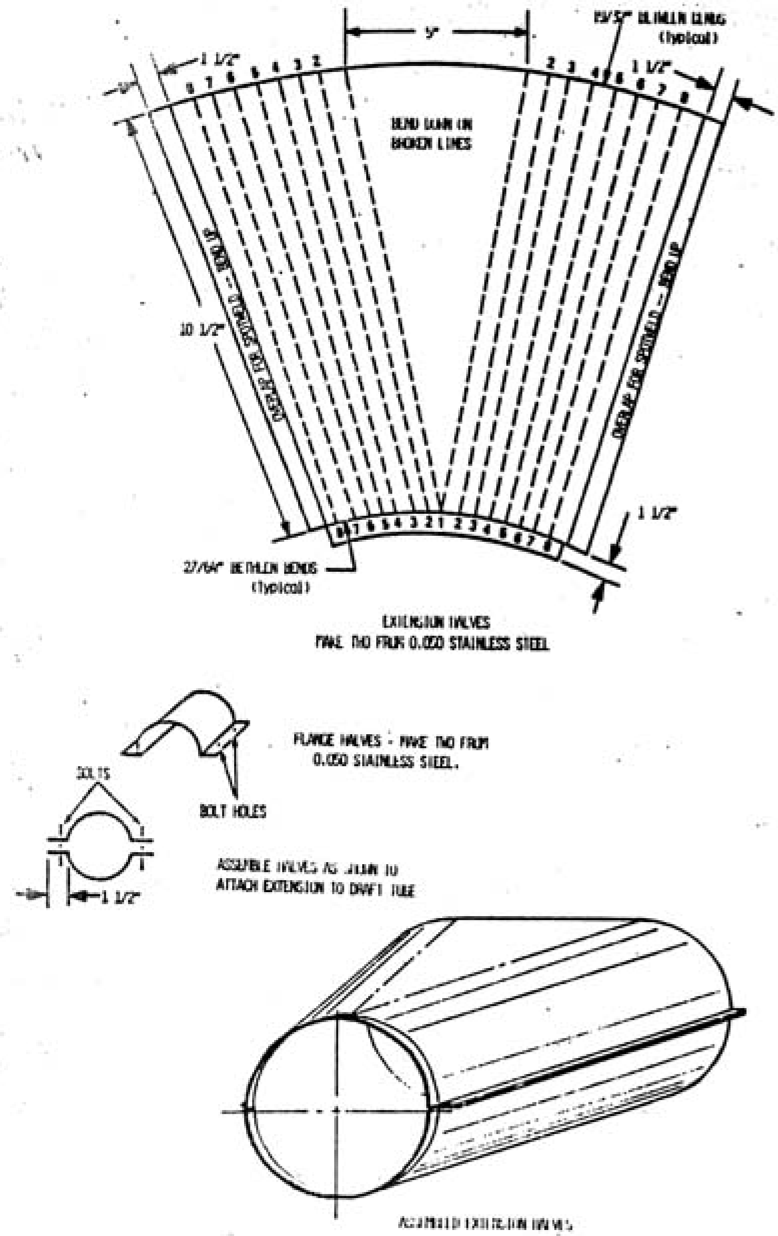

FIGURE 7. DRAFT TUBE EXTENSION

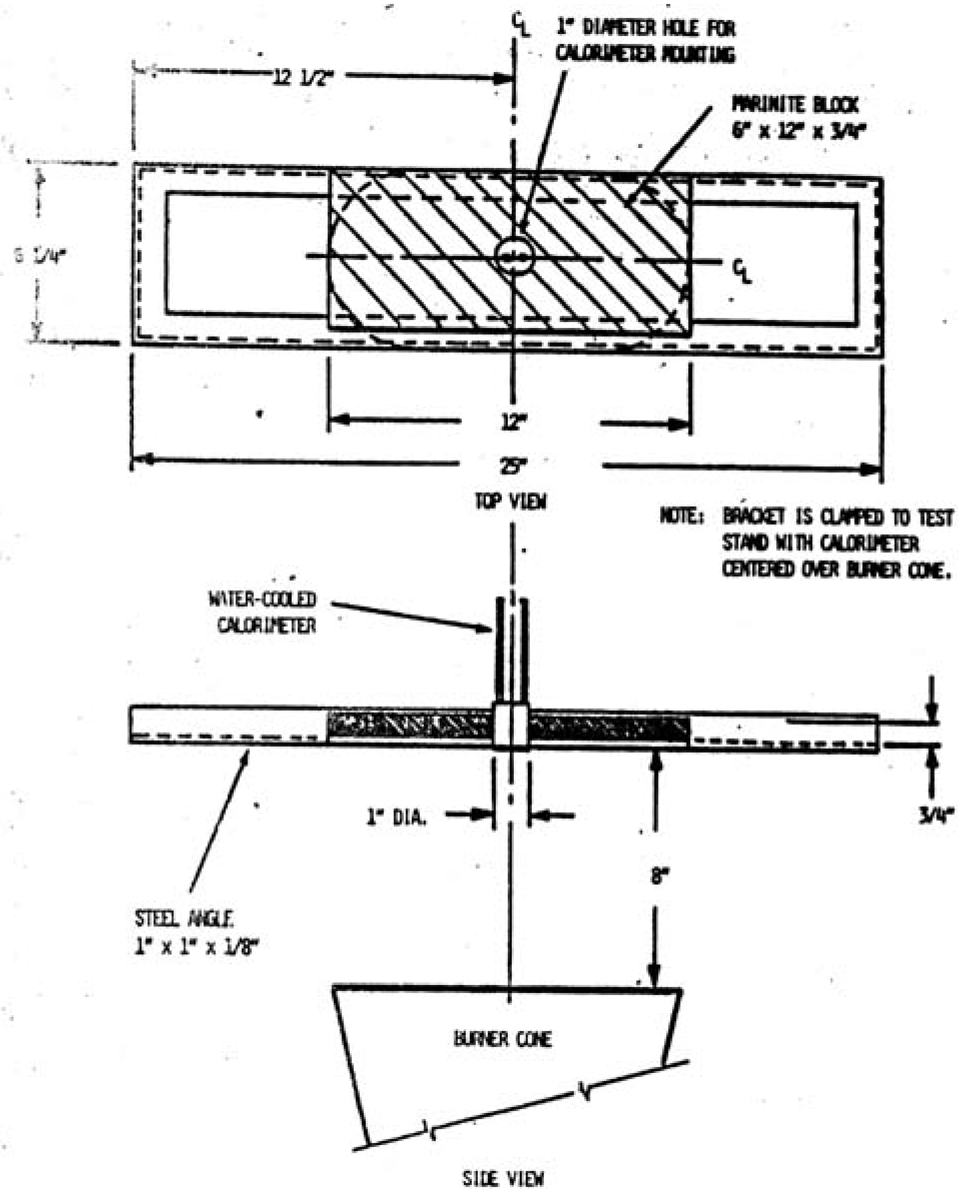

FIGURE 3. CALORIMETER BRACKET

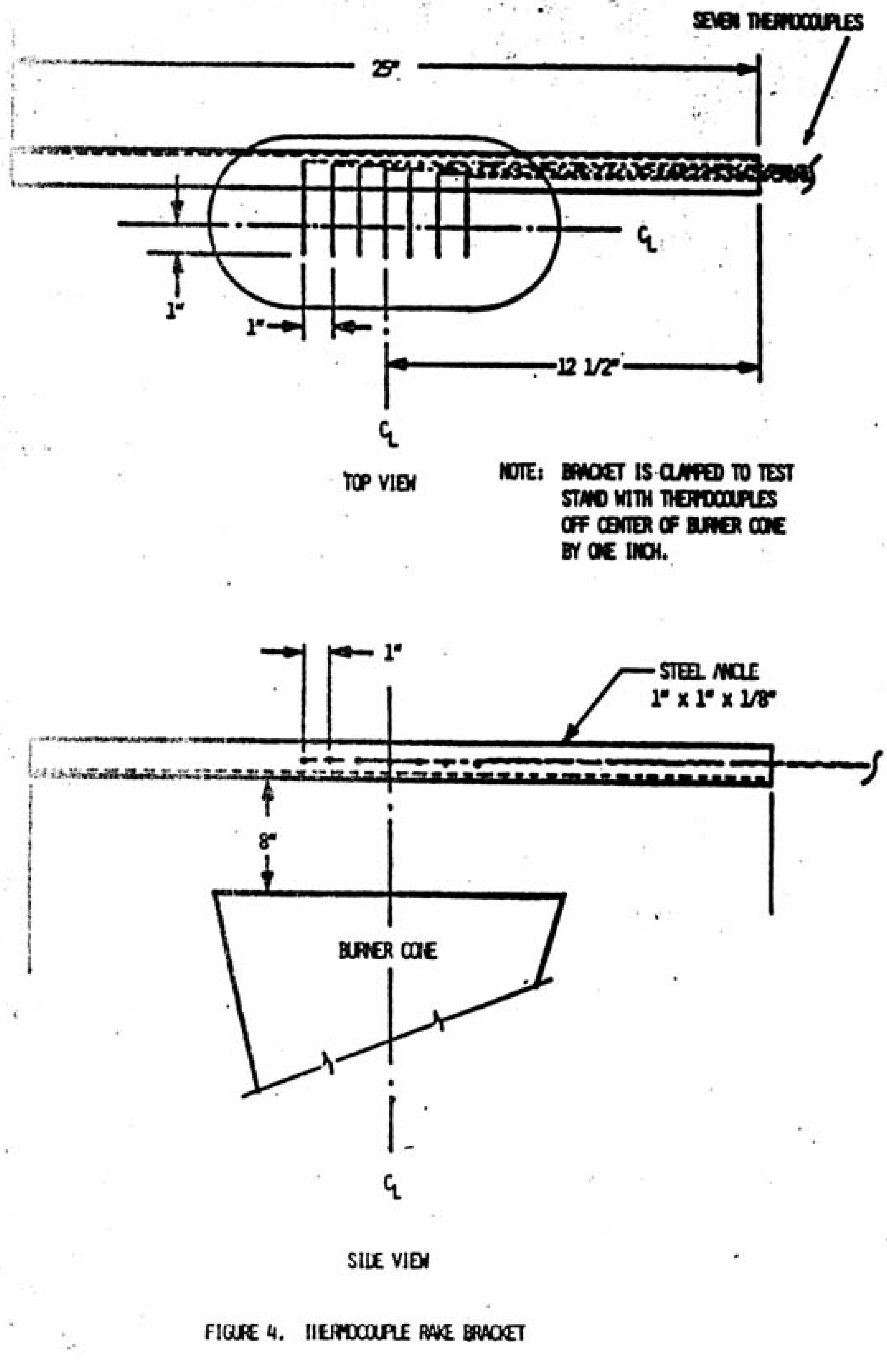

FIGURE 4. THERMOCOUPLE RAKE BRACKET

Issued in Seattle, Washington, on May 7, 1984.
Charles R. Foster,
Director, Northwest Mountain Region
[FR Doc. 84-30936 Filed 8-3-84; 10:02 am]
BILLING CODE 4910-13-M

Other Notice of Proposed Rulemaking Actions:

Not Applicable.

Final Rule Actions:

Final Rule. Docket No. 23791; Issued on 10/23/84.
Final Rule. Docket No. 24185; Issued on 05/09/86.