DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 25, 121, and 135

[Docket No. 26192, Amendments Nos. 25–83, 121–247 and 135–55]

RIN 2120–AD28

Improved Flammability Standards for Materials Used in the Interiors of Transport Category Airplane Cabins

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: These amendments clarify standards adopted in 1986 concerning the flammability of components used in the cabins of certain transport category airplanes. This action is being taken to preclude costly, unintended changes to airplane interiors. The clarifications, which are applicable to air carriers, air taxi operators and commercial operators, as well as manufacturers of such airplanes, will result in more appropriate, consistent application of those standards.

EFFECTIVE DATE: March 6, 1995.

FOR FURTHER INFORMATION CONTACT: Gary L. Killion, Manager, Regulations Branch, ANM–114, Transport Airplane Directorate, Aircraft Certification Service, FAA, 1601 Lind Avenue Southwest, Renton, Washington 98055–4056; telephone (206) 227–2114.

SUPPLEMENTARY INFORMATION:

Background

These amendments are based on Notice of Proposed Rulemaking (NPRM) 90–12, that was published in the **Federal Register** on April 12, 1990 (55 FR 13886).

As discussed in the notice, Amendments 25–61 and 121–189 (51 FR 26206, July 26, 1986) were adopted to upgrade the flammability standards for materials used in the interiors of transport category airplanes. The improved flammability standards were developed following a research and development program managed and conducted primarily at the FAA Technical Center in Atlantic City, New Jersey, to study aircraft fire characteristics and develop practical test methods. Among the tests conducted at the Technical Center were full-scale fire tests using the fuselage of a military C–133 configured to represent a wide-body jet transport airplane. The test conditions simulated representative post-crash external fuel-fed fires. Numerous laboratory tests were also conducted to correlate possible material qualification test methods with the full-scale tests. As a result of those tests, the Ohio State University (OSU) radiant rate-of-heat-release apparatus was determined to be the most suitable for material qualification. These tests led to the adoption of Amendment 25–61.

Amendment 25–61 established flammability standards for transport category airplanes with passenger seating capacities of 20 or more and specified the test method and apparatus to be used in showing compliance with those standards. It specified that interior ceiling and wall panels (other than lighting lenses), partitions, and the outer surfaces of galleys, large cabinets and stowage compartments (other than underseat stowage compartments and compartments for stowing small items such as magazines and maps) must meet the new standards. As outlined in the amendment, an average of three or more test specimens must not exceed 65 kilowatts per square meter peak heat release nor 65 kilowatt minutes per square meter total heat release during the first two minutes of sample exposure time (65/65) when tested using the OSU test apparatus. These acceptance criteria were chosen in order to produce a significant retardation of the flashover event which controls occupant survivability, as experienced in the full-scale testing. (Burning cabin materials give off unburned gases that collect in the upper portions of the cabin. After a very short time, these unburned gases are heated to the point where they ignite and burn instantaneously. When this occurs, the temperature in the whole cabin becomes so hot that survival is impossible for anyone remaining in the cabin. This phenomenon, known as flashover, also makes further survival impossible by consuming the oxygen in the cabin.)

Because Amendment 25–61 applies explicitly only to airplanes for which an application for type certificate is made after August 20, 1986, Amendment 121–189 to Part 121 of the FAR was also adopted to require operators of certain other airplanes used in air carrier or commercial service to meet the new 65/65 standards. Those airplanes must meet the new standards if they were newly manufactured after August 19, 1990. Airplanes type certificated on or after January 1, 1958, and manufactured prior to August 20, 1990, must also comply with the new standards upon the first substantially complete replacement of the specified cabin interior components on or after the latter date.

Although Part 135 was not amended at that time, air taxi and commercial operators of large airplanes are required to comply as well because § 135.169 incorporated the newly adopted provisions of Part 121 by reference.

At the time the amendments were adopted, the FAA understood that some persons were planning to install components which, even though they would meet the previously existing requirements of Part 25 for flammability, were more flammable than the components that were in general use at that time. In order to preclude a possible degradation in the flammability characteristics of the cabin interiors, Amendment 121–189 also established interim standards of 100 kilowatts per square meter peak heat release and 100 kilowatt minutes per square meter total heat release (100/100). The interim standards are applicable to airplanes manufactured during the two-year period prior to August 20, 1990; and, unless there is a substantially complete replacement of the specified cabin interior components after August 19, 1990, they will remain applicable to those airplanes as long as they are operated under the provisions of Part 121 or Part 135. (If there is a substantially complete replacement on or after August 19, 1990, the definitive 65/65 standards would be applicable.) In addition, the interim standards are also applicable to airplanes in which there is a substantially complete replacement of the specified interior components during that two-year period.

Prior to the adoption of Amendment 121–189, § 121.312 required certain airplanes to meet earlier flammability standards upon the first substantially complete replacement of the cabin interior. (Note that this earlier rulemaking refers to a substantially complete replacement of all cabin interior components, while the later rulemaking refers to a substantially complete replacement of the specified interior components. Whether certain other interior components, e.g., seat cushions and flooring, are replaced is not relevant to whether there is a substantially complete replacement in the latter case. Also, the earlier rulemaking applies to all airplanes while the later rulemaking applies only to airplanes with 20 or more passengers.) This earlier requirement is partially superseded if there is a substantially complete replacement of the interior components specified in § 25.853(a–l) after August 19, 1988. It does, however, remain applicable insofar as interior components not specified in § 25.853(a–l) are concerned. The earlier requirement also remains applicable to airplanes in which there has not been a substantially complete

replacement of the cabin interior since August 19, 1988, and to airplanes with 19 or fewer passengers.

The date of manufacture, as used in § 121.312, is the date on which inspection records show that an airplane is in a condition for safe flight. This is not necessarily the date on which the airplane is in conformity to the approved type design, or the date on which a certificate of airworthiness is issued, since some items not relevant to safe flight, such as passenger seats, may not be installed at that time. It could be earlier, but would be no later than the date on which the first flight of the airplane occurs.

For reasons discussed in the preamble to that amendment, Amendment 25–66 was adopted (53 FR 37542, September 27, 1988) to make minor refinements in the test procedures and apparatus required to show compliance with the standards adopted by Amendment 25–61 and to add a requirement for smoke testing. Amendment 121–198, which was adopted at the same time, added a provision allowing deviations to be granted for certain components.

In the preamble to Amendment 25–61, the FAA noted that the new heat release standards apply to all large-surface cabin interior components, such as sidewalls, ceilings, bins and partitions, and galley structures. It was also noted that the new standards do not apply to smaller items because their small masses would preclude significant contributions to the total heat release in the cabin area. The FAA has received a number of requests for clarification as to the maximum size a component may be without having to comply with the new heat release standards.

The distinction between parts with large surface areas, which must meet the new standards, and those with smaller surface areas is very difficult because of the size of the cabin and other factors that may vary from one airplane to another. For example, a specific component might be insignificant when installed in a large wide-body airplane because it would make a minor contribution to the overall flammability of the area of the cabin in which it is installed. On the other hand, it might represent a major contribution when installed in a smaller transport category airplane. The proximity of the component to a potential source of fire, such as an exit or galley, is also a consideration. It is not possible to cite a specific size that will apply in all installations; however, as a general rule, components with exposed-surface areas of one square foot or less may be considered small enough that they do not have to meet the new standards. Components with exposed-surface areas greater than two square feet may be considered large enough that they do have to meet the new standards. Those with exposed-surface areas greater than one square foot, but less than two square feet, must be considered in conjunction with the areas of the cabin in which they are installed before a determination could be made.

Discussion

Since the time Amendments 25–61 and 121–189 were adopted, the FAA became aware of four areas in which the wording of the new rules does not clearly reflect the intent of the agency as discussed in the preamble to those amendments. Because the new rules do not clearly reflect the intent in those areas and because the comments that were received may have been based on the intent, as expressed in the preambles, rather than the literal wording of the rules, the following clarifications were proposed in Notice 90–12.

Cabin windows and clear vision panels in cabin partitions: The preamble to Amendments 25–61 and 121–189 states, ''The new flammability standards do not apply to transparent or translucent components such as lenses used in interior lights and illuminated signs, and window anti-scratch panels, because of the lack of materials which will meet the flammability standards and still have the light transmissibility characteristics which are vital in emergency situations.'' Although not specifically mentioned in the earlier rulemaking, transparent panels are sometimes inserted in cabin partitions to enhance cabin safety. For example, they are sometimes used to provide seated flight attendants a clear, unobstructed view of the cabin or to provide passengers a view of an exit as an aid to an emergency evacuation. As in the case of lighting lenses and windows, the need for transparent partition panels that enhance cabin safety outweighs the increased safety provided by components that meet the new flammability standards considering the small area such transparencies would involve. In order to preclude confusion concerning the applicability of the standards to such transparent or translucent panels, § 25.853(a–l) (1) and (2) were proposed to read, ''Interior ceiling and wall panels, other than lighting lenses and windows,'' and, ''Partitions, other than transparent panels needed to enhance cabin safety,'' respectively. The maximum size of a transparent panel would, of course, be limited to that which is actually needed to enhance cabin safety.

It was noted that the FAA would consider further rulemaking to require those components to meet the new flammability standards should materials capable of meeting the new flammability standards and having the necessary light transmissibility characteristics for use as windows, etc., be developed later.

Galleys: As currently worded, § 25.853(a–1) states that the new flammability standards apply to the ''outer surfaces of galleys.'' This phrase was intended to make an exception for the interior surfaces of galley cabinets, etc., that would not be exposed to a cabin fire. It is ambiguous, however, because most galleys are not isolated from the main cabin by a door. While one might consider the surfaces of a galley working are to be ''inner surfaces,'' they are actually outer surfaces in most installations in the sense that they could be exposed to a cabin fire. In addition, the inner walls of the galley cart cavity or standard container cavity may also be exposed on some lightly loaded flights when there is not a full complement of carts or containers on board. In order to preclude any confusion in this regard, it was proposed that § 25.853(a–1) would be amended to clarify that any galley surface exposed to the passenger cabin must meet the new standards.

Isolated compartments: Unlike previously existing paragraphs (a) and (b) of § 25.853, the new flammability standards of paragraph (a–1) were intended to apply only to the passenger cabin and not to compartments that are isolated from the passenger cabin. Due, however, to the organization of § 25.853(a–1), if taken literally, the new standards also pertain to each compartment occupied by crew (including one occupied only on a temporary basis) or passengers regardless of whether the particular compartment is isolated from the passenger cabin.

Neither the research and development program nor the regulatory evaluations on which the new flammability standards were based considered that compartments isolated from the passenger cabin (or cabins in the case of airplanes with passenger cabins located on two different decks) would have to comply with the new standards. Unlike most galleys located in the main cabin, remote galleys and other compartments, such as lavatories, pilot compartments and crew rest or sleeping areas, are generally isolated from the passenger cabin by at least a door. In some instances, they are located on separate decks. They would, therefore, not be exposed to a cabin fire until well after

flashover had occurred in the cabin and egress was no longer possible. Should an external fire enter the airplane at one of those compartments, the flammability of the materials used in them would not directly affect the cabin due to their isolation. As stated in the earlier rulemaking, the new standards address a post-crash, external fuel-fed fire situation. With the exception of the pilot compartment, it can be assumed that such compartments would not be occupied by passengers or crewmembers during a post-crash situation.

Although the rulemaking was undertaken to address a post-crash scenario, there is also the question of whether or not requiring the lavatories to meet the new flammability standards would enhance safety significantly in the event a fire originated in a lavatory during flight. This question is particularly pertinent in light of the recently adopted ban on smoking on domestic airline flights. Although some persons might be more tempted to smoke illicitly in a lavatory during such flights, the lavatory smoke detector required by recently adopted Amendment 121–185 (50 FR 12726, March 29, 1985) serves as a deterrent and provides warning of illicit smoking to the crew. In addition, the new standards would not apply to many of the components in a lavatory due to their small size. The doors and most sidewalls have to meet the new standards regardless of whether the new standards are applicable to lavatories because their outer sides also form surfaces of the passenger cabin. Some portions of the lavatory are generally constructed of fireproof stainless steel due to functional considerations. Requiring the few remaining large components to meet the new standards would have very little impact on the overall flammability of the lavatory and would not significantly enhance safety in the event of an inflight fire.

Pilot compartments are generally isolated from the passenger cabin by a bulkhead and door. Although they are obviously occupied full-time, requiring them to meet the new standards would not significantly enhance safety in the event of an inflight fire for essentially the same reasons. Pilot compartments are generally constructed of many small components which would not have to meet the new standards due to their small size. The bulkhead and entry door have to meet the new standards regardless of whether they are applicable to the pilot compartment because the aft sides of those components also form surfaces of the passenger cabin. As in the case of the lavatories, requiring the few remaining large components to meet the new standards would have very little impact on the overall flammability of the pilot compartment. Although there is no smoke detector required, a fire would be detected immediately by the flight crewmembers. In addition, at least one hand fire extinguisher must be conveniently located in the pilot compartment in accordance with § 25.851.(a)(6).

In view of these considerations, it was proposed that § 25.853 would be amended to clarify that compartments that are isolated from the cabin need not meet the standards. Sidewalls, doors etc., that separate such compartments from the passenger cabin would, of course, have to meet the new standards because their outer sides also form surfaces of the passenger cabin.

Galley carts and other rotatable galley equipment: The earlier rulemaking contained the statement, ''Service items, such as pillows or blankets, magazines, food, and alcoholic beverages, are not part of the certification process and would not have to meet the new flammability standard.'' Galley carts are considered to be service items; however, unlike the items cited in the preamble statement, they are generally approved as part of the airplane type design. Although the new flammability standards do not apply expressly to galley carts, it was intended that they would apply implicitly to the extent that, when stowed, the galley carts form exterior surfaces of the galley. Typically, at least one end of each cart remains exposed and forms a galley surface while the cart is stowed. In addition to galley carts, these are galley standard containers used for various meal courses, beverages, plates, etc., that also form galley surfaces when stowed.

Operators have pointed out that galley carts are removable items that are rotated from one airplane to another with each flight. In this regard, they note that their fleets will include older airplanes that are not required to meet the new standards, as well as new airplanes (or airplanes in which the interiors have been replaced) that will be required to meet the new standards. They further note that the carts are loaded before a flight by persons, usually independent caterers, who have no way of knowing whether or not the airplane that will be used on a particular flight is required to meet the new standards. Unless all existing noncomplying galley carts are replaced with galley carts that meet the new standards, there is no practical means to ensure that galley carts meeting the new standards will be loaded on the airplanes that are required to have them. It is estimated that there are now approximately 125,000 galley carts in use with the U.S. air carrier fleet. Typically, the cost per cart ranges from $800 to $3,500; and the service life is about eight to ten years. While it is feasible to replace the existing carts on an attrition basis, it would be impractical to produce enough galley carts meeting the new standards in time to meet the established deadlines. In addition, such immediate replacement would be very costly. The operators note that they would have commented accordingly had they not believed that, as service items, galley carts did not have to meet the new standards.

The galley standard containers are also rotated from airplane to airplane; and they, too, are filled prior to the flight by persons who have no way of knowing whether the airplane that will be used on the flight is one required to meet the new standards. While the cost of each galley standard container would be less than that of a beverage cart, replacing the entire inventory of containers would be very costly.

Although it was intended that the exposed surfaces of stowed galley carts and standard containers should meet the new standards, the FAA has concluded, upon further review, that it was not clearly stated that the galley carts and containers would be required to comply. The FAA does, however, consider that the exposed surfaces of stowed galley carts and standard containers must ultimately meet the new flammability standards. It was, therefore, proposed that § 25.853(a–1) would be amended to specifically require the exposed surfaces of those components to meet the new standards.

The FAA concurs that unless all carts and containers are replaced, it would be extremely difficult to ensure that galley carts and standard containers meeting the new standards are loaded on the airplanes that are required to meet them. Furthermore, the immediate replacement of all galley carts and standard containers would be logistically impossible and would present an unreasonable economic burden. If, on the other hand, galley carts and standard containers that meet the new standards are acquired at a rate commensurate with the rate at which new airplanes are acquired (and interiors of older airplanes are replaced), it can be assumed that the overall level of safety of the air carrier fleet will not be adversely affected by intermixing carts and containers complying with the new standards with those that do not. The small decrement of safety that would be suffered due to

the use of noncomplying carts and containers in an airplane that must meet the new standards would be compensated by an increment of safety enjoyed due to the use of complying carts and containers in another airplane that is not required to meet them. It was, therefore, proposed that § 121.312 would be amended to allow such intermixing of galley carts and standard containers, provided that all carts and containers manufactured after a specified date meet the new standards.

Other changes: Certain minor refinements in the test apparatus and procedures were identified; and it was proposed that Appendix F of Part 25, including the associated figures, would be revised accordingly. The proposed refinements would not preclude the use of materials previously found to be acceptable under the new standards; nor enable the use of materials previously found unacceptable; however, they would improve the repeatability of test results from one test run to another and from one laboratory to another. Other minor nonsubstantive editing changes would be made for consistency in style. Nonsubstantive editing changes would also be made to § 25.853 for clarity.

It was also proposed that the organization and language of § 121.312(a) would be revised for clarity.

As noted above, Part 135 was not amended at the time the new standards were adopted; however, they are equally applicable to Part 135 operators because § 135.169(a) incorporates the provisions of § 121.312 by cross reference. Since that time, it has come to the attention of the FAA that the practice of incorporating certain provisions of Part 121 in Part 135 by cross reference may cause confusion. In order to preclude any confusion in this regard, it was proposed that Part 135 would be amended to include the new standards explicitly rather than by reference. Because Part 135 operators are already required to meet these standards due to the incorporation by cross reference, this change would not place any additional burden on any person.

The reference to ''November 26, 1987'' in § 121.312(b) is no longer relevant because that date has already passed. It would, therefore, be removed for simplification. The redundant reference to Appendix F of Part 25 would also be removed from § 121.312(b) for simplification and consistency with the editorial style used in § 121.312(a). (Appendix F, Part II, is incorporated by cross reference in § 25.853(c); and Appendix F, Part IV, is incorporated by cross reference in § 25.853(a-1).)

Since the time Notice 90–12 was issued, Amendment 25–72 was adopted (55 FR 29756, July 20, 1990). Although no substantive changes to § 25.853 were adopted, the requirements of that section were rearranged considerably for clarity, and the test acceptance criteria formerly contained in that section were transferred to Part I of Appendix F. It is, therefore, necessary to make a number of nonsubstantive conforming changes for consistency with § 25.853 in its present format.

Among the changes made to § 25.853 as a result of the adoption of Amendment 25–72 was the transfer of the seat cushion flammability standards from former § 25.853(c) to new § 25.853(b). It has been brought to the attention of the FAA that this change is causing considerable confusion.

Seats are frequently transferred from one airplane to another; therefore, as a practical matter, they must be marked to show that their cushions comply with the flammability standards. With the change in section number, the previous markings indicating compliance with § 25.853(c) are no longer accurate. In order to eliminate further confusion in that regard, § 25.853(b) has been marked ''Reserved,'' and the seat cushion flammability standards have been transferred back to § 25.853(c).

For convenience, the proposed changes to § 25.853 are discussed below both in terms of their identity in Notice 90–12 and as rearranged for conformity with the changes resulting from the adoption of Amendment 25–72.

Discussion of Comments

Seven commenters responded to the request for comments contained in Notice 90–12. These included manufacturers, a foreign airworthiness authority, and organizations representing manufacturers, airlines, and airline employees.

One commenter notes that the restructuring and numbering of § 25.853 may have inadvertently excluded such items as lighting lenses, windows, transparent panels needed to enhance cabin safety, etc., from compliance with any of the flammability standards of § 25.853. The FAA concurs that the wording proposed in Notice 90–12 could have led to an incorrect interpretation of that nature. Section 25.853 is, therefore, changed by transferring the statement ''Except as provided * * *'' to § 25.853(d), which would have been § 25.853(a-1) as proposed in Notice 90–12.

One commenter opposes the proposal to clarify that compartments isolated from the cabin are not required to meet the heat release standards of § 25.853(a–l). The commenter states that all compartment components should be of the same standard and that meeting the same standard would ensure that the net amount of material contributing to fire development and propagation is at the absolute minimum. In that regard, the commenter cites the accident involving a McDonnell Douglas DC–9 operated by Air Canada on June 2, 1983, at the Greater Cincinnati Airport, Covington, Kentucky. The commenter notes that, while the origin of the fire that destroyed the airplane could not be identified, the lavatory compartment's interior material was the primary source of fuel and that the fire burned undetected for almost 15 minutes before the smoke was first noticed. The commenter asserts that requiring the compartment to meet the same low heat release standards as the main cabin would significantly reduce the amount of fuel available for such a fire.

Contrary to the commenter's assertion, requiring all lavatory components to meet the new standards for heat release would not significantly reduce the amount of fuel available for a fire originating in the lavatory. As noted above under Background, the heat release standards do not apply to small surface-area components. As further noted above under Discussion, many of the components in the lavatory are small enough that they would not have to meet the new standards in any event. The doors and most sidewalls have to meet the new standards regardless of whether the new standards are applicable to lavatories because their outer sides also form surfaces of the passenger cabin. Some portions of the lavatory are generally constructed of stainless steel due to functional considerations. Stainless steel is, of course, fireproof. Requiring the few remaining large components to meet the new standards would have very little impact on the overall flammability of the lavatory and would not significantly enhance safety in the event of an inflight fire.

In the accident cited by the commenter, smoke was discovered coming from the left-hand lavatory in the aft cabin while the airplane was enroute from Dallas, Texas to Montreal, Quebec. An emergency landing was not made until 17 minutes later. By that time, the fire and smoke had grown in intensity to the point that only half of the 46 occupants were able to escape. As noted in their official accident report, NTSB/AAR–86/02, the National Transportation Safety Board determined that the probable causes of the accident were a fire of unknown origin, an underestimate of the fire severity, and

misleading fire progress information provided to the captain. Considering the few lavatory components that would be affected and the time that the fire had been burning prior to the emergency landing, it is unlikely that the outcome of the accident would have been more favorable if the lavatory of that airplane had met the new heat release standards.

Subsequent to the accident, the FAA adopted Amendments 25–58 and 121–183 (49 FR 43182, October 26, 1984), and 25–59 and 121–184 (49 FR 43188, October 26, 1984), that require, respectively, low-level lighting to enable occupants to locate emergency exits in smoke-filled cabins and new flammability standards for seat cushions. Unlike the heat release standards of Amendment 25–61, the new flammability standards for seat cushions are designed to slow the progression of a fire through the cabin. The standards of Amendment 25–61 are, on the other hand, designed to reduce the overall release of heat into the cabin during a post-crash fire situation and provide more time for egress before flashover makes further escape impossible. Amendment 121–185 (50 FR 12726, March 29, 1985) was also adopted to require each lavatory to be equipped with a smoke detection system, or equivalent, and a fire extinguisher that discharges automatically upon the occurrence of a fire in the trash receptacle. In addition, the amendment requires the passenger cabins of certain airplanes to be equipped with additional hand fire extinguishers, some of which must contain the improved agent Halon 1211.

The commenter also notes that all compartments with essential systems adjacent to their surfaces should be required to meet the heat release standards of § 25.853(a–1) in order to protect the essential conductors of those systems from the high heat releases of burning interior materials.

The commenter appears to be confusing the standards for heat release with other standards for flame resistance. As noted above, the heat release standards are designed to reduce the overall release of heat into an area and thereby delay the time until flashover occurs. It is assumed, on the other hand, that the insulation of electrical wiring and cables could be enveloped by flame. They must, therefore, be tested by actual application of flame to the insulation surface.

The same commenter recommends that, if an isolated compartment does not have to meet the heat release standards, the doors separating the compartment from the main cabin should be able to contain the heat and smoke in the isolated compartment for at least five minutes. (Such doors would be 'fire-resistant' as defined in Part 1 of the FAR.)

The commenter's recommendation is apparently based on the assumption that there will be an uncontrollable fire originating from an isolated compartment. In view of the fire protection measures that have been adopted for lavatories since the above noted accident, there is no evident need for fire-resistant lavatory doors. Furthermore, service history does not support a need for such doors to other isolated compartments. The exception proposed as § 25.853(a–2) is, therefore, adopted as § 25.853(e).

One commenter recommends that § 25.853(a–1)(1) be amended to read, ''other than lighting lenses, illuminated signs and windows,'' since illuminated signs are discussed in the preamble to Notice 90–12 as examples of excluded items. While it is true that the illuminated portions of passenger information signs are not required to meet the heat release standards of that section, it is not necessary to refer to them specifically in § 25.853(a–1)(1) because they are ''lighting lenses.'' Proposed § 25.853(a–1)(1) is adopted as § 25.853(d)(1).

The same commenter and one other recommend that § 25.853(a–2) be clarified by adding ''lavatories'' to the list of compartments whose interiors are excluded. Unlike the illuminated signs discussed above, it may not be as clear that lavatories are considered isolated compartments and, as such, are already excluded. Proposed § 25.853(a–2) is, therefore, changed to read, ''* * * such as pilot compartments, galleys, lavatories, crew rest quarters, cabinets and stowage compartments, * * *,'' and adopted as § 25.853(e).

One commenter suggests that § 25.853(a–2) should stipulate ''20 or more passengers.'' Since the only purpose of this paragraph, adopted as paragraph (e), is to make an exception to paragraph (a–1), adopted as paragraph (d), which is already so limited, there is no need to repeat this limitation of applicability.

Because the flammability standards of § 25.853(d), formerly § 25.853(a–1), are applicable only to airplanes with 20 or more passengers, some persons have mistakenly assumed that the seat cushion standards of § 25.853(c) are also applicable only to airplanes with 20 or more passengers. To preclude any confusion in this regard, the phrase, ''regardless of the passenger capacity of the airplane,'' has been added to § 25.853 (a) and (c).

Another commenter suggests that Part IV of Appendix F should be amended to permit the use of the optional 14-hole upper pilot burner that has been found satisfactory. Actually, the use of this optional burner has already been accepted by the FAA under the equivalent safety provisions of § 21.21(b)(1). The FAA notes that test data obtained during testing with the three-hole burner are sometimes invalidated because the pilot burner would not remain lighted for the entire 5-minute duration of the test. With the optional 14-hole burner, there is a greater probability of reigniting any flamelets that might extinguish during a test. Because the 14-hole burner may be preferable in some instances, Part IV is amended to describe the optional use of that burner, as suggested by the commenter. Testing with this optional burner is already permitted under the equivalent safety provisions of § 21.21(b)(1); therefore, this is a minor nonsubstantive change that places no additional burden on any person.

Paragraph (b)(8) states that the pilot burners must remain lighted for the entire duration of the test. In regard to the difficulties experienced in keeping the three-hole upper pilot burner lighted for the entire duration of the test, the FAA proposed to add the statement, ''Intermittent pilot flame extinguishment for more than 3 seconds would invalidate the test results.'' The same commenter notes that further clarification is required. According to the commenter, it is normal for some of the upper pilot-burner flamelets to be extinguished for periods that can exceed three seconds when samples containing flame retardants are tested. The commenter notes that the results of such tests have been considered acceptable provided some of the flamelets have remained lighted.

The FAA concurs that it is not necessary for each flamelet of the three-hole upper pilot burner to remain lighted for the entire 5-minute duration of the test; however, test results may be invalidated if two flamelets are unlighted for more than 3 seconds. In order to preclude, such intermittent flamelet extinguishment, the FAA has permitted applicants to install an igniter. Intermittent flame extinguishment has not posed a problem with the optional 14-hole upper pilot burner since it was developed to preclude flame extinguishment. Paragraph (b)(8) is, therefore, changed to read, ''Since intermittent pilot flame extinguishment for more than 3 seconds would invalidate the test results, a spark igniter may be installed to ensure that the burners remain lighted.'' Paragraph

(e)(8), which is considered a more appropriate location than paragraph (b)(8), is amended to clarify the requirements for burners and flamelets to remain lighted.

Part IV, paragraph (e)(3) states that the proper air flow may be set and monitored by either an orifice meter or a rotometer. Because of difficulties experienced in setting and monitoring the air flow with a rotometer, the FAA proposed in Notice 90–12 to amend that paragraph to refer only to an orifice meter. The same commenter cited the successful use of a rotometer by the National Research Council of Canada and recommended that the reference to a rotormeter be retained in that paragraph. While the use of a rotometer may be successful in some instances, the FAA does not have sufficient information at this time to conclude that a rotometer is acceptable on a general basis. It is, therefore, not considered appropriate to specifically cite the rotormeter in that paragraph as an acceptable alternative means of setting and monitoring air flow. The FAA does recognize, however, that rotometers, or any other devices for that matter, may be improved to the point that their use is acceptable. In that event, those devices could be used under the equivalent safety provisions of § 21.21(b)(1).

The same commenter notes that the area of .02323 m^2 specified in the heat release equation of paragraph (f)(2) is based on a test specimen size of 6 x 6 inches. Since the actual size of the sample is 150 x 150 mm, the commenter believes that an area factor of .0225 m^2 should actually be used in the heat release equation.

Although the commenter is technically correct, the definitive 65/65 and the interim 100/100 standards were established based on the use of a factor of .02323 m^2. Furthermore all testing completed to date has been based on the use of the .02323 factor. Changing the factor to .0225 at this late date would mean that the 65/65 and 100/100 standards would have to be changed to 67/67 and 103/103, respectively, in order to preclude a degradation of the components approved for use in airplane cabins. This would no doubt cause considerable confusion, particularly when test results obtained with the .0225 factor are compared with earlier test results obtained with the original .02323 factor.

The same commenter notes that considerable confusion is created by the fact that dimensions of the the test apparatus are specified in U.S. units in some instances and in metric units in others. The FAA concurs. For clarity, part IV is revised to show dimensions in both U.S. units and their metric equivalents. Other minor, nonsubstantive changes are also made to Part IV for clarity.

Section 121.312(a) incorporates the heat release standards of § 25.853(a–1) by cross reference. Since the latter section applies only to airplanes with passenger capacities of 20 or more, § 121.312(a) requires compliance with these heat release standards only for airplanes with passenger capacities of 20 or more. As one commenter notes, § 121.312(a) can be misinterpreted to require compliance for all transport category airplanes regardless of their passenger capacity. In order to preclude possible confusion in this regard, both § 121.312(a) and newly adopted § 135.170(b)(1) state specifically that compliance is required only for airplanes with passenger capacities of 20 or more.

Another commenter notes that § 121.312(a) (1) through (6) and the corresponding § 135.170(b)(1) (i) through (vi) are complex and difficult to understand. The FAA acknowledges that these sections are very complex. This is due primarily to the fact that there are differing requirements dependent on such factors as when the airplane was type certificated, when it was manufactured, when there was a substantially complete replacement of the cabin interior components, etc. There is even a distinction between complete replacement of all cabin interior components in one case and just those components identified in § 25.853(a–1) in another. The only way in which the provisions of these sections could be significantly simplified would be to require compliance for all airplanes at one time. While that would simplify the regulatory language considerably, it would impose costly additional burdens on some operators with no commensurate improvement in safety. Nevertheless, minor nonsubstantive changes have been made wherever possible to clarify these requirements.

Proposed § 121.312(a)(8) states, in part, that ''* * * galley carts and galley standard containers that do not meet the heat release rate testing requirements * * * may be used * * * provided the galley carts or standard containers were manufactured prior to August 20, 1990.'' One commenter believes that this section should refer to galley carts and standard containers manufactured prior to a date two years after the effective date of this amendment.

The FAA concurs that it is inappropriate to specify a date earlier than the date on which this final rule becomes effective. The FAA does not, however, agree that an additional two-year compliance time is necessary. The amendment does not require galley carts and standard containers manufactured after the specified date to comply. Instead, it relieves operators of the burden of ensuring that only complying galley carts and standard containers are loaded on airplanes that are required to meet the new flammability standards *provided* the galley carts and standard containers are manufactured prior to that date. Section 121.312(a)(8) and the corresponding § 135.170(b)(viii) are, therefore, changed to read, ''* * * provided the galley carts or standard containers were manufactured prior to March 6, 1995.

One commenter believes that there should be a specific definition of what constitutes ''substantially complete replacement'' as stated in § 121.312. The commenter expresses concern that the definition should allow for the individual replacement of cabin interior components without the mandatory replacement of all components at the same time.

''Complete replacement,'' as used in § 121.312 and newly adopted § 135.170(b), means that all of the affected components in the cabin are replaced. (As noted above under *Background*, whether the other components that are not affected, e.g. seat cushions and flooring, are replaced is not relevant.) The qualifying word ''substantially'' was added simply to prevent operators from avoiding compliance by not replacing a minor, inconsequential cabin component and claiming that there had not been a ''complete replacement.'' Section 212.312 does, therefore, permit individual replacement of cabin interior components without the mandatory replacement of all components at the same time. This, of course, assumes that the cabin components did not already have to meet the heat release standards because of the date of manufacture of the airplane or because they had been completely replaced previously. It should also be noted that removing components for refinishing and reinstalling them in the same airplane is considered ''refurbishment,'' not ''replacement.''

Proposed § 135.170(b) states, ''No person may operate a large airplane unless * * *'' Several commenters note that Part 23 commuter category airplanes are ''large airplanes,'' as defined by Part 1 of the FAR, and, as such, would be required to meet the new flammability standards contained in that section. Another commenter has a similar concern that proposed

§ 135.170(b) would appear to add substantial requirements for airplanes type certificated under the provisions of Part 23 and Special Federal Aviation Regulations (SFAR) No. 41.

Although commuter category airplanes may be large enough to be ''large airplanes'' as defined by Part 1, they are not permitted to carry more than 19 passengers. Since the flammability standards of § 135.170(b) apply only to airplanes with more than 19 passengers, commuter category airplanes would not be required to comply even though they may be ''large airplanes.'' SFAR No. 41 provides that, contrary provisions of Part 1 notwithstanding, airplanes certificated under the provisions of that SFAR are considered to be ''small airplanes'' in regard to compliance with Part 135. Furthermore they, like commuter category airplanes, are not permitted to carry more than 19 passengers.

Since neither commuter category airplanes nor those type certificated under the provisions of SFAR No. 41 are permitted to carry more than 19 passengers, there is no need to amend § 135.170(b) of specifically exclude those airplanes. Specifically stating in §§ 121.312(a) and 135.170(b)(1) that only airplanes with 20 or more passengers seats are required to comply, as discussed above, will preclude confusion in this regard.

One commenter reiterates a belief that the seat cushion flammability standards of § 25.853(c) are an unnecessary burden for operators of small transport category airplanes with passenger seating capacities of fewer than 19 passengers. The commenter is referring in this regard to the provisions of § 121.312 which were previously incorporated by cross reference in § 135.169 and now are stated explicitly as new § 135.170(b)(2). Section 121.312(b) and the new § 135.170(b)(2), in turn specify that the operator must have seat cushions that meet the flammability standards of § 25.853(c). That issue has already been addressed by FAA in earlier rulemaking and is not related, in any substantive manner, to the present rulemaking.

Another commenter notes an inadvertent error in proposed § 135.169(a) in that it would incorporate § 121.311 by cross reference. The intent was to move the no longer needed reference to § 121.312, not to replace it with § 121.311. Section 135.169(a) is corrected accordingly.

Regulatory Evaluation

Regulatory Evaluation

Exeuctive Order 12291, dated February 17, 1981, directs Federal agencies to promulgate new regulations or modify existing regulations only if potential benefits to society for each regulatory change outweigh potential costs. This section summarizes the full regulatory evaluation prepared by the FAA that provides more detailed estimates of the economic consequences of this regulatory action.

The evaluations prepared for Amendments 25–61 and 121–189, and Amendments 25–66 and 121–198 remain unchanged by this rule with respect to costs and benefits, regulatory flexibility determinations, and trade impact assessment.

None of the amendments in this rule will generate significant costs or benefits. In part, the rule clarifies the original intent of the earlier amendments. The changes to the test apparatus and procedures for determining heat release rate are minor refinements that will result only in negligible costs and benefits. The amendment to Part 135 is a nonsubstantive change that incorporates existing requirements explicitly rather than by cross reference. The remaining changes are editorial or conforming in nature.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1989 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily or disproportionately burdened by Government regulations. The RFA requires a Regulatory Flexibility Analysis if a rule has a significant economic impact, either detrimental or beneficial, on a substantial number of small entities. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, established threshold cost values and small entity size standards for complying with RFA review requirements in FAA rulemaking actions. The FAA has determined that this rule will not have a significant economic impact on a substantial number of small entities.

International Trade Impact Analysis

This rule will not have an adverse impact either on the trade opportunities of U.S. operators or manufacturers of transport category airplanes doing business abroad, or on foreign operators or aircraft manufacturers doing business in the United States.

Federalism Implications

The regulations adopted herein will not have substantial direct effects 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, in accordance with Executive Order 12612, it is determined that this final rule will not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion: Because the regulations adopted herein are expected to result only in negligible costs, the FAA has determined that this final rule is not major as defined in Executive Order 12291. Because this is an issue that has not prompted a great deal of public concern, this final rule is not considered to be significant as defined in Department of Transportation Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). In addition, since there are no small entities affected by this rulemaking, it is certified, under the criteria of the Regulatory Flexibility Act, that this final rule, at promulgation, will not have a significant economic impact, positive or negative, on a substantial number of small entities. The regulatory evaluation prepared for Amendments 25–66 and 121–198 remains applicable and has been placed on the docket. A copy of this evaluation may be obtained by contacting the person identified under the caption **FOR FURTHER INFORMATION CONTACT.**

List of Subjects

14 CFR Part 25

Aircraft, Air transportation, Aviation safety, Safety.

14 CFR Part 121

Air carriers, Aircraft, Airplanes, Air transportation, Aviation safety, Common carriers, Flammable materials, Safety, Transportation.

14 CFR Part 135

Air carriers, Aircraft, Airplanes, Air transportation, Aviation safety, Cargo, Hazardous materials, Mail, Safety, Transportation.

Adption of the Amendment

Accordingly, 14 CFR Parts 25, 121 and 135 of the Federal Aviation Regulations (FAR) are amended as follows:

PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

1. The authority citation for Part 25 is revised to read as follows:

Authority: 49 U.S.C. 106(g), 1344, 1354(a), 1355, 1421, 1423, 1424, 1425, 1428, 1429, 1430.

2. By revising § 25.853 to read as follows:

§ 25.853 Compartment interiors.

For each compartment occupied by the crew or passengers, the following apply:

(a) Materials (including finishes or decorative surfaces applied to the materials) must meet the applicable test criteria prescribed in Part I of Appendix F of this Part, or other approved equivalent methods, regardless of the passenger capacity of the airplane.

(b) [Reserved]

(c) In addition to meeting the requirements of paragraph (a) of this section, seat cushions, except those on flight crewmember seats, must meet the test requirements of part II of Appendix F of this Part, or other equivalent methods, regardless of the passenger capacity of the airplane.

(d) Except as provided in paragraph (e) of this section, the following interior components of airplanes with passenger capacities of 20 or more must also meet the test requirements of parts IV and V of Appendix F of this Part, or other approved equivalent method, in addition to the flammability requirements prescribed in paragraph (a) of this section:

(1) Interior ceiling and wall panels, other than lighting lenses and windows;

(2) Partitions, other than transparent panels needed to enhance cabin safety;

(3) Galley structure, including exposed surfaces of stowed carts and standard containers and the cavity walls that are exposed when a full complement of such carts or containers is not carried; and

(4) Large cabinets and cabin stowage compartments, other than underseat stowage compartments for stowing small items such as magazines and maps.

(e) The interiors of compartments, such as pilot compartments, galleys, lavatories, crew rest quarters, cabinets and stowage compartments, need not meet the standards of paragraph (d) of this section, provided the interiors of such compartments are isolated from the main passenger cabin by doors or equivalent means that would normally be closed during an emergency landing condition.

(f) Smoking is not to be allowed in lavatories. If smoking is to be allowed in any other compartment occupied by the crew or passengers, an adequate number of self-contained, removable ashtrays must be provided for all seated occupants.

(g) Regardless of whether smoking is allowed in any other part of the airplane, lavatories must have self-contained, removable ashtrays located conspicuously on or near the entry side of each lavatory door, except that one ashtray may serve more than one lavatory door if the ashtray can be seen readily from the cabin side of each lavatory served.

(h) Each receptacle used for the disposal of flammable waste material must be fully enclosed, constructed of at least fire resistant materials, and must contain fires likely to occur in it under normal use. The capability of the receptacle to contain those fires under all probable conditions of wear, misalignment, and ventilation expected in service must be demonstrated by test.

3. By amending part IV of Appendix F to Part 25 by revising paragraphs (a), (b)(1) through (6), (b)(8), (c)(1), (d) heading and (d)(1), (d)(3), (e)(1) through (5), (e)(8), (f)(2), and by adding paragraph (c)(3); transferring Figures 1 through 5 at the end of Appendix F to the end of part IV of Appendix F and adding a heading preceding the figures, and by removing Figure 1 of part IV and adding Figures 1A and 1B in its place to read as follows:

Appendix F to Part 25

* * * * *

Part IV—Test Method to Determine the Heat Release Rate from Cabin Materials Exposed to Radiant Heat.

(a) *Summary of Method.* Three or more specimens representing the completed aircraft component are tested. Each test specimen is injected into an environmental chamber through which a constant flow of air passes. The specimen's exposure is determined by a radiant heat source adjusted to produce, on the specimen, the desired total heat flux of 3.5 W/cm^2. The specimen is tested with the exposed surface vertical. Combustion is initiated by piloted ignition. The combustion products leaving the chamber are monitored in order to calculate the release rate of heat.

(b) * * *

(1) This apparatus is shown in Figures 1A and 1B of this part IV. All exterior surfaces of the apparatus, except the holding chamber, must be insulated with 1 inch (25 mm) thick, low density, high temperature, fiberglass board insulation. A gasketed door, through which the sample injection rod slides, must be used to form an airtight closure on the specimen hold chamber.

(2) *Thermopile.* The temperature difference between the air entering the environmental chamber and that leaving must be monitored by a thermopile having five hot, and five cold, 24-guage Chromel-Alumel junctions. The hot junctions must be spaced across the top of the exhaust stack, .38 inches (10 mm) below the top of the chimney. The thermocouples must have a .050 ± .010 inch (1.3 ± .3mm) diameter, ball-type, welded tip. One thermocouple must be located in the geometric center, with the other four located 1.18 inch (30 mm) from the center along the diagonal toward each of the corners (Figure 5 of this part IV). The cold junctions must be located in the pan below the lower air distribution plate (see paragraph (b)(4) of this part IV). Thermopile hot junctions must be cleared of soot deposits as needed to maintain the calibrated sensitivity.

(3) *Radiation Source.* A radiant heat source incorporating four Type LL silicon carbide elements, 20 inches (508 mm) long by .63 inch (16 mm) O.D., must be used, as shown in Figures 2A and 2B of this part IV. The heat source must have a nominal resistance of 1.4 ohms and be capable of generating a flux up to 100 kW/m^2. The silicone carbide elements must be mounted in the stainless steel panel box by inserting them through .63 inch (16 mm) holes in .03 inch (1 mm) thick ceramic fiber or calcium-silicate millboard. Locations of the holes in the pads and stainless steel cover plates are shown in Figure 2B of this part IV. The truncated diamond-shaped mask of .042 ± .002 inch (1.07 ± .05mm) stainless steel must be added to provide uniform heat flux density over the area occupied by the vertical sample.

(4) *Air Distribution System.* The air entering the environmental chamber must be distributed by a .25 inch (6.3 mm) thick aluminum plate having eight No. 4 drill-holes, located 2 inches (51 mm) from sides on 4 inch (102 mm) centers, mounted at the base of the environmental chamber. A second plate of 18 guage stainless steel having 120, evenly spaced, No. 28 drill holes must be mounted 6 inches (152 mm) above the aluminum plate. A well-regulated air supply is required. The air-supply manifold at the base of the pyramidal section must have 48, evenly spaced, No. 26 drill holes located .38 inch (10 mm) from the inner edge of the manifold, resulting in an airflow split of approximately three to one within the apparatus.

(5) *Exhaust Stack.* An exhaust stack, 5.25 × 2.75 inches (133 × 70 mm) in cross section, and 10 inches (254 mm) long, fabricated from 28 guage stainless steel must be mounted on the outlet of the pyramidal section. A. 1.0 × 3.0 inch (25 × 76 mm) baffle plate of 0.18 ± .002 inch (.50 ± .05 mm) stainless steel must be centered inside the stack, perpendicular to the air flow, 3 inches (76 mm) above the base of the stack.

(6) *Specimen Holders.* (i) The specimen must be tested in a vertical

orientation. The specimen holder (Figure 3 of this part IV) must incorporate a frame that touches the specimen (which is wrapped with aluminum foil as required by paragraph (d)(3) of this Part) along only the .25 inch (6 mm) perimeter. A ''V'' shaped spring is used to hold the assembly together. A detachable .50×.50×5.91 inch (12×12×150 mm) drip pan and two .020 inch (.5 mm) stainless steel wires (as shown in Figure 3 of this part IV) must be used for testing materials prone to melting and dripping. The positioning of the spring and frame may be changed to accommodate different specimen thicknesses by inserting the retaining rod in different holes on the specimen holder.

(ii) Since the radiation shield described in ASTM E–906 is not used, a guide pin must be added to the injection mechanism. This fits into a slotted metal plate on the injection mechanism outside of the holding chamber. It can be used to provide accurate positioning of the specimen face after injection. The front surface of the specimen must be 3.9 inches (100 mm) from the closed radiation doors after injection.

(iii) The specimen holder clips onto the mounted bracket (Figure 3 of this part IV). The mounting bracket must be attached to the injection rod by three screws that pass through a wide-area washer welded onto a ½-inch (13 mm) nut. The end of the injection rod must be threaded to screw into the nut, and a .020 inch (5.1 mm) thick wide area washer must be held between two ½-inch (13 mm) nuts that are adjusted to tightly cover the hole in the radiation doors through which the injection rod or calibration calorimeter pass.

(7) * * *

(8) *Pilot-Flame Positions.* Pilot ignition of the specimen must be accomplished by simultaneously exposing the specimen to a lower pilot burner and an upper pilot burner, as described in paragraph (b)(8)(i) and (b)(8)(ii) or (b)(8)(iii) of this part IV, respectively. Since intermittent pilot flame extinguishment for more than 3 seconds would invalidate the test results, a spark ignitor may be installed to ensure that the lower pilot burner remains lighted.

(i) *Lower Pilot Burner.* The pilot-flame tubing must be .25 inch (6.3 mm) O.D., .03 inch (0.8mm) wall, stainless steel tubing. A mixture of 120 cm^3/min. of methane and 850 cm^3/min. of air must be fed to the lower pilot flame burner. The normal position of the end of the pilot burner tubing is .40 inch (10 mm) from and perpendicular to the exposed vertical surface of the specimen. The centerline at the outlet of the burner tubing must intersect the vertical centerline of the sample at a point .20 inch (5 mm) above the lower exposed edge of the specimen.

(ii) *Standard Three-Hole Upper Burner.* The pilot burner must be a straight length of .25 inch (6.3 mm) O.D., .03 inch (0.8 mm) wall, stainless steel tubing that is 14 inches (360 mm) long. One end of the tubing must be closed, and three No. 40 drill holes must be drilled into the tubing, 2.38 inch (60 mm) apart, for gas ports, all radiating in the same direction. The first hole must be .19 inch (5 mm) from the closed end of the tubing. The tube must be positioned .75 inch (19 mm) above and .75 inch (19 mm) behind the exposed upper edge of the specimen. The middle hole must be in the vertical plane perpendicular to the exposed surface of the specimen which passes through its vertical centerline and must be pointed toward the radiation source. The gas supplied to the burner must be methane and must be adjusted to produce flame lengths of 1 inch (25 mm).

(iii) *Optional Fourteen-Hole Upper Pilot Burner.* This burner may be used in lieu of the standard three-hole burner described in paragraph (b)(8)(ii) of this part IV. The pilot burner must be a straight length of .25 inch (6.3 mm) O.D., .03 inch (0.8 mm) wall, stainless steel tubing that is 15.75 inches (400 mm) long. One end of the tubing must be closed, and 14 No. 59 drill holes must be drilled into the tubing, .50 inch (13 mm) apart, for gas ports, all radiating in the same direction. The first hole must be .50 inch (13 mm) from the closed end of the tubing. The tube must be positioned above the specimen holder so that the holes are placed above the specimen as shown in Figure 1B of this part IV. The fuel supplied to the burner must be methane mixed with air in a ratio of approximately 50/50 by volume. The total gas flow must be adjusted to produce flame lengths of 1 inch (25 mm). When the gas/air ratio and the flow rate are properly adjusted, approximately .25 inch (6 mm) of the flame length appears yellow in color.

(c) * * * (1) *Heat Release Rate.* A calibration burner, as shown in Figure 4, must be placed over the end of the lower pilot flame tubing using a gas tight connection. The flow of gas to the pilot flame must be at least 99 percent methane and must be accurately metered. Prior to usage, the wet test meter must be properly leveled and filled with distilled water to the tip of the internal pointer while no gas is flowing. Ambient temperature and pressure of the water are based on the internal wet test meter temperature. A baseline flow rate of approximately 1 liter/min. must be set and increased to higher preset flows of 4, 6, 8, 6 and 4 liters/min. Immediately prior to recording methane flow rates, a flow rate of 8 liters/min. must be used for 2 minutes to precondition the chamber. This is not recorded as part of calibration. The rate must be determined by using a stopwatch to time a complete revolution of the wet test meter for both the baseline and higher flow, with the flow returned to baseline before changing to the next higher flow. The thermopile baseline voltage must be measured. The gas flow to the burner must be increased to the higher preset flow and allowed to burn for 2.0 minutes, and the thermopile voltage must be measured. The sequence must be repeated until all five values have been determined. The average of the five values must be used as the calibration factor. The procedure must be repeated if the percent relative standard deviation is greater than 5 percent. Calculations are shown in paragraph (f) of this part IV.

(2) * * *

(3) As noted in paragraph (b)(2) of this part IV, thermopile hot junctions must be cleared of soot deposits as needed to maintain the calibrated sensitivity.

(d) *Preparation of Test Specimens.* (1) The test specimens must be representative of the aircraft component in regard to materials and construction methods. The standard size for the test specimens is 5.91 ± .03 × 5.91 ± .03 inches (149 ± 1 × 149 ± 1 mm). The thickness of the specimen must be the same as that of the aircraft component it represents up to a maximum thickness of 1.75 inches (45 mm). Test specimens representing thicker components must be 1.75 inches (45 mm).

(2) * * *

(3) *Mounting.* Each test specimen must be wrapped tightly on all sides of the specimen, except for the one surface that is exposed with a single layer of .001 inch (.025 mm) aluminum foil.

(e) *Procedure.* (1) The power supply to the radiant panel must be set to produce a radiant flux of 3.5 ± .05 W/cm^2, as measured at the point the center of the specimen surface will occupy when positioned for the test. The radiant flux must be measured after the air flow through the equipment is adjusted to the desired rate.

(2) After the pilot flames are lighted, their position must be checked as described in paragraph (b)(8) of this part IV.

(3) Air flow through the apparatus must be controlled by a circular plate orifice located in a 1.5 inch (38.1 mm) I.D. pipe with two pressure measuring

points, located 1.5 inches (38 mm) upstream and .75 inches (19 mm) downstream of the orifice plate. The pipe must be connected to a manometer set at a pressure differential of 7.87 inches (200 mm) of Hg. (See Figure 1B of this part IV.) The total air flow to the equipment is approximately .04 m^3/ seconds. The stop on the vertical specimen holder rod must be adjusted so that the exposed surface of the specimen is positioned 3.9 inches (100 mm) from the entrance when injected into the environmental chamber.

(4) The specimen must be placed in the hold chamber with the radiation doors closed. The airtight outer door must be secured, and the recording devices must be started. The specimen must be retained in the hold chamber for 60 seconds, plus or minus 10 seconds, before injection. The thermopile ''zero'' value must be determined during the last 20 seconds of the hold period. The sample must not be injected before completion of the ''Zero'' value determination.

(5) When the specimen is to be injected, the radiation doors must be opened. After the specimen is injected into the environmental chamber, the radiation doors must be closed behind the specimen.

(6) * * *

(7) * * *

(8) The test duration is five minutes. The lower pilot burner and the upper pilot burner must remain lighted for the entire duration of the test, except that there may be intermittent flame extinguishment for periods that do not exceed 3 seconds. Furthermore, if the optional three-hole upper burner is used, at least two flamelets must remain lighted for the entire duration of the test, except that there may be intermittent flame extinguishment of all three flamelets for periods that do not exceed 3 seconds.

(9) * * *

(f) * * *

(2) Heat release rates may be calculated from the reading of the thermopile output voltage at any instant of time as:

$$HRR = \frac{(V_m - V_b)K_n}{.02323m^2}$$

HRR=heat release rate (kw/m^2)

V_b=baseline voltage (mv)

V_m=measured thermopile voltage (mv)

K_h=calibration factor (kw/mv)

* * * * *

Figures to Part IV of Appendix F

BILLING CODE 4910–13–M

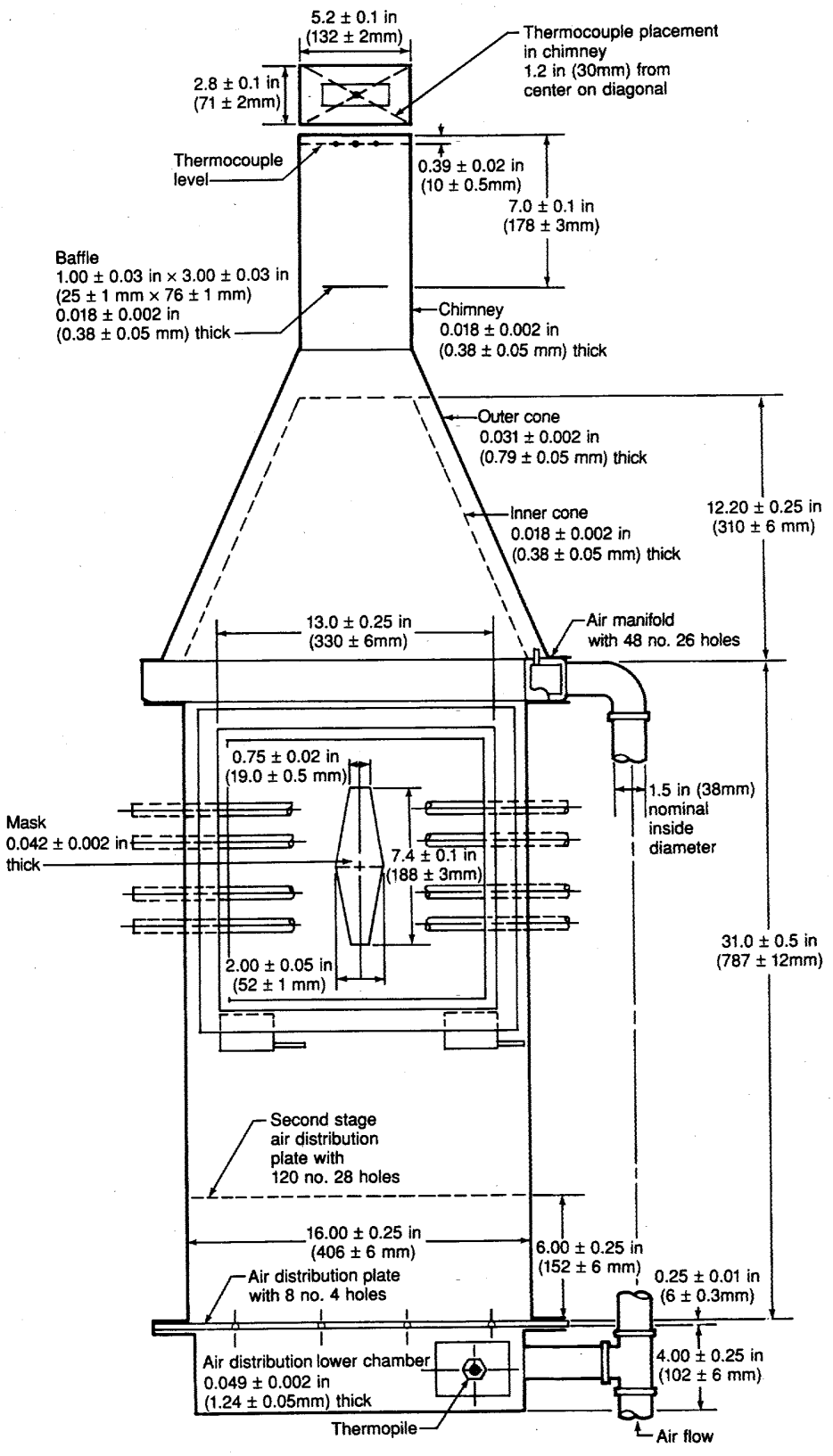

Figure 1A Rate of Heat Release Apparatus

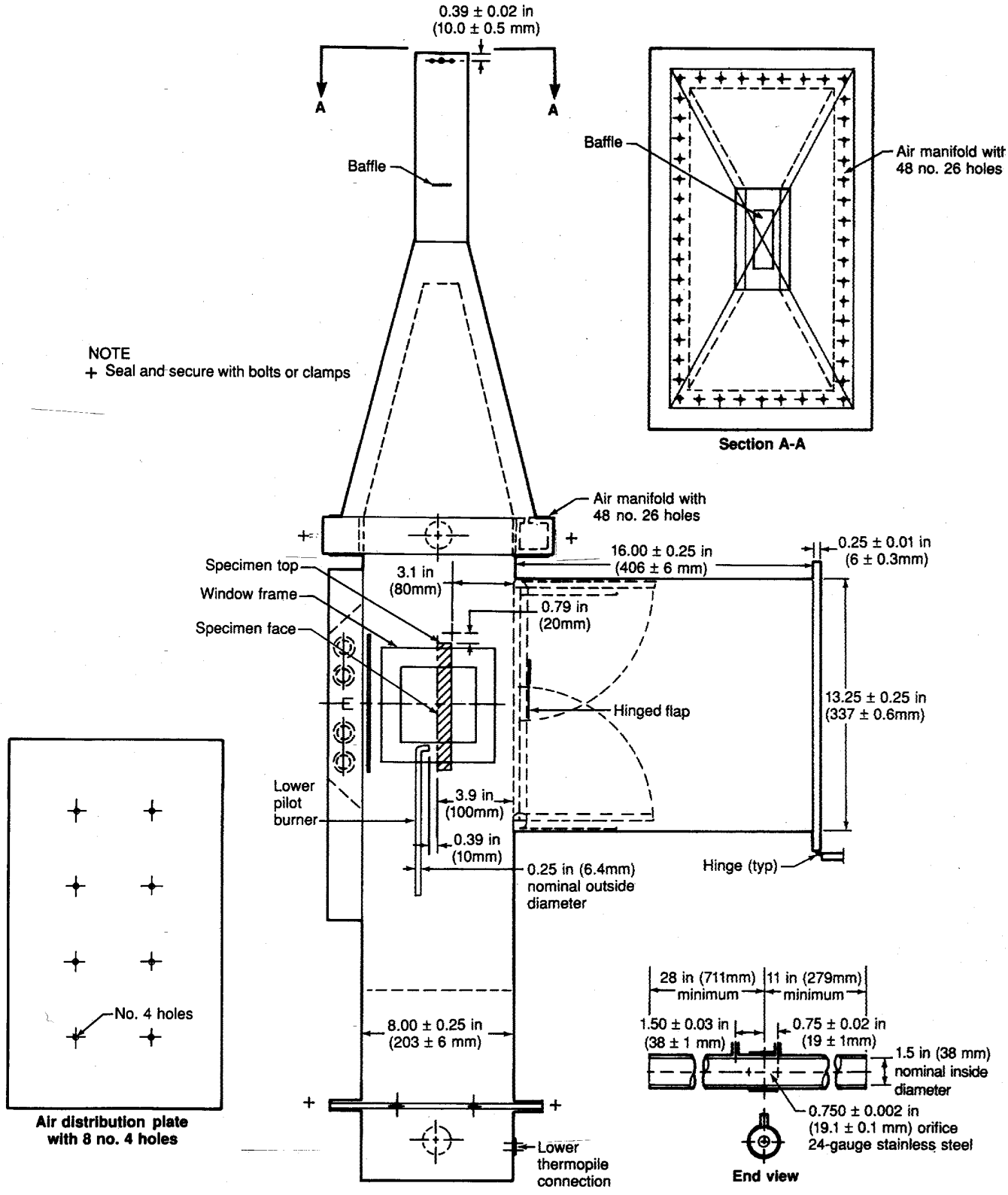

Figure 1B

Rate of Heat Release Apparatus

BILLING CODE 4910–13–C

* * * * *

PART 121—CERTIFICATION AND OPERATIONS: DOMESTIC, FLAG, AND SUPPLEMENTAL AIR CARRIERS AND COMMERCIAL OPERATORS OF LARGE AIRCRAFT

4. The authority citation for Part 121 continues to read as follows:

Authority: 49 U.S.C. 1354(a), 1355, 1356, 1357, 1401, 1421–1430, 1472, 1485, and 1502; 49 U.S.C. 106(g); 49 CFR 1.47(a).

5. By amending § 121.312 by revising paragraphs (a)(1) through (a)(6), adding a new paragraph (a)(8), and revising paragraph (b) to read as follows:

§ 121.312 Materials for compartment interiors.

(a) * * *

(1) Except as provided in paragraph (a)(6) of this section, each airplane with a passenger capacity of 20 or more and manufactured after August 19, 1988, but prior to August 20, 1990, must comply with the heat release rate testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986), except that the total heat release over the first 2 minutes of sample exposure must not exceed 100 kilowatt minutes per square meter and the peak heat release rate must not exceed 100 kilowatts per square meter.

(2) Each airplane with a passenger capacity of 20 or more and manufactured after August 19, 1990, must comply with the heat release rate and smoke testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on September 26, 1988).

(3) Except as provided in paragraph (a)(5) or (a)(6) of this section, each airplane for which the application for type certificate was filed prior to May 1, 1972, must comply with the provisions of § 25.853 in effect on April 30, 1972, regardless of the passenger capacity if there is a substantially complete replacement of the cabin interior after April 30, 1972.

(4) Except as provided in paragraph (a)(5) or (a)(6) of this section, each airplane for which the application for type certificate was filed after May 1, 1972, must comply with the material requirements under which the airplane was type certificated regardless of the passenger capacity if there is a substantially complete replacement of the cabin interior after that date.

(5) Except as provided in paragraph (a)(6) of this section, each airplane that was type certificated after January 1, 1958, and has a passenger capacity of 20 or more, must comply with the heat release rate testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986), if there is substantially complete replacement of the cabin interior components identified in § 25.853(d) on or after that date, except that the total heat release over the first 2 minutes of sample exposure shall not exceed 100 killowatt-minutes per square meter and the peak heat release rate shall not exceed 100 kilowatts per square meter.

(6) Each airplane that was type certificated after January 1, 1958, and has a passenger capacity of 20 or more, must comply with the heat release rate and smoke testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on September 26, 1988), if there is a substantially complete replacement of the cabin interior components identified in § 25.853(d) on or after August 20, 1990.

* * * * *

(8) Contrary provisions of this section notwithstanding, galley carts and galley standard containers that do not meet the flammability and smoke emission requirements of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1)) may be used in airplanes that must meet the requirements of paragraph (a–1), (a)(2), (a)(5) or (a)(6) of this section, provided the galley carts or standard containers were manufactured prior to March 6, 1995.

(b) For airplanes type certificated after January 1, 1958, seat cushions, except those on flight crewmember seats, in any compartment occupied by crew or passengers must comply with the requirements pertaining to fire protection of seat cushions in § 25.853(c) effective on November 26, 1984.

PART 135—AIR TAXI OPERATORS AND COMMERCIAL OPERATORS

6. The authority citation for Part 135 continues to read as follows:

Authority: 49 U.S.C. 1354(a), 1355(a), 1421–1431, and 1502; 49 U.S.C. 106(g); 49 CFR 1.47(a).

7. By amending § 135.169 by revising paragraph (a) to read as follows:

§ 135.169 Additional airworthiness requirements.

(a) Except for commuter category airplanes, no person may operate a large airplane unless it meets the additional airworthiness requirements of §§121.213 through 121.283 and 121.307 of this chapter.

* * * * *

8. By revising § 135.170 to read as follows:

§ 135.170 Materials for compartment interiors.

(a) No person may operate an airplane that conforms to an amended or supplemental type certificate issued in accordance with SFAR No. 41 for a maximum certificated takeoff weight in excess of 12,500 pounds unless within one year after issuance of the initial airworthiness certificate under that SFAR, the airplane meets the compartment interior requirements set forth in § 25.853(a) in effect March 6, 1995 (formerly § 25.853 (a), (b), (b–1), (b–2), and (b–3) of this chapter in effect on September 26, 1978).

(b) No person may operate a large airplane unless it meets the following additional airworthiness requirements:

(1) Except for those materials covered by paragraph (b)(2) of this section, all materials in each compartment used by the crewmembers or passengers must meet the requirements of § 25.853 of this chapter in effect as follows or later amendment thereto:

(i) Except as provided in paragraph (b)(1)(iv) of this section, each airplane with a passenger capacity of 20 or more and manufactured after August 19, 1988, but prior to August 20, 1990, must comply with the heat release rate testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986), except that the total heat release over the first 2 minutes of sample exposure rate must not exceed 100 kilowatt minutes per square meter and the peak heat release rate must not exceed 100 kilowatts per square meter.

(ii) Each airplane with a passenger capacity of 20 or more and manufactured after August 19, 1990, must comply with the heat release rate and smoke testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.83(a–1) in effect on September 26, 1988).

(iii) Except as provided in paragraph (b)(1) (v) or (vi) of this section, each airplane for which the application for type certificate was filed prior to May 1, 1972, must comply with the provisions of § 25.853 in effect on April 30, 1972, regardless of the passenger capacity, if there is a substantially complete replacement of the cabin interior after April 30, 1972.

(iv) Except as provided in paragraph (b)(1) (v) or (vi) of this section, each airplane for which the application for type certificate was filed after May 1, 1972, must comply with the material requirements under which the airplane was type certificated regardless of the passenger capacity if there is a substantially complete replacement of the cabin interior after that date.

(v) Except as provided in paragraph (b)(1)(vi) of this section, each airplane that was type certificated after January 1, 1958, must comply with the heat release testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986), if there is a substantially complete replacement of the cabin interior components identified in that paragraph on or after that date, except that the total heat release over the first 2 minutes of sample exposure shall not exceed 100 kilowatt-minutes per square meter and the peak heat release rate shall not exceed 100 kilowatts per square meter.

(vi) Each airplane that was type certificated after January 1, 1958, must comply with the heat release rate and smoke testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986), if there is a substantially complete replacement of the cabin interior components identified in that paragraph after August 19, 1990.

(vii) Contrary provisions of this section notwithstanding, the Manager of the Transport Airplane Directorate, Aircraft Certification Service, Federal Aviation Administration, may authorize deviation from the requirements of paragraph (b)(1)(i), (b)(1)(ii), (b)(1)(v), or (b)(1)(vi) of this section for specific components of the cabin interior that do not meet applicable flammability and smoke emission requirements, if the determination is made that special circumstances exist that make compliance impractical. Such grants of deviation will be limited to those airplanes manufactured within 1 year after the applicable date specified in this section and those airplanes in which the interior is replaced within 1 year of that date. A request for such grant of deviation must include a thorough and accurate analysis of each component subject to § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986), the steps being taken to achieve compliance, and for the few components for which timely compliance will not be achieved, credible reasons for such noncompliance.

(viii) Contrary provisions of this section notwithstanding, galley carts and standard galley containers that do not meet the flammability and smoke emission requirements of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986), may be used in airplanes that must meet the requirements of paragraph (b)(1)(i), (b)(1)(ii), (b)(1)(iv) or (b)(1)(vi) of this section provided the galley carts or standard containers were manufactured prior to March 6, 1995.

(2) For airplanes type certificated after January 1, 1958, seat cushions, except those on flight crewmember seats, in any compartment occupied by crew or passengers must comply with the requirements pertaining to fire protection of seat cushions in § 25.853(c) effective November 26, 1984.

Issued in Washington, D.C., on January 24, 1995.

David R. Hinson,

Administrator.

[FR Doc. 95–2114 Filed 2–1–95; 8:45 am]

BILLING CODE 4910–13–M