

**DEPARTMENT OF TRANSPORTATION****Federal Aviation Administration****14 CFR Parts 21, 23, 36, 91, 121, 135, 139****[Docket No. 18315; Amendment Nos. 91-159 and 135-2; SFAR No. 41]****Airworthiness Standards: Reciprocating and Turbopropeller-Powered Small Multiengine Airplanes—Increase in Approved Takeoff Weights and Passenger Seating Capacities****AGENCY:** Federal Aviation Administration (FAA), DOT.**ACTION:** Final rule.

**SUMMARY:** This amendment adopts a new Special Federal Aviation Regulation (SFAR) which prescribes additional airworthiness standards applicable to existing propeller driven multiengine small airplanes to allow their type and airworthiness recertification at weights in excess of the limitation of 12,500 pounds maximum certificated takeoff weight, or with an increase in the number of passenger seats, or both. The rules applicable to air taxi and commercial operators (Part 135) are amended to allow the operation of airplanes certificated under the SFAR. In addition, the operating rules (Parts 91 and 135) are amended to require that airplanes certificated under the SFAR at weights in excess of 12,500 pounds: meet updated interior material flammability requirements within one year of initial airworthiness certification. These amendments are intended to allow the design capabilities of certain existing small airplanes to be more fully utilized. They are also designed to increase aircraft availability for the commuter market that is burgeoning since enactment of the Airline Deregulation Act of 1978.

**EFFECTIVE DATE:** October 17, 1979.

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**Background**

In general, under the Federal Aviation Regulations (FAR) relating to certification, airplanes are treated, as they have been for many years, as either small or large. Numerous pilot, operating, and maintenance requirements of the FAR utilize the same small and large distinction. In addition,

the International Civil Aviation Organization (ICAO) uses this weight distinction. The distinction is based on the maximum certificated takeoff weight (MCTW) of the airplane. For airplanes with an MCTW of 12,500 pounds or less, the airplane is defined in § 1.1 of the FAR as small. Airplanes with an MCTW of more than 12,500 pounds are defined as large.

The 12,500 pound weight distinction, adopted in 1953, was based in part upon certain airplane and powerplant design considerations which were then considered significant. Over the past 28 years, however, numerous additional operational factors have developed and must be considered in airplane design. In fact manufacturers have asserted that the 12,500 pound weight distinction no longer provides an appropriate demarcation between small and large airplanes.

A number of recent requests for exemption or for rule change concerning this weight distinction have been made by operators who utilize airplanes with an MCTW of exactly or very near 12,500 pounds. The operators assert that these airplanes are capable of operating safely at maximum takeoff weights in excess of 12,500 pounds. In addition, they have indicated that this weight limit has the effect of reducing safety margins by preventing the installation of additional navigational equipment and by preventing the installation of increased fuel reserves. Based on these comments and requests and the claimed overall safety benefit, the FAA issued a specific proposal (Notice No. 78-14, 43 FR 46734, October 10, 1978) to allow certification and operation of certain small airplanes at MCTW's in excess of 12,500 pounds.

Current airworthiness standards exist for two basic designations of airplanes: Part 23 for airplanes 12,500 pounds or under having nine or less passenger seats and Part 25 for transport category airplanes. Commuter airlines and air taxi operators in the United States, which have grown substantially in recent years, have demonstrated a need for airplanes which are not fully transport category but exceed the size limitations of Part 23.

Recognizing the need for improved standards for airplanes intended for commuter operations, the Administrator initiated a three-phase program. The first phase was the issuance of a revised Part 135, "Air Taxi Operators and Commercial Operators" on September 26, 1978 (43 FR 46742, October 10, 1978) which aligned the rules for those operations more closely with those of Part 121. The second phase was the initiation of the Light Transport Airplane Airworthiness Review (43 FR

60848, December 28, 1978) which will result in a separate set of airworthiness standards for multiengine airplanes with a suggested 30 passenger seating capacity and maximum gross weight of about 35,000 pounds. The third phase was the issuance of Notice 78-14 initiating this rulemaking action by proposing an increase in approved takeoff weights and passenger seating capacities for existing small airplanes that meet stated requirements.

Notice 78-14 proposed special certification requirements and changes to operating rules applicable to air taxis and commercial operators of small airplanes which would allow the design capability of certain existing propeller-driven multiengine small airplanes to be more fully utilized. The proposed certification requirements are of an interim nature and therefore formulated as a Special Federal Aviation Regulation (SFAR).

The essential provisions that were proposed in Notice 78-14 are being adopted by this amendment. The new rules will allow the certification of propeller-driven multiengine small airplanes with a passenger seating configuration of between 10 and 19 seats that were originally type certificated in accordance with Part 23 of the FARs in effect on March 13, 1971 or later. The new rules will also allow the certification and operation, with appropriate restrictions and limitations, of small propeller-driven multiengine airplanes at maximum takeoff weights in excess of 12,500 pounds.

The interim nature of the SFAR is reflected in the time limits imposed. The amendment provides that an application for aircraft supplemental or amended type certification under the SFAR must be filed within two years after the effective date of the SFAR, while production of airplanes certificated with maximum takeoff weights in excess of 12,500 pounds will be limited to 10 years after the effective date of the SFAR. The 10 year period is intended to provide the time needed to develop the new FAR Part 24 and for airplane manufacturers to demonstrate compliance with the new part.

The international implications of the amendment should be noted. The United States as a contracting State of ICAO is under agreement to comply with the Convention on International Civil Aviation. Annex 8 to the Convention contains international standards of airworthiness applicable to certification of airplanes having an MCTW in excess of 5,700 kg (approximately 12,500 pounds). The airworthiness standards set forth in the SFAR are not intended to and do not meet the Annex 8

requirements. Therefore, airplanes certificated in accordance with the SFAR that operate at weights in excess of 5,700 kg would be prohibited from international navigation unless specifically allowed by the countries of overflight or entry. These airplanes' airworthiness certificates would be appropriately endorsed. In addition, the international airman licensing and aircraft operating provisions in Annexes 1 and 6 to the Convention on International Civil Aviation must be met to operate these airplanes on international flights. The FAA is aware of the potential problems that this dichotomy will create. It is the FAA's intention to have this matter brought to ICAO's attention for resolution at an early date.

Turbojet powered multiengine airplanes are not covered in this amendment because these high performance airplanes require more stringent airworthiness provisions than those applicable to propeller driven multiengine small airplanes. Therefore, at the present time, Part 25 of the FAR, where applicable, continues to be an appropriate standard for these airplanes.

Interested persons have been afforded an opportunity to participate in the making of these amendments and due consideration has been given to all matter presented. A number of substantive changes and changes of an editorial and clarifying nature have been made to the proposed rules based upon relevant comments received and upon further review within the FAA. Except for minor editorial and clarifying changes and the substantive changes discussed below, these amendments and the reasons for them are the same as those contained in Notice No. 78-14.

These amendments implement the President's directive (Executive Order 12044) that regulations be as simple as possible and not impose unnecessary burdens on the economy or on the regulated public. They also are designed to promote the public interest by increasing safety, availability of aircraft, and efficiency.

#### Discussion of Comments

Twenty-two individual sets of comments were submitted in response to Notice 78-14. Many of these addressed more than one aspect of the proposals. While the great majority of the commenters were in general agreement with the objectives of the proposals, a number of them offered criticisms or suggested changes to the proposed rules or requested clarification and guidance on compliance with the rules.

One commenter recommended that the SFAR not be adopted on the ground that small airplane airworthiness standards would be applied to airplanes of over 12,500 pounds which up to this time have been required to meet transport category standards. The FAA does not agree. The SFAR incorporates additional airworthiness requirements designed to provide the necessary level of safety for a type of airplane that has not heretofore had regulations specifically developed for it. As noted in the background discussion, the SFAR provides interim standards to enable greater utilization of existing airplanes when those airplanes meet the higher standards of the SFAR even though they may not meet transport category certification requirements.

Among the comments received were recommendations for various requirements not proposed in the notice. Among these were recommendations for less than the minimum number of required exits in freight-only airplanes, for determination of takeoff distance based on criteria different than currently required, for bird strike protection in front of pilots, for establishment of life limits for components not presently subject to such limits, and freedom from flutter after various trim tab failures. None of these recommendations were supported by justification from a safety standpoint for imposing the additional burden or lesser standard involved and the FAA does not have information to indicate the need for such requirements at this time.

The comments related to specific elements of the proposal are discussed below under the like-numbered paragraphs of the SFAR and the applicable Part 135 sections as proposed.

#### 1. *Special Federal Aviation Regulation*

**Section 1. *Applicability.***—Six commenters questioned the need to impose the additional performance requirements of Appendix A, Part 135, in order to achieve an increase in passenger seating capacity or an increase in maximum certificated takeoff weight (MCTW). These commenters asserted that the requirements contained in SFAR 23 are adequate. At the other extreme, one commenter recommended that Part 25 performance requirements be made applicable for weights exceeding 12,500 pounds. Such generalized comments, however, do not address the reasons for the proposed interim SFAR standards which have been set forth in the various notices explaining the Administrator's three-phase program or provide a basis for now altering the proposals.

In more specific vein, one commenter believed it inconsistent that under the proposal some 19 passenger airplanes would have to comply with the entire new SFAR whereas others would have to comply only with Appendix A to Part 135. This commenter recommended that all 10-19 passenger airplanes, regardless of weight, comply with the proposed requirements that would be applicable to airplanes originally type certificated to Part 23 regulations in effect on March 13, 1971, or later. Under the proposal, airplanes to be certificated at MCTW over 12,500 pounds regardless of the number of passengers would have to meet not only the modified requirements of Appendix A but the additional requirements contained in the new SFAR.

The difference in certification requirements under the proposed SFAR is not dependent on the number of passengers but the MCTW of each airplane. Section 1.(a) of the SFAR is limited to those airplanes that do not exceed 19 passenger seats, have a MCTW of 12,500 pounds or less, and were originally type certificated to include Amendment 23-10. Section 1.(a) has been clarified with respect to the weight limitations. Section 1.(b) on the other hand, and in response to another commenter's request for clarification, covers all normal category airplanes to be certificated at MCTW in excess of 12,500 pounds. Thus to certificate an Amendment 23-10 airplane for 19 passengers at an MCTW in excess of 12,500 pounds, the airplane would have to meet the requirements of section 1.(b). Since the added requirements of section 1.(b) go with the increased weight above 12,500 pounds, there is no inconsistency in the applicability.

With respect to its applicability for other than Amendment 23-10 airplanes, the new SFAR does not apply to a normal category airplane, originally type certificated in accordance with Part 23 in effect prior to March 13, 1971 (i.e. not including Amendment 23-10), that is to be certificated for an increase in passenger seating capacity unless that airplane is to be certificated for a maximum takeoff weight in excess of 12,500 pounds. If the weight does not exceed 12,500 pounds, the regulations incorporated in the type certificate apply to an increase in passenger seating capacity as well as to an increase in MCTW that does not exceed 12,500 pounds. Furthermore, this rulemaking action is not intended to impose retroactive requirements on airplanes of older type design, as questioned by one commenter, when there is to be no change in the number of

seats or MCTW. It should also be noted that under section 1.(b) of the SFAR, there is no limitation on the number of passenger seats for which the airplane may be certificated when the MCTW exceeds 12,500 pounds although regulations governing operations impose other limitations on the number of passengers. Section 1.(b) has been changed to clarify that the passenger seating configuration may be increased if the applicant so requests.

One commenter objected to provisions of the SFAR which were interpreted as allowing increased weight and derogated performance at the expense of safety. However, contrary to the commenter's concern, an airplane must comply with the minimum performance standards as well as the other requirements of the SFAR, under which it will be safe to operate notwithstanding the increase in weight and lessened performance. Under the SFAR, if increased weight prevents the airplane from meeting the minimum performance requirements, the airplane does not meet the required level of safety and it would not be certificated.

With respect to section 1.(b), six commenters contended that compliance with the performance requirements of Appendix A of Part 135 at all operating weights below 12,500 pounds, would unfairly penalize airplane performance. According to these commenters, the Appendix A performance requirements, although appropriate for MCTW above 12,500 pounds, place additional unneeded restrictions on airplane weight on hot days, at high altitudes, and on short runways when the takeoff weight does not exceed 12,500 pounds in any event. Asserting that such restrictions are inconsistent with the stated purpose of the proposal to allow full utilization of an airplane's design capabilities, they recommended that SFAR 23 performance standards apply to weights up to 12,500 pounds and Appendix A performance standards to weights above 12,500 pounds.

The FAA agrees with the analysis that shows compliance with Appendix A performance requirements may be unnecessarily restrictive at weights of up to 12,500 for airplanes that were not required to meet Appendix A as a type certification requirement. Moreover, for airplanes to be certificated under the SFAR at maximum certificated takeoff weights of more than 12,500 pounds, it was not the FAA's intent to change the certification basis of such airplanes for takeoff weights of 12,500 pounds or less. Thus, where an airplane's preexisting certification basis does not include Appendix A but the airplane with 10 or

more passenger seats is qualified for operations under Part 135 or is certificated under Part 23 in effect prior to amendment 23-10 and is to be used only in Part 91 operations, there appears to be no safety reason why the airplane's certification basis needs to be changed for weights at which the airplane is currently operating. Although the commenters emphasized only the performance requirements of Appendix A as being unnecessarily restrictive at weights below 12,500 pounds, the FAA has determined that any of the requirements of Appendix A may be included within the exception for an airplane whose certification basis provides the required level of safety, regardless of the number of passengers at weights up to 12,500 pounds. Therefore, an exception has been added as section 5.(b) of the SFAR which provides relaxation from the requirements of the notice to allow compliance with the regulations incorporated in the type certificate in lieu of compliance with Appendix A at takeoff weights of 12,500 pounds or less for specified airplanes. For all takeoff weights above 12,500 pounds the airplane must meet the Appendix A requirements as modified by the other section 5 exceptions.

Section 1.(b)(3) of the SFAR requires compliance with sections 7 through 14 of the SFAR as an additional condition for certification at MCTW in excess of 12,500 pounds. For reasons similar to those discussed above in connection with Appendix A requirements, it was the intent that these requirements not constitute a new certification basis for takeoff weights at or below 12,500 pounds but rather provide additional requirements for takeoff weights in excess of 12,500 pounds. Section 1.(b)(3) has been amended to make this clear.

Two commenters asked what modifications it would be permissible to make in order to take advantage of the proposal. It was not the intent to identify or otherwise limit the specific modifications that might be necessary in any particular case to meet the proposal. Any modification that would enhance an airplane's ability to meet the applicable requirements of the new SFAR would be permissible. In this connection, however, it should be noted that the new SFAR by its terms is limited to amended and supplemental type certification of airplanes previously certificated in the normal category. Therefore, the limitations contained in § 21.19, and in Subparts D and E of Part 21 relative to such certification, also apply.

One commenter objected to the proposal in the belief that it would increase the noise contours due to the added weight requiring more power for takeoffs of airplanes recertificated under section 1.(b). On the other hand, two commenters suggested that the maximum allowable noise should be increased above the levels allowed for small airplanes as proposed in the notice. The considerations involved in these comments result from proposed SFAR section 1.(c) which would define an airplane certificated under section 1.(b) as a small airplane for purposes of Part 36. The comments do not explain how or why persons on the ground exposed to the modified airplanes would be subjected to more noise than is now permitted for the existing certificated airplanes.

The proposal will not increase noise contours. The SFAR standards must be met regardless of engine power or thrust available or used for takeoff. Therefore, the effect of the increased weight on takeoff noise output must be accounted for and kept within present noise limits. The comments do not provide any basis for modifying the proposal with respect to noise.

With further reference to paragraph 1.(c), since "small aircraft" are defined in Part 1, the intent was that airplanes certificated under section 1.(b) be considered small airplanes for purposes of the parts listed rather than be "defined" as small airplanes. Accordingly, a nonsubstantive change has been made in section 1.(c) to clarify the point. The definitions of small and large aircraft set forth in Part 1 remain unchanged.

Finally, upon review of section 1.(c) by the FAA, it is noted that Part 139 was inadvertently omitted from the listing of Parts under which an airplane certificated under section 1.(b) of the SFAR would be considered a small airplane. FAR § 139.12a provides for the issuance of a limited airport operating certificate for an airport serving CAB-certificated air carriers conducting only unscheduled operations with small aircraft. Unless the newly certificated aircraft are "small" aircraft, airports serving them would no longer be eligible for the limited certificate and would have to obtain a regular or full certificate. For this reason, Part 139 is added to the listing in section 1.(c).

**2. Eligibility.**—No unfavorable comments were received on the proposal and the section is adopted without substantive change.

**3. Production Limitation.**—One commenter recommended that the proposed 10-year limitation for receiving original airworthiness certificates based

on an amended or supplemental type certificate issued under the SFAR be increased and made indefinite. This commenter cited the high cost of certification as the only justification. The FAA agrees that the high cost of certification is one factor to be considered. However, in view of the proposed Part 24, the intent is that the SFAR provisions be self-limiting as to time. It is the intent of Part 24 to construct a regulation that reflects the state of the art for the entire aircraft. Therefore the reason for the limitation is to ensure that once Part 24 aircraft are available, these will be the aircraft on the market because Part 24 aircraft will represent a significant safety increase over the aircraft produced pursuant to this SFAR.

Another commenter requested verification of his understanding that once an airplane receives an airworthiness certificate under the SFAR procedures, no life limit is otherwise imposed by the SFAR. That understanding is correct. The 10-year limitation applies only to obtaining the initial airworthiness certificate under an amended or supplemental type certificate issued under the SFAR. Once issued, the duration of the airworthiness certificate is governed by the same rule applicable to other standard airworthiness certificates.

Both of the foregoing comments indicate there may have been some ambiguity in the proposed rule due to the reference to an "original" airworthiness certificate. Actually, in a case where an aircraft is modified to conform to an amended or supplemental type certificate, it is possible that there may not be an issue of an original airworthiness certificate. The intent was to impose the 10-year limit on obtaining whatever form of airworthiness certificate results from the changed type certificate. Section 3 has therefore been clarified by specifying an original or amended airworthiness certificate.

**4. Restrictions.**—No unfavorable comments were received on the proposal and the section is adopted without substantive change.

**5. Exceptions.**—No unfavorable comments were received on section 5.(a) and it is adopted without substantive change.

Section 5.(b) contains the general exception to the requirements of Appendix A Part 135 for certain airplanes. This was discussed in connection with section 1.(b) of the SFAR concerning applicability of the SFAR to airplanes with an MCTW of over 12,500 pounds.

With reference to landing performance requirements, one

commenter stated that the proposal could be interpreted to require a double application of the effective runway length factor specified in section 7 of Appendix A of Part 135. The ambiguity results because the airplanes are also subject to the requirements of §§ 135.385 and 135.387 which specify like factors. The problem does not arise outside the SFAR since the landing requirements of Appendix A apply only to normal category airplanes while those of §§ 135.385 and 135.387 apply only to large transport category airplanes. The SFAR as proposed could be interpreted to mean that airplanes would be subject to both sets of requirements. The FAA agrees that the effective runway length requirement should be clarified since there is no intent that the factor be applied twice. In addition, the proposed landing performance requirements did not require consideration of wind corrections. For these reasons, the proposed requirement to comply with section 7, as well as with related §§ 19.(b)(3) and 19.(c), of Appendix A of Part 135 has been deleted and the applicable landing performance requirements, not covered in §§ 135.385 and 135.387, are included in a new section 5.(c) of the SFAR.

The fatigue evaluation standards set forth in proposed section 5.(b) (section 5.(d) as adopted) are stricter than those in Appendix A and apply where the MCTW exceeds 12,500 pounds. One commenter recommended that the proposed fatigue requirement also be applied to those airplanes whose passenger seating capacity is increased above nine even though the weight does not exceed 12,500 pounds. However, the commenter presented no justification to show that the current safety requirements are inadequate or that the fatigue evaluation standards should be extended to airplanes of 12,500 pounds or less.

Another commenter objected to the proposal which would allow fatigue strength evaluation to be conducted by analysis alone. It was contended that tests should be required because of adverse service experience reported with surplus military aircraft which had sustained structural damage due to overloading. However, such experience is not relevant to type certification standards since evaluation of the structure must be made under the conditions and loads expected in service. The FAA does agree that there should be limitations on the analysis-alone evaluation and a recent amendment to § 23.572(a)(1) provides such a limitation. Accordingly, the fatigue strength investigation

requirement is modified to be consistent with the current Part 23 type certification requirement by specifying that analysis alone is acceptable only when it is conservative and applied to simple structures.

Section 5.(c) proposed additional door and exit requirements considered necessary for safety at the higher weights. Two commenters suggested that movable seat backs be allowed to obstruct window-type emergency exits but presented no evidence to show that an equivalent level of safety would be achieved. The commenters also questioned the need for the door locking mechanism to be visible from within the fuselage; however, even though the proposal requires visual inspection by crewmembers, it does not specify that the inspections must be conducted from within the airplane. Thus, external inspection, as of cargo doors could be made through appropriate openings or transparent coverings. Finally, one commenter was of the opinion that the number of emergency exits could be reduced so long as the 90-second evacuation test was met; however, those are not alternative requirements, and no justification was given for not meeting both. The door and exit requirements are adopted as substantively proposed and designated section 5.(e).

No unfavorable comments were received on the lightning strike protection requirements proposed in section 5.(d) and it is adopted as section 5.(f) without substantive change.

Three commenters questioned the need for the fire containment requirement of section 5.(e) when there are other requirements that speak to fire extinguishment. However, extinguishment and containment are separate requirements. Containment prevents an engine fire from spreading to the rest of the airplane before the fire can be extinguished. With respect to containment, the proposal referred to burn-through of the external skin whereas any burn-through that could create additional hazards is the condition to be prevented. The paragraph has been amended to make this clarification. Several commenters suggested the use of heat-resistant coatings in place of fireproof cowlings; however, the basic requirement is for containment without specifying the means. A heat-resistant coating that merely delays burn-through would not be in compliance with the requirement. Finally, a number of commenters objected to applying the fire containment requirement to turbine-powered airplanes, but their asserted lack of fire history statistics does not

justify avoidance of a safety standard intended to cover the over 12,500 pound weight category for which there is no actual operating experience. The requirements are adopted as substantively proposed and designated as section 5.(g).

Section 5.(f) proposed that the flammable fluid fire protection requirements of Part 25 be used in lieu of section 57 of Appendix A. Seven commenters questioned the need for and practicability of complying with the more stringent requirements of Part 25. However, in this connection, it should be noted that the regulatory intent is for all aircraft to conform to a uniform minimum standard for flammable fluid fire protection. To this end, FAR Parts 23, 27, and 29 were amended after the issuance of Notice 78-14 to be consistent with updated Part 25 requirements. At the time of issuing Notice 78-14, the minimum acceptable standards for flammable fluid fire protection for the new category SFAR airplanes was contained in § 25.863 then in effect. The commenters have presented no justification for relaxing the safety standard set forth in the notice, and section 5.(f) (redesignated 5.(h)) is adopted as proposed.

**6. Additional requirements—general**  
This section states, in effect, that the additional requirements specified in succeeding sections of the SFAR apply to airplanes to be certificated at MCTW in excess of 12,500 lbs. Two commenters raised general objections—one that such requirements should not apply if the passenger capacity does not exceed 19, the other that retrofit to such standards would be costly in weight and dollars. The FAA does not deny that to meet the additional requirements may be costly, but the commenters presented no reasons why the requirements, considered collectively, would not be necessary in the interest of safety or why 19 passengers should be a cutoff point rather than 12,500 pounds. The FAA considers the SFAR requirements to be minimum safety standards necessary for the new category airplanes. Moreover, nothing compels exceeding a 12,500 pound MCTW so that compliance is a matter of choice with an operator who must decide if such compliance is economically feasible in his particular case.

Comments addressed to individual additional requirements are discussed below.

**7. Compartment interiors.** This section states various requirements relating to cabin materials, smoking, disposal receptacles, lavatories, and hand fire extinguishers. All the comments objecting to section 7 were directed to

the requirement for materials. One group of commenters objected because of the alleged high cost to retrofit older airplanes and the alleged lack of history of in-flight fires on this type aircraft. Two other commenters contended that it would not be economically feasible to comply immediately with the interim material requirements.

The FAA does not agree that the cost of cabin interior materials to meet the flammability requirements of proposed section 7.(a) is sufficient justification for not imposing them. Neither have the commenters shown that the alleged lack of history of in-flight fires supports a withdrawal of the requirement. Actually there is no operating history for this new class of airplane and the commenters have not addressed the need for safety measures necessary to achieve the level of safety at the higher weights. The proposed cabin material requirements are the same as those specified for transport category airplanes under Part 25. The FAA does agree that it would be reasonable to grant additional time in which to install the materials. The burden of refurbishing the cabin materials would be substantially lessened if operators could take advantage of periods when their airplanes are down for extended periods.

In view of these considerations, the cabin material requirements of section 7 and the Appendix are deleted from the SFAR. In place thereof, the operating rules of Parts 91 and 135 are amended by adding a requirement that airplanes certificated under the SFAR at MCTW in excess of 12,500 pounds must meet the compartment interior material requirements of § 25.853(a), (b), (b-1), (b-2), and (b-3) within one year after receiving an airworthiness certificate under the SFAR.

**8. Landing Gear.** In response to one inquiry as to the applicability of § 25.721(b) to fixed landing gear airplanes, the rule requires compliance only when one or more landing gear legs is not extended. Since this condition would not exist in a fixed landing gear airplane, the rule would not be applicable. Resubstantiation of fixed landing gear to Part 25 ground load standards, as questioned by that commenter, would not be necessary since the initial airplane certification under Part 23 is sufficiently conservative for a maximum zero fuel weight that does not exceed 12,500 pounds.

**9. Fuel system components crashworthiness.** This section requires compliance with certain Part 25 rules under various emergency landing conditions. There should be no confusion as to their applicability in the

case of fixed landing gear airplanes as questioned by one commenter. Thus, § 25.561(b)(2) clearly states that the wheels are retracted (where applicable) and then specifies the inertia forces that may result. It is these inertia forces that the fuel tanks must be able to resist irrespective of the type of landing gear. Section 25.994, by its terms, is clearly not applicable to fixed landing gear airplanes since it refers specifically to the condition of wheels-up landing.

**10. Shutoff means.** No specific objection was made to this section and it is adopted substantively as proposed.

**11. Fire extinguishing systems.** The National Transportation Safety Board (NTSB) expressed the view that a fire detection system is a prerequisite to a fire extinguishing system. Under the proposal, turbopropeller-powered airplanes would be required to have a detector system in compliance with Part 135, Appendix A, as would multiengine reciprocating engine powered airplanes incorporating turbosuperchargers under current § 23.1203. However, older airplanes not covered by current § 23.1203 and those not equipped with turbosupercharger-equipped reciprocating engines would not be required under the proposal to have fire detection systems. The NTSB therefore recommended that the final rule require fire detection systems for all reciprocating-engine powered airplanes. The NTSB views were also expressed by another commenter. The FAA agrees. The intent of the proposal to provide adequate fire extinguishment can best be achieved by inclusion of the detecting system requirement.

Moreover, without a detection system, airplanes that could be certificated under the proposed SFAR at the higher MCTW would be operating at a different and lower level of safety than that now applicable to Part 23 airplanes. Accordingly, to assure that necessary safety standards are applied uniformly to all airplanes eligible for certification under the SFAR, paragraph 11 is modified to include the requirement for a fire detection system in all airplanes.

A number of commenters objected to the requirement for the two-bottle discharge extinguisher capability in engine compartments. It was their contention that in-flight fire statistics did not justify such redundancy and that the over-protection would impose a payload sacrifice and be expensive. In this connection, neither Part 23 nor Appendix A of Part 135 requires an extinguisher system. Upon reconsideration of the proposal, and consistent with the recognized need for improved standards for the category of

airplanes to be certificated under the SFAR, the FAA has concluded that a system to provide a "one-shot" discharge to each designated fire zone is the minimum safety standard for the new category airplanes. Section 11.(b) [now 11.(b)(2)] has been changed accordingly.

12. *Fire extinguishing agents.*

13. *Extinguishing agent containers.*

14. *Fire extinguishing system materials.*

The comments received were directed to fire extinguishing systems in general under section 11 rather than to the specific areas covered in sections 12, 13, and 14. Sections 12, 13, and 14 are adopted as substantively proposed. In the notice, section 13 inadvertently referenced § 25.1189 although by subject matter it is clear that § 25.1199 was intended. Section 13 has been corrected accordingly.

15. *Expiration.* One commenter's inquiry regarding applicability of this section appears to be questioning, in effect, the duration of supplemental and amended type certificates issued under the SFAR and the airworthiness certificates derived from them. These points have been discussed in detail earlier in this preamble in connection with sections 1 and 3. The section is adopted substantively as proposed.

#### *Discussion on proposals concerning Part 135*

*FAR § 135.169.* No unfavorable comments were received on the proposal to amend § 135.169 and the proposal is adopted without substantive change. However, the general reference to airplanes type certificated in compliance with the SFAR has been expanded to refer separately to those certificated under sections 1.(a) and 1.(b). This distinction is necessary for clarity because of the separate references required in § 135.399.

*FAR § 135.399.* The proposed addition to § 135.399 would require airplanes certificated under the SFAR to comply with the landing limitations that are applicable to large transport category turbine-engine powered airplanes under Part 135 at destination and alternate airports. Two commenters believed it would be confusing to incorporate regulations whose indicated applicability is only to large transport category turbine-engine powered airplanes when the affected airplanes are non-transport category and include those with reciprocating engines. The FAA agrees and the paragraph, as adopted, has been changed to clarify this applicability.

One commenter noted that the proposed § 135.399(b) would require

compliance with landing limitations but nothing was proposed to revise § 135.399(a) to implement the takeoff limitations for the new SFAR airplanes. According to the commenter this was a serious omission because takeoff performance limitations are usually more critical in operation. The FAA agrees that takeoff weight limitation requirements are as much applicable to SFAR airplanes as they are to the normal category airplanes already covered by the rule. Section 135.399(a) is amended accordingly. In addition, the landing weight limitation requirements applicable to airplanes certificated in accordance with paragraph 1.(a) of the SFAR (i.e. airplanes meeting Appendix A of Part 135) are transferred from § 135.399(b) as proposed to § 135.399(a). This non-substantive change makes § 135.399 internally consistent since landing weight limitations of non-SFAR airplanes meeting Appendix A are already covered in § 135.399(a).

#### **Adoption of the Amendment**

#### **PART 21—CERTIFICATION PROCEDURES FOR PRODUCTS AND PARTS**

#### **PART 23—AIRWORTHINESS STANDARDS: NORMAL, UTILITY, AND ACROBATIC CATEGORY AIRPLANES**

#### **PART 36—NOISE STANDARDS: AIRCRAFT TYPE AND AIRWORTHINESS CERTIFICATION**

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

#### **PART 139—CERTIFICATION AND OPERATIONS: LAND AIRPORTS SERVING CAB-CERTIFICATED AIR CARRIERS**

Accordingly, the Federal Aviation Regulations (14 CFR Chapter I) are amended, effective October 17, 1979, as follows:

1. By adding the following new Special Federal Aviation Regulation:  
**Special Federal Aviation Regulation No. 41**

##### **1. Applicability.**

(a) Contrary provisions of Parts 21 and 23 of the Federal Aviation Regulations notwithstanding, an applicant is entitled to an amended or supplemental type certificate in the normal category for a reciprocating or turbopropeller-powered multiengine small airplane originally type certificated in accordance with Part 23

of the Federal Aviation Regulations in effect on March 13, 1971, or later, that is to be certificated with a passenger seating configuration, excluding pilot seats, of 10 seats or more (but not more than 19 seats) at a maximum certificated takeoff weight of 12,500 pounds or less, if the applicant complies with—

(1) The regulations incorporated in the type certificate; and

(2) The requirements of Appendix A of Part 135 of the Federal Aviation Regulations in effect on September 26, 1978.

(b) Contrary provisions of Parts 1, 21, 23, 91, 121, and 135 of the Federal Aviation Regulations notwithstanding, an applicant is entitled to an amended or supplemental type certificate in the normal category for a reciprocating or turbopropeller powered multiengine airplane that is to be certificated with a maximum takeoff weight in excess of 12,500 pounds, a maximum zero fuel weight not in excess of 12,500 pounds, and, where requested by the applicant, an increase in passenger seating configuration, if the applicant complies with—

(1) The regulations incorporated in the type certificate;

(2) The requirements of Appendix A of Part 135 of the Federal Aviation Regulations in effect on September 26, 1978 with the exceptions specified in section 5 of this Special Federal Aviation Regulation; and

(3) The additional requirements specified in sections 7 through 14 of this Special Federal Aviation Regulation applicable to takeoff weights in excess of 12,500 pounds.

(c) Contrary provisions of Part 1 of the Federal Aviation Regulations notwithstanding, an airplane certificated under paragraph (b) of this section is considered to be a small airplane for purposes of Parts 21, 23, 36, 121, 135, and 139 of the Federal Aviation Regulations, and a large airplane for purposes of Parts 61 and 91. Compliance with the small airplane provisions of Part 36 of the Federal Aviation Regulations must be shown at the maximum certificated takeoff weight approved under this Special Federal Aviation Regulation.

2. *Eligibility.* Any person may apply for a supplemental type certificate (or an amended type certificate in the case of a type certificate holder) under this Special Federal Aviation Regulation.

3. *Production limitation.* An amended or supplemental type certificate issued pursuant to section 1.(b) of this Special Federal Aviation Regulation is effective for the purpose of obtaining an original or an amended airworthiness certificate, until October 17, 1989 unless the type

certificate is sooner surrendered, suspended, revoked, or terminated.

4. *Restrictions.* For airplanes certificated under section 1.(b) of this Special Federal Aviation Regulation—

(a) The maximum zero fuel weight of the airplane must be established as an operating limitation and may not exceed 12,500 pounds; and

(b) The airworthiness certificate shall be endorsed "This airplane at weights in excess of 5,700 kg does not meet the airworthiness requirements of ICAO, as prescribed by Annex 8 of the Convention on International Civil Aviation."

5. *Exceptions.* For purposes of obtaining an amended or supplemental type certificate under section 1.(b) of this Special Federal Aviation Regulation, the following exceptions apply. All references in this section to specific sections of Parts 23 and 25 of this chapter are to those in effect on September 26, 1978 if no other date is given:

(a) Compliance with section 1 of Appendix A of Part 135 of the Federal Aviation Regulations is not required.

(b) Compliance may be shown with the applicable regulations incorporated in the type certificate in lieu of the requirements of Appendix A of Part 135 of the Federal Aviation Regulations for takeoff weights of 12,500 pounds or less, if the airplane was type certificated—

(1) Under FAR Part 23 in effect prior to Amendment 23-10 and the airplane is to be used only in FAR Part 91 operations;

(2) Before July 1, 1970, in the normal category with a passenger seating configuration, excluding any pilot seat, of 10 seats or more, and meets special conditions issued by the Administrator for airplanes intended for use in operations under FAR Part 135; or

(3) Before July 1, 1970, in the normal category with a passenger seating configuration, excluding any pilot seat, of 10 seats or more, and meets the additional airworthiness standards in Special Federal Aviation Regulation No. 23.

(c) In lieu of compliance with sections 7., 19.(b)(3), and 19.(c) of Appendix A of Part 135 of the Federal Aviation Regulations, comply with the following at takeoff weights in excess of 12,500 pounds:

#### *Landing*

(a) The landing distance must be determined for standard atmosphere at each weight, altitude, and wind within the operational limits established by the applicant in accordance with § 23.75(a) of this chapter effective March 30, 1967. Instead of a gliding approach specified

in § 23.75(a)(1), the landing may be preceded by a steady approach down to the 50-foot height at a gradient of descent not greater than 5.2 percent (3°) at a calibrated airspeed not less than 1.3  $V_{S0}$ .

(b) The landing distance data must include correction factors for not more than 50 percent of the nominal wind components along the landing path opposite to the direction of landing, and not less than 150 percent of the nominal wind components along the landing path in the direction of landing.

(d) In lieu of compliance with section 28 of Appendix A of Part 135 of the Federal Aviation Regulations, comply with the following:

*Fatigue evaluation of flight structure.* Unless it is shown that the structure, operating stress levels, materials, and expected use are comparable from a fatigue standpoint to a similar design which has had substantial satisfactory service experience, the strength, detail design, and the fabrication of those parts of the wing, wing carrythrough, vertical fin, horizontal stabilizer, and attaching structure whose failure would be catastrophic must be evaluated under either—

(a) A fatigue strength investigation in which the structure is shown by analysis, tests, or both, to be able to withstand the repeated loads of variable magnitude expected in service. Analysis alone is acceptable only when it is conservative and applied to simple structures; or

(b) A fail-safe strength investigation in which it is shown by analysis, tests, or both, that catastrophic failure of the structure is not probable after fatigue, or obvious partial failure, of a principal structural element, and that the remaining structure is able to withstand a static ultimate load factor of 75 percent of the critical limit load factor at  $V_C$ . These loads must be multiplied by a factor of 1.15 unless the dynamic effects of failure under static load are otherwise considered.

(e) In lieu of compliance with section 32 of Appendix A of Part 135 of the Federal Aviation Regulations, comply with the following:

*Doors and exits.* The airplane must meet the requirements of §§ 23.783 and 23.807 (a)(3), (b), and (c) of this chapter, and in addition the following requirements:

(a) Each cabin must have at least one easily accessible external door.

(b) There must be a means to lock and safeguard each external door against opening in flight (either inadvertently by persons or as a result of mechanical failure or failure of a single structural element). Each external door must be

operable from both the inside and the outside, even though persons may be crowded against the door on the inside of the airplane. Inward opening doors may be used if there are means to prevent occupants from crowding against the door to an extent that would interfere with the opening of the door. The means of opening must be simple and obvious and must be arranged and marked so that it can be readily located and operated, even in darkness.

Auxiliary locking devices may be used. (c) Each external door must be reasonably free from jamming as a result of fuselage deformation in a minor crash.

(d) Each external door must be located where persons using it will not be endangered by the propellers when appropriate operating procedures are used.

(e) There must be a provision for direct visual inspection of the locking mechanism by crewmembers to determine whether external doors, for which the initial opening movement is outward (including passenger, crew, service, and cargo doors), are fully locked. In addition, there must be a visual means to signal to appropriate crewmembers when normally used external doors are closed and fully locked.

(f) Cargo and service doors not suitable for use as exits in an emergency need only meet paragraph (e) of section 5(e) of this regulation and be safeguarded against opening in flight as a result of mechanical failure or failure of a single structural element.

(g) The passenger entrance door must qualify as a floor level emergency exit. If an integral stair is installed at such a passenger entry door, the stair must be designed so that when subjected to the inertia forces specified in § 23.561 of this chapter, and following the collapse of one or more legs of the landing gear, it will not interfere to an extent that will reduce the effectiveness of emergency egress through the passenger entry door. Each additional required emergency exit except floor level exits must be located over the wing or must be provided with acceptable means to assist the occupants in descending to the ground. In addition to the passenger entrance door—

(1) For a total seating capacity of 15 or less, an emergency exit, as defined in § 23.807(b) of this chapter, is required on each side of the cabin;

(2) For a total seating capacity of 16 through 23, three emergency exits, as defined in § 23.807(b) of this chapter, are required with one on the same side as the door and two on the side opposite the door; and

(3) For a total seating capacity in excess of 23, the number of emergency exits and their kind and distribution must be approved by the Administrator.

(h) An evacuation demonstration must be conducted utilizing the maximum number of occupants for which certification is desired. It must be conducted under simulated night conditions utilizing only the emergency exits on the most critical side of the aircraft. The participants must be representative of average airline passengers with no prior practice or rehearsal for the demonstration. Evacuation must be completed within 90 seconds.

(i) Each emergency exit must be marked with the word "Exit" by a sign which has white letters 1 inch high on a red background 2 inches high, be self-illuminated or independently internally electrically illuminated, and have a minimum luminescence (brightness) of at least 160 microlamberts. The colors may be reversed if the passenger compartment illumination is essentially the same.

(j) Access to window type emergency exits may not be obstructed by seats or seat backs.

(k) The width of the main passenger aisle at any point between seats must equal or exceed the values in the following table:

Total seating capacity	Minimum main passenger aisle width—	
	Less than 25 inches from floor	25 inches and more from floor
10 through 23	9 inches	15 inches
over 23	15 inches	20 inches

(f) In lieu of compliance with Section 45 of Appendix A of Part 135 of the Federal Aviation Regulations, comply with § 23.954 of this chapter.

(g) In lieu of compliance with Section 56 of Appendix A of Part 135 of the Federal Aviation Regulations, comply with the following:

**Cowlings.** The airplane must be designed and constructed so that no fire originating in any engine compartment can enter, either through openings or by burn through, any other region where it would create additional hazards.

(h) In lieu of compliance with Section 57 of Appendix A of Part 135 of the Federal Aviation Regulations, comply with § 25.863 of this chapter.

**6. Additional requirements—general.** The additional requirements specified in sections 7 through 14 apply to the certification of airplanes pursuant to section 1.(b) of this Special Federal Aviation Regulation.

#### 7. *Compartment interiors.*

(a) If smoking is to be prohibited, there must be a placard so stating, and if smoking is to be allowed—

(1) There must be an adequate number of self-contained removable ashtrays; and

(2) Where the crew compartment is separated from the passenger compartment, there must be at least one sign (using either letters or symbols) notifying all passengers when smoking is prohibited. Signs which notify when smoking is prohibited must—

(i) Be legible to each passenger seated in the passenger cabin under all probable lighting conditions; and

(ii) When illuminated, be so constructed that the crew can turn them on and off.

(b) Each disposal receptacle for towels, paper, or waste must be fully enclosed and constructed of at least fire resistant materials, and must contain fires likely to occur in it under normal use. The ability of the disposal receptacle to contain those fires under all probable conditions of wear, misalignment, and ventilation expected in service must be demonstrated by test. A placard containing the legible words "No Cigarette Disposal" must be located on or near each disposal receptacle door.

(c) Lavatories must have "No Smoking" or "No Smoking in Lavatory" placards located conspicuously on each side of the entry door, and 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 it can be seen from the cabin side of each lavatory door served. The placards must have red letters at least one-half inch high on a white background at least one inch high. (A "No smoking" symbol may be included on the placard).

(d) There must be at least one hand fire extinguisher conveniently located in the pilot compartment.

(e) There must be at least one hand fire extinguisher conveniently located in the passenger compartment.

**8. Landing gear.** Comply with §§ 25.721(a)(2), (b), and (c) of this chapter in effect on September 26, 1978.

**9. Fuel system components crashworthiness.** Comply with §§ 25.963(d) and 25.994 of this chapter in effect on September 26, 1978.

**10. Shutoff means.** Comply with § 23.1189 of this chapter in effect on September 26, 1978.

**11. Fire detector and extinguishing systems.**

(a) *Fire detector systems.*

(1) There must be a means which ensures the prompt detection of a fire in an engine compartment.

(2) Each fire detector must be constructed and installed to withstand the vibration, inertia, and other loads to which it may be subjected in operation.

(3) No fire detector may be affected by any oil, water, other fluids, or fumes that might be present.

(4) There must be means to allow the crew to check, in flight, the function of each fire detector electric circuit.

(5) Wiring and other components of each fire detector system in an engine compartment must be at least fire resistant.

(b) *Fire extinguishing systems.*

(1) Except for combustor, turbine, and tail pipe sections of turbine engine installations that contain lines or components carrying flammable fluids or gases for which it is shown that a fire originating in these sections can be controlled, there must be a fire extinguisher system serving each engine compartment.

(2) The fire extinguishing system, the quantity of the extinguishing agent, the rate of discharge, and the discharge distribution must be adequate to extinguish fires. An individual "one shot" system may be used.

(3) The fire-extinguishing system for a nacelle must be able to simultaneously protect each compartment of the nacelle for which protection is provided.

**12. Fire extinguishing agents.** Comply with § 25.1197 of this chapter in effect on September 26, 1978.

**13. Extinguishing agent containers.** Comply with § 25.1199 of this chapter in effect on September 26, 1978.

**14. Fire extinguishing system materials.** Comply with § 25.1201 of this chapter in effect on September 26, 1978.

**15. Expiration.** This Special Federal Aviation Regulation terminates on October 17, 1981, unless sooner rescinded or superseded.

## PART 91—GENERAL OPERATING AND FLIGHT RULES

2. By adding a new § 91.58 to read as follows:

### § 91.58 Materials for compartment interiors.

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), (b), (b-1), (b-2), and

(b-3) of this chapter in effect on September 26, 1978.

**PART 135—AIR TAXI OPERATORS AND COMMERCIAL OPERATORS**

3. By revising § 135.169 by deleting the word "or" at the end of § 135.169(b)(3); by deleting the period at the end of § 135.169(b)(4) and inserting a semicolon in its place; by adding a new § 135.169(b)(5) and (b)(6) and by revising § 135.169(c)(2) to read as follows:

**§ 135.169 Additional airworthiness requirements.**

\* \* \* \* \*

(b) \* \* \*

(5) In the normal category and complies with section 1.(a) of Special Federal Aviation Regulation No. 41; or

(6) In the normal category and complies with section 1.(b) of Special Federal Aviation Regulation No. 41.

(c) \* \* \*

(2) An airplane that complies with—  
(i) Appendix A of this part provided that its passenger seating configuration, excluding pilot seats, does not exceed 19 seats; or

(ii) Special Federal Aviation Regulation No. 41.

4. By adding a new § 135.170 to read as follows:

**§ 135.170 Materials for compartment interiors.**

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), (b), (b-1), (b-2), and (b-3) of this chapter in effect on September 26, 1978.

5. By amending § 135.399 to read as follows:

**§ 135.399 Small nontransport category airplane performance operating limitations.**

(a) No person may operate a reciprocating engine or turbopropeller-powered small airplane that is certificated under § 135.169(b) (2), (3), (4), (5), or (6) unless that person complies with the takeoff weight limitations in the approved Airplane Flight Manual or equivalent for operations under this part, and, if the airplane is certificated under § 135.169(b) (4) or (5) with the landing weight limitations in the Approved Airplane Flight Manual or equivalent for operations under this part.

(b) No person may operate an airplane that is certificated under § 135.169(b)(6) unless that person complies with the landing limitations prescribed in §§ 135.385 and 135.387 of this part. For purposes of this paragraph, §§ 135.385 and 135.387 are applicable to reciprocating and turbopropeller-powered small airplanes notwithstanding their stated applicability to turbine engine powered large transport category airplanes.

(Secs. 313 (a), 601, 603, and 604, Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1424); sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c))).

Note.—The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044, as implemented by DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A copy of the final evaluation prepared for this action is contained in the regulatory docket. A copy of it may be obtained by writing to Raymond E. Ramakis, Safety Regulations Staff (AVS-24), Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591.

Issued in Washington, D.C., on September 7, 1979.

**Langhorne Bond,**  
*Administrator.*

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