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# Part IV
# Department of Transportation

## Federal Aviation Administration

**Airworthiness Standards: Reciprocating and Turbopropeller-Powered Small Multiengine Airplanes; SFAR 41**

VS-81-342-P

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Parts 21, 23, 36, 91, 121, 135, and 139**

**[Docket No. 21716; SFAR No. 41C]**

**Airworthiness Standards: Reciprocating and Turbopropeller-Powered Small Multiengine Airplanes; SFAR 41 Interim Standards**

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

**ACTION:** Final rule.

**SUMMARY:** This amendment reinstates and extends the effectivity of Special Federal Aviation Regulation (SFAR) 41 which expired October 17, 1981, and amends the SFAR to: (1) Eliminate the 12,500-pound maximum zero fuel weight (MZFW) restriction; (2) limit the number of passenger seats to 19 for those small propeller-driven multiengine airplanes that operate at a certificated gross takeoff weight in excess of 12,500 pounds; and (3) relax the landing distance determination requirement, making it consistent with Parts 23 and 25. This amendment results from a number of petitions for exemption and rulemaking submitted to the FAA and provides economic benefits to commuter airlines by improving operating efficiency without compromising safety. This amendment does not address the possible codification of SFAR 41 into Part 23 as mentioned in Notice 82-3.

**EFFECTIVE DATE:** September 13, 1982.

**FOR FURTHER INFORMATION CONTACT:** Joseph Snitkoff, Certification Procedures and Standards Branch (AWS-130), Aircraft Engineering Division, Office of Airworthiness, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591, telephone (202) 426-8395.

**SUPPLEMENTARY INFORMATION:**

**Background**

A longstanding limitation, which distinguishes between large and small airplanes, requires all new type certificated airplanes with a maximum certificated takeoff weight of more than 12,500 pounds to meet the transport category airworthiness standards of Part 25 of the Federal Aviation Regulations, regardless of the type of operation or number of passenger seats. At the time this limitation was established in the regulations, there were few small airplanes with maximum weights near 12,500 pounds. The International Civil Aviation Organization (ICAO) standards make a similar distinction.

SFAR 41 was adopted as an interim standard to permit limited growth and utilization of existing small propeller-driven multiengine airplanes that had demonstrated, through service experience, a satisfactory level of safety. These airplanes were made available to the emerging commuter airline industry consistent with the Airline Deregulation Act of 1978, without compromising the high safety standards in air transportation. SFAR 41 was designed to fill the gap between Part 23 and Part 25 certification standards until commuter airplanes could be developed and certificated to a set of standards more appropriate to their size and type of operation.

SFAR 41 prescribes additional airworthiness standards applicable to existing small propeller-driven multiengine airplanes. It allows, in part, type and airworthiness recertification of these airplanes at weights in excess of 12,500 pounds maximum certificated takeoff weight and with an increase in the number of passenger seats. A design restriction is imposed which limits the maximum zero fuel weight to 12,500 pounds.

The regulation was amended April 14, 1980 (SFAR 41A; 45 FR 25046), for clarification and to make editorial changes. It was further amended December 8, 1980 (SFAR 41B; 45 FR 80972), to specify additional requirements needed to comply with ICAO Annex 8 airworthiness standards. SFAR 41B expired October 17, 1981.

Notice of Proposed Rulemaking (NPRM) 82-3 to reinstate and amend SFAR 41 was published in the Federal Register on March 4, 1982 (47 FR 9360). The comment period closed on April 20, 1982. Comments received after the closing date were also considered in accordance with § 11.47(a).

**Discussion of Comments**

Twenty sets of comments were received concerning Notice 82-3 from many segments of the aviation community. Views of airplane manufacturers, owners, operators, pilots, foreign airplane manufacturers, foreign aviation authorities, and the flying public were received in response to the notice. In addition to the comments on Notice 82-3, one commenter's response to the related petition concerning landing distance determination also is disposed of in this change to SFAR 41.

**Reinstatement of SFAR 41**

Two commenters oppose reinstating SFAR 41. They maintain that SFAR 41, by virtue of its status as an interim standard, is deficient in many respects to Part 25 and therefore does not provide an equivalent level of safety to Part 25. They point out that SFAR 41 has lower performance standards and lacks comparable emergency evacuation, systems and equipment reliability and integrity, and fire protection requirements.

Regarding the contention that SFAR 41 is deficient compared to Part 25, the FAA wishes to point out that SFAR 41 was never intended as an equivalent to or a replacement for Part 25 with identical requirements. Rather, SFAR 41 was promulgated to enable greater utilization of existing Part 23 type airplanes for commuter operations when those airplanes are certificated to the higher standards of SFAR 41 even though they may not meet transport category certification requirements. The SFAR 41 standards incorporated additional airworthiness, crashworthiness, and airplane performance requirements designed to provide the necessary level of safety for a type of airplane that heretofore had not had such requirements specifically developed for it. Airplanes certificated under SFAR 41 have a good safety record. Extending the applicability of SFAR 41 for a limited period of time will benefit the commuter airplane industry and the flying public by improving service and operating efficiency with no derogation of safety. SFAR 41 was and will continue to be applicable only to small propellar-driven multiengine airplanes certificated before October 17, 1979, with a satisfactory service history at the time of application. This applicability date is not changed by this final rule; therefore, the proposal to reinstate the effectivity of SFAR 41 is adopted without substantive change.

**Removal of the Maximum Zero Fuel Weight (MZFW) Restriction**

Thirteen commenters support and one opposes removing the MZFW restriction. The opposing commenter proposes that instead of this, a maximum takeoff weight or a new MZFW limitation be established to control the large increases in weights for aircraft used in combined commuter/cargo operations which he predicts could result from removing the restriction. Such large weight increases, however, could not occur since there is a regulatory constraint on maximum payload of 7,500 pounds for commuter operations under Part 135 which, together with the 19-passenger limitation, effectively maintains aircraft weights at reasonable levels. Supporters of the proposal claim that removing the MZFW restriction is in the public

interest as it increases the commuter airlines' profit potential and reduces operating costs without any adverse effect on safety. They assert that the MZFW is only a design consideration and should not be a limitation. Further, removing the restriction would permit the use of improved avionics equipment which, even though adding to the aircraft weight, would still result in economic benefits because of the greater payload allowed. Therefore, the proposal to eliminate the MZFW restriction is adopted without substantive change.

**19-Passenger Limit**

SFAR 41 through Amendment 41B contained no limitation on the number of passengers, but imposed a MZFW restriction of 12,500 pounds. Notice 82-3 made clear that, as a condition for eliminating the MZFW restriction, a specified passenger limit would be prescribed to preclude escalation of airplane size to the point where Part 25 standards would apply. As explained, a 19-passenger configuration was selected as the logical and economic limit to avoid the burden that would be imposed by flight attendant and possible other requirements for additional passengers. Eight commenters support the 19-passenger limitation and six commenters oppose it on the basis that a greater number be allowed. Those opposed believe that passenger capacities above 19 should be permitted as long as the airplane meets all applicable regulations, the safety level is not lowered, and there are some economic benefits to be gained. They point out that SFAR 41 to date does not contain constraints on the number of passengers except to define minimum aisle widths for 10 to 23 passengers and configurations with over 23 passengers, and specifies additional airworthiness standards for 16 to 23 passengers. Therefore, since SFAR 41 permitted applicants to request certification for more than 19 passengers, it is argued that the proposed limitation becomes arbitrarily restrictive in not allowing other manufacturers the same opportunity. Advocates of a higher passenger limitation also agree that the proposed limitation is artificial, that the additional emergency equipment that would be required is minimal, and that the number of emergency exits required for 16 to 23 passengers is the same. Three commenters support a 23-passenger limitation. None of these commenters, however, discuss the passenger limitation in the context of tradeoff for eliminating the MZFW.

When SFAR 41 was originally developed, both the FAA and the public involved in the rulemaking agreed that some constraint should be imposed to limit the number and size of airplanes designed to SFAR 41 standards. The "number" aspect was addressed by making SFAR 41 applicable only to airplanes type certificated before October 17, 1979. To limit the size, both an MZFW and passenger limit were discussed. At that time it was deemed most appropriate to utilize the MZFW as the means for controlling size. In today's economic environment, however, it is realized that this limit may impose undue hardship on SFAR 41 airplane operators and may even impede installing improved equipment. As recognized by some commenters, the FAA must now establish some other limiting criteria to prevent escalating SFAR 41 small airplanes into larger, pseudotransport-category types, and the 19-passenger limitation can effectively serve this purpose. Accordingly, the 19-passenger limitation is adopted without substantive change.

The FAA has reviewed all aircraft certificated (and existing applications for certification) under SFAR 41 and has found that all these airplanes involve no more than 19 passengers. Thus, imposing the 19-passenger limit will not adversely affect any existing application. Limiting the passenger configuration does not contradict the provisions of the Airline Deregulation Act in that it provides economic benefits for existing commuter and cargo operations without degrading safety.

Two commenters state that, if the 19-passenger limitation is adopted, reference to passengers in excess of 19 in the table of paragraph 5(e)(*k*) under *Doors and Exits* should be deleted. The FAA agrees and the table is amended to reflect the maximum passenger seating configuration of 19. Other changes proposed in Notice 82-3, consistent with the elimination of the MZFW restriction and adoption of the 19-passenger-seat configuration (proposals numbered 3, 4, 6, and 7), are adopted without change. No substantive comments beyond those previously discussed were made on these proposals.

**Landing Distance Determination**

Proposal 5 addresses the landing distance determination of SFAR 41 airplanes. It proposes to amend paragraph 5(c)(*a*) to relax the landing distance determination requirement to make it consistent with current Parts 23 and 25. In addition to comments expressing overall concurrence with Notice 82-3, six commenters specifically support the proposed change to paragraph 5(c)(*a*). Additionally, one of these commenters suggests two changes to Appendix A of Part 135. One change pertains to paragraph 6(a)(2) of Appendix A of Part 135 and would separate the go-around and landing cases or completely eliminate the $1.05V_{MC}$ requirement. The other change would realign paragraph 7(b) of Appendix A of Part 135 to relax the landing distance determination requirement in a manner similar to that proposed for SFAR 41, paragraph 5(c)(*a*). Neither of the changes suggested by the commenter are addressed at this time as revising Part 135 is beyond the scope of this rulemaking action.

However, the FAA does recognize that all applicants eligible for an amended or supplemental type certificate under SFAR 41 should be entitled to the benefits of the relaxed landing distance determination requirement proposed for paragraph 5(c)(*a*). Therefore, in addition to amending paragraph 5(c)(*a*) as proposed, which relaxes the requirement for aircraft certified under paragraph 1(*b*) of SFAR 41, identical relief is granted for aircraft certificated under paragraph 1(a) of SFAR 41 by amending paragraph 1(a)(2) to allow the $1.3V_{s1}$ gliding approach of the present § 23.75(a) or an alternative steady approach of a specified gradient.

One commenter disagrees with the proposal to relax the landing distance determination requirement of paragraph 5(c)(*a*) by allowing landing distances to be determined in accordance with § 23.75. The commenter cites the proliferation of operations under Part 135 with SFAR 41 airplanes and notes the importance and advantages of requiring the same high level of safety as provided under Part 121. The commenter cites the added safety factors in Part 121 of 1.67 and 1.43 for landing distances at destination and alternate airports, respectively.

The FAA agrees with the commenter's assertion with regard to the level of safety in landing distance determination for Parts 135 and 121 aircraft. This is exemplified by the fact that the 1.67 and 1.43 safety factors are required in both Parts 135 and 121. With the continued applicability of these identical landing safety factors and approach techniques, the same high level of safety will be maintained for landing distance determination with both SFAR 41/Part 135 and transport category/Part 121 airplanes.

By implementing the proposed change to SFAR 41, the landing distance would be determined using either a $1.3V_{s1}$ power approach or a $1.3V_{s1}$ gliding approach as specified currently in both §§ 23.75 and 25.125. If paragraph (*a*)

under Section 5(c) of SFAR 41 remains unchanged, longer (and thus more conservative) landing distances would be specified for an airplane certificated under SFAR 41 than if that airplane were certificated under the existing Part 23 or Part 25. There is no justifiable reason for this inequity to exist. Because landing distances determined under SFAR 41 were overly conservative and since the landing safety factors are identical in Parts 135 and 121, the FAA cannot support the commenter's position. Therefore, the change to paragraph (a) under Section 5(c) is adopted as proposed and paragraph 1(a)(2) is similarly revised for consistency.

**Miscellaneous Comments**

Notice 82-3 proposed to extend the pre-existing production cutoff date by 2 years. Five commenters express support of the extension and cite the reasons given in the NPRM. One commenter misunderstood the proposal, believing the extension of the cutoff date to be only 1 year, and states that it should be related to the effective date of the amendment. The proposal to extend the production cutoff date from 1989 to 1991 is adopted without substantive change.

Proposal 8 extends the expiration date of SFAR 41C to 1 year after the effective date of this amendment. Five commenters specifically support this proposal and one commenter suggests that the expiration date be extended to 2 years. The FAA believes that 1 year affords sufficient time for manufacturers to apply for certification of their existing models with the MZFW restriction removed. Proposal 8 is adopted without substantive change.

One commenter proposes to delete the date "October 17, 1979" from paragraph 1(a) and 1(b) of SFAR 41 and to insert in its place "the effective date of this amendment." He states that under the proposed rule, an applicant having designed an airplane of this class after October 17, 1979, would be required to certify its airplane under Part 25 and would not be permitted certification under SFAR 41. The commenter feels it would be arbitrarily restrictive not to permit an applicant the opportunity to certify its airplane to SFAR 41 standards. The FAA considers this suggested change to be outside the scope of this rulemaking action.

**Comments on Codification of SFAR 41 into Part 23**

Notice 82-3 invited comments on the advisability of codifying the substance of SFAR 41B and the proposed SFAR 41C into Part 23 and to extend its applicability to new multiengine airplanes having a maximum takeoff gross weight greater than 12,500 pounds with 19 passenger seats. By its request, the FAA merely wished to accept preliminary comments on the advisability of changing Part 23, with the intent that any definite proposals would be included in future notices. Many interesting views and comments received on this issue are included in the docket file. In general, there is great interest in providing a viable regulation applicable to the certification of commuter airplanes. The FAA realizes that this issue needs careful study and review by all concerned, and it will be addressed in a separate notice.

**Economic Impact and Benefits**

Eliminating the MZFW restriction will have no adverse safety impact and may, in fact, improve safety because operators will be encouraged to add additional or improved avionics equipment. Aircraft operators will now be able to add more pasenger seats, up to 19, increase baggage allowances, provide improved passenger amenities, and increase cargo capacity. Because the marginal cost of carrying the additional payload would be relatively low compared to the additional revenue for such carriage, the added utility of this payload increase could be significant.

A commuter carrier estimates that the proposed rule would permit an additional 1,500 pounds of cargo in its aircraft. At a cargo yield of 40 cents per pound, the carrier had the potential to increase its revenue by $936,000 per year. In addition, the carrier points out that there have been instances where it had been forced to refuse a shipment because of its weight. It also could increase the number of its passengers from 16 to 19 on one of its route segments.

It has been determined that the proposal to allow the use of shorter runways will not have an adverse impact upon safety. Economic benefits include the increased availability of air transportation to small cities that might otherwise be denied service because of short runways. For example, for a certain airplane the landing distance could be reduced from 5,171 feet to 4,100 feet. While difficult to measure in dollar terms, the benefits would be substantial, and because there would be no adverse impact on safety, the regulatory change will be in the public interest.

The airplane manufacturer will face some moderate costs in recertifying the airplane to the proposed new weight and landing distance criteria. An airplane manufacturer who does not wish to establish revised weight or landing distance limitations will not incur these costs.

**Summary of Final Regulatory Flexibility Analysis**

The Regulatory Flexibility Act requires an analysis of alternatives if a proposal has a significant economic impact on a substantial number of small entities.

The amendment to eliminate the MZFW restriction will have a significant positive impact on a substantial number of entities. The amendment is relaxatory in nature and a manufacturer may choose either to seek the benefits of the proposal or maintain the status quo. No further easing of the MZFW restriction is possible; therefore, there are no other alternatives to consider.

The amendment relating to the minimum landing distance determination will have a significant economic impact on a substantial number of small entities. There are no other relaxatory alternatives consistent with safety. This landing distance determination is needed to be consistent with longstanding §§ 23.75 and 25.125, the requirements of which have been proven by service experience and for which there is no safety basis to consider further relaxation.

If increasing the proposed 19-passenger limitation (for example, to 23 passengers) would improve the economic utility of a qualifying airplane as some commenters contend, this would not impact a substantial number of small entities and, therefore, need not be analyzed. The agency believes that without an MZFW restriction, there must be a passenger limitation to prevent these SFAR 41 airplanes which do not meet Part 25 standards from an uncontrolled increase in size. It is the FAA's judgment that airplanes carrying more than 19 passengers require different standards. The FAA will review Parts 23 and 25 as applicable to new commuter type airplanes and will give careful consideration to the issue of a passenger limitation.

The final Regulatory Flexibility Analysis and Regulatory Flexibility Determination are combined with the Regulatory Evaluation in the docket.

**List of Subjects**

*14 CFR Part 21*

Air transportation, Aircraft, Aviation safety, Safety.

*14 CFR Part 23*

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

*14 CFR Part 36*

Aircraft noise, Type certification.

*14 CFR Part 91*

Air carriers, Aviation safety, Safety, Aircraft, Air transportation, Cargo, Airports, Airworthiness directives and standards.

*14 CFR Part 121*

Aviation safety, Safety, Air carriers, Air transportation, Aircraft, Airplanes, Airports, Airworthiness directives and standards, Cargo, Transportation, Common carriers.

*14 CFR Part 135*

Air carriers, Aviation safety, Safety, Air transportation, Air taxi, Airworthiness, Cargo, Aircraft, Airports, Transportation, Airplanes.

*14 CFR Part 139*

Charter flights, Transportation, Air safety, Safety, Aviation safety, Air transportation, Air carriers, Aircraft, Airports, Airplanes.

**Adoption of Amendment**

Accordingly Special Federal Aviation Regulation 41 (14 CFR Parts 21, 23, 36, 91, 121, 135, and 139) is amended as follows, effective September 13, 1982.

**SFAR No. 41 [Amendment C]**

Paragraph 1. *Applicability.* (Amended)

1. By replacing the period at the end of paragraph 1(a)(2) with a comma and adding the following:

* * * except that the landing distance must be determined for standard atmosphere at each weight, altitude, and wind within the operating limits established by the applicant in accordance with § 23.75(a) of this chapter in effect on September 26, 1978. Instead of a gliding approach specified in § 23.75(a), 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 $1.3V_{s1}$.

2. By deleting the phrase "a maximum zero fuel weight not in excess of 12,500 pounds," from paragraph 1.(b) and inserting in its place the phrase "a specified maximum zero fuel weight to be established by the applicant," and by inserting after the word "configuration" the parenthetical phrase "(but not more than 19 passenger seats)".

Paragraph 3. *Production limitation.* (Amended)

3. By deleting the year "1986," and inserting in its place the year "1991,".

Paragraph 4. *Restrictions.* (Amended)

4. By deleting the phrase "and may not exceed 12,500 pounds" from paragraph 4.(a).

Paragraph 5. *Exceptions.* (Amended)

5. By inserting after the phrase "of 10 seats or more" in paragraphs 5.(b)(2) and 5.(b)(3) the parenthetical phrase "(but not to exceed 19 passenger seats)".

6. By inserting a period after the word "chapter" in the first sentence of paragraph 5(c)(*a*) under *Landing* and deleting the remainder of the sentence and by deleting reference to subparagraph (1) in "§ 23.75(a)(1)" in the second sentence of paragraph 5(c)(*a*) under *Landing.*

7. By deleting paragraph 5.(e)(*g*)(3) under *Doors and Exits* and by revising paragraphs 5.(e)(*g*)(1) and 5.(e)(*g*)(2) to read as follows:

5. *Exceptions*

* * * * *

(e) * * *

(*g*) * * *

(1) For a total passenger 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; and

(2) For a total passenger seating capacity of 16 through 19, 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.

* * * * *

8. By revising the table under *Doors and Exits* paragraph 5.(e)(*k*) to read as follows:

| Number of passenger seats | Minimum main passenger aisle width | |
|---|---|---|
| | Less than 25 inches from floor | 25 inches and more from floor |
| 10 through 19 | 9 inches | 15 inches. |

Paragraph 15. *Expiration.* (Amended)

9. By deleting the date "October 17, 1981" and inserting in its place the date September 13, 1983.

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

Note.—This amendment will allow manufacturers and operators of certain existing airplanes the option of complying with relaxed requirements that will increase payloads and improve air carrier services to the public. The FAA has determined that it involves a regulation which is not a major rule under Executive Order 12291 and is not a significant rule under the Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A regulatory evaluation, including a final regulatory flexibility analysis, has been placed in the public docket. A copy of it may be obtained from the person indentified under "FOR FURTHER INFORMATION CONTACT."

Issued in Washington, D.C., on July 21, 1982.

**J. Lynn Helms,**

*Administrator.*

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