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Parts 37 and 121

Title 14—Aeronautics and Space
CHAPTER I—FEDERAL AVIATION ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

[Docket No. 16027; Amdt. Nos. 37-40 and 121-129]

PART 37—TECHNICAL STANDARD ORDER AUTHORIZATIONS

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

Ground Proximity Warning-Glide Slope Deviation Alerting System

• The purpose of this amendment to Parts 37 and 121 of the Federal Aviation Regulations (FARs) is to revise § 37.201 to provide a new Technical Standard Order (TSO), applicable to ground proximity warning-glide slope deviation alerting equipment, TSO-C92b, and to revise § 121.360 to permit the use of equipment that meets either the current standards of TSO-C92a or the new standards of TSO-C92b in airplanes required to have such equipment under the operating rules. •

Section 37.201 of the FARs contains performance, environmental, marking, and data requirements that must be met in order to obtain a TSO-authorization for the manufacture of ground proximity warning-glide slope deviation alerting equipment under TSO-C92a. The performance standards of TSO-C92a are based on the Radio Technical Commission for Aeronautics (RTCA) Document No. DO-161, titled "Minimum Performance Standards, Airborne Ground Proximity Warning System" dated February 7, 1975, including Change Number 2, dated June 13, 1975, which are incorporated by reference in the TSO. Also included in the performance standard are certain exceptions to Document No. DO-161 as well as a number of additional requirements. As is pertinent here, § 121.360(f) prohibits the operation of certain large turbine-powered airplanes unless they are equipped with ground proximity warning-glide slope deviation alerting

systems that meet the performance and environmental standards contained in TSO-C92a or incorporate TSO-approved equipment.

After the adoption of TSO-C92a and § 121.360(f) (Amdt. 37-38 and 121-122; 40 FR 42183, September 11, 1975), the FAA began to receive reports of numerous false and nuisance warnings being made by the required ground proximity warning-glide slope deviation alerting systems. These false and nuisance warnings, if allowed to continue, would have resulted in an erosion in pilot confidence in the system and the loss of system effectiveness. Based on further information received from certain air carriers and the Air Transport Association on this subject, the FAA concluded that a major reason for the number of undesired warnings related to the across-board application of certain of the standards contained in RTCA Document No. DO-161. Subsequently, the FAA requested that the RTCA Committee responsible for the development of Document No. DO-161, Special Committee 128, reconvene to reevaluate and refine the document.

Recently, the RTCA adopted a revised RTCA minimum performance standard (MPS) in Document No. DO-161A, dated May 27, 1976, for ground proximity warning-glide slope deviation alerting equipment. This MPS, in part, includes new optional warning envelopes (Envelope 3) for Modes 1 and 4 (Excessive Rates of Descent and Flight Into Terrain When Not in Landing Configuration) directed at reducing the number of undesired warnings. In addition, the revised MPS provides for the discontinuation of a warning enunciation cycle following the termination of an envelope penetration. Based on a review of the information currently available, the FAA believes that these changes will result in a greater degree of pilot confidence and more effective pilot utilization of the ground proximity warning-glide slope deviation alerting system. Therefore, § 37.201 is being amended to

incorporate RTCA Document No. DO-161A. In this connection, it should be noted that equipment approved under TSO-C92a can be modified and approved under the new standard, TSO-C92b, without additional flight tests if the filtering and time delays in the equipment remain unchanged. In addition, § 121.360(f) is being amended to permit an operator to use equipment meeting either the current standard, TSO-C92a, or the new standard, TSO-C92b, to comply with the Part 121 requirements.

Current § 37.201(a)(2) contains a number of exceptions to RTCA Document No. DO-161. The exception in § 37.201(a)(2)(v) is not necessary under the new standard (TSO-C92b) since the exception has been incorporated into RTCA Document No. DO-161A.

Furthermore, based on data and information available to the FAA, the exceptions contained in current § 37.201(a)(2)(i) through (iv), that prohibit the use of two warning envelopes contained in RTCA Document No. DO-161, are not necessary if the equipment that incorporates these warning envelopes is used only on turbopropeller powered airplanes. Therefore, the exceptions contained in current § 37.201(a)(2) are being deleted and are not contained in TSO-C92b. However, a new § 121.360(d) is being added to limit the use of the pertinent warning envelopes (Envelope 2 of Modes 1 and 4 of RTCA Document No. DO-161A) to turbopropeller powered airplanes.

It should also be noted that § 37.201, as amended, (TSO-C92b) does not contain the current mean time between failure (MTBF) standard specified in § 37.201(c)(1) but does contain a new Mode 4 flap warning inhibition control provision. While the FAA continues to believe that a reliability requirement is desirable, the current MTBF standard has been difficult to administer. The FAA will continue to work for the development of an acceptable standard.

With respect to Mode 4 warnings based on flap position, numerous airplanes

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have more than one flap setting approved for landing. Only one of these settings need be set for Mode 4 of the system. However, when landings take place using other approved flap settings, undesired warnings will occur. In order to permit the pilot to eliminate these undesired warnings without deactivating the entire system, § 37.201(c), as amended, (TSO-C92b) allows a Mode 4 flap warning inhibition control and a provision is being added to § 121.360 to require the incorporation of procedures in the Airplane Flight Manual for the inhibition of Mode 4 flap warnings for those airplanes having a Mode 4 flap warning inhibition control.

As an interim measure, after the FAA began receiving reports of undesired warnings, §§ 121.303(d) and 121.360(d) were amended (Amdt. 121-126; 40 FR 55313, November 28, 1975) to permit, until September 1, 1976, pilots to deactivate ground proximity warning systems when those systems emit false or nuisance warnings. After September 1, 1976, the deactivation of these systems will be limited to abnormal and emergency conditions as specified in the Airplane Flight Manual. The FAA believes that false warnings are no longer a problem and that an extension of the September 1, 1976, date would further delay the benefits to be derived from the system and would not be in the interest of safety. Equipment can continue to be approved and manufactured under TSO-C92a and used by those operators who have found that equipment compatible with their aircraft and operating environment. In addition, this amendment provides a necessary alternate means of compliance for other operators by establishing a second set of standards for TSO approval of equipment. In view of the imminence of the September 1, 1976, date and the need for this equipment to be activated and used in operations without further delay, and since this amendment imposes no additional burden on any person, I find that notice and public procedure hereon are impracticable and contrary to the public interest and good cause exists for making the amendment effective in less than 30 days.

This amendment is made under the authority of sections 313(a), 601, and 604 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1424) and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, Parts 37 and 121 of the Federal Aviation Regulations are amended as follows, effective August 19, 1976:

1. By revising the title of § 37.201 and by revising §§ 37.201 (a), (c), (g), and (h) to read as follows:

§ 37.201 Ground proximity warning-glide slope deviation alerting equipment TSO-C92b.

(a) *Applicability—Minimum performance standards.* This Technical Standard Order prescribes the minimum performance standards that ground proximity warning-glide slope deviation alerting equipment must meet in order to be identified with the applicable TSO marking. Equipment to be so identified must meet the minimum performance standards prescribed in Radio Technical Commission for Aeronautics (RTCA) Document No. DO-161A, titled "Minimum Performance Standards, Airborne Ground Proximity Warning System" (DO-161A), revised May 27, 1976, with the exception specified in paragraph (c)(4) of this section, and the additional standards contained in paragraphs (c)(1) through (c)(3) of this section.

(c) *Additional standards and exception.* (1) *Fire protection.* Except for small parts (such as knobs, fasteners, seals, grommets, and small electrical parts) that the Administrator finds would not contribute significantly to the propagation of a fire, all materials used must be self-extinguishing when tested in accordance with the requirements of § 25.853 and § 25.1359(d), as applicable, and Appendix F to Part 25 of this chapter, effective May 1, 1972, except that the materials may be of a size and be mounted for the test in accordance with paragraph (b) of Appendix F or may be of a size and be mounted as used in the aircraft.

(2) *Aural and visual warnings.* The required aural and visual warnings must initiate simultaneously.

(3) *Deactivation control.* If the equipment incorporates a deactivation control other than a circuit breaker, the control must be a switch with a protective cover. The cover must be safety wired so that the wire must be broken in order to gain access to the switch.

(4) *Mode 4 flap warning inhibition.* A separate guarded control may be provided to inhibit Mode 4 warnings based on flaps being in other than the landing configuration.

(g) *Availability of referenced documents.* RTCA Document Nos. DO-138, dated June 27, 1968, including Change Number 2, dated October 29, 1969, DO-160, dated February 28, 1975, and DO-

161A, revised May 27, 1976, are incorporated herein in accordance with 5 U.S.C. 552(a)(1) and § 37.23 and are available as indicated in § 37.23. Additionally, RTCA Document Nos. DO-138, DO-160, and DO-161A may be examined at any FAA Regional Office of the Chief, Engineering and Manufacturing Branch or, in the case of the Western Region, the Chief, Aircraft Engineering Division, and may be obtained from the RTCA Secretariat, Suite 655, 1717 H Street, N.W., Washington, D.C. 20006 at a cost of \$16.00 per copy for Document No. DO-138, \$20.00 per copy for Document No. DO-160, and \$16.00 per copy for Document No. DO-161A.

(h) *TSO-C92a equipment.* TSO-authorizations for the manufacture of ground proximity warning-glide slope deviation alerting equipment may continue to be obtained under TSO-C92a and equipment approved under TSO-C92a may continue to be manufactured under its original approval.

2. By deleting the word "and" from the end of § 121.360(c)(1)(iii); by inserting a comma and the words "or TSO-C92b" between the words "in TSO-C92a" and "or" in § 121.360(f); and by adding new §§ 121.360(c)(1)(iv) and 121.360(i) to read as follows:

§ 121.360 Ground proximity warning-glide slope deviation alerting system.

- (c)
(1)

(iv) Inhibition of Mode 4 warnings based on flaps being in other than the landing configuration if the system incorporates a Mode 4 flap warning inhibition control; and

(i) No person may operate a turbojet powered airplane equipped with a system required by paragraph (f) of this section, that incorporates equipment that meets the performance and environmental standards of TSO-C92b or is approved under that TSO, using other than Warning Envelopes 1 or 3 for Warning Modes 1 and 4.

Issued in Washington, D.C., on August 13, 1976.

The incorporation by reference in this document was approved by the Director of the Federal Register on April 16, 1969.

JOHN L. McLUCAS,
Administrator.