

Advance copy pending issuance of
Changes to FAR Parts 25, 91, & 121

Title 14—AERONAUTICS AND SPACE

Chapter I—Federal Aviation Administration, Department of Transportation

[Docket No. 9653; Amdts. Nos. 25-22; 91-71; 121-67]

PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

PART 91—GENERAL OPERATING AND FLIGHT RULES

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

Additional Attitude Instrument in Large Turbojet Aircraft

The purpose of these amendments to Parts 25, 91, and 121 of the Federal Aviation Regulations is to require a third (additional) attitude indicating instrument, operating from a source of power independent of the normal electrical generating system, on all large turbojet powered airplanes operated pursuant to the requirements of Part 121; and to permit certification under Part 25 and operation under Parts 91 and 121 of a large airplane without a gyroscopic rate of turn instrument installed, if that airplane is equipped with an additional attitude indicating instrument system. Persons holding certificates issued under Parts 123 and 135 who operate large turbojet powered airplanes under the operating rules of Part 121 of this chapter are subject to this requirement.

These amendments were proposed in Notice 69-26, which was published in the FEDERAL REGISTER on June 17, 1969 (34 F.R. 9456).

Several comments received questioned the source and interpretation of the statistics used to establish a projected failure rate for attitude indicators. The FAA statistics are based on information received from field offices and cover unscheduled removals as well as failures. In our opinion the projected failure rate based on those statistics is valid. All statistics developed from FAA sources, as well as those submitted by the industry, point up the problem of unpredictable, irregular failures resulting in the loss of attitude reference. In this connection, it is worth noting that since the notice was issued, another air carrier CV-880 airplane lost total electrical power while flying at 35,000 feet under VFR conditions. In that instance, a third

attitude reference system would have provided a margin of safety not otherwise available if the flight had been conducted under instrument conditions.

All commentators expressed concern about reliable attitude reference, and many suggestions were made as alternatives to the proposal in the notice. However, none of the proposed alternatives provide for gyroscopic attitude reference after total aircraft electrical failure, or for alternatives to any but single component failure. This amendment requires a system capable of attitude presentation which continues for a minimum of 30 minutes after total aircraft electrical generating system failure, using an independent instrument, amplifier (if needed), gyroscope, and power source. We believe the totally independent system to be preferable to any single component alternative suggested.

There was also criticism that the proposal was too restrictive, providing only for equipment presently available. No such restriction was intended and the agency believes this amendment establishes requirements which may be met in a number of ways.

In light of comments concerning the location of the indicator, the language of the proposal has been changed in the amendment to require the indicator to be installed on the instrument panel in a position acceptable to the Administrator that will make it plainly visible to and usable by both pilots occupying the pilot stations. This change makes administration of the rule more flexible and precludes an interpretation that two indicators are required.

Several comments emphasized the need for the third attitude indicator to be lighted during its operation. The FAA agrees, and believes that while a requirement for appropriate lighting is inherent in the regulations, the specific requirement for indicator illumination should be set forth. Therefore, the proposal is revised to state this requirement.

All commentators except one concurred in the proposed deletion of the gyroscopic rate-of-turn indicator when the third attitude indicator system is installed. The single comment proposing retention of the rate-of-turn indicator emphasized the instrument's reliability and use as a basic attitude reference. However, the FAA believes, and all other commentators apparently agree, that in large transport category airplanes the rate-of-turn indicator is no longer as useful as an instrument which gives both horizontal and vertical attitude information. Accordingly, Parts 25, 91, and 121 are amended, as proposed, to authorize certification and operation of large aircraft without a gyroscopic rate-of-turn indicator if a third attitude indicating system is installed in accord-

ance with § 121.305(j).

Comments also suggested that certain other instruments or systems be made redundant, that the attitude indicator conform to certain named requirements, and that the third attitude indicator system appear on the Minimum Equipment List. However, these suggested amendments are outside the scope of the Notice, and therefore, were not considered.

Some of the comments suggested that the time proposed for compliance was inadequate because of demand, technology, or programmed modification. Upon further consideration, the FAA agrees that additional time for compliance should be provided. Accordingly, the proposed compliance date is revised by this amendment to allow 18 months for compliance. While this should allow sufficient time to achieve compliance, the agency realizes that unforeseen circumstances beyond the control of a particular Part 121 operator may arise and prevent the operator from achieving compliance by the date specified. Therefore, a provision is included whereby such an operator can obtain a limited extension from the FAA Air Carrier District Office charged with the overall inspection of its operation.

Interested persons have been afforded an opportunity to participate in the making of these amendments and due consideration has been given to all relevant matter presented.

In consideration of the foregoing, Parts 25, 91, and 121 of the Federal Aviation Regulations are amended, effective February 5, 1970, as follows:

1. Section 25.1303(a) (6) is amended to read as follows:

§ 25.1303 Flight and navigation instruments.

(a) * * *

(6) A gyroscopic rate-of-turn indicator combined with an integral slip-skid indicator (turn and bank indicator) except that only a slip-skid indicator is required on large airplanes with a third attitude instrument system installed in accordance with § 121.305(j) of this title.

2. Section 91.33(d) (3) and (4) are amended to read as follows:

§ 91.33 Powered civil aircraft with standard category U.S. airworthiness certificates; instrument and equipment requirements.

(d) * * *

(3) Gyroscopic rate-of-turn indicator, except on large aircraft with a third attitude instrument system installed in accordance with § 121.305(j) of this title.

(4) Slip-skid indicator.

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(As published in the Federal Register /35 F.R. 304/ on January 8, 1970)

3. Section 121.305 is amended by revising paragraph (f) and by adding a new paragraph designated (j) to read as follows:

§ 121.305 Flight and navigation equipment.

(f) A gyroscopic rate-of-turn indicator combined with an integral slip-skid indicator (turn-and-bank indicator), except that only a slip-skid indicator is required when a third attitude instrument system is installed in accordance with paragraph (j) of this section.

(j) After August 5, 1971, on large turbojet powered airplanes, in addition to two gyroscopic bank-and-pitch indicators (artificial horizons) for use at the pilot stations, a third such instrument

that—

(1) Is powered from a source independent of the electrical generating system;

(2) Continues reliable operation for a minimum of 30 minutes after total failure of the electrical generating system;

(3) Operates independently of any other attitude indicating system;

(4) Is operative without selection after total failure of the electrical generating system;

(5) Is located on the instrument panel in a position acceptable to the Administrator that will make it plainly visible to and usable by any pilot at his station; and

(6) Is appropriately lighted during all phases of operation.

A certificate holder may obtain an ex-

tension of the August 5, 1971, compliance date described in paragraph (j) of this section, but not beyond February 5, 1972, from the Air Carrier District Office charged with the overall inspection of its operations, if it shows to the ACDO before August 5, 1971, that due to circumstances beyond its control it cannot comply by that date and has submitted by that date a schedule for compliance which is acceptable to the ACDO.

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

Issued in Washington, D.C., on December 31, 1969.

D. D. THOMAS,
Acting Administrator.