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14 CFR Parts 121, 125 and 135
Revision to Minimum Altitudes for the Use of an Autopilot; Final Rule
Advisory Circular 120–67; Criteria for Operational Approval of Auto Flight Guidance System; Notice

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 121, 125, and 135

[Docket No. 27987; Amendment No. 121–265, 125–29, 135–68]

RIN 2120–AF19

Revision to Minimum Altitudes for the Use of an Autopilot

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The Federal Aviation Administration amends the regulations governing the use of approved flight control guidance systems with automatic capability (autopilot), and would permit the use of an autopilot at altitudes less than 500 feet above ground level (AGL) during the takeoff and initial climb phases of flight. This amendment permits this use of approved autopilot systems for takeoff and initial climb phases of flight if the Administrator authorizes their use as stated in an air carrier's operations specifications. By permitting air carriers to take advantage of technological improvements in the operational capabilities of autopilot systems, safety will be enhanced by decreasing pilot workload during the critical takeoff phase of flight.

EFFECTIVE DATE: This amendment is effective June 20, 1997.

FOR FURTHER INFORMATION CONTACT: Richard A. Temple, AFS–410, Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591, telephone (202) 267–5824.

SUPPLEMENTARY INFORMATION:

Background

The FAA is amending §§ 121.579 125.329, and 135.93 of Title 14 of the Code of Federal Regulations to permit certificate holders that operate under parts 121, 125, or 135 to obtain authorization to use an approved autopilot system for takeoff if authorized by the FAA in the certificate holders's operations specifications. Section 121.579(a) currently states that no person may use an autopilot en route, including climb and descent, at an altitude above the terrain that is less than twice the maximum altitude loss specified in the Airplane Flight Manual (AFM) for a malfunction of the autopilot under cruise conditions, or less than 500 feet, whichever is higher. Sections 125.329(a) and 135.93(a) state that no person may use an autopilot at an altitude above the terrain which is less than 500 feet or less than twice the maximum altitude loss specified in the approved Airplane Flight Manual or equivalent for a malfunction of the autopilot, whichever is higher. Paragraphs (b) and (c) in § 121.579, paragraphs (b), (c) and (d) of § 125.329, and paragraphs (b), (c), and (d) in § 135.93 provide exceptions to this restriction for the approach and landing phases of flight.

The current restrictions in the regulations regarding the use of an autopilot below 500 feet AGL have not been amended since 1965, when provisions for the landing phase of flight were incorporated into § 121.579. This change was incorporated into part 135 when § 135.93 was recodified in 1978, and into part 125 when § 125.329 was established in 1980. Although significant improvements in autopilot technology have been made, the regulations have not been amended to specifically permit the use of an autopilot system during the takeoff and initial climb phases of flight. In addition, the aviation industry anticipates further improvements in autopilot technology, particularly in relation to using the autopilot during the takeoff phase of flight.

The Aviation Rulemaking Advisory Committee (ARAC) and some industry members expressed their opinion that amending the regulation to permit increased usage of autopilot engagement during takeoff would have certain benefits, such as allowing pilots to focus proportionately more attention on duties other than the manual manipulation of the flight controls and constant surveillance of the cockpit instruments during the critical takeoff phase of flight. Based on a recommendation from the Autopilot Engagement Working Group of the ARAC, the FAA published a Notice of Proposed Rulemaking (NPRM) in the **Federal Register** on December 9, 1994 (59 FR 63868). Comments on the proposal closed January 9, 1995. Seven comments were received.

Based on autopilot technology, the expectation that technology will continue to advance, and the safety benefits that will result from using improved technology, the FAA amends the current regulations to permit authorization for the use of an autopilot during the takeoff and initial climb phases of flight; to enable parts 121, 125, and 135 operators, when authorized, to use existing technology; and to further promote technological advances while increasing the level of public safety.

The FAA and the aviation industry anticipate that further technological advances will lead to the evolution of additional autoflight guidance systems that can safely be used from initiation of takeoff roll to completion of landing.

Comments

The FAA received seven comments on the proposal. The Regional Airline Association (RAA) comments that it supports the proposal; that support is based primarily on its development and recommendation by the ARAC.

The National Air Transportation Association (NATA) comments that it supports the proposal because it allows operators to take advantage of advanced technology, thus decreasing pilot workload during a critical phase of flight. NATA also comments that it will achieve a significant increase in aviation operating safety without a corresponding increase in capital or operating expenses.

Maine Instrument Flight (MIF) supports the proposal, saying that this is a good example of how the FAA can respond to advances in technology and give regulatory relief to operators.

The Air Line Pilots Association (ALPA) also supports the proposed rule and advisory circular based on the permitted advantages of technological improvements in the operational capabilities of approved flight control guidance systems.

Boeing Commercial Airplane Group comments that it agrees with the FAA that an automatic pilot system can provide the flightcrew with work load relief during the busy takeoff and landing phases of flight. Boeing notes, however, that the NPRM addresses only a limited part of the total minimum engagement altitude issue, which is currently being addressed by the FAA/JAA/Industry All Weather Operations Harmonization Program. Boeing also sees no value in the proposed advisory circular discussed in the NPRM, commenting that existing methods of approval and use of the autopilot are adequate.

AVRO International Aerospace comments that it supports the proposal, but is concerned that it does not cover all phases of flight for which modern autopilots are being used, e.g., circling approaches. AVRO also comments that the certification procedures of 14 CFR 25.1329 must be updated since they do not specifically cover the operational changes of this proposal. AVRO notes that there is some overlap in the areas covered by the Autopilot Engagement Requirements Working Group and the All Weather Operations Working Group, and urges the FAA to coordinate within

the ARAC system to determine areas of responsibility. AVRO views the proposed advisory circular as "increasing certification costs," and therefore recommends that it not be issued. AVRO also requests that commenters be given at least 30 working days to comment; they find 30 calendar days, over a holiday period, unacceptable.

The Civil Aviation Authority makes a similar comment on the abbreviated comment period. CAA commends the removal of arbitrary takeoff limitations, but also notes that this operational proposal fails to provide detailed airworthiness requirements, which it finds need to be developed in harmonization with the JAA requirements in JAR 25.1329.

In response to Boeing, AVRO, and CAA, the FAA notes that the ARAC, in establishing the initial terms of reference for its task, focused on the takeoff phase of flight only which is addressed in this rule change. Certification issues for future autopilot systems are presently being addressed by the ICAO All Weather Operations Harmonization working group and will complement this rule change.

The ICAO All Weather Operations Harmonization working group will propose the modification of 14 CFR 25.1329, automatic pilot systems, to determine any additional certification requirements for future uses of autopilot systems. This action is in keeping with the goal of FAR/JAR harmonization to the maximum extent possible.

The FAA agrees with Boeing and AVRO that the initial approval of the equipment installation would be addressed in the normal certification process. The advisory circular is addressed to operators under parts 119, 121, 125, and 135, providing issues to consider when requesting changes to their operations specifications. The FAA sees no additional program requirement or cost in the areas of certification and maintenance to the certificate holder by providing this list for their use. However, the FAA acknowledges that there may be minimal costs voluntarily incurred by the certificate holder associated with modifying existing training programs and manuals to utilize the new/lower engagement altitude.

An abbreviated comment period was determined by the FAA as adequate because of previous FAA/Industry participation and agreement through the ARAC process.

In the course or reviewing and addressing comments to the proposed minimum takeoff engagement height requirement the FAA noted that additional adjustments to the proposed provisions were necessary to properly relate these amended provisions to operational procedures and other provisions of the FAR, such as 14 CFR 121.189. Adjustments to the language of the provisions were also necessary to acknowledge that proper operational use of automatic flight guidance and control systems may sometimes require specific mode use constraints or minimum engagement altitudes above that demonstrated in the AFM. For example, because autoflight system use must be consistent with both lateral and vertical obstacle clearance requirements, and must take into account irregular terrain in the departure path, non-normal procedures for such things as engine failure, and the application of different methods for autoflight engagement height airworthiness demonstrations, it was recognized that the FAA and the operator may sometimes need to operationally specify mode use constraints or minimum engagement heights above that demonstrated and specified in the AFM. Issues such as these are typically addressed by the FAA's Flight Standardization Board (FSB) for each aircraft type, and any additional provisions for safe operational autoflight system use, if required, are identified by the FAA. Although the language in sections 121.579(d)(2), 125.329(e)(2), and 135.93(e)(2) [redesignated in this rule as sections 121.579(d)(3), 125.329(e)(3), and 135.93(e)(3)] was designed to address issues like the irregular terrain in the departure path, it would not have addressed some of the other issues mentioned above which warrant a higher minimum engagement height for the autopilot than specified in the AFM. Accordingly, the language of each of the provisions was modified to acknowledge this, and note that the Administrator may in certain instances find it necessary for safety to operationally specify engagement heights above or different than the minimum specified in the AFM. In view of the modifications discussed above, it was necessary to add some new language to the three sections to make it clear that engagement of the autopilot below the greater of two altitudes specified in §§ 121.579(a), 125.329(a), or 135.93(a) is only permitted if the AFM specifies a minimum engagement height. Thus, under these amendments, engagement of the autopilot is prohibited below the minimum engagement altitude specified in the AFM and may in some circumstances be prohibited below an altitude that is higher than the altitude specified in the AFM.

The Amendment

Section 121.579

Section 121.579 is amended by adding a new paragraph (d), which will allow the Administrator to issue operations specifications that establish the minimum altitude permitted to engage/use an autopilot during the takeoff and initial climb phases of flight. In addition, § 121.579(a) will be amended by striking the words "paragraphs (b) and (c)" and inserting the words "paragraphs (b), (c), and (d)."

Section 125.329

Section 125.329 is amended by adding paragraph (e) to allow the Administrator to issue operations specifications that establish the minimum altitude permitted to engage/use an autopilot during the takeoff and initial climb phases of flight. In addition, § 125.329(a) is amended by striking the words "paragraphs (b), (c), and (d)" and inserting the words "paragraphs (b), (c), (d), and (e)."

Section 135.93

Section 135.93 is amended by redesignating paragraph (e) as paragraph (f) and adding a new paragraph (e) to allow the Administrator to issue operations specifications that establish the minimum altitude permitted to engage/use an autopilot during the takeoff and initial climb phases of flight. In addition, § 135.93(a) is amended by striking the words "paragraphs (b), (c), and (d)" and inserting the words "paragraphs (b), (c), (d), and (e)."

Paperwork Reduction Act

The information collection requirements in the amendment to §§ 121.579, 125.329, and 135.93 have previously been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.) and have been assigned OMB Control Number 2120–0008.

Economic Assessment

The FAA has determined that this rulemaking is not a significant rulemaking action as defined by Executive Order 12866, and therefore no assessment is required. In accordance with Department of Transportation Policies and Procedures (44 FR 11034; February 26, 1979) when the impact of a regulation will be minimal if adopted, a full regulatory evaluation does not need to be prepared. The following discussion provides an economic

assessment of the proposal's anticipated costs and benefits.

Costs

The amendment will allow air carriers and commercial operators to seek authorization for the use of autopilot systems during the takeoff phase of flight. Because the decision whether to seek authorization for the use of autopilot is optional and voluntary, the amendment will not impose any additional costs on certificate holders that operate under parts 121, 125, or 135.

Benefits

This amendment will have positive effects on the safety of air operations. As with any change to operations specifications, the FAA reserves the right to determine whether suggested revisions to an air carrier's operations specifications meet the various criteria and guidelines that will ensure that the current level of safety is met or exceeded.

The use of the autopilot system below 500 feet AGL will enable the pilot to monitor the performance of the aircraft while performing other safety-related functions, such as scanning the outside area for other aircraft. Since less time is spent manipulating the controls, the use of the autopilot also enables the flightcrew to more readily identify any deviations from expected aircraft performance thus increasing the pilot's opportunity to quickly respond to any aircraft malfunctions. Increasing the pilot's opportunity to scan the area outside the aircraft for other airborne traffic, to detect aircraft malfunctions, and to respond more quickly to problems will increase the level of safety.

International Trade Impact Analysis

The FAA has determined that the amendments to parts 121, 125, and 135 will not have a significant impact on international trade. The amendments are expected to have no negative impact on trade opportunities for U.S. firms doing business overseas or foreign firms doing business in the United States.

International Civil Aviation Organization and Joint Aviation Regulations

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with ICAO Standards and Recommended Practices (SARP) to the maximum extent practicable. In reviewing the SARP for air carrier operations and JAR–OPS 1, the FAA finds that there is not a comparable rule under either ICAO standards or the JAR.

Regulatory Flexibility Determination

Congress enacted the Regulatory Flexibility Act (RFA) of 1980 (Pub. L. 96–354) to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires agencies to review rules that may have a significant impact on a substantial number of small entities. This amendment will impose no additional costs on air carriers; therefore, it will not have a significant economic impact on small business entities.

Federalism Implications

The regulations contained herein will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this amendment will not have sufficient implications to warrant the preparation of a Federalism Assessment.

Conclusion

For the reasons discussed in the preamble, and based on the findings in the Regulatory Flexibility Determination and the International Trade Impact Analysis, the FAA has determined that this regulation is not a significant rulemaking action under Executive Order 12866. This amendment is also considered nonsignificant under Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). In addition, the FAA certifies that this amendment will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the RFA.

List of Subjects

14 CFR Part 121

Air carriers, Aircraft, Airmen, Aviation safety, Reporting and recordkeeping requirements, Safety, Transportation.

14 CFR Part 125

Aircraft, Airmen, Aviation safety, Reporting and recordkeeping requirements.

14 CFR Part 135

Air taxis, Aircraft, Airmen, Aviation safety, Reporting and recordkeeping requirements.

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends parts 121, 125, and 135 of the Federal Aviation Regulations (14 CFR parts 121, 125, and 135) as follows:

PART 121—OPERATING REQUIREMENTS: DOMESTIC, FLAG, AND SUPPLEMENTAL OPERATIONS

1. The authority citation for part 121 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 40119, 44101, 44701–44702, 44705, 44709–44711, 44713, 44716–44717, 44722, 44901, 44903–44904, 44912, 46105.

2. Section 121.579 is amended by removing "paragraphs (b) and (c)" and adding in their place "paragraphs (b), (c), and (d)" in paragraph (a) and adding new paragraph (d) to read as follows:

§ 121.579 Minimum altitudes for use of autopilot.

* * * * *

(d) *Takeoffs.* Notwithstanding paragraph (a) of this section, the Administrator issues operations specifications to allow the use of an approved autopilot system with automatic capability below the altitude specified in paragraph (a) of this section during the takeoff and initial climb phase of flight provided:

(1) The Airplane Flight Manual specifies a minimum altitude engagement certification restriction;

(2) The system is not engaged prior to the minimum engagement certification restriction specified in the Airplane Flight Manual or an altitude specified by the Administrator, whichever is higher; and

(3) The Administrator finds that the use of the system will not otherwise affect the safety standards required by this section.

PART 125—CERTIFICATION AND OPERATIONS: AIRPLANES HAVING A SEATING CAPACITY OF 20 OR MORE PASSENGERS OR A MAXIMUM PAYLOAD CAPACITY OF 6,000 POUNDS OR MORE

3. The authority citation for part 125 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701–44702, 44705, 44710–44711, 44713, 44716–44717, 44722.

4. Section 125.329 is amended by removing "paragraphs (b), (c), and (d)" and adding in their place "paragraphs (b), (c), (d), and (e)" in paragraph (a) and adding new paragraph (e) to read as follows:

§ 125.329 Minimum altitudes for use of autopilot.

* * * * *

(e) Notwithstanding paragraph (a) of this section, the Administrator issues operations specifications to allow the use of an approved autopilot system with automatic capability during the takeoff and initial climb phase of flight provided:

(1) The Airplane Flight Manual specifies a minimum altitude engagement certification restriction;

(2) The system is not engaged prior to the minimum engagement certification restriction specified in the Airplane Flight Manual or an altitude specified by the Administrator, whichever is higher; and

(3) The Administrator finds that the use of the system will not otherwise affect the safety standards required by this section.

PART 135—OPERATING REQUIREMENTS: COMMUTER AND ON-DEMAND OPERATIONS

5. The authority citation for part 135 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701–44702, 44705, 44709, 44711–44713, 44715–44717, 44722.

6. Section 135.93 is amended by removing "paragraphs (b), (c), and (d)" and adding in their place "paragraphs (b), (c), (d), and (e)" in paragraph (a), redesignating paragraph (e) as paragraph (f), and adding new paragraph (e) to read as follows:

§ 135.93 Autopilot: Minimum altitudes for use.

* * * * *

(e) Notwithstanding paragraph (a) of this section, the Administrator issues operations specifications to allow the use of an approved autopilot system with automatic capability during the takeoff and initial climb phase of flight provided:

(1) The Airplane Flight Manual specifies a minimum altitude engagement certification restriction;

(2) The system is not engaged prior to the minimum engagement certification restriction specified in the Airplane Flight Manual, or an altitude specified by the Administrator, whichever is higher; and

(3) The Administrator finds that the use of the system will not otherwise affect the safety standards required by this section.

* * * * *

Issued in Washington, DC, on May 9, 1997.

Barry L. Valentine,

Acting Administrator.

[FR Doc. 97–12747 Filed 5–20–97; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Advisory Circular 120–67; Criteria for Operational Approval of Auto Flight Guidance Systems

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Advisory circular.

SUMMARY: This advisory circular (AC), published with a related final rule amendment elsewhere in this separate part of the **Federal Register**, states an acceptable means, but not the only means, for obtaining operational approval of the initial engagement or use of an Auto Flight Guidance System (AFGS) under Title 14 of the Code of Federal Regulations (14 CFR) part 121, § 121.579(d); part 125, § 125.329(e); and part 135, § 135.93(e) for the takeoff and initial climb phase of flight. This advisory circular supports recent changes in the Title 14 that allow use of the autopilot at lower altitudes than previously allowed.

FOR FURTHER INFORMATION CONTACT: Richard A. Temple, AFS–410, Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591, telephone (202) 267–5824.

SUPPLEMENTARY INFORMATION:

1. Purpose

This advisory circular (AC) states an acceptable means, but not the only means, for obtaining operational approval of the initial engagement or use of an Auto Flight Guidance System (AFGS) under Title 14 of the Code of Federal Regulations (14 CFR) part 121, § 121.579(d); part 125, § 125.329(e); and part 135, § 135.93(e) for the takeoff and initial climb phase of flight.

2. Applicability

The criteria contained in this AC are applicable to operators using commercial turbojet and turboprop aircraft holding Federal Aviation Administration (FAA) operating authority issued under SFAR 38–2 and 14 CFR parts 119, 121, 125, and 135. The FAA may approve the AFGS operation for the operators under these parts, where necessary, by amending the applicant's operations specifications (OPSPECS).

3. Background

The purpose of this AC is to take advantage of technological improvements in the operational capabilities of autopilot systems, particularly at lower altitudes. This AC complements a rule change that would allow the use of an autopilot, certificated and operationally approved by the FAA, at altitudes less than 500 feet above ground level in the vertical plane and in accordance with §§ 121.189 and 135.367, in the lateral plane.

4. Definitions

a. Airplane Flight Manual (AFM). A document (under 14 CFR part 25, § 25.1581) which is used to obtain an FAA type certificate. This document contains the operating procedures and limitations and performance information applicable to a particular airplane type in order to safely operate that aircraft and conform to the type certificate.

b. Autopilot. An aircraft system and associated sensors designed to provide automatic control of the pitch, roll, and, in certain instances, yaw axis of an aircraft.

c. Auto Flight Guidance System (AFGS). Aircraft systems, such as an autopilot, autothrottles, displays, and controls, that are interconnected in such a manner to allow the crew to automatically control the aircraft's lateral and vertical flightpath and speed. A flight management system (FMS) is sometimes associated with an AFGS.

d. Auto Throttle System (ATS). A system selected by the crew to provide automatic engine thrust control, as required, to achieve and maintain desired aircraft speed or vertical flight profile.

e. Control Wheel Steering (CWS). A selectable feature of some autopilots that directly relates control wheel displacement to a desired aircraft response. The pilot's force or displacement inputs of the control wheel/column or stick are transmitted by the autopilot into appropriate commands to the control surfaces to achieve the desired aircraft pitch, roll, or yaw response.

f. Flight Director (FD). An instrument display system providing visual commands for aircraft control by displaying appropriate command indications on the primary flight display. The flightcrew use these command indications to manually fly the aircraft or monitor the autopilot.

g. Flight Management Systems (FMS). An integrated system used by flightcrews for flight planning, navigation, performance management, aircraft guidance and flight progress monitoring.

h. Minimum Altitude for AFGS Engagement. Unless otherwise specified by the FAA, the minimum height relevant to the airport elevation, and runway elevation over which the crew may either initially engage an AFGS for automatic flight after takeoff or allow the AFGS to remain engaged during approach and landing.

5. Discussion

a. AFGS capabilities have steadily increased and improved with time. Air carrier crews now routinely use autoflight features that are operational during takeoff and landing/roll-out (e.g., control wheel steering, automatic landing, automatic throttles, and wingload alleviation).

b. Some aircraft now have automatic features identified for operations specifically at low altitudes (e.g., for noise abatement) which when used, contribute to performance, workload, cost, noise, and safety benefits. Such features will be certificated on the aircraft by either type certification or supplemental type certification. Operators may obtain operational approval for in service use by following the guidance in this AC. This should meet the intent of §§ 121.579, 125.329, and 135.93 for existing aircraft and describe acceptable methods for demonstration of these systems for new or modified aircraft.

c. In accordance with the regulations, §§ 121.579(d), 125.329(e), and 135.93(e), the autopilot system may not be engaged below the minimum engagement certification altitude specified in the AFM or an altitude specified by the Administrator, whichever is higher, and may not be engaged below that altitude without a finding by the Administrator that use of the system will not otherwise affect the safety standards required by those sections of the regulations. Additionally, the Flight Standardization Board (FSB) report for the aircraft may contain further conditions or limitations regarding AFGS engagement after takeoff. Inclusion of a specified altitude for use after takeoff in the AFM or the FSB report does not constitute approval to conduct operations. Authorization to engage the AFGS at the altitude specified in the AFM are made by a revision to the operator's OPSPECS. For aircraft with an AFM that specifies an AFGS engagement altitude for takeoff, principal operations inspectors (POI's) may issue OPSPECS authorizing the engagement of the AFGS after takeoff at or above the altitude specified in the AFM or as specified in the FSB report, whichever is higher. When an FSB report is not available, the FAA does not approve an altitude below that specified in the AFM or 200 feet, whichever is higher. The expectation is that as technology continues to advance, additional operational and safety

benefits can be derived from using improved autopilot technology. Such a benefit may eventually include the use of an AFGS from the beginning of the takeoff phase of flight, in which case the rules will have to be amended.

6. Operational Concept

a. The AFGS, as discussed in this AC, consists of an Autopilot (pitch, roll, and yaw) Flight Guidance System, which if used in conjunction with other available components such as FMS, autothrottle, etc. will enhance safety and ease pilot workload. Any or all of the many available automatic operational features are selectable at the pilot's discretion in modern transport aircraft. This allows a clear distinction to be made in contrast to the primary flight control system which may also be largely automatic and electronic, but is not normally deselectable at the flightcrew's discretion, such as the yaw dampers.

b. There are several functions of an AFGS that could be presented for operational approval. These functions could be used singularly or in combination with each other. The following are examples of these functions:

(1) Setting takeoff thrust.
(2) Initial climb.
(3) Noise abatement profiles.
(4) Engine failure recognition.
(5) Reduced climb performance profiles.

c. Approval for using any of the above functions may include changing equipment, equipment support, and operational procedures in the aircraft manufacturer's AFM and in the air carrier's operations manual. Approval may require adjustments to the air carrier's OPSPECS.

d. Once the new operation is developed and approved, maintenance and flightcrew training programs must be adjusted and approved. Qualification of maintenance personnel and flightcrews must be accomplished before flight operations with the new procedure can be implemented.

7. Airport and Ground Facilities

An applicant authorized to use an AFGS may have certain constraints related to airports or ground facilities specified in the operator's OPSPECS where such specific provisions are necessary (e.g., operations based on special procedures at airports with adjacent mountainous terrain, operations requiring runway guidance information, etc.).

8. Airborne Equipment

AFGS system criteria will be defined in the AFM.

9. Pilot Training and Proficiency Program

The operator's training program for flight-crews should provide ground and flight training in the following subjects:

a. Knowledge of airport and ground facilities—as defined in the airborne equipment certification, AFM, and/or Flight Operations Manual (FOM) to include new minima criteria for weather operations authorized through OPSPECS.

b. The use of the AFGS within the parameters indicated by the AFM and FOM. This should include all normal and abnormal procedures.

c. Training should include checking in the flight tasks (maneuvers and procedures) that have been adjusted in the manuals.

10. Operations Manual and Procedures

Procedures, instructions, and information to be used by flightcrews should be developed by each air carrier to include, as applicable, the following:

a. Flight Crewmember Duties. Flight crewmember duties during initial engagement or use of the AFGS should be described in the air carrier's operations manual. These duties should contain a description of the responsibilities and tasks for the pilot flying the aircraft and the pilot not flying the aircraft during all stages of operation. The duties of the third flight crewmember, if required, should also be explicitly defined.

b. Training Information. Training requirements and procedures should be provided in the operator's approved training program.

11. Maintenance Program

Each operator should establish a maintenance and reliability program, acceptable to the Administrator, to ensure that the airborne equipment will continue at a level of performance and reliability established by the manufacturer or the FAA. [part 121, subpart L; part 125, subpart G; and part 135, subpart J] The program should include the following:

a. Maintenance Personnel Training. Each operator should establish an initial and recurrent training program, or arrange for contract maintenance that is acceptable to the Administrator for personnel performing maintenance work on airborne systems and equipment. Personnel training records should be maintained.

b. Test Equipment and Standards. The operator's program for maintenance of line (ramp) test equipment, shop (bench) test equipment, and a listing of all primary and secondary standards utilized during maintenance of test equipment which relates to airborne system operation should be submitted to the Administrator for determination of adequacy. Emphasis should be placed on standards associated with flight directors, automatic flight control systems, maintenance techniques and procedures of associated redundant systems.

c. Maintenance Procedures. Any changes to maintenance procedures, practices, or limitations established in the qualification for airborne system operations are to be submitted to the Administrator for acceptance before such changes are adopted.

12. Engineering Modifications.

Titles and numbers of all modifications, additions, and changes that were made to qualify aircraft systems performance should be provided to the Administrator. [part 21, subparts D and E]

Dated: May 13, 1997.

W. Michael Sacrey,

Acting Deputy Director, Flight Standards Service.

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