Federal Aviation Administration – Regulations and Policies
Aviation Rulemaking Advisory Committee

Air Carrier Operations Issue Area
Airport Noise Assessment Working Group

**Task 1 – Noise Distribution Patterns**

# Task Assignment

FILE COPY



## Aviation Rulemaking Advisory Committee; Air Carrier Operations Subcommittee; Airport Noise Assessment Working Group

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

**ACTION:** Notice of establishment of Airport Noise Assessment Working Group.

**SUMMARY:** Notice is given of the establishment of an Airport Noise Assessment Working Group by the Air Carrier Operations Subcommittee of the Aviation Rulemaking Advisory Committee. This notice informs the public of the activities of the Air Carrier Operations Subcommittee of the Aviation Rulemaking Advisory Committee.

**FOR FURTHER INFORMATION CONTACT:** Mr. David S. Potter, Executive Director, Air Carrier Operations Subcommittee, Flight Standards Service (AFS-201), 800 Independence Avenue, SW., Washington, DC 20591, Telephone: (202) 267-8166; FAX: (202) 267-5230.

**SUPPLEMENTARY INFORMATION:** The Federal Aviation Administration (FAA) established an Aviation Rulemaking Advisory Committee (56 FR 2190, January 22, 1991) which held its first meeting on May 23, 1991 (56 FR 20492, May 3, 1991). The Air Carrier Operations Subcommittee was established at that meeting to provide advice and recommendations to the Director, FAA Flight Standards Service, on air carrier operations, pertinent regulations, and associated advisory material. At its July 31, 1991, meeting (56 FR 27783, June 17, 1991), the subcommittee established the Airport Noise Assessment Working Group.

Specifically, the working group's task is the following:

Analyze and evaluate the noise distribution patterns that result from close-in and distant noise abatement departure profiles. Make comparisons between the current national standards, existing non-standard procedures, and proposed national standards and document the effects the noise patterns generated by the proposed standard would have on airport communities.

The Airport Noise Assessment Working Group will be comprised of experts from those organizations having an interest in the task assigned to it. A working group member need not necessarily be a representative of one of the organizations of the parent Air Carrier Operations Subcommittee or of the full Aviation Rulemaking Advisory Committee. An individual who has expertise in the subject matter and wishes to become a member of the working group should write the person listed under the caption **"FOR FURTHER INFORMATION CONTACT"** expressing that desire and describing his or her interest in the task and the expertise he or she would bring to the working group. The request will be reviewed with the subcommittee chair and working group leader, and the individual advised whether or not the request can be accommodated.

The Secretary of Transportation has determined that the formation and use of the Aviation Rulemaking Advisory Committee and its subcommittees are necessary in the public interest in connection with the performance of duties imposed on the FAA by law. Meetings of the full committee and any subcommittees will be open to the public except as authorized by section 10(d) of the Federal Advisory Committee Act. Meetings of the Airport Noise Assessment Working Group will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. No public announcement of working group meetings will be made.

Issued in Washington, DC, on August 7, 1991.

**David S. Potter,**

*Executive Director, Air Carrier Operations Subcommittee, Aviation Rulemaking Advisory Committee.*

[FR Doc. 91-19171 Filed 8-12-91; 8:45 am]

BILLING CODE 4910-13-M

# Recommendation Letter

AVR sig

**AIR LINE PILOTS ASSOCIATION**

535 HERNDON PARKWAY □ P.O. BOX 1169 □ HERNDON, VIRGINIA 22070 □ (703) 689-2270

June 30, 1992

Mr. Tony Broderick
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, DC 20591

Subject: Recommendation of the Air Carrier Operations Subcommittee

Dear Mr. Broderick:

The Air Carrier Operations Subcommittee is pleased to send you the report of the Noise Assessment Working Group and recommendations regarding, among other things, publication of Draft Advisory Circular 91-53A, Noise Abatement Departure Profiles. We would ask that the FAA proceed as rapidly as possible with the publication of the draft AC and make noise assessment information available to those persons desiring it during the comment period of the AC.

We would note the first of recommendation of the working group that the application of the noise abatement take-off procedures as described in the draft AC be made mandatory for all operators of subsonic turbojet aircraft with a maximum take-off weight of more than 75,000 pounds. If it is felt that rulemaking is necessary to accomplish this, then it should start right away.

The Noise Assessment Working Group will continue to review the noise results from the John Wayne Airport Flight Demonstration Program.

Sincerely,

Bill Edmunds

William W. Edmunds, Jr., Chairman
Air Carrier Operations Subcommittee

WWE:jeg

cc: Dave Potter (FAA, AFS-201)
R. J. Linn (letter only)

# Acknowledgement Letter

U.S. Department
of Transportation

**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

SEP 14 1992

Mr. William W. Edmunds, Jr.
Chairman, Air Carrier Operations
Subcommittee
Air Line Pilots Association
Herndon, VA 22070

Dear Mr. Edmunds:

Thank you and the Noise Assessment Working Group for your diligent effort regarding departure profiles. This letter responds to your submission of the final report and recommendations. The Advisory Circular (AC) that you drafted was reviewed within the Federal Aviation Administration (FAA) and was subsequently published in the Federal Register (57 FR 34990) on August 7, 1992. The Agency sought comments from the general public to the proposed advisory circular; that comment period will close on October 1, 1992. We will review all the comments, make any changes determined necessary, and then produce the AC in final form for distribution.

Recommendation No. 1 and 2 of the Noise Assessment Working Group advocated that the FAA make the minimum criteria proposed in the AC mandatory for all affected operators. We will adopt those recommendations. To do this, the FAA will change the standardized operations specifications (OPSPECS) to incorporate the model noise abatement departure profile. This section of the OPSPECS will be used by the reviewer when an airline requests changes to its operating manual in this area. Therefore, future changes to the airline's OPSPECS for noise abatement departure profiles will parallel your proposed profiles.

Lastly, the FAA concurs with Recommendation No. 3 that the Working Group remain in active status to review and analyze the results of the John Wayne Airport's Flight Demonstration Program.

Sincerely,

Anthony J. Broderick
Associate Administrator for
Regulation and Certification

# Recommendation

FINAL DRAFT
MAY 2 1992

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

Proposed Advisory Circular 91-53A, Noise Abatement Departure Profiles

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

**ACTION:** Request for comments on proposed advisory circular

**SUMMARY:** The Federal Aviation Administration (FAA) is proposing to issue an advisory circular designed to standardize the noise abatement departure profiles for all types of subsonic turbojet-powered airplanes, with a maximum certificated weight of more than 75,000 pounds, operating to or from an airport in the 48 contiguous United States and the District of Columbia.

The proposed advisory circular would revise Advisory Circular 91-53, Noise Abatement Departure Profile, issued in October 1978. The proposal reflects FAA's continuing effort to enhance safety of flight operations through standardization while providing effective noise relief to communities. To achieve this objective, the FAA proposes a means, but not the only means, of avoiding proliferation of noise abatement profiles tailored for unique airport/community environments.

The current Advisory Circular 91-53 provides for one standard noise abatement departure profile, which is most effective in providing relief for noise sensitive areas some distance from the airport. The revised proposal recommends two noise abatement departure profiles, one "close-in" and one "distant", be adopted as standard for nationwide use for each airplane type as determined by each airplane operator. It is recommended that no more than two noise abatement departure profiles be used by each airplane operator for each airplane type to minimize the number of profiles and thus benefit

airplane operators and pilots. Standardization of operational profiles and flight crew training enhances safety.

**DATES:** Comments must be received on or before xxxxxxx, 1992.

**ADDRESS:** Send all comments on this proposed AC to: Federal Aviation Administration, Attn: AFS-435, 800 Independence Ave., SW, Washington, D.C. 20591. Comments may be inspected at the above address between 8:30 A.M. and 4:30 P.M. weekdays, except federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Mr. Wesley Te Winkle, Flight Standards Service, at the above address; telephone (202) 267-3728.

**SUPPLEMENTARY INFORMATION:**

**COMMENTS INVITED:**

A copy of the proposed AC is attached or may be obtained by contacting the person named above under "FOR FURTHER INFORMATION CONTACT." Interested persons are invited to comment on the proposed AC by submitting such written data, views, or arguments as they desire. Commenters should identify AC91-53A and submit comments in duplicate to the address specified above. All communications receivec on or before the closing date for comments will be considered by the Flight Standards Staff before issuing the final AC.

**BACKGROUND:**

The Secretary of Transportation and the FAA Administrator createc a Departmental Task Force on FAA Reform to recommend improvements that could be made in the operations within the FAA itself and between the FAA and the Office of the Secretary. A subgroup of the Task Force was specifically directed to recommend improvements in the rulemaking process concerning safety issues. That subgroup proposed to establish

an advisory committee as a forum for the FAA to obtain input from outside the Government on major regulatory issues facing the agency.

The Secretary approved the proposal to establish an advisory committee, and the Aviation Rulemaking Advisory Committee (ARAC) was chartered in February 1991. The committee is to provide advice and recommendations to the Administrator, through the Associate Administrator for Regulation and Certification and the Director of Rulemaking, concerning the full range of the FAA's rulemaking activity with respect to safety-related issues, such as air carrier operations, aircraft certification, airports, and noise. The committee affords the FAA additional opportunities to obtain information and insight directly from the substantially affected interests meeting together and exchanging ideas on proposed or existing rules and other operational procedures that should be revised or eliminated. This will result in the development of better rules and operational procedures in less time and is intended to require fewer FAA resources than under the current practice. The activities of the committee are designed to facilitate but not circumvent the normal coordination process or the public rulemaking procedures. All communications between the FAA and the committee on any particular issue and an assessment of the effect of those communications on the development of proposed rules will be disclosed fully in the public docket.

The Aviation Rulemaking Advisory Committee is composed of approximately 60 members and has sufficient diversity to ensure the requisite range of views and expertise necessary to discharge its responsibilities. The membership of the committee is balanced fairly in points of view representative of the aviation community and

affected non-aviation interests and includes air carriers, manufacturers, general aviation representatives, airport operators, labor groups, environmental groups, universities, corporations, associations, and passenger groups.

One of the initial subcommittees established under the ARAC was the Air Carrier Operations Subcommittee. One of the initial safety-related procedures that surfaced in an early meeting of the Subcommittee was the lack of standardization in noise abatement departure profiles. Although some work had been accomplished on this issue, the task for resolving the problem of nonstandard noise abatement departure profiles was formally assigned to a working group, appropriately named the Noise Abatement Takeoff Profile Working Group. Within this group were the representatives of various affected aviation interests.

As the working group began its task, a number of related problems surfaced. One problem was that, because of unique runway/community situations and varying performance and noise characteristics of different airplanes, pressures to use nonstandard or special noise abatement takeoff profiles have been increasing. A second problem was that the lack of standardization and any proliferation of airport specific vertical departure profiles may conflict with the high degree of public safety demanded of aviation. Although a nonstandard profile may not have a significant effect when considered alone, a plethora of profiles varying from airport to airport and airplane to airplane would tend to derogate safety.

On August 12, 1991, the working group formally presented its recommendations to the subcommittee in a public hearing, and the

recommendations were forwarded to the FAA Administrator for acceptance. The FAA accepted the following:

1) The minimum performance criteria established by the working group (draft AC) should be incorporated in an advisory circular.

2) The guidelines established for selection of noise abatement takeoff profiles should be formalized.

3) In the interest of ensuring an orderly transition in the adoption of the performance criteria described in recommendation #1, it is recommended that the FAA implement subsequent takeoff noise abatement profiles through Operations Specifications at an appropriate time. In addition, at airports where current airplane operations are not compatible with the performance criteria in recommendation #1, it is recommended that the FAA coordinate appropriate agreements and arrangements with the affected airports and, if appropriate, the affected airplane operators.

4) Although some preliminary noise assessments have been accomplished with data from a B737-300 simulator, more work is needed to ensure that a process is available to assess whether any proposed takeoff profile does in fact offer sufficient noise abatement to justify its use. Accordingly, assessments of which departure profile is preferable from environmental standpoints, including noise abatement and energy conservation, require consideration of airplane type and the variety of airport conditions including the

locations of affected noise sensitive areas. In the interest of developing a method and data base for assessing the community noise benefit (or non-benefit) of the noise abatement takeoff profiles, it is recommended that the FAA establish a working group to accomplish this activity.

The submission and acceptance of these recommendations completed the work of the Noise Abatement Takeoff Profile Working Group and it was disbanded. Subsequently, the FAA authorized the subcommittee to form an Airport Noise Assessment Working Group to evaluate the noise impact relating to proposed noise abatement departure profiles and other factors.

The acceptance of a limitation to no more than two basic noise abatement departure profiles per airplane type for each airplane operator, applicable to all types of subsonic turbojet-powered airplanes with a maximum certificated weight of more than 75,000 pounds, would assure standardization of flight crew procedures and training. The two noise abatement departure profiles, a close-in and a distant profile, would be adopted as standard guidelines for nationwide use for each airplane type, as determined by each airplane operator. The profile selected for a particular runway situation would depend on the location of the noise sensitive areas.

Using a minimum altitude of 800 feet above field elevation to initiate noise abatement thrust reduction would provide for reasonable flight crew workloads to achieve a stable flight profile during a critical workload period in a high density traffic area. It would also provide a safety margin in altitude should unexpected wind-shear,

wake turbulence or other adverse weather conditions be encountered after the thrust reduction or configuration change is initiated.

A minimum allowable thrust level would ensure a positive rate of climb in the event of an engine failure, without pilot intervention. This minimum level also would provide sufficient thrust margins to permit normal maneuvering after a thrust reduction, thereby reducing flight crew workloads associated with a pitch-over to an acceptable airplane attitude.

In summary, following the procedures set forth in the proposed Advisory Circular would enhance safety, standardize departure profiles, and address the noise associated with airplane operations nationwide. Additionally, these proposed departure profiles would serve as a reference for operational testing to be completed in 1992.

Issued in Washington, D.C. on xxxxxxxxxx 1992

Thomas C. Accardi

DRAFT AC 91-53A

NOISE ABATEMENT DEPARTURE PROFILES

[Draft Revised 1992]

1. **PURPOSE.** This Advisory Circular (AC) describes acceptable criteria for safe noise abatement departure profiles for subsonic turbojet-powered airplanes with a maximum certified gross takeoff weight of more than 75,000 pounds. These departure profiles are consistent with the airworthiness standards required by Federal Aviation Regulations (FAR) Part 25 for type certification and FAR Part 91 for general aircraft operations. This AC also provides a technical analysis and description of typical departure profiles that are consistent with the Federal Aviation Administration's (FAA) safety responsibilities and have the potential to minimize the airplane noise impact on communities surrounding airports.

2. **REVISION.** AC91-53 is revised by this publication.

3. **RELATED READING MATERIAL.** Federal Aviation Regulations Parts 25, 91, and 121.

4. **BACKGROUND.**

a. For several years, the FAA has worked to develop and standardize profiles to minimize airplane noise. As part of that commitment, the FAA has worked with airport managers, airplane operators, pilots, special interest groups and federal, state, and local agencies in numerous programs for evaluating noise levels in the airport environment. The research considered a variety of departure flight tracks and profiles.

b. From an environmental standpoint, avoiding noise sensitive areas by using preferential noise abatement runways and flight tracks

whenever possible can effectively supplement a comprehensive noise abatement program. The FAA believes that using the two noise abatement departure profiles described in this advisory circular for subsonic turbojet-powered airplanes can provide environmental benefits to the airport communities. The profiles outline acceptable criteria for speed, thrust settings and airplane configurations used in connection with noise abatement departure profiles. These noise abatement departure profiles can be combined with preferential runway selection and flight path techniques to minimize noise impact.

c. FAA reviews of various airplane vertical noise abatement profiles indicate that some intricate noise abatement departure profiles have been developed on an airport specific basis. The management of these intricate profiles could compromise the pilot's attention to interior flight deck details, traffic avoidance, and other safety responsibilities.

5. **COMMENTS INVITED.** Comments regarding this publication should be directed to:

Attn: AFS-400

Federal Aviation Administration

800 Independence Avenue, S.W.

Washington DC 20591

Comments received will not necessarily be acknowledged but will be considered in the development of upcoming revisions to ACs or other related technical material.

6. **DEFINITIONS.**

a. NADP: Noise Abatement Departure Profile

b. CLOSE-IN COMMUNITY NADPs: NADPs for individual airplane types intended to provide noise reduction for noise sensitive areas located in close proximity to the departure end of an airport runway.

c. DISTANT COMMUNITY NADPs: NADPs for individual airplane types intended to provide noise reduction for all other noise sensitive areas.

d. AFE: Above field elevation.

7. **NOISE ABATEMENT DEPARTURE PROFILES (NADPs).** Acceptable criteria have been established for two types of NADPs for each airplane type, as defined by each airplane operator. These departure profiles are applicable to all types of subsonic turbojet-powered airplanes over 75,000 pounds gross takeoff weight. The two types of NADPs are the "close-in" and "distant" profiles as described below.

a. CLOSE-IN NADP.

(1) Initiate thrust cutback at an altitude of no less than 800 feet AFE and prior to initiation of flaps or slats retraction.

(2) For airplanes <u>without</u> an operational automatic thrust restoration system, achieve and maintain no less than the thrust level necessary after thrust reduction to maintain, for the flaps/slats configuration of the airplane, the takeoff path engine-inoperative climb gradients specified in FAR 25.111(c)(3) in the event of an engine failure.

(3) For airplanes <u>with</u> an operational automatic thrust restoration system, achieve and maintain no less than the thrust level necessary after thrust reduction to maintain, for the flaps/slats configuration of the airplane, a takeoff path engine-inoperative climb gradient of 0%, provided that the automatic thrust restoration system will, at a minimum, restore sufficient thrust to maintain the takeoff path engine-inoperative climb gradients specified in FAR 25.111(c)(3) in the event of an engine failure.

(4) During the thrust reduction, coordinate the pitchover rate and thrust reduction to provide a decrease in pitch consistent with allowing indicated airspeed to decay to no more than 5 knots below the all-engine target climb speed, and in no case to less than $V_2$ for the airplane configuration.

(5) Maintain the speed and thrust criteria described in steps 7a(2) through (4) to 3,000 feet AFE or above, or until the airplane has been fully transitioned to the en route climb configuration (whichever occurs first), then transition to normal en route climb procedures.

b. DISTANT NADP.

(1) Initiate flaps/slats retraction prior to thrust cutback initiation. Thrust cutback is initiated at an altitude no less than 800 feet AFE.

(2) For airplanes <u>without</u> an operational automatic thrust restoration system, achieve and maintain no less than

the thrust necessary after thrust reduction to maintain, for the flaps/slats configuration of the airplane, the takeoff path engine-inoperative climb gradients specified in FAR 25.111(c)(3) in the event o: an engine failure.

(3) For airplanes <u>with</u> an operation automatic thrust restoration system, achieve and maintain no less than the thrust level necessary after thrust reduction to maintain, for the flaps/slats configuration of the airplane, a takeoff path engine-inoperative climb gradient of 0%, provided that the automatic thrust restoration system will, at a minimum, restore sufficient thrust to maintain the takeoff path engine-inoperative climb gradients specified in FAR 25.111(c)(3) in the event of an engine failure.

(4) During the thrust reduction, coordinate the pitchover rate and thrust reduction to provide a decrease in pitch consistent with allowing indicated airspeed to decay to no more than 5 knots below the all engine target climb speed, and in no case to less than $V_2$ for the airplane configuration.

(5) Maintain the speed and thrust criteria as described in steps 7b(2) through (4) to 3,000 feet AFE or above, or until the airplane has been fully transitioned to the en route climb configuration (whichever occurs first), then transition to normal en route climb procedures.

## 8. OPERATIONAL GUIDELINES

a. Each airplane operator may apply the procedures specified in this AC to determine the following for each of its airplane types:

(1) Close-in community noise abatement departure profile (NADP).

(2) Distant community noise abatement departure profile (NADP).

b. Each airplane operator is encouraged to consult with the airport operator before determining the appropriate NADP for each airplane type and runway it will be using at that airport.

c. For each NADP, the airplane operator shall specify the altitude above field elevation (AFE) at which thrust reduction from takeoff thrust or airplane configuration change, excluding gear retraction, is initiated.

d. Each airplane operator should limit the number of noise abatement departure profiles for any airplane type at any one time to no more than two.

e. This AC should not be construed to affect the responsibilities and authority of the pilot in command for the safe operation of the airplane.

FAA Action

U.S. Department of Transportation
**Federal Aviation Administration**

# Advisory Circular

Subject: **NOISE ABATEMENT DEPARTURE PROFILES**

Date: 7/22/93
Initiated by: AFS-400

AC No: **91-53A**

**1. PURPOSE.** This advisory circular (AC) describes acceptable criteria for safe noise abatement departure profiles (NADP) for subsonic turbojet-powered airplanes with a maximum certificated gross takeoff weight of more than 75,000 pounds. These procedures provide the user with one means, although not the only means, of establishing acceptable NADP's. These departure profiles are consistent with the airworthiness standards required by the Federal Aviation Regulations (FAR's) Part 25 for type certification and FAR Part 91 for general airplane operations. This AC also provides a technical analysis and description of typical departure profiles that are consistent with the Federal Aviation Administration's (FAA's) safety responsibilities and have the potential to minimize the airplane noise impact on communities surrounding airports.

**2. CANCELLATION.** AC 91-53, Noise Abatement Departure Profile, dated October 17, 1978, is canceled.

**3. RELATED READING MATERIAL.**

*a.* FAR Parts 25, 91, 121, 125, 129, and 135.

*b.* U.S. Department of Transportation, Federal Aviation Administration Environmental Assessment for AC 91-53A. Copies may be obtained from the Office of Environment and Energy, FAA, 800 Independence Avenue SW., Washington, DC 20591.

*c.* FAA Analysis of Noise Abatement Departure Procedures for Large Turbojet Airplanes. Copies may be obtained from the Office of Environment and Energy, FAA, 800 Independence Avenue SW., Washington, DC 20591.

*d.* County of Orange, California, Environmental Impact Report #546. Copies may be obtained from County of Orange, Environmental Management Agency, 12 Civic Center Plaza, P.O. Box 4048, Santa Ana, CA 92701-4048.

**4. BACKGROUND.**

*a.* For several years, the FAA has worked to develop and standardize profiles to minimize airplane noise. As part of that commitment, the FAA has worked with airport managers, airplane operators, pilots, special interest groups, and Federal, State, and local agencies in numerous programs for evaluating noise levels in the airport environment. The research considered a variety of departure flight tracks and profiles.

*b.* From an environmental standpoint, avoiding noise sensitive areas by using preferential noise abatement runways and flight tracks whenever possible can effectively supplement a comprehensive noise abatement program. The FAA believes that using the two NADP's described in this AC for subsonic turbojet-powered airplanes can provide environmental benefits to the airport communities. The profiles outline acceptable criteria for speed, thrust settings, and airplane configurations used in connection with NADP's. These NADP's can be combined with preferential runway selection and flightpath techniques to minimize noise impact.

*c.* FAA reviews of various airplane vertical NADP's indicate that some intricate NADP's have been developed on an airport specific basis. The management of these intricate profiles could compromise the pilot's attention to interior flight deck details, traffic avoidance, and other safety responsibilities.

**5. DEFINITIONS.**

*a. NADP.* Noise abatement departure profile.

*b. Close-in Community NADP's.* NADP's for individual airplane types intended to provide noise reduction for noise sensitive areas located in close proximity to the departure end of an airport runway.

*c. Distant Community NADP's.* NADP's for individual airplane types intended to provide noise reduction for all other noise sensitive areas.

*d. AFE.* Above field elevation.

**6. NADP's.** Acceptable criteria have been established for two types of NADP's for each airplane type, as defined for use by each airplane operator. These departure profiles are applicable to all types of subsonic turbojet-powered airplanes over 75,000 pounds gross takeoff weight. The two types of NADP's are the "close-in" and "distant" profiles as described below.

*a. Close-in NADP.*

(1) Initiate thrust cutback at an altitude of no less than 800 feet AFE and prior to initiation of flaps or slats retraction.

(2) The thrust cutback may be made by manual throttle reduction or by approved automatic means. The automatic means may be armed prior to takeoff for cutback at or above 800 feet AFE or may be pilot initiated at or above 800 feet AFE.

(3) For airplanes without an operational automatic thrust restoration system, achieve and maintain no less than the thrust level necessary after thrust reduction to maintain, for the flaps/slats configuration of the airplane, the takeoff path engine-inoperative climb gradients specified in FAR Section 25.111(c)(3) in the event of an engine failure.

(4) For airplanes with an operational automatic thrust restoration system, achieve and maintain no less than the thrust level necessary after thrust reduction to maintain, for the flaps/slats configuration of the airplane, a takeoff path engine-inoperative climb gradient of zero percent, provided that the automatic thrust restoration system will, at a minimum, restore sufficient thrust to maintain the takeoff path engine-inoperative climb gradients specified in FAR Section 25.111(c)(3) in the event of an engine failure.

(5) During the thrust reduction, coordinate the pitchover rate and thrust reduction to provide a decrease in pitch consistent with allowing indicated airspeed to decay to no more than 5 knots below the all-engine target climb speed and, in no case to less than $V_2$ for the airplane configuration. For automated throttle systems, acceptable speed tolerances can be found in AC 25-15, Approval of Flight Management Systems in Transport Category Airplanes.

(6) Maintain the speed and thrust criteria as described in subparagraph 6 a(3) through 6 a(5) to 3,000 feet AFE or above, or until the airplane has been fully transitioned to the en route climb configuration (whichever occurs first), then transition to normal en route climb procedures.

*b. Distant NADP.*

(1) Initiate flaps/slats retraction prior to thrust cutback initiation. Thrust cutback is initiated at an altitude no less than 800 feet AFE.

(2) The thrust cutback may be made by manual throttle reduction or by approved automatic means. The automatic means may be armed prior to takeoff for cutback at or above 800 feet AFE or may be pilot initiated at or above 800 feet AFE.

(3) For airplanes without an operational automatic thrust restoration system, achieve and maintain no less than the thrust level necessary after thrust reduction to maintain, for the flaps/slats configuration of the airplane, the takeoff path engine-inoperative climb gradients specified in FAR Section 25.111(c)(3) in the event of an engine failure.

(4) For airplanes with an operational automatic thrust restoration system, achieve and maintain no less than the thrust level necessary after thrust reduction to maintain, for the flaps/slats configuration of the airplane, a takeoff path engine-inoperative climb gradient of zero percent, provided that the automatic thrust restoration system will, at a minimum, restore sufficient thrust to maintain the takeoff path engine-inoperative climb gradients specified in FAR Section 25.111(c)(3) in the event of an engine failure.

(5) During the thrust reduction, coordinate the pitchover rate and thrust reduction to provide a decrease in pitch consistent with allowing indicated airspeed to decay to no more than 5 knots below the all-engine target climb speed and, in no case to less than $V_2$ for the airplane configuration. For automated throttle systems, acceptable speed tolerances can be found in AC 25-15, Approval of Flight Management Systems in Transport Category Airplanes.

(6) Maintain the speed and thrust criteria as described in subparagraph 6b(3) through 6 b(5) to 3,000 feet AFE or above, or until the airplane has been fully transitioned to the en route climb configuration (whichever occurs first), then transition to normal en route climb procedures.

## 7. OPERATIONAL GUIDELINES.

*a.* Each airplane operator may apply the procedures specified in this AC to determine the following for each of its airplane types:

(1) Close-in community NADP.

(2) Distant community NADP.

*b.* For each NADP, the airplane operator should specify the altitude AFE at which thrust reduction from takeoff thrust or airplane configuration change, excluding gear retraction, is initiated.

*c.* Each airplane operator should limit the number of NADP's for any airplane type to no more than two.

*d.* Each airplane operator is encouraged to use the appropriate NADP when an airport operator requests its use to abate noise for either a close-in or distant community.

*e.* This AC should not be construed to affect the responsibilities and authority of the pilot in command for the safe operation of the airplane.

Anthony J. Broderick
Associate Administrator for Regulation and Certification