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UNITED STATES

ENVIRONMENTAL PROTECTION AGENCY

RECOMMENDED

NOTICE OF PROPOSED RULE MAKING

ON

REDUCED FLAP SETTING NOISE ABATEMENT APPROACH

FOR TURBOJET ENGINE - POWERED AIRPLANES

22 AUGUST 1975

N-96-01
II-A-260

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[14 CFR Part 91]

[Docket No. ; Notice No. 75-]

REDUCED FLAP SETTING NOISE ABATEMENT APPROACH FOR TURBOJET ENGINE - POWERED AIRPLANES

Notice of Proposed Rulemaking

In accordance with a recommendation by the Administrator of the Environmental Protection Agency, the Federal Aviation Administration is considering an amendment to Section 91.85 of the Federal Aviation regulations which would provide noise relief to communities in the vicinity of airports by prescribing reduced flap setting procedures for civil turbojet powered airplanes.

This proposal is one of three rules recommended by the EPA for the control of noise during the approach and landing of turbojet engine-powered airplanes. The two remaining rules recommended by the EPA involve the use of a two-segment approach with a glide slope angle of approximately 6 and 3 degrees for the first and second segments, respectively. One rule would require two-segment ILS approach for operations under either IFR or VFR while the other rule would require a two-segment visual approach for operations under specifically defined visual weather conditions only, which are more restrictive than VFR. The latter rule, if promulgated, could be made effective in the near future, applying to airports equipped with colocated ILS and DME ground facilities, as it does not require any additional airborne equipment.

If the two-segment ILS approach rule were promulgated and implemented--including the necessary airborne glide-slope computer installations on all affected aircraft--it would supersede the two-segment visual approach rule.

In addition to recommending the promulgation of three proposed regulations, the EPA has recommended certain non-regulatory actions by the FAA, concerning evaluation of an increased approach glide angle and reduced use of reverse thrust after landing. These recommendations, with background information, are included in each NPRM, so that each is complete in itself, independent of the others.

Interested persons are invited to participate in the subject rulemaking process by submitting such written data, views, or arguments as they may desire. Communications should identify the regulatory docket or notice number and be submitted in duplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket, GC-24, 800 Independence Avenue, S.W., Washington, D.C. 20590, and Environmental Protection Agency, Office of Noise Control Programs, AW-571, Attention: Docket No. 75-12, 401 M Street, S.W., Washington, D.C. 20460. All communications received on or before will be considered by the FAA Administrator before taking action on the proposed rule. The concepts contained in this notice may be changed in the light of comments received. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons.

Under the requirements of Section 7 (a) of the Noise Control Act of 1972 (Pub. L. 92-574, 86 Stat. 1234) the Administrator of the Environmental Protection Agency conducted a study of aircraft and airport noise and submitted a report thereon to the Congress. (Report on Aircraft/Airport Noise, Senate Committee on Public Works, Serial No. 93-8, Aug. 1973 Reference 1). Under Section 611 of the Federal Aviation Act, as amended by the Noise Control Act of 1972, the Administrator of the EPA is also required, not earlier than the date of submission of his report to the Congress, to submit to the Federal Aviation Administration proposed regulations to provide such control and abatement of aircraft noise and sonic boom (including control and abatement through the exercise of any of the FAA's regulatory authority over air commerce or air transportation or over aircraft or airport operations) as the Administrator of the EPA determines is necessary to protect the public health and welfare. In accordance with the foregoing requirement, the EPA published in the Federal Register on February 19, 1974, (39 F.R. 6142) a "Notice of Public Comment Period" containing a synopsis of the proposed rules it is considering to achieve a satisfactory level of aircraft noise control and abatement for the protection of the public health and welfare.

The proposed rules and the type of control which each rule would implement are as follows:

<u>Flight procedure noise control.</u>

(1) Takeoff procedures.

(2) Approach procedures.

(3) Minimum altitudes.

Source noise Control.

(4) Retrofit/fleet noise level.

(5) Supersonic civil aircraft noise.

(6) Modifications to Part 36 of the Federal Aviation Regulations.

(7) Propeller driven small airplanes.

(8) Short haul aircraft.

Airport operations noise control.

(9) Airport goals, mechanisms and procedures by which noise exposure of communities around airports can be limited to levels consistent with public health and welfare requirements.

This proposal is identified as the reduced flap setting procedures portion of Item (2), above.

References

In the development of this proposed rule the EPA evaluated several pertinent studies made by Federal agencies and private persons. Those studies are listed herein for the information of all interested persons and are available for examination at the FAA Rules Docket Office, GC-24, 800 Independence Avenue, S.W., Washington, D.C. 20590, or Environmental Protection Agency, Office of Noise Control Programs, Crystal Mall 2, 1921 Jefferson Davis Highway, Arlington, VA 20460.

(1) "Report on Aircraft/Airport Noise", Report of the Administrator of the Environmental Protection Agency in compliance with Public Law 92-574, Senate Committee on Public Works, Serial No. 93-8, August 1973.

(2) "Note on Effect of Thrust and Altitude on Noise in Steep Approaches", NASA, LWP-283, September 14, 1966.

(3) "Flight Investigations of Methods for Implementing Noise Abatement Landing Approaches", "Progress of NASA Research Relating to Noise Alleviation of Large Subsonic Jet Aircraft", NASA SP-189, October 8-10, 1968.

(4) "Flight and Simulation Investigation of Methods for Implementing Noise Abatement Landing Approaches", NASA TN D-5781, May, 1970.

(5) "Noise Measurement for a Three-Engine Turbo-Fan Transport Airplane During Climbout and Landing Approach Operations", NASA TN D-61337, May 1971.

(6) "Measurement and Analysis of Noise from Four Aircraft During Approach and Departure Operations (727, KC-135, 707-320B, and DC-9)", FAA Report FAA-RD-71-84, September 1971.

(7) "Preliminary Results on Two-Segment Noise Abatement Studies", NASA TM X-62, 098, September 22, 1971.

(8) "Noise Reductions Achieved on a 720-320 B Aircraft Using a Two-Segment Approach", NASA CR-14417, December, 1971.

(9) "Flight Evaluation of Two-Segment Approaches for Jet Transport Noise Abatement", American Airlines NASA Contractor Report, prepared under Contract No. NAS2-6501, June, 1973.

(10) "Aircraft Noise Reduction Technology", Report by the National Aeronautics and Space Administration to the Environmental Protection Agency for the Aircraft/Airport Noise Study, 30 March 1973.

(11) "Initial Flight and Simulator Evaluation of Head-Up Display for Standard and Noise Abatement Visual Approaches", NASA, TM S-62, 187, February 1973.

(12) "NBAA Noise Abatement Program", National Business Aircraft Association, Report SRT 67-12, June 1967

(13) "Effects of Aircraft Operations on Community Noise", The Boeing Company, Commercial Airline Group, June 1971.

(14) "A Comparison of Aircraft Approach Angles at Los Angeles and San Diego International Airports", City of Inglewood, California, June 1972.

(15) "Operations Analysis Including Monitoring, Enforcement, Safety, and Cost", Report of Task Group 2, EPA NTID 73.3, 27 July, 1973.

(16) "Field Evaluation of 3000 Ft. Glideslope Intercept Program", Report No. FAA AT-72-1, March 1972.

(17) "Glideslope Angles at Airports", FAA Report, December 1971.

(18) "Research and Technology for Aircraft Noise Abatement", statement by Deputy Associate Administrator, NASA, before Subcommittee on Aviation, Committee on Commerce, U.S. Senate, July 1973.

(19) "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," EPA Technical Document 550/9-74-004, March 1974.

(20) C. Bartel, L. C. Sutherland and L. Simpson, "Airport Noise Reduction Forecast", DOT Report DOT-TST-75-3, October 1974.

(21) J. E. Wesler, "Airport Noise Abatement - How Effective Can It Be?", <u>Sound and Vibration</u>, February 1975, pp 16-21.

(22) R. H. Peterson and R. F. Burke, "Studies of Methods for Reducing Community Noise Around Airports", Nielsen Engineering and Research Inc., Report NEAR TR 73, prepared under contract no. NAS2-8190 for NASA/Ames, August 1974.

(23) "Approach and Landing Procedures for Noise Control", EPA Project Report, 1 July 1975,

Reduced-Flap Approach and Landing

As shown in the foregoing list of references numerous studies have been conducted to determine the noise reduction potential that can be achieved by the use of certain procedures for approaches and landings. It has been concluded from a review of these studies that an approach made with less than full landing flaps reduces aircraft noise as compared to a full flap approach, since the airframe drag with reduced settings is less and lower power is thereby required. The results of the studies show that a noise reduction of approximately 2 to 3 EPNdB can be achieved for various types of turbojet powered airplanes under a reduced flap procedure. For example, a B-727 with an approach flap setting of 30 degrees requires an average net thrust per engine (Fn) of about 4600 lb and produces an Effective Perceived Noise Level (EPNL) on the flight track 3 dB lower than the same airplane using 40 degrees flaps, requiring an Fn of about 6600 lb. The area within the 90 EPNdB contour is approximately 4.2 square miles at 30 degrees flaps, compared to 7.5 square miles at 40 degrees flaps, a decrease of 44 percent in area. A reduction similar in magnitude is achieved in the area within the 80 EPNdB contour. For a B-737, the improvement is about a 2 dB reduction on the flight track and about a 30% reduction in the 90 EPNdB area. The benefit obtained with a B-707, using flaps at 40 degrees in lieu of 50 degrees, is somewhat lower, but still useful--about 1.5 dB reduction in EPNL in the flight track and a reduction of about 10 percent in the area within the 90 EPNdB contour.

The Airplane Flight Manual for many types of airplanes (B-707, B-727, B-737, B-747, DC-10, L-1011) shows more than one certificated flap setting for landing. Several air carriers, including United, American and Northwest Air Lines, have standardized on a flap setting for landing that is less than the maximum certificated flap setting; some use an even lower flap setting during the early approach phase. For example, one air carrier's procedures provide for using a flap setting during the approach of one notch less than the planned flap setting for landing which generally is less than the maximum certificated flap setting. The procedure provides for the flaps to be lowered to final setting at an altitude sufficient to allow the aircraft to become stabilized in the landing configuration prior to reaching an altitude of 500 feet above the runway elevation. Approximately 200 to 300 feet of altitude are required to stabilize an aircraft following a configuration, airspeed, or power change during approach.

In addition to the present use of a reduced flap approach procedure by certain air carriers, the Air Transport Association recommended continuation of the reduced flap approach across the board now in response to the invitation for comments to the two-segment ILS approach provisions proposed in ANPRM 74-12 (39 FR 11193, Mar. 26, 1974). Since the procedure is considered safe and will achieve an appreciable reduction in noise caused by civil turbojet engine-powered airplanes, it is proposed to make the use of a reduced flap procedure mandatory for all civil turbojet engine-powered airplanes.

In addition to the noise reduction benefits obtained with reduced flap approach, there is also a slight decrease in fuel consumption, owing to the lower engine thrust used in such an approach. A minor negative factor is a small increase in approach speed required to obtain the necessary lift at the lower flap setting, coupled with a small increase in the time needed to increase engine thrust to maximum if the landing has to be aborted. However, the changes involved are small, and well within the limits of safe operation.

The reduced flap procedure for each type of turbojet engine-powered airplane would consist of the lowest flap setting shown in the Airplane Flight Manual that is appropriate and safe for landing based upon such factors as load, weather, runway conditions, etc However, since this proposal relates to noise abatement rather than safety, it would expressly recognize that each pilot in command of an airplane covered by the proposal has the final authority and responsibility for the safe operation of his airplane. Therefore, if he determines in the interest of safety that a higher flap setting for that airplane should be used for a particular approach and landing he may do so. The authority for alternative procedures is presently provided under the noise abatement runway system requirements in §91.87(g) and would be equally appropriate for the noise abatement flap reduction procedures proposed herein.

Health and Welfare Considerations

The EPA Report to Congress on Aircraft and Airport Noise (Reference 1) indicated that large numbers of persons are subjected to levels of cumulative noise exposure due to aircraft operations which have a potential for producing a permanent impairment of hearing, interference with speech, and the generation of annoyance. That report estimated that in 1972, 16 million persons in the United States were subjected, due to aircraft operations, to a Day-Night Average Sound Level of 60 dB or greater. The Day-Night Average Sound Level, Ldn is the measure used by the EPA to express quantitatively the cumulative noise exposure of a population.

Information presented in the Report to Congress (Reference 1) further indicated that, based on available data in the scientific literature, at Ldn values of 60 dB there is about a 2.5 percent occurrence of speech interference and about 23 percent of the exposed population is highly annoyed. Further, the EPA "Levels Document" (Reference 19) specifically identified two long-term average levels of noise exposure which should not be exceeded in order to protect the public health and welfare with an adequate margin of safety:

- A Day-Night Level (Ldn) no greater than 55 dB, to protect against annoyance (including interference with speech communication):
- An Equivalent Noise Level (Leq) no greater than 70 dB, to protect against significant adverse effects on hearing.

As pointed out in EPA's "Levels Document" the phrase "health and welfare" is taken to mean "complete physical, mental and social well-being and not merely the absence of disease and infirmity". It is clear from the foregoing data that noise due to aircraft operations represents a significant hazard to the health and welfare of millions of persons.

As set forth in the Report to Congress, the EPA has determined that, in order to protect the public health and welfare from aircraft noise, it is necessary that regulations be proposed to the FAA. for promulgation, in the eight subject areas of aircraft noise control listed earlier in this preamble.

The intent of those aircraft noise regulations is to produce a substantial reduction in the number of persons subjected to cumulative noise levels that are considered hazardous to their health and welfare, i.e., in the terms outlined in the foregoing paragraphs, to Ldn values of 55 dB or greater. Although theoretically it might be considered desirable to reduce the day-night level due to aircraft noise to less than 55 dB for all persons, this is an unrealistic goal. As reported in the Levels Document, Reference 19, some 62 million persons in the United States are estimated to be exposed to Ldn 60 or greater due simply to vehicular traffic noise, and some 75 percent of the urban population are estimated to be exposed to ambient sound levels averaging Ldn 55 or greater. Present technology does not provide the capability of reducing cumulative noise due to aircraft operations to Ldn 55 for all persons without essentially destroying the national air-carrier system, with all its attendant benefits to the public health and welfare. And even if aircraft noise were completely eliminated, many millions of persons still would be subjected to cumulative noise in excess of Ldn 55 due to other sources, mainly motor vehicles. Consequently, the EPA has a more modest and realistic goal, namely, to achieve the maximum reduction of cumulative noise due to aircraft operations that is technologically feasible to obtain without exorbitant costs. This is a position consistent with the requirements under the Noise Control Act that EPA, as well as the FAA, must meet in developing and promulgating noise control regulations which are within their respective areas of responsibility.

The EPA believes that the succeeding paragraphs quantify the environmental noise impact associated with aircraft and airport operations. This is done for both a defined baseline situation and for hypothetical situations in which it is assumed that one or more of the proposed aircraft noise regulations has been implemented. Comparison of the various sets of figures provides reasonable estimates of the noise reduction benefits to be gained by implementation of the various regulatory proposals for the control of aircraft noise.

Assessment of Noise Impact due to Aircraft Operations

This section deals with the health and welfare effects of environmental noise in terms of noise impact assessment, which is a methodology for quantifying the extensiveness and severity of noise impact by a single number. An explanation of Noise Impact Methodology has been presented in various EPA publications, including Reference 23. In brief, this methodology comprises the following steps, for each specified environmental noise situation.

1. Determine (or estimate) the number of persons [P(i)] exposed to various ranges of Day-Night Equivalent Sound Level (Ldn) (e.g., 8.5 million persons between Ldn 60 and 65; 4.1 million between Ldn 65 and 70, etc.)

2. Assign to each Ldn range a Fractional Impact value [FI(i)] appropriate to the criterion under consideration. For purposes of this analysis, Ldn 55 is considered to represent a zero impact [FI =0], and Ldn 75 an impact of 1.0 [FI = 1.0]. For Ldn 60-65, FI(1) is 0.375; for Ldn 65-70, FI(2) is 0.625; for Ldn 70-75, FI(3) is 0.875, etc.

3. For each range of Ldn values, determine the Noise Impact Contribution as the product of number of persons exposed and fractional impact, or

$$NI(i) = [FI(i)] \times [P(i)]$$

4. Calculate the Equivalent Noise Impact, ENI, as the sum of the individual Noise Impact contributions, or

$$ENI = \Sigma(i)\ [FI(i)]\ [P(i)]$$

This quantity may be interpreted as the equivalent number of persons "fully impacted" by the noise in the given situation. For residential land use affected by noise, the ENI value is the equivalent number of persons exposed to Ldn 75.

To obtain an estimate of the noise impact reduction resulting from some action, such as implementation of aircraft noise regulation, one would estimate the ENI values for the baseline condition and for the condition existing as a result of the action taken. The result could be expressed as a change in absolute value, or as a ratio, of the baseline Equivalent Noise Impact.

1. Baseline Noise Impact - Aircraft Operations

For this analysis, the baseline year of 1972 is used, mainly because the best available analyses of aircraft environmental noise have been premised on a 1972 baseline (References 20-22). Since the Noise Control Act was enacted into law in 1972, this baseline seems quite appropriate.

Of the three references listed, Reference 20, "Aircraft Noise Reduction Forecast", also known as the DOT "23-Airport Study", is the most widely known. It provides the basic data and point of departure for the others. In terms of the individual elements of EPA's proposed regulatory package, Reference 21, which extended the analysis of Reference 20 to cover additional options of noise reduction, seems most nearly oriented towards evaluation of the effects of the various options considered. Consequently, the calculations and results presented in this section are based largely on the data of Reference 21, with key data points confirmed by Reference 20. This latter report adduced that the

23 airports studied accommodated approximately half of the operations nationally of air-carrier jet aircraft. In terms of total impact, however, independent analyses by EPA and its consultants indicated that the population impacted by the operations to and from the 23 airports represented about 63% of the national impacted population. The results presented herein are based on that premise.

On the basis of the information discussed in the previous paragraphs, the EPA has estimated that for the 1972 baseline condition, the national population exposed to Ldn 65 or greater is 7,925,000 persons, and to Ldn 75 or greater is 792,000 persons. This corresponds to an Equivalent Noise Impact (ENI) (considering the population exposed to Ldn 65 or greater) of approximately 5,800,000 persons. By extrapolating the population data, a rough estimate can be obtained of the baseline population exposed to Ldn 60 or greater. This rough estimate is about 25,000,000 persons; the corresponding ENI, considering the population exposed to Ldn 60 or greater, is about 12,000,000 persons.

2. Noise Impact - Projected Fleet of the late 1970's, with several Noise Control Options Applied

Summarized below are the estimates of the effects of several of the noise control options that would be undertaken if the regulations package proposed by EPA were promulgated and implemented. The results for the late 1970's, are given in terms of reduction in numbers of persons exposed to Day-Night Equivalent Levels of 65 or greater, and 75 or greater, respectively, and corresponding changes in Noise Impact, taking into account the change in air-carrier fleet mix and number of operations projected for that period.

The conditions considered are the following:

- 1978 Baseline Fleet (this reflects the introduction of new, less noisy aircraft that meet or better FAR 36 noise limits, and the phasing out of old, noisier aircraft.)
- Two-Segment Approach
- Noise Abatement Takeoff
- Quiet Nacelle (QN) also referred to as Sound Absorption Material (SAM) Retrofit

The estimated data on numbers of people affected in various Ldn ranges, and the corresponding changes in Noise Impact, are tabulated below.

- 1978 Baseline Fleet (relative to 1972 Baseline):
  - Population exposed to Ldn 65 or greater reduced by 2,520,000.
  - Population exposed to Ldn 75 or greater reduced by 287,000.
  - Severity and extensiveness of impact reduced by 33.6 percent.
- Two-segment approach (relative to 1978 Baseline):
  - Population exposed to Ldn 65 or greater reduced by 570,000.
  - Population exposed to Ldn 75 or greater reduced by 54,000.
  - Severity and extensiveness of impact reduced by 10.4 percent.
- Noise Abatement Takeoff (relative to 1978 Baseline):
  - Population exposed to Ldn 65 or greater reduced by 1,050,000.
  - Population exposed to Ldn 75 or greater reduced by 102,000.
  - Severity and extensiveness of impact reduced by 19.1 percent.

- Quiet Nacelle Retrofit (relative to 1978 Baseline):
  - Population exposed to Ldn 65 or greater reduced by 1,600,000.
  - Population exposed to Ldn 75 or greater reduced by 283,000.
  - Severity and extensiveness of impact reduced by 32.3 percent.

EPA has estimated that reduced - flap approach, if universally applied, is about 30 percent as effective as two-segment approach in reducing noise impact. Accordingly, the EPA believes that adoption of the regulation proposed herein would result in a reduction of about 3 per cent in the severity and extensiveness of airplane noise impact. Based on an estimated current population of about 6.7 million people exposed to Ldn 65 or greater and about 650,000 people exposed to Ldn 75 or greater, this would mean a reduction of about 200,000 in the number of persons exposed to Ldn 65 or greater, and a reduction of about 20,000 in the number of persons exposed to Ldn 75 or greater. This would be a significant contribution to the protection of the public health and welfare, and would be essentially cost-free.

Thrust Reversers

The EPA Report to the Congress in respect to aircraft noise ("Report on Aircraft/Airport Noise", Senate Committee on Public Works, Serial No. 93-8, August 1973) observed, among other things, that thrust reverse noise on landing contributes to noise annoyance at some airports. This noise depends on the amount of the reverse power applied and varies over an extremely wide range, from idle thrust (no appreciable thrust reversal) to almost takeoff power. On the average, thrust reverse noise is approximately 10 EPNdB lower than takeoff noise. The effect of thrust reverse noise on cumulative noise exposure (e.g., Ldn) is often negligible because of its lower level and short duration compared to sideline takeoff noise.

One unpleasant characteristic of thrust reverse noise, however, is its sharp application, making it especially annoying, particularly at night. During that time, takeoff noise is louder at most locations in the community, but the sound builds up gradually. But, in the case of thrust reversal there may be a "startle" effect associated with the noise which becomes a problem when there are people living in the vicinity of an operational runway.

Thrust reversal is used on landing to slow the aircraft at high speeds since the high kinetic energy of the aircraft can cause excessive heating and wear of the wheel brakes at such speeds. As the airplane slows down, the relative effectiveness of the brakes increases while that of the reverse thrust decreases; below about 60 knots, the reverse thrust has very little effect compared to the brakes. However, the use of thrust reversal generally is not necessary even at high speeds for transport category aircraft. Such aircraft have a certificated runway length in which they can safely land and stop without the use of thrust reversers and in all cases that distance is considerably shorter than the runway length available at the airports used by those aircraft. In general, the use or non-use of thrust reversal for a particular landing is situation-dependent and from a safety standpoint it may be desirable to deploy thrust reversers on some relatively short runways. However, when landing on a long, dry runway, with no air traffic control urgency, the thrust reverse noise is more detrimental to the public welfare than the additional ground taxi noise that results from the non-use of thrust reversers.

In accordance with the recommendations of the EPA Aircraft/Airport Noise Study Task Group Two Report, it is proposed that the FAA prepare and issue an Advisory Circular which would discuss the appropriate use of thrust reversal and which would encourage pilots to minimize the use of thrust reverse where it does not adversely affect the safety of the landing. The fact that reduced flap settings result in slightly increased landing speeds should also be taken into consideration in that circular.

4-Degree Glide Angle

As pointed out earlier, the EPA is submitting two proposals for rulemaking concerned with two-segment approaches, in addition to the rule discussed herein. Another method of abating approach noise which could provide much of the noise-reduction benefit of the two-segment approach while avoiding some of the costs and complications is the use of a conventional single-segment approach using a glide angle of 4 degrees, instead of the conventional 3 degrees or less.

Conceptually, introduction of a 4 degree glide angle ILS approach would be simple, requiring no change in airborne avionics nor in the basic approach and landing technique now in use. It could be accomplished by a mechanical adjustment of the ground-based ILS glide slope transmitter from a 3-degree to a 4-degree angular orientation above horizontal and appropriate relocation of the marker beacons. For visual approach guidance, the Visual Approach Slope Indicators (VASI) would also have to be modified for the new glide angle, which may involve substantial repositioning of the light bars.

Although a small number of airports now have approach glide path angles greater than 3 degrees, there has not been a thorough systematic program of development testing and in-service evaluation to establish the practical acceptability for all or most airports of a 4-degree glide angle approach. Consequently, it is not proposed herein to initiate rulemaking regarding such an approach. However, the EPA strongly recommends that appropriate studies be initiated to determine both the practical benefits to be gained and the effects, if any, on airplane operation and safety as well as pilot reaction, of a 4° glide angle approach.

The Proposed Rule

In consideration of the foregoing, it is proposed to amend §91.85 by adding a new paragraph (c) to read as follows:

§91.85 Operating on and in the vicinity of an airport: general rules.

* * * * *

(c) When approaching for a landing, each person operating a civil turbojet engine-powered airplane shall use the minimum certificated flap setting set forth in the Airplane Flight Manual that is appropriate to each phase of that approach and landing. However, each pilot in command has final authority and responsibility for the safe operation of his airplane and he may use a different flap setting approved for that airplane if he determines that it is necessary in the interest of safety.

This notice of proposed rulemaking is issued under the authority of sections 313(a), 307(c), 601, and 611 of the Federal Aviaiton Act of 1958, as amended (49 U.S.C. 1354, 1358, 1421 and 1431); and sections 2(b) (2) and 6(c) of the Department of Transportation Act (49 U.S.C. 1651(b) (2) and 1655(c).

Issued in Washington, D.C. on

Administrator