

Federal Aviation Agency

ADVISORY CIRCULAR

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GENERAL OPERATING
AND FLIGHT RULES

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by 91-10A*

SUBJECT : SUGGESTIONS FOR USE OF ILS MINIMA BY GENERAL AVIATION OPERATORS OF TURBOJET AIRPLANES

1. **PURPOSE.** This circular provides general aviation operators of turbojet airplanes with information on the following:
 - a. Practices and procedures to be considered before utilizing the lowest published IFR minima prescribed by Federal Aviation Regulations Part 97 and appearing on Coast and Geodetic instrument approach procedure charts.
 - b. Use of IFR minima by Federal Aviation Regulations Part 91 operators approved for air-carrier operations only and published by other than the U.S. Department of Commerce, Coast and Geodetic Survey.
 - c. Pilot-in-command experience, initial and recurrent pilot proficiency and airborne airplane equipment.
2. **REFERENCE.** Advisory Circular No. AC 90-13, "Turbojet Training Program - General Aviation," dated April 22, 1964; Federal Aviation Regulations Part 91, "General Operating and Flight Rules," and Federal Aviation Regulations Part 97, "Standard Instrument Approach Procedures."
3. **BACKGROUND.**
 - a. **ILS Turbojet Landing Minima.**
 - (1) Except for a very few small turbojet airplanes of foreign manufacture purchased for operation in the United States, civil operations of turbojet airplanes did not reach any significant proportions until the air carriers became jet equipped. While the air carriers had operated piston or turboprop airplanes to the lowest published minima, they were not initially permitted to do so upon placing turbojet airplanes in service. The Federal Aviation Agency established basic air-carrier turbojet minima of 300-foot ceiling and 3/4-mile visibility or 4,000-foot runway visual range (RVR). On September 26, 1961, the

Agency issued criteria by which minima of 200-foot ceiling and 1/2-mile visibility or 2,600-foot runway visual range in lieu of the basic 300-foot ceiling and 3/4-mile visibility or 4,000-foot runway visual range minima could be approved for use at selected locations by the air carriers. These criteria provide for:

- (a) A minimum of pilot-in-command flight experience in a particular type of turbojet airplane;
 - (b) Additional airborne equipment consisting of a flight director system or automatic approach coupler and instrument failure warning system;
 - (c) Approved flight crew training programs;
 - (d) Initial and recurrent pilot-in-command proficiency demonstrations; and
 - (e) Runway and approach lighting and markings.
- (2) Evaluation of the air-carrier operational experience under these criteria established that further reductions in turbojet landing minima could under certain conditions be safely authorized. It should be borne in mind that in the foregoing application and evaluation, air-carrier pilots as a regular requirement are route and airport qualified, and not less than two pilots with assigned cockpit duties were in all cases involved.
- (3) The Agency recognizes the high standards of proficiency maintained by many general aviation pilots and the extent to which many of the airplanes operated by them exceed the minimum requirements of the regulations. The Agency is also aware that many general aviation pilots recognize their limitations and those of the airplane and prudently establish for their use IFR minima considerably higher than the lowest published FAR Part 97 minima. These pilots in particular should recognize that turbojet airplanes because of superior performance and utility over piston-powered airplanes in general will in many cases place additional demands upon the crew to obtain maximum utility. The referenced Advisory Circular No. AC 90-13, "Turbojet Training Program - General Aviation," was specifically issued as a suggested guide to be followed by pilots and operators concerned with the operation of these types of airplanes.

- (4) Although recurrent training is not a requirement for general aviation pilots who conduct their operations under FAR Part 91, the benefits of training programs have long been recognized. Training becomes particularly important to a pilot as he transitions to the more complex, modern turbojet airplanes. It often-times affords a pilot the only opportunity to become familiar with and practice emergency procedures. The time involved in organized and directed training has proven to be far more productive than an equal amount of routine flight experience acquired in the airplane. For these reasons, it is suggested that operators establish, maintain, or sponsor training programs whereby their flight crews may be upgraded to and maintained at a maximum degree of proficiency or obtain appropriate training offered by the airplane manufacturer or professional training organization.

4. SUGGESTIONS FOR USE OF ILS MINIMA PRESCRIBED BY FAR PART 97 AND APPEARING ON INSTRUMENT APPROACH PROCEDURE CHARTS PUBLISHED BY COAST AND GEODETIC SURVEY.

- a. Procedures and Criteria. The Agency believes that operators who observe the suggested procedures and criteria set forth below will be able to realize the full potential of their turbojet airplane with safety.
- (1) It is suggested that consideration be given to the use of interim ILS straight-in minima of 300-foot ceiling and 3/4-mile visibility or 4,000-foot runway visual range at those locations where minima of 200-foot ceiling and 1/2-mile visibility or 2,400-foot runway visual range are published until:
- (a) The pilot-in-command acquires 100 hours of pilot-in-command flight experience in the particular turbojet airplane to be operated (make and model).
- (b) The second-in-command (copilot), in addition to holding a valid airman certificate and current instrument rating, receives training for copilot duties in the particular turbojet airplane (make and model) in which he will serve.
- (c) The pilot-in-command and copilot receive initial training consistent with that suggested in Advisory Circular No. AC 90-13, "Turbojet Training Program - General Aviation."
- b. Aircraft Equipment. In addition to that equipment required elsewhere in the airplane certification or operating rules, many turbojet airplane operators are also installing a flight director system or automatic approach coupler and an instrument failure warning system.

If or when this equipment is installed, it is suggested that pilots become familiar with its use during the suggested initial training and pilot-in-command flight experience. The use of this equipment during this period also provides the opportunity to evaluate its accuracy and reliability under IFR minima higher than the lowest published.

- c. Pilot-In-Command Proficiency. It is suggested that prior to using minima below 300-foot ceiling and 3/4-mile visibility or 4,000-foot runway visual range and notwithstanding the completion of training and meeting the 100 hours of pilot-in-command flight experience, each pilot-in-command conduct sufficient approaches under the hood in VFR conditions to determine that his degree of proficiency will assure the safe and consistent execution of the following:

- (1) Manual ILS approaches to 200 feet without using either the flight director or approach coupler. If the pilot predicates his operation on the use of a dual flight director system, manual approaches may be given secondary consideration.
- (2) ILS approaches to 100 feet using either the flight director system or the approach coupler. If a pilot intends to use both the flight director and approach coupler in his operations, then it is suggested that he be equally proficient in the use of both.
- (3) From approaches to 100 feet using the flight director or approach coupler continue the approaches to a landing.
- (4) From at least one of the approaches specified in par. 4c(1) and (2), execute a missed approach with one of the critical engines in the idle thrust position.

5. SUGGESTED OPERATING PROCEDURES AND LIMITATIONS.

- a. As an adjunct to the instrument failure warning system suggested in par. 4b establish a cockpit procedure to insure detection of instrument failures or malfunctions.
- b. When IFR operations are based on data published by other than the Coast and Geodetic Survey, determine that the minima used are not lower than those published by Coast and Geodetic. IFR minima published as the result of approved air carrier operations specifications in most cases are not applicable to operations conducted under FAR Part 91, consequently, may not legally be used by those who operate under FAR Part 91. For example, current ILS instrument approach procedure data and related IFR landing minima published by

other than the Coast and Geodetic Survey may be utilized, except when (1) the corresponding minima are lower than those published by the Coast and Geodetic Survey, or (2) when the minima appearing on other than Coast and Geodetic publications are based on approved air carrier operations specifications.

- c. Determine the minimum runway length for use at the destination airport by:

(1) Application of the six-tenths factor when set forth in the approved airplane flight manual for airplanes type certificated under Federal Aviation Regulations Part 25 (formerly Part 4b of the Civil Air Regulations) plus (+) 15 percent, or in the absence of such a factor and for airplanes certificated under other regulatory requirements by:

- (a) Selecting from the airplane flight manual the appropriate landing distance information; i.e., from the 50-foot height point (threshold) to a full stop;
- (b) Computing the basic runway length required by multiplying the landing distance determined in (a) above by 1.67; and
- (c) Adjusting the computed basic runway length arrived at in (b) by adding 15 percent to establish the minimum operational length that should be available.

EXAMPLE: Computed landing distance - 4,000 feet
4,000 feet times 1.67 = 6,680 feet
plus 15 percent = 7,682 feet

- d. The suggested effective runway length considered desirable would be equal to or greater than the minimum length determined in accordance with par. 5c(1)(c).

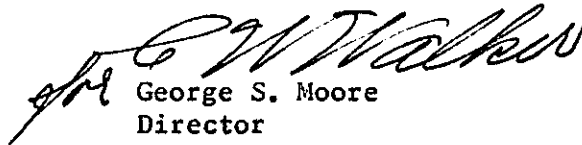
NOTE: As used herein, effective runway length is the distance from the point at which the obstruction clearance plane associated with the approach end of the runway intersects the centerline of the runway to the far end thereof. The obstruction clearance plane is a plane which is tangent to or clears all obstruction within the obstruction clearance area and which slopes upward from the runway at a slope of 1:20 to the horizontal as shown in a profile view of the obstruction clearance area.

- e. The crosswind component should not exceed 10 knots.

6. PILOT-IN-COMMAND AND COPILOT RECURRENT TRAINING AND PROFICIENCY.

Finally, when minima below 300-foot ceiling and 3/4-mile visibility or 4000-foot runway visual range are being utilized, it is further suggested that consideration be given to:

- a. A recurrent training program whereby the pilot-in-command and co-pilot are able to maintain a satisfactory level of proficiency;
- b. A periodic review and the execution of those maneuvers listed as (1) through (4) of par. 4c or completion of training consistent with Advisory Circular No. AC 90-13, "Turbojet Training Program - General Aviation"; and
- c. When appropriate, the use of company chief pilots, company designated check pilots, or individuals performing similar duties for professional training organizations, to conduct periodic proficiency checks.



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