



U.S. Department
of Transportation

**Federal Aviation
Administration**

Great Lakes Region
Illinois, Indiana, Michigan
Minnesota, North Dakota,
Ohio, South Dakota,
Wisconsin

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POLICY AND PROCEDURES MEMORANDUM - AIRPORTS DIVISION

NUMBER: 5300.4
DATE: NOV 26 1996
SUBJECT: General Guidance on Runway/Taxiway Safety Areas
REFERENCE: 1. Advisory Circular 150/5300 - 13 - Airport Design
2. FAR Part 139 - Certification and Operations: Land Airports Serving Certain Air Carriers
3. FAA Order 5280.5B - Airport Certification Program Handbook.
4. Policy And Procedure Memorandum 5050.5C - Planning: Airport Layout Plan Approval and Airport Master Plan Acceptance
APPENDIX 1. Background
APPENDIX 2. Comment Resolution (Internal Use Only)

1. Background: The excerpts contained in Appendix 1 when considered collectively may be confusing and when considered separately could foster inconsistent determinations of the safety area standard to be applied at a specific airport. This PPM provides guidelines that will assist planners and engineers in selecting the proper safety areas for facilities at any airport.

2. Policy/Procedures. Safety areas are to be kept free of all objects, except for frangible mounted structures that need to be located in the safety area because of their function, cleared, graded, drained, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment and the occasional passage of aircraft without causing structural damage to the aircraft. These areas surround runways and taxiways and are suitably prepared to reduce the risk of damage to airplanes in the event the aircraft overshoot, undershoot or unintentionally depart the runway or taxiway operating surfaces.

a. General

(1) Current runway and taxiway safety area dimensional standards are contained in Advisory Circular 150/5300-13, Airport Design (Runway safety areas - Tables 3-1, 3-2, & 3-3; Taxiway safety areas - Table 4-1).

(a) The runway safety area extensions, beyond the runway end, begin at each runway end when a stopway is not provided. When a stopway is provided, these lengths are measured from the stopway end.

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(b) For Airport Reference Codes C-I and C-II, a runway safety area width of 400 feet is permissible.

(c) For aircraft in Approach Category D, the runway safety area width increases 20 feet for each 1,000 feet of airport elevation above mean sea level. Only increments of 20 feet are to be used and intermediate safety area width increases are rounded down, i.e. 900 feet of airport elevation would result in no change, where as 1000 feet of airport elevation would result in a 20-foot increase in runway safety area width.

(2) When the FAA upgrades a safety area standard, airport operators should, to the extent practicable, include the upgrade in their airport planning documents (Approved ALP on obligated airports) before starting future development at the airport.

(3) At constrained airports, where it is impracticable to provide the full runway safety area, declared distances may be implemented to provide for the runway safety area requirements. Procedures for implementing declared distances are in PPM 5300.2 "Guidance on Declared Distance Standards".

(4) FAA's intent is to protect safety areas and not to permit the safety area dimensions to be reduced once they have been approved by FAA for a specific set of operational conditions.

(a) The declared distance concept is implemented at constrained airports where it is impractical to provide the entire runway safety area based upon the current design standard. In these declared distance situations, future development shall not be permitted within the safety areas nor shall a modification of standards be issued to provide for future development within these same safety areas.

(b) When a modification of standards is approved to provide a safety area less than that required by the current design standard, future development shall not be permitted nor shall a future modification of standards be issued to provide for future development in these same safety areas.

(c) Future development shall not be permitted, nor shall a modification of standards be issued to provide for future development within the safety areas depicted on the approved ALP.

(5) The ADO/block grant state is required to determine the effect that any proposed modification of standards, for a safety area, would have on the safety of persons and property on the ground. This determination is independent of the comments received from the regional coordination process for the modification of standards. However, the ADO/block grant state will rely upon the regional coordination comments in making this determination.

b. Obligated Airports. Airport operators must provide and maintain the runway safety areas and taxiway safety areas that are depicted on the current, FAA-approved, airport layout plan (ALP). The safety areas depicted on the ALP are the standard for that airport, provided a safe and acceptable operational environment is available. To the extent practicable, the FAA-approved ALP must conform to the FAA airport design standards existing at the time of its approval.

(1) If construction, reconstruction, or significant expansion (runway extensions of 500 feet or more are considered significant) clearly provides for a different critical aircraft or provides for increased payload or range for the critical aircraft (exceeding the design parameters upon which the approved ALP was based), then the safety areas for the applicable aircraft operating surface shown on the ALP must be upgraded in accordance with the current FAA design standard to the extent practicable. This requirement to

comply with the current safety area design standard applies to the total operating surface being upgraded and to both ends of a runway that is upgraded. For example, a 500-foot runway extension to accommodate aircraft that impose an expanded runway safety area, would require the same runway safety area to be provided at both ends of the runway.

(2) If the aircraft reference code (ARC) for aircraft that are to operate at the airport (at least 500 annual operations forecasted) is different from the ARC of the critical aircraft on which the approved ALP was based, then the safety areas for the applicable aircraft operating surfaces shown on the ALP must be modified in accordance with the current FAA design standard.

(3) If a change in safety area, in accordance with current FAA design standards, is required and the safety area cannot be provided, then a modification of design standards (see PPM 5320.1E with change 1) must be approved by the ADO/block grant state before the airport change is implemented and/or prior to designating a new critical aircraft. Such a change in safety area requirements could be necessitated by a change in ARC from that of the previous critical aircraft for the airport/airport facility. The ALP must be revised to reflect the airport change and/or modification of standards and the revised ALP must be approved by the FAA/block grant state.

c. Obligated FAR Part 139 Airports. The above requirements for obligated airports are applicable to obligated FAR Part 139 airports. In addition to those requirements, the following apply:

(1) Airport operators of FAR Part 139 airports are required to provide and maintain runway safety areas (RSA's) and taxiway safety areas (TSA's) consistent with those specified in the Airport Certification Manual (ACM) or Airport Certification Specification (ACS). The airport operator must ensure that the ACM/ACS safety areas are the same as those that actually existed, as of January 1, 1988 (or later, if revised due to construction approved by FAA/block grant state) in the field. The airport operator must also ensure that the safety areas in the ACM/ACS are the same as those depicted on the approved ALP and that these safety areas are in accordance with all approved modifications of design standards for that airport and the current ALP on file with the FAA. The safety areas depicted on the approved ALP are the standard for that airport. In case of conflict between the currently approved ALP and the ACM/ACS, the approved ALP shall always take precedence.

(2) The safety areas depicted on the approved ALP are acceptable to FAA for meeting FAR Part 139 requirements for that airport, provided a safe and acceptable operational environment is made available.

(3) A modification of standards for safety areas, approved by the ADO/block grant state, is acceptable to FAA for meeting FAR Part 139 safety area requirements.

(4) Airport operators of FAR Part 139 airports are required to update the ACM/ACS to reflect the safety areas approved by the modification of standards, and are to provide a statement of practicability, in the ACM/ACS, as to why the applicable design standard could not be obtained. This statement should be based on the analysis provided in accordance with paragraph 5.

(5) ADO's/block grant states are to coordinate proposed modifications of design standards for safety areas at certificated airports with the Safety/Standards Branch for FAR Part 139 review. A copy of the approval letter for the modifications of standards is to be provided to AGL-620 to assure that the airport operator is in compliance with FAR Part 139 and that the modification is included on the bulletin board listing of approved modifications.

d. Non-Obligated FAR Part 139 Airports. To the extent practicable, safety areas meeting current FAA design standards, must be provided to satisfy FAR Part 139 safety area requirements for the airport. If the FAA design standard safety area is not proposed/cannot be provided, then the ADO/block grant state must coordinate the proposed variance from the FAA design standards with AGL-620. The coordination procedures and resulting determination will be handled on a case-by-case basis.

e. Other Non-Obligated Airports. Airport operators should be encouraged to provide and maintain runway and taxiway safety areas in accordance with current FAA design standards. To the extent practicable, these airports should comply with the current FAA design standards for safety areas. If a change in the safety area, in accordance with current FAA design standards, is necessitated by the FAR Part 157 proposal and the full safety area is not proposed/cannot be provided, then the ADO/block grant state is required to determine the effect that the proposed safety area would have on the safety of persons and property on the ground. This determination is normally accomplished through the airspace review process (reference FAA Order 7400.2D). The ADO/block grant state will rely upon CHI FPO/AGL-400/AGL-500/AGL-700 coordination, as appropriate, in making this determination.

3. Restriction On Safety Area Use.

a. Future development shall not be permitted within existing and planned airport safety areas. A modification shall not be issued to provide for future development.

b. Airport roadways (Airway facilities maintenance roads, perimeter roads, safety and security roads, etc.) should not be permitted within safety areas and a modification should not be issued for an airport roadway. Existing roadways should be relocated outside of the safety areas to the extent practicable. If it is not feasible to relocate the roadway, all roadway grading must conform to the safety area grading criteria (AC 150/5300-13, chapter 5) and the access into the safety area must be controlled by appropriate signs and airport operational procedures that are acceptable to FAA. On FAR Part 139 airports, the signing and operational procedures must be included in the airport certification manual/airport certification specifications, which must be approved by the certification inspector prior to implementation.

c. A modification of standards generally should not be issued to provide for open ditches and drainage facilities within the safety area. To the extent practicable, all existing open ditches that pass through safety areas shall be enclosed. Drainage structures (manholes, inlets, head walls, etc.) to be located in safety areas due to their function shall conform to the height, grading and loading requirements for the safety area involved. Drainage swales that conform to the safety area grading requirements may be permitted within the safety area, providing no ponding, erosion, or soft areas are developed.

d. Navaids and related facilities that need to be located in the safety areas because of their function shall be constructed on low impact resistant supports (frangibly mounted structures).

(1) Localizer antenna (ILS), guide slope antenna (ILS), azimuth antenna (MLS), elevation antenna (MLS), non-directional beacons (NDB), marker beacons, very high frequency omnirange (VOR), and related facilities (shelters, transformers, etc.) functionally do not have to be located in safety areas.

(2) These navaids and related facilities may be located within safety areas only if there is no feasible or practicable alternative for their location, the mountings meet the frangibility requirements of AC 150/5300-13 paragraphs 211.a.(2) and 305.a.(4), and a modification of standards for their location has been approved by the Airports District Office/block grant state. Locating these navaids within safety

areas may impact standards for siting the navaid and may require approval from AAS-1. AGL-400 is responsible for obtaining approval for deviations of the navaid siting criteria. The ADO/block grant state is responsible for modifications of standards to permit changes in the safety area due to the navaid being sited within the current safety area standard for that runway as presented on the current approved ALP.

(3) When it is impractical to locate a localizer antenna beyond the end of the current runway safety area standard, it may be located within the runway safety area in accordance with AAS-100 memorandum dated December 11, 1995, provided the localizer antenna satisfies the true frangibility criteria set forward in Advisory Circular 150/5300-13.

(a) Any existing or proposed localizer antenna array having true frangibility (i.e., the lowest practical height and the frangible point is no higher than 3 inches above grade) will require a modification of standards for an adaptation to local conditions, to permit the localizer to be constructed or remain within the current safety area standard for that runway. This modification of standards will permit the runway safety area to wrap around the localizer antenna array. The grading adjacent to the localizer array, including its foundation and the wrap around area, must conform to the safety area grading criteria (AC 150/5300-13, Chapter 5). This wrap-around runway safety area must be depicted on the approved airport layout plan and included in the Airport Certification Manual (ACM)/Airport Certification Specifications (ACS).

(b) Any proposed localizer antenna array not having true frangibility, should not be installed within the current safety area standard for that runway. A modification of standards for an adaptation to local conditions to permit the localizer to be within the safety area would require the runway safety area length to be reduced to the localizer antenna array location. The grading adjacent to the localizer array and the reduced safety area should conform to the safety area grading criteria (AC 150/5300-13, Chapter 5). This reduced runway safety area must be depicted on the approved airport layout plan and included in the ACM/ACS.

(c) Any existing localizer antenna array not having true frangibility, but shown on the approved airport layout plan as located within the current safety area standard for that runway, will be permitted as long as it doesn't compromise safety. However, the ALP and the ACM/ACS for the certificated airport must depict the runway safety area, for the runway involved, to exclude the localizer antenna array. If the current ALP does not depict the area excluded for the localizer array, the next revision of the ALP must depict it. The area excluded for the localizer array, to the extent practicable, should conform to the safety area grading criteria (AC 150/5300-13, Chapter 5). The airport owner and/or Airway Facilities Division must be strongly encouraged to replace the localizer antenna array with one having true frangibility or to relocate the localizer antenna array outside the current safety area standard for that runway.

(d) If the localizer is to be sited inside the runway safety area design standard but outside the current safety area standard for that runway, a modification of design standard for the non-standard localizer siting needs to be approved by the ADO/block grant state.

e. Storm water retention or detention basins and farming shall not be permitted within the safety areas for the specific airport.

4. A modification of standards for a safety area should only be granted when the following conditions are met:

a. There is no feasible alternative.

b. The maximum safety area practicable is provided for the operating surface involved.

c. Safe aircraft operations can be ensured.

d. It is not feasible to implement declared distances.

5. When a modification of standards for a safety area is appropriate it must be properly documented and formally approved by FAA/block grant state in a letter to the airport owner (ALP approval letter prepared in accordance with PPM 5050.5C is acceptable). The modification must be supported by an analysis that:

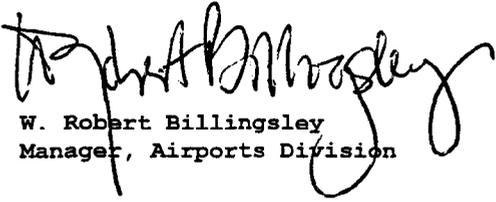
a. Describes the proposed modification.

b. Discusses the standards requiring a modification and why the standards can not be met. It is recommended that this discussion identify the existing and planned aircraft operational demand which justifies the dimensional parameters for the operational area involved. The discussion should identify the physical, environmental, economic and political reasons for the safety area's non-conformance with the current national design standard. Also, this discussion should explain why the declared distance concept cannot be implemented.

c. Develops and discusses viable alternatives for accommodating the unique conditions. The viable alternatives should provide safety areas that maximize conformance to the current national design standard. This discussion should explain why the proposed modification of standards is the only practicable and feasible alternative.

d. Discusses how the modification of airport design standards will provide an acceptable level of safety. This discussion should address how safety areas are improved (filling in low areas, grading to remove excessive slopes, replacing ditches with culverts, etc.), to the extent practicable, to provide the maximum size safety area possible. Aeronautical activity forecasts, along with overall safety area enhancement or maintenance, are factors to be considered for a modification of standards for safety areas. Aeronautical activity forecasts to be considered are those that project a change in the critical aircraft, a change in the haul length or payload of the critical aircraft, or a significant change in aircraft operations. A discussion of these factors should be included to help explain how the proposed modification of standards provides an acceptable level of safety.

6. Obligated airport owners shall hold fee simple or equivalent title to all safety areas in accordance with the current approved ALP, for that airport. FAR Part 139 airport owners shall hold fee simple or equivalent title to all safety areas that are included in their ACM/ACS for the airport. At non-obligated airports, the airport owner should, but is not required to hold fee simple title to all safety areas.


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APPENDIX 1. Background

1. Canceled Advisory Circular 150/5300-12 - Airport Design Standards - Transport Airports (aircraft in approach categories C, D, & E), dated 2/28/83 with change 1 (dated 3/14/85) required safety areas 500' wide by 1000' long at the end of each runway. Safety areas for runways with stopways over 1000' long would extend to the end of the stopway. The runway safety area standard commenced at the runway end and not at the end of the stopway.

2. Canceled Advisory Circular 150/5300-4B - Utility Airports Air Access to National Transportation (Aircraft in Approach Categories A and B), dated June 24, 1975 with changes 1 through 9 (dated 9/18/87) required runway safety areas 120' to 300' wide and extending in length from 240' to 600' from the runway end. These safety areas varied with approach minimums and the aircraft design group. Runway safety areas for runways with stopways increased the safety area length to keep the stopway within the runway safety area. The declared distance concept introduced in change 8 did not require the runway safety area to extend the required length beyond a stopway or to precede the landing threshold. This same declared distance concept also applied to Advisory Circular 150/5300-12.

3. Current safety area design standards are in Advisory Circular 150/5300-13 with changes 1 through 4 (dated 11/10/94) which canceled Advisory Circulars 150/5300-4B and 150/5300-12 on May 18, 1989. Runway safety areas ranging in width from 120' to 500' and lengths ranging from 240' to 1000' are required at each runway end, stopway end, end of Landing Distance Available (LDA) and before the landing threshold. Tables 3-1, 3-2 and 3-3 contain the current runway safety area dimensional standards. A note on each of these tables states that the runway safety area begins at each runway end or at the stopway end when a stopway is provided. Taxiway safety area dimensional standards are presented in Table 4-1.

a. The standards and recommendations contained in advisory circular 150/5300-13 are recommended by the Federal Aviation Administration for use in the design of civil airports. For airport projects receiving Federal grant-in-aid assistance, the use of these standards is mandatory. At certificated airports, the standards and recommendations may be used to satisfy specific requirements of Federal Aviation Regulations (FAR) Part 139, Certification and Operations: Land Airports Serving Certain Air Carriers, Subpart D.

b. Advisory Circular 150/5300-13 requires all airport development carried out at Federally obligated airports to be done in accordance with an FAA-approved ALP. The FAA-approved ALP, to the extent practicable, should conform to the FAA airport design standards existing at the time of its approval. Due to unique site, environmental, or other constraints, the FAA may approve an ALP not fully complying with FAA airport design standards. Such approval requires an FAA study and finding that the proposed modification is safe for the specific site and conditions. When the FAA upgrades a standard, airport owners should, to the extent practicable, include the upgrade in the ALP before starting future development.

4. FAR Part 139.309(a). To the extent practicable, each certificate holder shall provide and maintain a safety area for each runway end and taxiway which is available for air carrier use:

a. If the runway or taxiway had a safety area on December 31, 1987, and if no reconstruction or significant expansion of the runway or taxiway was begun on or after January 1, 1988, a safety area of at least the dimensions that existed on December 31, 1987; or

NOV 26 1986

b. If construction, reconstruction, or significant expansion of the runway or taxiway began on or after January 1, 1988 a safety area which conforms to the dimensions acceptable to the Administrator at the time construction, reconstruction, or expansion began.

5. FAA Order 5280.5B, paragraph 325(b).

a. All surface variations, such as drainage ditches and culverts, within safety areas which existed as of December 31, 1987, must be documented in the Airport Certification Manual/Specifications. The safety area would extend only to the culvert or ditch and would be grandfathered (FAR Part 139.309(a)(1)). Even if the full length/width of the current standard safety area cannot be achieved, it may be practicable to extend the safety area beyond the length/width that was grandfathered. This might entail minor earth work or the relocation of a ditch or culvert to provide the maximum safety area practicable.

b. Major pavement "reconstruction" projects which are part of an overall plan to extend the useful life of the runway/taxiway, and similar major pavement rehabilitation efforts, should be considered reconstruction triggering the safety area requirements of Section 139.309(a). Neither the addition of a porous friction course or grooving, nor a pavement overlay designed only to protect the structural integrity of the existing pavements as a means of achieving its originally anticipated useful life, is considered reconstruction under this provision. Significant "expansion" would include projects which are clearly designed to accept a different critical aircraft or to provide for increased payload or range for the existing critical aircraft using that pavement. As a guideline, the extension of runways approximating 500 feet or more is considered "significant" for purposes of this provision.

6. Policy and Procedures Memorandum 5050.5C, paragraph 2. If the sponsor has an approved ALP, the only standard requiring compliance is the ALP, irrespective of its consistency with any other document.

a. We can strongly encourage a sponsor to revise the ALP to meet current design standards but cannot stop a sponsor from building a project that is in accordance with the approved ALP. FAA should strive to obtain a completed project that meets current design standards.

b. If a sponsor needs to add a runway extension to his ALP, he must use the FAA airport design standards currently in effect or obtain a modification of standards. He should, in order to achieve a uniform appearance and standardization, strive to have the entire runway meet the current airport design standards.

c. If the proposed runway extension project constitutes a significant expansion, the sponsor should be asked to have the entire runway meet the current airport design standards. A significant expansion is defined as a project which is clearly designed to provide for a different critical aircraft or to provide for increased payload or range for the existing critical aircraft using the pavement. Normally a runway extension in excess of 1000 feet would be considered significant. This inconsistency with the 500-foot criteria will be resolved in the next PPM revision.

d. If a runway extension is being added to an ALP or revised using the current design standards (e.g. in preparation for a project) and the ALP shows another runway extension that was approved based on superseded design standards, this latter extension would not have to be revised to meet the current design standards, unless a safe, acceptable, operational environment cannot be maintained, the safe and efficient use of airspace is adversely affected, or the proposal impacts FAA facilities or equipment. It is not required that only one set of design standards be shown on an ALP.

e. A sponsor undertaking a Master Planning Study or an ALP update should use the FAA airport design standards in effect at that time. It is strongly recommended, but not mandatory, that "updates" incorporate current FAA airport design standards. If a prior-approved ALP used a superseded standard - that standard may be carried forward at the Sponsor's option (unless, as in 4. above, a safe acceptable, operational environment cannot be maintained, the safe and efficient use of airspace is adversely affected, or the proposal impacts FAA facilities or equipment).

f. From a FAR Part 139 standpoint, advisory circulars (ACs) in the 150 series contain standards and procedures that are acceptable to the Administrator. One way of meeting FAR Part 139 requirements is to meet the AC requirement. However, it may be possible to comply with FAR Part 139 without meeting the current FAA airport design standard. The following paragraph helps explain the intent of FAR Part 139 compliance requirements:

(1) With respect to the Section 130.309(a)(2) requirement for safety areas, a runway or taxiway extension of 500 feet or more should normally be considered "significant expansion" for purposes of determining whether it is necessary to provide "a safety area which conforms to the dimensions acceptable to the Administrator at the time construction, reconstruction, or expansion began".

(2) The term "to the extent practical", pertains to the establishment of safety areas and states that "we should strive to obtain the safety area dimensions according to current design criteria whenever the establishment of a safety area is triggered by Section 139.309(a)(2)".

7. U.S. House of Representatives Report On Safety Areas. "The Committee is also concerned about the problem of inadequate safety areas beyond the ends of runways at certificated airports. This deficiency has resulted in airline accidents which could have been prevented. The standards for safety areas were changed in 1987, and some areas that did not meet the new standards were "grandfathered," meaning they continued to be certificated even though they failed to meet the new standards. In order to help remedy this problem and bring these airports up to current standards, the FAA should, within six months of enactment, complete a study and a cataloging of runways used by air carriers at certificated airports to determine which runway safety areas do not meet current FAA standards. Within six months of enactment, the FAA should also determine the costs and the feasibility of bringing these runway safety areas up to standards."