DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 1, 91, 97, 121, 125, 129, and 135

[Docket No. FAA–2002–14002; Amdt. Nos. 1–57, 91–296, 97–1336, 121–333, 125–52, 129–42, 135–110]

RIN 2120–AH77

Area Navigation (RNAV) and Miscellaneous Amendments

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is amending its regulations to reflect technological advances that support area navigation (RNAV); include provisions on the use of suitable RNAV systems for navigation; amend certain terms for consistency with those of the International Civil Aviation Organization (ICAO); remove reference to the middle marker in certain sections because a middle marker is no longer operationally required; clarify airspace terminology; and incorporate by reference obstacle departure procedures into Federal regulations. The changes will facilitate the use of new navigation reference sources, enable advancements in technology, and increase efficiency of the National Airspace System.

DATES: *Effective date:* August 6, 2007. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of August 6, 2007.

FOR FURTHER INFORMATION CONTACT: Ernest Skiver, Flight Technologies and Procedures Division, Flight Standards Service, AFS–400, Federal Aviation Administration, 800 Independence Ave., SW., Washington, DC 20591; telephone: (202) 385–4586.

SUPPLEMENTARY INFORMATION:

Authority for This Rulemaking

The FAA's authority to issue rules regarding aviation safety is found in Title 49 of the United States Code. Subtitle I, section 106 describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the agency's authority.

This rulemaking is promulgated under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, ''General requirements.'' Under Section 44701, the FAA is charged with prescribing regulations and minimum standards for practices, methods, and procedures the Administrator finds necessary for safety in air commerce.

This regulation is within the scope of that authority because it will facilitate air navigation from other than ground-based navigation aids, enable new technology and provide for consistency between FAA and ICAO terminology.

Guide to Terms and Acronyms Frequently Used in This Document

AC—Advisory Circular
APV—Approach procedure with vertical guidance
ARAC—Aviation Rulemaking Advisory Committee
ATC—Air Traffic Control
ATS—Air Traffic Service
DA—Decision altitude
DH—Decision height
DME—Distance measuring equipment
EFVS—Enhanced Flight Vision System
FL—Flight level
GPS—Global Positioning System
ICAO—International Civil Aviation Organization
IAP—Instrument approach procedure
IFR—Instrument flight rules
ILS—Instrument landing system
MDA—Minimum descent altitude
MEA—Minimum en route IFR altitude
MOCA—Minimum obstruction clearance altitude
MSL—Mean sea level
NAS—National Airspace System
ODP—Obstacle departure procedure
Over the top—Over the top of clouds
RNAV—Area navigation
RNP—Required navigation performance
RVR—Runway visual range
TAOARC—Terminal Area Operations Aviation Rulemaking Committee
TERPS—U.S. Standard for Terminal Instrument Procedures
VOR—Very high frequency omnidirectional range

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I. Background

I.A. Previous Rulemaking Actions

On December 17, 2002, the FAA published a notice of proposed rulemaking (NPRM) titled ''Area Navigation (RNAV) and Miscellaneous Amendments'' (67 FR 77326; Dec. 17, 2002). The comment period closed on January 31, 2003, and several commenters requested that the FAA extend the comment period. The comment period was reopened for an additional 60 days until July 7, 2003 (68 FR 16992; April 8, 2003) to receive comments specifically on the proposed RNAV operations and equipment requirements. The FAA received approximately 30 comments from industry groups, aircraft manufacturers, navigation equipment manufacturers, communication service providers, and air carriers.

On April 8, 2003 (68 FR 16943; April 8, 2003), the FAA issued a final rule with request for comments titled

''Designation of Class A, B, C, D, and E Airspace Areas; Air Traffic Service Routes; and Reporting Points,'' which adopted certain proposed amendments to parts 1, 71, 95, and 97 from the RNAV NPRM. In that rule, the FAA adopted the following:

§ 1.1 General definitions: Air Traffic Service (ATS) route revised as proposed; area navigation (RNAV) revised as proposed; area navigation high route removed as proposed; area navigation low route removed as proposed; area navigation (RNAV) route revised as proposed; RNAV waypoint removed as proposed; and route segment revised as proposed.

Part 71: Subpart A heading transferred and revised (with wording modification) as proposed; §§ 71.11, 71.13, and 71.15 added as proposed; §§ 71.73, 71.75, 71.77, and 71.79 removed as proposed.

Part 95: § 95.1 revised as proposed.

Part 97: § 97.20 revised as proposed with minor modifications. (Note that this section is further amended in this final rule.)

Except for § 97.20 described above, the foregoing amendments are not addressed in this document. Comments received in response to the April 8, 2003 final rule are contained in docket number FAA–2003–14698. (See ''V. Availability of Rulemaking Documents'' for information on how to access the docket.)

Also, on January 9, 2004 (69 FR 1620; Jan. 9, 2004), the FAA issued the ''Enhanced Flight Vision Systems'' (EFVS) final rule. The EFVS rule did not incorporate any proposed RNAV terminology. Certain sections amended by the EFVS final rule are further amended in this rule to update the terminology as appropriate.

I.B. Terminal Area Operations Aviation Rulemaking Committee (TAOARC)

The Regional Airline Association (RAA), United Parcel Service (UPS), and the Airline Transport Association (ATA) all suggested that the FAA allow the Terminal Area Operations Aviation Rulemaking Committee (TAOARC) to review the comments and recommend action to the FAA. The TAOARC (now under a new charter as the Performance-Based Operations Aviation Rulemaking Committee (PARC)) is an FAA-chartered advisory committee composed of government and industry representatives which provides a forum for the United States aviation community to discuss and resolve issues, provide direction for United States flight operations criteria, and produce U.S. consensus positions for global harmonization. The FAA asked TAOARC to review the comments filed in the docket on the RNAV NPRM and provide recommendations.

TAOARC held a public meeting on December 9, 2003, in Arlington, VA, to present its recommendations and request comments. Minutes from this meeting and the TAOARC recommendations are available in the docket. The recommendations are included with the discussion of comments below.

I.C. Concept of Performance-Based Criteria

Many civil aviation authorities (CAAs), including the FAA, recognize the need to change the way airspace is managed due to increased demands for the use of certain airspace within a particular geographic area. Moving towards a performance-based National Airspace System (NAS) may necessitate, for example, the establishment of performance requirements for aircraft communication and navigation equipment needed to manage instrument flight rule (IFR) aircraft, which could ultimately increase capacity in certain airspace. For reasons discussed below, aircraft communication and navigation equipment performance criteria will be addressed in future rulemaking.

In this rule, the FAA is updating its communication and navigation operating regulations to allow flexibility in accommodating technological advances. Part of the FAA's plan to implement a performance-based NAS is to update its regulations and remove prescriptive references to ground-based navigation systems in the operating regulations and to permit the use of non-ground based navigation systems. In a performance-based NAS, operational flexibility depends upon many factors including the performance capability of the aircraft communication and navigation equipment, the availability of the communication and navigation facilities along the route to be flown, and the performance capabilities of those (communication and navigation) facilities that are made available for use by air traffic management service providers.

II. Discussion of the Final Rule

II.A. General

Northwest Airlines stated that, as the FAA is moving toward a required navigation performance (RNP)-based infrastructure, the RNAV system should be performance-based to allow operators to use both existing navigation aids and any future satellite-based systems as sensors to navigate using the concept of RNP. Continental, Boeing, and Airbus expressed concern that the NPRM did not address RNP.

This rulemaking lays the groundwork for navigation equipment and other operational requirements for the RNP environment and is consistent with planned RNP implementation. The FAA already has established RNP criteria for RNAV systems used to conduct certain instrument approach procedures. The agency plans to establish RNP criteria for RNAV systems used in the en route environment in the near future.

Rockwell Collins recommended that the rule clearly state whether there is any change to Wide-Area Augmentation System (WAAS) or LPV (localizer performance with vertical guidance) and their roles within the NAS.

This rule allows for the use of WAAS or any other system where it satisfies the performance requirements and is suitable for the operation to be conducted. The rule also applies to all phases of flight, including LPV approaches.

II.B. Terminology and Definitions (§§ 1.1, 1.2, and 97.3)

To facilitate RNAV operations, the FAA proposed to change certain terminology for area navigation, en route operations, instrument approach procedures, and landings. These amendments were proposed in §§ 1.1 General definitions, 1.2 Abbreviations and symbols, and 97.3 Symbols and terms. Conforming changes to other sections in parts 91, 95, 97, 121, 125, 129, and 135 were also proposed. The FAA proposed removing the words ''ground'' and ''radio'' in the regulations where using those words restricted the type of navigation and communication systems permitted in order for operators to take advantage of future technology and still meet NAS requirements.

Airbus commented generally that several of the proposed amendments to § 1.1 would have an undesirable ''ripple effect'' on other rules in parts 91, 97, 121, 125, 129, and 135.

Rockwell Collins asked if the new terminology would be applied retroactively. While the FAA finds this question somewhat unclear, it confirms that the rule does not impose retrofit requirements for older RNAV equipment. If it becomes necessary, however, to impose future conditions and limitations on the use of RNAV equipment, the FAA will do so through future rulemaking.

The following table sets forth the proposed terms, definitions and their dispositions in this final rule. (Note that terms and definitions adopted in the April 8, 2003 rule are not included in

the table.) A discussion of the comments on these terms and the FAA's responses follows the table.

Proposed definitions and abbreviations	FAA decision reflected in the final rule
Approach procedure with vertical guidance (APV) (§ 1.1)	Withdrawn and action deferred until reviewed by joint industry/government working groups.
Category I, II, & III, IIIa, IIIb, and IIIc approaches (§ 1.1)	Withdrawn and action deferred until reviewed by joint industry/government working groups.
Decision altitude (DA) (§ 1.1)	Adopted.
Decision height (DH) (§ 1.1)	Adopted with modification.
Final approach fix (FAF) (§ 1.1)	Adopted.
HAT (Height above threshold) (§ 97.3)	Withdrawn.
Helipoint (§ 97.3)	Adopted.
Instrument approach procedure (IAP) (§ 1.1)	Adopted with modification.
Minimum descent altitude (MDA) (§ 1.1)	Adopted with modification.
MSA (minimum safe altitude) (§ 97.3)	Adopted.
Night (§ 1.1)	Withdrawn.
Nonprecision approach procedure (NPA) (§ 1.1)	Withdrawn and action deferred until reviewed by joint industry/government working groups.
Person	Adopted as appropriate to section.
Pilot	Adopted as appropriate to section.
Precision approach procedure (PA) (§ 1.1)	Withdrawn and action deferred until reviewed by joint industry/government working groups.
Precision final approach fix (PFAF) (§ 1.1)	Withdrawn and action deferred until reviewed by joint industry/government working groups.
RNAV (abbreviation) (§ 1.2)	Adopted.
Visibility minimum (§ 97.3)	Adopted.

II.B.1. Classification of Instrument Approach Procedures (§ 1.1: APV, NPA, PA)

The FAA proposed to redefine ''nonprecision approach procedure (NPA)'' and ''precision approach procedure (PA).''

For the term ''nonprecision approach procedure (NPA),'' the proposal eliminated reference to ''electronic glide slope'' and defined it as, ''* * * an instrument approach procedure based on a lateral path and no vertical glide path.''

Similarly, the proposed definition of ''precision approach procedure (PA)'' deleted reference to ''electronic glide slope'' and ''standard instrument procedure'' and defined that term as ''* * * an instrument approach procedure based on a lateral path and a vertical glide path.'' This definition would provide lateral course and track information with vertical glide path information.

The term ''approach procedure with vertical guidance (APV)'' was proposed as ''* * * an instrument approach procedure based on lateral path and vertical glide path. These procedures may not conform to requirements for precision approaches.''

ATA, the Aircraft Owners and Pilots Association (AOPA), American Airlines, Continental Airlines, Alaska Airlines, Airbus, Boeing, and American Trans Air all objected to the above three proposed definitions. They recommended withdrawing the definitions for reconsideration because the terms were either inconsistent with, or were in direct conflict with, the same terms defined in Advisory Circular (AC) 120–28D ''Criteria for Approval of Category III Weather Minima for Takeoff, Landing, and Rollout,'' and AC 120–29A ''Criteria for Approval of Category I and Category II Weather Minima for Approach.''

In addition, RAA and Airbus contended that adopting the term ''approach with vertical guidance (APV)'' would impose additional crewmember training requirements and require the updating of training materials.

TAOARC commented that the Aviation Rulemaking Advisory Committee's (ARAC's) All Weather Operations Working Group has already initiated a review of this terminology and that the FAA should defer final action until that group completes its review.

Based on the above comments, and the fact that these terms are currently under review by ARAC, the FAA concludes that it is inappropriate to adopt these terms and definitions at this time. The FAA anticipates that working groups within the ARAC, PARC, and civil aviation authorities will review the terms and submit recommendations to the agency for future consideration. Therefore, all proposed amendments using these three proposed terms are withdrawn.

II.B.2. Category I, II, III, IIIa, IIIb, and IIIc Operations (§ 1.1)

The FAA proposed to add a definition of ''Category I;'' expand the definitions of ''Category II, and III, IIIa, IIIb, and IIIc operations'' to accommodate precision RNAV approaches; and replace the terms ''ILS [instrument landing system] approach'' and ''instrument approach'' with ''precision approach'' or ''precision instrument approach,'' respectively. The proposed definitions are as follows.

''Category I (CAT I) operation is a precision instrument approach and landing with a decision altitude that is not lower than 200 feet (60 meters) above the threshold and with either a visibility of not less than ½ statute mile (800 meters), or a runway visual range of not less than 1,800 feet (550 meters).

''Category II (CAT II) operation is a precision instrument approach and landing with a decision height lower than 200 feet (60 meters), but not lower than 100 feet (30 meters), and with a runway visual range of not less than 1,200 feet (350 meters).

''Category III (CAT III) operation is a precision instrument approach and landing with a decision height lower than 100 feet (30 meters) or no DH, and with a runway visual range less than 1200 feet (350 meters).

''Category IIIa (CAT IIIa) operation is a precision instrument approach and landing with a decision height lower than 100 feet (30 meters), or no decision height, and with a runway visual range of not less than 700 feet (200 meters).

''Category IIIb (CAT IIIb) operation is a precision instrument approach and landing with a decision height lower than 50 feet (15 meters), or no decision height, and with a runway visual range of less than 700 feet (200 meters), but not less than 150 feet (50 meters).

''Category IIIc (CAT IIIc) operation is a precision instrument approach and landing with no decision height and with a runway visual range less than 150 feet (50 meters).''

ATA, Delta, Alaska Airlines, AOPA, Helicopter Association International (HAI), RAA, and American Trans Air objected to the proposed definitions because the terms would specify the approaches as ''precision.'' As discussed previously, numerous commenters objected to the proposal with respect to redefining ''precision'' and ''nonprecision.''

In addition, HAI stated that the definition of ''Category I'' should take into account the capabilities of helicopters and better define the parameters for helicopter operations to execute Category I operations.

TAOARC recommended withdrawing the above definitions until studies on precision/nonprecision procedures, decision altitude, decision height, and a concept for a new categorization of approach procedures to support the evolution of a performance-based NAS are completed.

In view of the comments and because the FAA is not adopting the proposed definitions for precision approach (PA) and nonprecision approach (NPA), it is inappropriate to amend these terms as proposed until the joint industry/government working groups review the issues.

II.B.3. Decision Altitude (DA) and Decision Height (DH) (§ 1.1)

The FAA proposed to redefine ''decision height (DH)'' as ''the specified height AGL [above ground level], at which a person must initiate a missed approach during a Category II or III approach if the person does not see the required visual reference.'' [1]

The FAA proposed a new definition of ''decision altitude (DA)'' to describe the altitude in feet above mean sea level (MSL) at which a person must initiate a missed approach if he or she does not see the required visual reference.

The FAA proposed these terms to be consistent with similar International Civil Aviation Organization (ICAO) terminology and, more importantly, to accurately identify the point where a pilot must decide to either continue the approach or execute a missed approach, depending on the instrument approach procedure.

Airbus commented that because the proposed definition of ''decision height (DH)'' only applies to Category II and Category III procedures, this would preclude the use of decision height in any future Category I procedures. Airbus also points to several Category II procedures that currently use an inner marker or a DA as the decision point and that have been safely conducted for more than 40 years.

TAOARC opposed adopting the term ''decision height (DH)'' because it may create charting, training, and performance-based systems implementation problems in the near term.

These comments raised valid concerns with respect to the proposed definition of decision height. The type of altitude-or height-measuring device that is selected by instrument approach procedure developers to accurately determine the height or altitude for the missed approach decision point depends on the underlying topography associated with the instrument approach procedure (IAP). The term decision altitude currently is not codified in the regulations, but it has become a term of reference in instrument approach procedure construction and is used by the aviation community.

In response to the comments, the FAA is modifying the term ''decision height (DH)'' by striking the words ''during a Category II or III approach,'' which will permit the use of DH in Category I approaches, if appropriate, as well as continuing to allow the use of DA in Category II approaches, if appropriate. In addition, the FAA is clarifying in both definitions that, if ''DA'' or ''DH'' is specified in an instrument approach procedure, it is the altitude or height at which the pilot must decide whether to initiate an immediate missed approach or to continue the approach.

Northwest Airlines expressed two concerns—(1) that the proposals to amend the flight data recorder requirements in part 121 (§ 121.344 and appendix M) and part 135 (§ 135.152 and appendix M) to record DA would require a costly software modification to certain aircraft; and (2) that although it supports the distinction between decision height and decision altitude, this distinction could require a software modification to add a ''discrete'' code to the flight data recorder parameters to differentiate between DH and DA.

The FAA did not intend for the NPRM to require modifications to the Flight Data Recorder requirements or software changes. The FAA agrees with Northwest that the proposals could result in these modifications and therefore, these proposals are withdrawn.

DA/DH (combined acronyms): Even though Boeing and ATA agreed with the FAA's distinction between ''altitude'' and ''height,'' they did not agree with the combined acronym of ''DA/DH'' for these terms.

Boeing, RAA, and Airbus stated that adopting this acronym would require them to change their charts, manuals, and training programs to conform to the FAA's acronyms.

The FAA has used the term ''DA(H)'' for several years in its handbook guidance to refer to the terms decision height and decision altitude and adopting this acronym now is not a substantive change. Operators and aircraft manufacturers will need to revise these documents accordingly; however, these revisions can be accomplished during their normal revision cycles.

II.B.4. Final Approach Fix (FAF) (§ 1.1)

The FAA proposed to add the term ''final approach fix (FAF)'' to provide that the final approach fix defines the beginning of the nonprecision final approach segment and the point where final segment descent may begin.

Delta and Alaska Airlines commented that the agency only proposed ''final approach fix'' relative to a nonprecision approach, but that AC 120–29A applies final approach fix to both nonprecision and precision approaches with no distinction. TAOARC recommended withdrawing the definition, but did not provide adequate rationale for this comment.

Because the term ''final approach fix'' is used in numerous operating rules and instrument approach procedures, the FAA finds it prudent to adopt this definition. However, the FAA agrees with the commenters that the proposal erroneously limited the term to nonprecision approach procedures instead of applying to both categories. Consequently, the FAA is adopting the term, but is removing the word ''nonprecision'' so that it applies to both precision and nonprecision procedures.

II.B.5. HAT as Acronym for ''Height Above Threshold'' (§ 97.3)

The FAA proposed to change the acronym ''HAT'' from ''height above touchdown'' to ''height above threshold.''

[1] Prior to this rule, the term decision height meant the height at which a decision must be made during an ILS or PAR instrument approach to either continue the approach or to execute a missed approach.

Boeing and Airbus commented that the ''height above touchdown'' is an important point in design of autoland systems and head-up displays, and said that the proposed change could have adverse consequences on aircraft design.

AOPA commented that ''height above touchdown'' provides pilots with more information about the portion of the runway where a landing will take place. AOPA contended that ''height,'' when referring to the threshold only, is misleading because the threshold height may not be the highest part of the ''touchdown zone.'' Furthermore, AOPA stated, general aviation pilots are trained that ''touchdown zone'' is larger than the runway threshold, and that the highest point in that area provides information about runway slope characteristics.

TAOARC supported this proposal.

While the FAA does not find that Boeing's and Airbus's comments are convincing, the agency does agree with AOPA's comment, and consequently is not proceeding with the proposed change. The agency recognizes the long-standing use of the current acronym ''HAT'' to mean ''height above touchdown.''

II.B.6. Helipoint (§ 97.3)

In the NPRM, the FAA proposed to add the term ''helipoint'' as ''* * * the aiming point for the final approach course for heliports. It is normally the center point of the touchdown and lift-off area (TLOF). The helipoint elevation is the highest point on the TLOF and is the same elevation as heliport elevation.'' In the NPRM, the FAA stated that the helipoint is usually the designated arrival and departure point located in the center of an obstacle-free area, 150-feet square overlying an approved landing area.

The Helicopter Association International (HAI) stated that many heliports do not have a 150-foot square obstacle-free area that would meet the requirements of the proposed term. HAI suggested, and TAOARC agreed, that instead, the FAA should add the term ''heliport reference point (HRP),'' which would be consistent with AC 150/5390–2B, ''The Heliport Design Guide.'' (At the time, HAI based its comment on the draft version of AC 150/5390–2B. The FAA published the AC after the publication of the RNAV NPRM.) HRP is defined in the AC as ''the geographic position of the heliport expressed as the latitude and longitude at—(1) the center of the FATO [final approach and takeoff area], or the centroid of multiple FATOs for heliports having visual and nonprecision instrument approach procedures; or (2) the center of the Final Approach Reference Area (FARA) when the heliport has a precision instrument approach procedure.''

Commenters are advised that a helipoint is the geographic point on the ground to which an approach is designed and it should not be confused with an HRP. The helipoint may or may not be coincident with the HRP, particularly where multiple landing areas are specified at a heliport. The helipoint and HRP are different terms serving different purposes. The AC defines both HRP (as stated by HAI) and helipoint. Under AC 150/5390–2B, a helipoint is ''the aiming point for the final approach course. It is normally the center point of the touchdown and lift-off area (TLOF).'' The proposed definition of ''helipoint'' and the term in the AC are substantively the same; therefore, the FAA adopts the term as proposed.

II.B.7. Instrument Approach Procedure (IAP) (§ 1.1)

The FAA proposed to define ''instrument approach procedure'' as—''A predetermined ground track and vertical profile that provides prescribed measures of obstruction clearance and assurance of navigation signal reception capability. An IAP enables a person to maneuver a properly equipped aircraft with reference to approved flight instruments from a specified position and altitude to—(1) a position and altitude from which a landing can be completed; or (2) a position and altitude at which holding or en route flight may begin.''

ATA commented that the word ''approach'' should be removed, as the definition includes the phrase ''en route flight may begin,'' which is not necessarily restricted to being on an approach. ATA also said this could confuse future airspace enhancement strategies and technology applications.

The FAA is not persuaded by ATA's comment and believes that removing the word ''approach'' is inappropriate. A pilot executing an instrument approach procedure is conducting a specific maneuver developed to permit a safe letdown to an airport. In this case, it is not appropriate to use general terminology that could be misunderstood as to the proper ground tracks and vertical profiles to be flown. TAOARC recommended that the FAA revise the definition to match the ICAO definition of IAP, which is, ''a series of predetermined maneuvers by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en route obstacle clearance criteria apply.''

The FAA agrees to modify the definition to mirror the ICAO definition, but is retaining the clause ''and assurance of navigation signal reception capability'' from the NPRM. By including this clause, the FAA is requiring that the signal used by an aircraft's navigation equipment to position that aircraft on an IAP, with the required performance established for the procedure, is available and suitable for use on the route to be flown.

II.B.8. Minimum Descent Altitude (MDA) (§ 1.1)

The FAA proposed to define minimum descent altitude (MDA) as ''the lowest altitude to which a person may descend on a nonprecision final approach, or during a circle-to-land maneuver, until the visual reference requirements of § 91.175(c) of this chapter are met. Minimum descent altitude is expressed in feet above mean sea level.''

In the proposed definition, the MDA was limited to non-precision final approaches and references to ''standard instrument approach procedure'' and ''electronic glide slope'' were deleted. These changes were intended to clarify that an MDA is applicable only to a non-precision instrument approach procedure.

Alaska Airlines objected to using ''nonprecision'' in this definition because AC 120–29A applies to instrument procedures generally and does not distinguish precision and nonprecision. Boeing, Airbus, Continental, and TAOARC agreed that the definition should refer to instrument procedures generally until the joint industry/government working groups and the FAA review the categorization issues associated with precision and nonprecision approaches.

The FAA is adopting the definition with several modifications. A precise definition of this term is critical to both the safe execution of the instrument approach procedure and the supporting design criteria. The FAA agrees with deleting reference to ''nonprecision,'' in view of the comments on this term and previously addressed in this document. In the final rule, the definition retains the current phrase ''instrument approach procedure.''

After further review, the FAA finds that this definition should be modified by replacing the words ''in execution of an instrument approach procedure, where no electronic glide slope is provided'' with the words ''specified in

an instrument approach procedure.'' This more general phrasing accommodates RNAV IAPs specific to the use of RNAV.

Lastly, the proposed definition did not include visual reference requirements added to § 91.175(l) by the Enhanced Flight Vision Systems rule (69 FR 1620; Jan. 9, 2004). Therefore, the words ''until the pilot sees the required visual references for the heliport or runway of intended landing'' are added for consistency with current § 91.175(l) and to clarify that, when an MDA is specified in an instrument approach procedure, that altitude is the lowest altitude to which the pilot is authorized to descend until he or she sees the required visual references to continue the approach to an intended landing.

II.B.9. MSA—Minimum Safe Altitude (§ 97.3)

The FAA proposed to revise the definition of ''minimum safe altitude (MSA)'' as ''expressed in feet above mean sea level, depicted on an approach chart that provides at least 1,000 feet of obstacle clearance for emergency use within a certain distance from the specified navigation facility or fix.'' TAOARC recommended that the FAA accept the definition as proposed.

AOPA commented that, while it would appear that the use of any navigational aid (NAVAID) or fix to be the reference point for MSA is beneficial, poor or inconsistent application of selection criteria for fixes or NAVAIDs could raise safety issues. AOPA contended that the FAA should establish regulatory criteria for the consistent application of MSA.

The FAA disagrees with AOPA and is adopting the definition as proposed. The FAA's ''Instrument Procedures Handbook'' (FAA–H–8261–1) and the ''Instrument Flying Handbook'' (FAA–H–8083–15) appropriately provide standardized guidance for the selection and depiction of the fix or NAVAID that forms the basis of the minimum safe altitude on the approach chart. AOPA did not cite any cases where this guidance has resulted in poor site selection or pilot confusion.

II.B.10. Night (§ 1.1)

The FAA proposed to revise the definition of ''night'' either to be the period of time published in the American Air Almanac, converted to local time, or other period between sunset and sunrise, as prescribed by the FAA.

Boeing, American, Delta, American Trans Air, AOPA, and ATA commented that the proposed definition could have operational impacts at particular locations, where terrain may cause sunset earlier than the American Air Almanac indicates. RAA asked where the local definition of ''night'' would be published.

TAOARC recommended that the FAA withdraw the definition and explore alternate methods that might address the local determination of the hours of darkness and how to impose those limitations.

In view of these comments, the FAA is withdrawing this proposal and will request that the term ''night'' be studied by joint industry/government working groups.

II.B.11. Use of the Word ''Pilot'' or ''Person''

The FAA proposed to change the word ''pilot'' to ''person'' in a number of sections depending on the context of the regulations. (See table below.) In certain regulations, the word ''person'' is appropriate if it applies to those individuals in an operator's organization, including pilots, who are authorized to develop the policies and procedures under which its aircraft are to be operated, and who are responsible for compliance with the requirements in the regulations.

Boeing and Continental argued that this change would be inappropriate, because ''pilots'' fly aircraft. Boeing added that the current definitions are adequate and familiar to pilots. TAOARC also objected to the change.

The FAA re-examined each proposed amendment in context to determine whether the requirement applies to an organization and its pilots or other persons used in its operations, or only to the pilots conducting the operation. Based on this re-examination, the term ''person'' or ''pilot'' is adopted as follows:

Section	FAA decision reflected in the final rule
§ 1.1 Decision altitude	The word ''pilot'' retained.
§ 1.1 Decision height	The word ''pilot'' retained.
§ 91.129 (e)	The word ''pilot'' retained.
§ 91.175 (e) and (j)	The word ''pilot'' retained.
§ 91.177	The word ''person'' adopted.
§ 91.189	The word ''pilot'' retained.
§ 121.347	The word ''person'' adopted.
§ 125.381	The word ''pilot'' retained (as adopted in the EFVS final rule of January 9, 2004).
§ 129.16 (renumbered as § 129.22 in the final rule) (a) and (b)	The word ''person'' changed to ''foreign air carrier'' to be consistent with terminology in part 129.
§ 129.17 (b) and (d)	The word ''person'' changed to ''foreign air carrier'' to be consistent with terminology in part 129.
§ 135.161	The word ''person'' adopted.
§ 135.165 (a), (b), (e), (f), and (g)	The word ''pilot'' retained.
§ 135.225	The word ''pilot'' retained (as adopted in the EFVS final rule of January 9, 2004).

II.B.12. Precision Final Approach Fix (PFAF) (§ 1.1)

The FAA proposed to add the definition of ''precision final approach fix (PFAF)'' as a final approach fix for a precision approach or an approach procedure with vertical guidance (APV).

ATA and Alaska Airlines commented that the use of ''precision'' and ''nonprecision'' is inappropriate and inconsistent with AC 120–29A because the AC does not differentiate between precision and nonprecision.

As previously discussed, the FAA is withdrawing the definition of ''approach procedure with vertical guidance (APV)'' pending its review by joint industry/government working groups. Consequently, the term ''precision final approach fix'' is withdrawn for the same reason.

II.B.13. RNAV (Acronym) (§ 1.2)

The FAA proposed to include the acronym ''RNAV'' for the term ''area navigation'' in § 1.2.

American Trans Air and Continental Airlines requested that the FAA withdraw the proposed acronym ''RNAV'' because, in their view, it needs industry input. Furthermore, American Trans Air said that ''RNAV'' appears to be a charting acronym and is not necessary for inclusion in § 1.2. TAOARC, however, supported the acronym.

''RNAV'' is a long-standing acronym that the industry and the FAA have used to refer to area navigation for several decades. It is unclear what ''industry input'' would be necessary with respect to merely codifying a universally accepted acronym. Therefore, the FAA is adopting the acronym ''RNAV'' for ''area navigation.'' The definition of ''RNAV'' in § 1.1 was adopted in the April 8, 2003 final rule, ''Designation of Class A, B, C, D, and E Airspace Areas; Air Traffic Service Routes; and Reporting Points.'' However, in that rule, the acronym ''RNAV'' was inadvertently left out of § 1.2.

II.B.14. Visibility Minimum (§ 97.3)

In the NPRM, the FAA did not propose any substantive amendments to the term ''visibility minimum.'' The term is defined as ''* * * the minimum visibility specified for approach, landing, or takeoff, expressed in statute miles, or in feet where RVR [runway visual range] is reported.''

Boeing, however, recommended adding the words, ''Unless otherwise specified'' to the beginning of the definition of ''visibility minimum'' to allow for alternative units of measure, such as meters.

TAOARC recommended adopting the definition as proposed.

FAA regulations uniformly refer to miles (nautical and statute) or feet, and the agency does not intend to introduce new units of measure in the foreseeable future. It is also noted that certain operators are issued operations specifications containing a feet-to-meters conversion table. Consequently, having one regulation that includes an alternative unit of measure, when numerous other regulations do not, would generate additional questions.

II.C. Communications Requirements

II.C.1. Communications Facilities (§ 121.99)

The FAA proposed the following amendment to § 121.99, Communications facilities:

(1) Change the requirement for a ''two-way radio communication system available over the entire route under normal operating conditions'' to a ''two-way communication system under normal operating conditions,'' which would permit the use of data link as opposed to just voice communication;

(2) Change the words ''point-to-point circuits'' to ''communication links;''

(3) Add the requirement for a communication system to have two-way voice communication capability for use between each airplane and the appropriate dispatch office, and between each airplane and the appropriate air traffic control (ATC) unit for non-normal and emergency conditions; and

(4) Define the term ''rapid communications'' in this section to mean that the caller must be able to establish communications with the called party in less than 4 minutes.

The Airline Dispatchers Federation commented that the new voice communications requirements would contribute to aviation safety and that the 4-minute time limit as used in the proposed definition of ''rapid communications'' is reasonable and technologically achievable.

The majority of other commenters, including airlines, industry associations, communication service providers, and aircraft manufacturers, objected to the proposed requirement for a communication system to have two-way voice communication capability for use between each airplane and the appropriate dispatch office for non-normal and emergency conditions. These commenters also did not support the proposed definition of ''rapid communications'' to mean that the caller must be able to establish communications with the called party in less than 4 minutes. The commenters cited the diminishing availability of communication service providers who use high frequency (HF) radio communications systems for long-range communications, e.g., oceanic and polar, the limitations of HF voice communications due to propagation characteristics, and the high costs of equipping their aircraft with satellite communication systems which would be one means of meeting these two proposed requirements. Several of these commenters stated that because of the limitations of HF communications and the costs of satellite communications they use only data link for dispatch office communications on certain routes and only maintain voice communication capability with ATC on those routes. Furthermore, nearly all of these commenters objected to the proposed definition of ''rapid communications'' stating that the proposed requirement is unrealistic especially in view of the limitations of HF voice communications systems and the lack of safety justification provided by the FAA.

Delta further commented that paragraph (b) of this section should be amended to permit domestic and flag operators, in an emergency, to communicate with their dispatch offices using an ATC facility communication link between the airplane and the dispatch office.

TAOARC recommended instead that ''rapid communication under normal operating conditions'' between the pertinent parties be established within 5–10 minutes, unless otherwise authorized by the Administrator. TAOARC also did not support requiring voice communication with dispatch in non-normal and emergency situations, but did not expand on the comment.

Delta commented that the § 121.99 proposals pertaining to two-way voice communication capability for use between each airplane and the appropriate dispatch office, and the proposed definition of ''rapid communications'' would require equipping its aircraft with both data link and satellite voice communication equipment under § 121.349.

Upon further consideration, the FAA is making the following changes to proposed paragraph (a) in the final rule: (1) The words ''under normal operating conditions'' are struck from the first sentence because they are redundant, and the acronym ''FAA'' is replaced with the words ''certificate holding district office;'' (2) in the second sentence, the words ''except as specified in § 121.351(c)'' are struck because they are no longer applicable to the rule as it has been modified. The FAA acknowledges the comments that opposed the proposal regarding ''rapid communication under normal operating conditions'' and proposed definition of ''rapid communications,'' and therefore, removes these statements from the rule text. Finally, the FAA is adopting Delta's recommendation to amend § 121.99(b) to permit, in an emergency, domestic and flag operators the use of U.S. ATC communication facilities to communicate with their dispatch offices.

II.C.2. Aircraft Communication Equipment (§§ 91.205, 91.511, 91.711, 121.345, 121.347, 121.349, 121.351, 125.203, 129.16 (Adopted as § 129.22), 129.17, 135.161, and 135.165)

In conjunction with the § 121.99(a) proposals for communications facilities described above, the FAA proposed to

amend the related aircraft communication equipment requirements in parts 91, 121, 125, 129, and 135 to make them less prescriptive. This would allow for the expanded use of different kinds of communication systems technology for aeronautical operational control and air traffic management as the NAS increasingly becomes more performance-based.

Upon further consideration, the agency has determined that many of the aircraft communication equipment proposals are premature because the future communication infrastructure needs for air traffic management of the NAS have not yet been determined, nor has the international aviation community made decisions regarding its respective air traffic communications. Accordingly, the FAA is withdrawing many of the associated proposed aircraft communication equipment amendments so that joint industry/government working groups may study the issues and provide recommendations to the FAA for the NAS communications infrastructure and for compatible aircraft communication equipment.

Specifically the agency has concluded that, where it had proposed to remove or omit reference to ''radio'' in order to refer generally to just ''communication,'' the existing language (use of the term ''radio'') should be retained for NAS and foreign air traffic service provider communication infrastructures.[2]

In proposing to add new § 129.16 (adopted as § 129.22), the FAA similarly proposed to require ''communication'' equipment; however, the word ''radio'' is added to this section for uniformity and consistency in the requirements for parts 121, 125, 129 and 135.

The FAA did not receive comments on the following issues; however, upon review the agency finds that further modifications are necessary.

This rule amends §§ 121.347(a)(2), 129.22(a)(2) (proposed as § 129.16), and 135.161(a)(2), as proposed, to clarify the communication requirement with appropriate air traffic control facilities within a Class E surface area and not in Class E airspace generally.

The agency's proposal to modify the factors considered by the FAA to approve the installation and use of a single long-range communication system (LRCS) and a single long-range navigation system (LRNS) under §§ 125.203(f)(2) and 135.165(g)(2) was incorrect and mistakenly makes these paragraphs inconsistent with the remainder of the section. Consequently, this proposed amendment is withdrawn and the factor considered by the FAA, among others, is for the length of the route.

The FAA sought to permit operators under parts 121, 125, and 135 to use a single LRNS and a single LRCS, if among other considerations, the aircraft was equipped with only very high frequency (VHF) communication equipment.[3] Upon review, the FAA has concluded that specifying VHF equipment unduly limits the communication gap exception requirement (found in §§ 121.351(c)(3), 125.203(f)(3), and 135.165(g)(3)) to VHF and would not permit the use of other kinds of communication systems to be included in the exception. This result was not intended and therefore, this proposal is also withdrawn.

The FAA proposed to add a requirement in parts 121, 129, and 135[4] that ''for non-normal and emergency operating conditions, at least one of the independent communication systems must have two-way voice communication capability.'' Although no comments were received regarding this proposal, the FAA has reconsidered and is removing the words ''Except as required in § 121.99'' and ''non-normal and emergency operating conditions,'' wherever they appear in those sections which expands the applicability of those sections. The FAA believes that voice communication is necessary in other than non-normal or emergency conditions.

Further, the FAA has concluded that it is necessary to modify the proposed communication equipment requirement language in §§ 121.349, 129.17, and 135.165 from ''For normal operating conditions'' to ''under normal operating conditions'' to be consistent with the FAA's legal interpretation issued on April 16, 1964.[5] The legal interpretation makes it clear that, in conjunction with §§ 121.99 and 121.347 and the modifications to these proposals, a temporary interruption of communications capability of the aircraft communication systems by conditions other than ''normal operating conditions'' is not intended to preclude the suitability of such communication systems for the routes to be flown.

The proposed caption of paragraph § 121.349(e), which read ''Additional communication system equipment requirements'' is misleading because it indicates that it applies to all part 121 operators. In the final rule, the caption is clarified and reads ''Additional communication system equipment requirements for operators subject to § 121.2.'' There is no substantive change.

There were no comments received on the following proposals and these proposals are adopted in this final rule. Proposed § 129.16 is adopted as § 129.22. Shortly before the NPRM was issued, the FAA added another section numbered § 129.16 (''Supplemental inspections for U.S.-registered aircraft'') via a separate rulemaking and the numbering adjustment inadvertently was not made in the RNAV NPRM. Therefore, the section is renumbered accordingly in this final rule.

As proposed, references to ''ground facilities'' are removed in order to permit the use of non-ground based navigational facilities in certain sections of parts 91, 121, and 135.[6]

The FAA is adopting the following proposed amendments to § 125.203: (1) Change the requirement that an airplane must have two-way radio communication equipment, able to transmit to and receive from appropriate facilities from ''25 miles away'' to ''22 nautical miles away''; and (2) add the requirement for two independent communication systems, one of which must have two-way voice communication capability, capable of transmitting to, and receiving from, at least one appropriate facility from any place on the route to be flown.

II.C.3. Flight Operations Communications Requirements (§§ 91.183, 91.185, 129.21, and 135.79)

The FAA did not receive any comments to its proposals to amend §§ 91.183, 91.185, 129.21, and 135.79. The FAA therefore is adopting the following proposed amendments: (1) Removing the words ''by radio'' in § 91.183(a); (2) removing the word ''radio'' from § 91.185 heading and paragraph (a); (3) removing the word ''ground'' from § 129.21; and (4) replacing the words ''radio or telephone communications'' with the word ''communication'' in § 135.79.

These amendments provide operators with greater flexibility to take advantage of future technology and to determine the appropriate communication equipment based on the availability of compatible communication facilities on the route to be flown.

Upon reconsideration, however, the FAA is further modifying § 91.183. The NPRM would have allowed for the use

[2] See proposed §§ 91.205(d)(2), 91.511(a)(1), 91.711(c)(1)(i), 121.345, 121.347, 125.203(a), and 135.161.

[3] See proposed §§ 121.351(c)(3), 125.203(f)(3), and 135.165(g)(3).

[4] See proposed §§ 121.349, 129.17 and 135.165(d)(2).

[5] The interpretation is included in the docket for this rulemaking.

[6] See proposed §§ 91.205(d)(2), 121.347, 135.161 and 135.165.

of advanced communications, other than by voice, in meeting the reporting requirements in the rule. The NPRM also sought to require pilots in command to monitor the frequency. While the rule does not require voice communication to monitor frequencies, it does require that the pilot get permission from ATC to be off the frequency previously required to be monitored, as ATC is the appropriate entity to determine when the frequency does not need to be continuously monitored. Also, the FAA is clarifying the requirement to monitor the frequency by specifying that if there is a two-pilot crew, either pilot can monitor the frequency.

II.D. Navigation Equipment Requirements

II.D.1. Aircraft Navigation Equipment Requirements

The FAA proposed to amend the aircraft navigation equipment requirements in parts 91, 121, 125, 129, and 135 to allow the use of navigation systems that use satellite navigation aids and to require that the navigation equipment must be suitable for the route to be flown. These proposals would allow for the use of future navigation system technology that does not rely on ground-based navigation aids (e.g., global positioning systems (GPS)). The proposals also sought to facilitate the use of RNAV equipment throughout all phases of flight (departure, en route, and approach).

The NPRM contained several proposed amendments to the rules addressing IFR operation equipment requirements. Specifically, the FAA proposed to add the words ''suitable RNAV system'' in several sections.[7] In other sections,[8] however, the FAA proposed adding the words ''suitable IFR-approved RNAV system.'' (Note that the word ''suitable'' was inadvertently omitted from the proposed text of § 91.711 (e).) Both phrases were intended to convey the same requirements, but only one phrase should have been proposed. The phrase ''IFR-approved'' implies a higher standard than the phrase ''suitable RNAV system'' and is misleading, in that some IFR-approved RNAV systems may not be suitable for providing accurate distance information to or from distance measuring equipment (DME) facilities. The term ''suitable RNAV system'' means that the navigation system is designed and installed to perform its intended function. Therefore, ''suitable RNAV system'' is adopted in this rule. (See the discussion under ''II.D.1.a. Suitability of RNAV systems,'' for a description of the assessment strategies used to determine whether certain RNAV systems are ''suitable'' substitutions for certain ground-based navigation facilities or fixes identified in a standard ILS instrument approach procedure.)

In part 129, the FAA proposed that equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals. (See proposed § 129.17(a).) The proposed language is identical to current regulations in other parts governing U.S. operators.[9] Upon review, the FAA has determined that it is no longer necessary to include this phrase in any of the cited regulations because it is redundant. Therefore, this proposal is not adopted and the phrase is removed from §§ 121.349, 125.203 and 135.165. There are legacy navigation systems capable of receiving both signals and operators may continue to use those systems.

This rule replaces, as proposed, the requirement under § 121.349(a) for two independent navigational receivers with the requirement for two independent navigation systems. These two systems are not required to be identical.

The FAA proposed to amend §§ 121.103 and 121.121 to make these sections performance-based by requiring that the navigation aids must be available over the route to navigate the airplane along the route ''with the required accuracy,'' so that any suitable navigation system could be used. The agency believed that the required accuracy would be defined by the route specifications (including route width) or by ATC if not operating on the route. The agency has reviewed the current regulatory text, which requires that the navigation aids used for the route must be used to navigate ''within the degree of accuracy required for ATC.'' This current language does permit the use of any suitable navigation system but also importantly continues the ATC expectation (and requirement under § 91.181, Course to be flown) that, unless otherwise authorized by ATC, aircraft must fly the centerline of an airway. The FAA concludes that the current language is clear and permits the use of any suitable navigation system and consequently, it is not necessary to adopt this proposed amendment.

Based on the above conclusion with respect to §§ 121.103 and 121.121, and supported by TAOARC's preference for consistency between the navigation equipment requirements of § 121.349 and the route accuracy requirements of §§ 121.103 and 121.121, the FAA has determined that it is necessary to further modify § 121.349(a) and (c) to require that the airplane's independent navigation systems be suitable for navigating the airplane along the route to be flown ''within the degree of accuracy required for ATC.'' Although the route accuracy requirement was not proposed for this particular section, the FAA finds that its inclusion here does not pose additional operating requirements but is clarifying the accuracy performance necessary for ATC purposes. (Further discussion on this proposal in relation to §§ 121.349, 125.203, 129.17, and 135.165 are found in ''II.D.3. En route navigation facilities.'')

Also in §§ 121.349(a), the FAA proposed to include a statement that only one navigation system need be provided for precision approach and APV operations.'' [10] Since this rule does not adopt the terms precision approach and APV operations, references to these terms are withdrawn. The current regulatory text provides that only one marker beacon receiver providing visual and aural signals and one ILS receiver is needed.

In §§ 121.349(a) and (c)(2),[11] the FAA proposed a requirement that the navigation systems used to meet the navigation equipment requirements be authorized in the operations specifications issued to the operator. The FAA finds this proposal unnecessarily broad because the navigation capabilities of equipment such as very high frequency omnidirectional range (VOR) and ADF are well known. Therefore, the FAA is limiting the operations specifications navigation equipment authorization requirements to RNAV systems only in the sections referenced.

For part 121 operators,[12] the FAA proposed to retain the requirement for two long-range navigation systems (LRNS) when VOR or ADF radio navigation equipment is unusable along a portion of the route. In the final rule, the FAA is adopting (in the introductory text of paragraph (a)) the requirement for two LRNSs; however, the words ''when VOR or ADF radio navigation equipment requirement is unusable along a portion of the route'' are

[7] See proposed §§ 91.131(c)(1), 91.175(k), and 91.205.

[8] See proposed §§ 91.711(e), 121.349(d), 125.203(e), 129.17(d) and 135.165(c).

[9] See proposed §§ 121.349, 125.203 and 135.165.

[10] Identical amendments were proposed in §§ 125.203(c)(5), 129.17(a), 135.165(a).

[11] Identical amendments were proposed in §§ 125.203(c)(5) and (d)(2), 129.17(a) and (c)(2), and 135.165(a) and (b)(2).

[12] See proposed § 121.351(a)(4).

removed. The references to VOR and ADF are removed because these navigation systems are rarely used in extended overwater operations. In addition, in the proposed rule, the FAA inadvertently did not include a reference to navigation systems in the introductory text of § 121.351(a). This reference is added in the final rule.

The FAA proposed to change one of the operational factors the Administrator may consider in authorizing the use of a single long-range navigation system and a long-range communication system from ''the ability of the flightcrew to reliably fix the position of the airplane within the degree of accuracy required by ATC'' to ''the ability of the flightcrew to navigate the airplane along the route with the required accuracy.'' [13] This proposal is not adopted in this rule because the NPRM did not include the route navigation accuracy performance requirements. (See the discussions under ''II.D.1.a. Suitability of RNAV systems'' and ''II.D.3. En route navigation facilities.'')

II.D.1.a. Suitability of RNAV Systems

Aircraft that use some of the older RNAV equipment cannot execute RNAV instrument approach procedures because that equipment cannot support the accuracy requirements necessary for those procedures. Also, some of the older RNAV systems are not capable of meeting the performance necessary for certain established departure procedures, in particular those RNAV systems that cannot process GPS and DME information.

In the various proposed amendments to aircraft navigation equipment requirements, the FAA proposed to include a ''suitable RNAV'' system. The NPRM, however, did not explain the term suitable. In order to clarify for operators with RNAV systems that they must ensure that aircraft's RNAV system is suitable, the agency believes that it is necessary to adopt a definition of that term in § 1.1. Consequently, a suitable RNAV system is defined as an RNAV system that—(1) meets the required performance established for a type of operations, e.g. IFR; and (2) is suitable for operation over the route to be flown in terms of any performance criteria (including accuracy) established by the air navigation service provider for certain routes , e.g. oceanic, ATS routes, and IAPs. An RNAV system's suitability is dependent upon the availability of ground and/or satellite navigation aids that are needed to meet any route performance criteria that may be prescribed in route specifications to navigate the aircraft along the route to be flown.

The FAA has published numerous Advisory Circulars on RNAV system operations, which may be found at: *http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/MainFrame?OpenFrameSet*.

II.D.1.b. Aircraft Navigation Requirements

Airbus commented that in the case of a GPS-equipped aircraft operating within the operational service volume of ground-based navigation aids, operators would have to show at each point along these routes that the aircraft retains the capability to ''navigate the airplane along the route with the required degree of accuracy.'' Airbus argued that this means that the aircraft can never be outside the operational service volume of the existing NAVAID network, which would be unreasonable, unnecessary, and a costly constraint. Moreover, it would significantly impede implementation of a performance-based NAS and the achievement of the safety and efficiency benefits of RNAV systems that use GPS information.

TAOARC contends that permitting the use of a single independent navigation system but mandating that the system must be able to ''navigate safely to a suitable airport'' in the event of a signal loss would result in an unrealistic requirement for operations in the future NAS under the FAA's plan to decommission ground-based navigation aids such as VOR and TACAN. TAOARC therefore, recommended that the word ''navigating'' be changed to ''proceeding'' because, under the GPS-sensor-interference scenario described in the proposal for § 121.349, the FAA would require operators to use ground-based navigation aids and be limited to operating within the service volume established for those navigation aids.

The FAA agrees with Airbus and TAOARC and replaces the words ''navigat(ing) safely to a suitable airport'' with the words ''proceed(ing) safely to a suitable airport'' in the final rule.[14] Proceeding to another airport can be accomplished many ways, such as reverting to ground-based navigation aids or reverting to inertial-referenced navigation systems. This exception does not require the alternative system to be capable of navigating within the degree of accuracy required for ATC, but rather to provide a safe means for the pilot to continue the flight to a suitable diversion airport.

The FAA realizes that in crafting the NPRM, a current equipment requirement in § 121.349(a) was omitted inadvertently. While no party commented on the omission, the agency believes it is critical to flight safety to maintain the requirement that the airplane's navigation systems must be capable to ''receive navigation signals from all primary en route and approach navigational facilities to be used.'' The pertinent language is updated and clarified so as to require the en route navigation aids necessary for navigating the aircraft along the route (e.g. ATS routes, arrival and departure routes and instrument approach procedures, including missed approach procedures if a missed approach routing is specified in the procedure), are available and suitable for use.[15] This clarifies that the route, for example, may be an ATS route (under part 71) or other ATS routing, or a part 97 instrument approach procedure.

AOPA requested that the FAA consider IFR-certified GPS equipment as a ''suitable RNAV system'' as an option to meet existing equipage requirements in lieu of the DME. (Note that currently DME is required to operate in certain airspace areas and at altitudes of flight level (FL) 240 and above.)

The FAA agrees that an RNAV system used to navigate under IFR operations may constitute a ''suitable RNAV system'' that can be used to substitute for the DME currently required to operate in certain airspace areas and at altitudes of FL 240 and above if the RNAV system is suitable for performing that function. Not all RNAV systems may be suitable to substitute for DME. Suitable navigation aids, e.g., GPS, must be available along the route to be flown to permit the system to provide distance information analogous to the distance information provided by DME, subject to any operating limitations or provisions that may be specified in the approved Airplane or Rotorcraft Flight Manual, AFM supplement, or pilot's guide.

Lastly, the FAA corrects § 91.131 to require that a VOR ''or'' TACAN receiver must be operable if an RNAV system is not available.

The FAA will issue an Advisory Circular containing guidance on what constitutes a suitable RNAV system that may be used to substitute for an ILS component or a ground-based navigation facility in the near future.

[13] See proposed §§ 121.351(c), 125.203(f) and 135.165(g).

[14] See adopted §§ 121.349(c)(1), 125.203, 129.17, and 135.165.

[15] Identical text is inserted in §§ 125.203, 129.17 and 135.165.

II.D.1.c. Navigation System Configurations

Airbus and others commented that the NPRM was unclear on the combinations of navigation sensors and/or aircraft equipment that would satisfy the proposed navigation system requirements. Northwest Airlines requested examples of the permitted combinations.

The FAA proposed to replace the requirement for two independent receivers with a requirement for two independent navigation systems to enable the use of new types of navigation systems such as autonomous inertial navigation systems (INS). A single VOR and a single suitable RNAV system may satisfy the requirement. The FAA also clarifies that this requirement can be met either by use of autonomous navigation systems or by use of ground and/or satellite navigation aids that are suitable and available for en route operations and for the intended instrument approach procedures.

Aircraft navigation systems are considered independent if there is no probable failure or event that will affect both systems. This ensures that, before dispatch or flight release, there will be no potential single point of failure or event that could affect an aircraft's navigation systems and cause loss of the ability to navigate along the intended route or to proceed safely to a suitable diversion airport. Therefore, the FAA is providing an exception [16] for operations on routes using only one navigation system suitable for navigating the aircraft along the route as discussed in the previous paragraph, provided that the aircraft is equipped with at least one other independent navigation system for purposes of proceeding to a suitable airport.

Although not proposed, the FAA finds it necessary to add a requirement under the exception that the certificate holder must show, by appropriate description in the certificate holder's operating manuals or by another means acceptable to the FAA, that the other independent navigation system is suitable, in the event of loss of the navigation capability of the single system at any point along the route, to enable the aircraft to proceed safely to a suitable airport and complete an instrument approach. For example, an operation that is currently permitted over routes on which navigation is based on low-frequency radio range or automatic direction-finding (ADF) navigation aids may use an airplane equipped with two VOR receivers and only one low-frequency radio range or ADF receiver. In the case of failure of the single low-frequency radio range receiver, or ADF receiver, the flight must be able to proceed safely to a suitable airport by means of VOR navigation aids and complete an instrument approach by use of the remaining aircraft VOR equipment. The FAA is making this change in the final rule to ensure that aircraft avoid collision with obstacles on the ground and other aircraft during flight.

II.D.2. Global Navigation Satellite System (GNSS) or Other Satellite Navigation Aids, e.g., Global Positioning Systems (GPS)

The FAA requires two independent navigation systems to ensure that there is no single point of failure or ''event'' that could result in losing the ability to navigate along the intended route or to navigate to a suitable diversion airport. This proposal addresses the vulnerability of GPS, which uses very weak signals that are susceptible to interference that may cause a loss of integrity, or total loss of usable signals, thus degrading the use of the GPS for IFR operations. Such single point of failure or an event is one that could lead to increased workload, the inability of the flight crew to cope, or prevent continued safe flight and landing.

Airbus commented that there are no known industry or agency criteria for determining which GPS systems can be considered ''independent.'' Furthermore, Airbus contended that the FAA did not define the probability of interference, nor state what the government might do to reduce or eliminate the generation of interfering signals.

Although the risk of intentional jamming of GPS is low in the United States, the FAA routinely issues Notices to Airmen (NOTAMs) indicating that GPS is unreliable in certain areas and during certain times due to planned testing. Unintentional interference is frequently encountered in some areas of the world, but historically is infrequent in the United States. Airbus states that interference in oceanic areas has not been experienced and can be expected to be very rare. The FAA agrees that the likelihood of interference varies by region, and the possibility of intentional interference could increase.

On December 15, 2004, the President of the United States issued the ''U.S. Space-Based Positioning, Navigation and Timing Policy'' acknowledging the vulnerability of GPS, and tasking the Department of Transportation, in coordination with the Secretary of Homeland Security, to—

* * * develop, acquire, operate, and maintain backup position, navigation, and timing capabilities that can support critical transportation, homeland security, and other critical civil and commercial infrastructure applications within the United States, in the event of a disruption of the Global Positioning System or other space-based positioning, navigation, and timing services, consistent with Homeland Security Presidential Directive-7, Critical Infrastructure Identification, Prioritization, and Protection, dated December 17, 2003;

In keeping with this policy, the FAA will continue to maintain adequate ground-based navigation aids for navigation services. The FAA does not believe it is appropriate or necessary, however, to restrict all operations to the service volume of ground-based navigation aids. As technology is developed, tested and accepted, it is the FAA's intention to permit the use of that technology when its use can be done in a safe and appropriate manner.

Under GPS interference scenarios, operations of aircraft that are not equipped for this contingency may be severely limited. Therefore, a DME infrastructure and a VOR network must remain in place for the foreseeable future. As the NAS evolves and navigation technology improves, however, a satellite-based system may become the core of the aviation navigation infrastructure.

II.D.3. En Route Navigation Facilities (§§ 121.103, 121.121, and 125.51)

The FAA proposed to use the term ''navigation systems'' in the headings of §§ 121.103 and 121.121 and the term ''navigation aids'' in the heading of § 125.51. Northwest Airlines pointed out that, while the FAA proposed to use the word ''systems'' in the headings of those sections, it addressed requirements for navigation aids in the text. American Trans Air recommended that the headings read ''Enroute navigation'' because use of the words ''systems,'' ''aids,'' and ''facilities'' confuses the rule. TAOARC recommended removing the word ''systems'' from the proposed headings of §§ 121.103 and 121.121.

After considering the comments, the FAA has concluded that ''facilities'' is appropriate under the current infrastructure and is changing the headings of §§ 121.103, 121.121, and 125.51 in the final rule to ''En route navigation facilities.''

Currently, §§ 121.103(a), 121.121(a), and 125.51(a) all provide that ''nonvisual ground aids'' must be available over the route for navigating an aircraft within the degree of accuracy required for ATC. The FAA proposed to replace reference to ''nonvisual ground

[16] See §§ 121.349 (c), 125.203 (d), 129.17 (c) and 135.165 (b).

aids'' in these sections with ''navigation aids.'' No comments were received and this rule adopts that amendment.

II.E. International Standards

An individual commenter objected to conforming FAA regulations to ICAO standards and argued that since the majority of aviation activity occurs within the United States, ICAO should conform to United States standards.

AOPA commented that there are significant differences between the United States and European operating environments and that harmonization with ICAO is not necessarily a good model for future changes to the domestic system. Moreover, AOPA contended that the FAA should only harmonize with ICAO when there is an operational benefit to users of the NAS.

The FAA recognizes that there are differences between the United States and European general aviation operating environments; however, harmonization of international standards remains a high priority for the FAA whenever it is in the public interest.

In the NPRM, the FAA erroneously stated that there are no current ICAO standards that corresponded to the proposed rule. The requirements proposed in §§ 121.349, 125.203, 129.17, and 135.165 are consistent with the current international standards in parts 1, 2, and 3 of ICAO Annex 6, ''Aeroplane Communication and Navigation Equipment'' for air carrier and general aviation operations, and ''Helicopter Communication and Navigation Equipment'' for helicopter operations.

American Trans Air asked whether the rule would apply to foreign operators in U.S. Gulf of Mexico airspace. Foreign operators are advised to review the regional procedures in the United States Aeronautical Information Publication (AIP) to determine the applicability of certain portions of this rule.

II.F. Elimination of Middle Markers (§§ 91.129 and 91.175)

In the NPRM, the FAA proposed deleting reference to the middle marker in §§ 91.129(e) and 91.175(k) because a middle marker is no longer operationally required. There are some middle markers still in use, but there are no middle markers being installed at new ILS sites by the FAA.

The FAA did not receive any comments on the §§ 91.129(e) and 91.175(k) proposals to remove the middle marker as a required component of an ILS, and the amendments are adopted as proposed.

II.G. DME Requirements for Aircraft Operating At or Above FL 180 Versus FL 240 (§§ 91.205 and 91.711)

The FAA proposed to lower the altitude for which DME is required from flight level (FL) 240 to FL 180.[17] This would make the altitude for which DME is required consistent with the floor of Class A airspace. The FAA believed that most aircraft operating in Class A airspace already have DME.

AOPA and Boeing objected to this proposal. AOPA argued that the justification is inadequate and that some operators must change or supplement their navigation systems, which would impose costs. AOPA estimated that approximately 30% of the aircraft capable of operating at or above FL 180 are equipped with DME. The number of aircraft equipped with a suitable RNAV system is unknown.

Boeing contends that maintaining FL 240 is necessary to address lead turn radius at high true airspeed. Boeing also argues that RNAV should also be permitted in lieu of DME. In view of the comments and after further consideration, the FAA concludes that this amendment may inadvertently create additional airspace congestion below FL 180 by restricting non-DME-equipped aircraft to operate at or below 18,000 feet. Consequently, the FAA withdraws this proposal.

II.H. Minimum Altitudes for Use of Autopilot (§§ 121.579 and 135.93)

The FAA proposed to amend §§ 121.579(b)(1) and (b)(2) and 135.93(b) and (c) to change references from ILS to precision approaches.

Boeing, ATA, and TAOARC suggested completely rewriting §§ 121.579 and 135.93 to reflect the previous input of ARAC's Flight Guidance System Harmonization Working Group. The FAA is currently reviewing the recommendations of this group. In the meantime, as the term ''precision approach'' is not being adopted in this rule, it is necessary to withdraw this proposal.

III. Discussion of Comments on Specific Sections

Section 91.129 Operations in Class D Airspace

ATA recommended removing the word ''glide'' from any definitions. The FAA does not agree with the commenter because the word ''glide'' must be associated with either the word ''slope'' or ''path'' in the context of this section. However, the FAA is changing the reference to ''glide slope'' proposed in paragraph (e)(4) to ''glide path'' because the term ''glide path'' is appropriate to all approaches with vertical guidance.

Section 91.175 Takeoff and Landing Under IFR

Upon reconsideration, the FAA has concluded that in paragraph (b), the terminology in the regulation as currently published is accurate and that it is appropriate to retain the language ''when the approach procedure being used provides for and requires the use of a DA/DH or MDA.''

In addition, the FAA is amending its proposal in paragraph (b)(3) from, ''The DA/DH or MDA for which the aircraft is equipped'' to ''The DA/DH or MDA appropriate for the aircraft equipment available and used during the approach.'' While this change is editorial, it is more precise and is consistent with the FAA's efforts to promote a performance-based NAS.

In paragraph (c), the FAA is deleting the phrase ''at any airport'' as the words are not necessary.

In paragraph (f), the FAA proposed to require that, if published civil takeoff weather minimums in part 97 are specified for a particular departure route, pilots must comply with these minimums and the published route unless an alternative route has been assigned by ATC. In order to ensure adequate obstacle clearance, the associated published weather minimums may only be applicable based upon a particular routing, i.e. departure procedure. For numerous airports, departure procedures are predicated upon obstacles located in the flight path(s) of the takeoff runway.

Airbus, Boeing, and Continental argued that it would be unnecessary, unsafe and economically onerous to require air carrier pilots to adhere to published departure procedures if in determining compliance with the aircraft takeoff limitations of § 121.189, air carriers have safely used a flight track significantly different from the flight track published in a part 97 procedure. In this case, Airbus argued that, in an engine-out situation, the pilot should fly the track that was determined to be compliant with § 121.189 and, in that case, it would be unsafe for the pilot to continue flying the part 97 departure procedure.

American Airlines contended that many part 121 operators already have approved engine-out procedures in place that are negotiated with air traffic control and provide for the safe operation of aircraft in such situations. American Airlines also argued that part 97 departure procedures are not based on engine-inoperative obstacle clearance

[17] See proposed §§ 91.205 and 91.711.

requirements contained in the airplane performance operating limitation regulations in parts 121 and 135. It also argued that it is too costly to conduct obstacle assessments for each departure procedure specified in part 97 and that negotiated departure procedures provide carriers with the flexibility and safe operating procedures.

TAOARC commented that the proposal does not contemplate the high standards for obstacle clearance in parts 121 and 135.

The FAA agrees in part with the above comments. Where takeoff minimums clearly are specified for a particular departure route, as a matter of safety, pilots must follow that routing. However, an exception is permitted. An operator may use an alternate departure route (see definition of ''T'' for an alternate departure route under § 97.3), if it is negotiated in advance with ATC and that alternative departure route allows part 121 and part 135 operators and certain part 129 operators to use a takeoff obstacle clearance or avoidance procedure that ensures compliance with the applicable airplane performance operating limitations requirements under part 121, subpart I or part 135, subpart I, or that ensures compliance with the airplane performance operating limitations for takeoff prescribed by the State of the operator, if applicable, at that airport. The provisions of subpart I in both part 121 and part 135 contain higher performance standards than that provided for in part 97 departure procedure. It is not the FAA's intention to disrupt or force operators to stop using established departure procedures that are safe and have been approved by the FAA. Therefore, these alternative routes may be used in lieu of the specified obstacle departure routes under § 97.1.

The FAA proposed to delete the runway visual range (RVR) table in paragraph (h) of § 91.175 and instead refer to the RVR table in FAA Order 8260.3, ''U.S. Standard for Terminal Instrument Procedures (TERPs).'' At the time of the NPRM, FAA Order 8260.3 was incorporated by reference in § 97.20.

Alaska Airlines and AOPA recommend using advisory circulars to disseminate the RVR table. AOPA and American Trans Air suggested that the agency list all the publications that provide the RVR table, i.e. the Aeronautical Information Manual, etc. ATA and Boeing recommended that these conversions go into carrier operations specifications.

Conversely, Delta maintained that the RVR table must have a regulatory source. American Trans Air also opposes incorporating the RVR table into an FAA order, and argues that the proposal would permit the FAA to change it without public input.

TAOARC endorsed putting the RVR table into the FAA Order because that Order was previously incorporated by reference into part 97, which makes it a regulatory provision.

On May 3, 2005, the FAA removed the incorporation by reference of FAA Order 8260.3. (See ''Revision of Incorporation by Reference Provisions'' final rule published on May 3, 2005 (70 FR 23002)). The agency concludes that the RVR table must have a regulatory basis and therefore, leaves the Comparable Values of RVR and Ground Visibility table in § 91.175.

The FAA proposed to amend paragraph (k) to allow certain locations on the ILS to be fixed by other than ground-based navigation aids.

AOPA requested clarification as to whether RNAV equipment, including IFR-approved GPS, can be used to identify certain locations on the ILS. AOPA estimated that less than one-third of all general aviation aircraft have the equipment necessary to identify a database fix. AOPA objected to any ILS implementation where RNAV equipage is a required component for completion of the approach because this would, as argued by AOPA, mandate the use of GPS for general aviation aircraft to access ''non-GPS'' procedures.

The FAA made an editorial error in paragraph (k) of § 91.175 that listed the means that may be used to substitute for the outer marker as ''requiring'' a suitable RNAV system instead of stating that a suitable RNAV systems was one of the many possible means of meeting this requirement.

AOPA also suggested modifying paragraph (h) to permit a pilot to use the ILS glide slope interception and altitude crosscheck as an acceptable substitute for an outer marker. Boeing recommended that a compass locator or precision radar may be substituted for the outer or middle marker.

AOPA's request to substitute an ILS glide slope interception and altitude crosscheck for an outer marker and Boeing's request to substitute a compass locator or precision radar for the outer or middle marker are beyond the scope of this rulemaking.

Published FAA guidance material advises that if a required fix for a particular instrument approach procedure is not in the aircraft's navigation database, then the pilot should not fly the procedure, nor enter such fix manually. (See Aeronautical Information Manual, Chapter 5, Air Traffic Procedures.) This reduces the risk of human error with respect to an incorrect manual fix entry and incorrect estimation of fix location while flying the instrument approach procedure. Pilot actions of this nature could result in controlled flight into terrain or manmade obstacles.

Boeing and Continental suggested adding a paragraph to § 91.175 to explicitly facilitate the introduction of new technology for low visibility approach and landing, when it can be shown that the new technology is appropriate. The commenters went on to state that the use of new technology could then be authorized through Operations Specifications or other suitable means.

The proposed recommendation is beyond the scope of the NPRM; however, the FAA already addressed the authorization of certain new technology in low-visibility approach and landing in the January 9, 2004 EFVS final rule (69 FR 1620).

Section 91.177 Minimum Altitudes for IFR Operations

The FAA proposed to clarify § 91.177(a) by stating that the section applies to both minimum en route IFR altitudes (MEA) and minimum obstruction clearance altitudes (MOCA) for a particular route or route segment. This would permit operators using other than ground-based navigation systems that meet navigation requirements to operate along the route at the MOCA.

The commenter stated that many general aviation IFR operations are done outside of radar contact while en route, and that more approach and departure procedures are flown to and from airports in a non-radar environment. AOPA said that while en route, general aviation aircraft remain at lower altitudes and, with the approval to operate at the minimum obstruction clearance altitude (MOCA), use of minimum altitudes along airways will increase. AOPA recommended that the FAA make every effort to accommodate area navigation operations outside of radar coverage because the NPRM appeared to revoke these capabilities, not expand them.

The FAA agrees that flights may be conducted at the MOCA if communication, navigation, and surveillance requirements are met, irrespective of whether the operation is in a radar environment. ATC may decide not to clear a flight to operate at the MOCA on a particular route if ATC is concerned that a flight may not be able to meet applicable separation standards. Additionally, ATC may require a flight requesting radar advisory services to operate at the MEA

as opposed to the MOCA because satisfactory communication can only be assured when operating at the MEA, not at the MOCA.

American Airlines, Air Transport Association of America, Boeing Commercial Airplanes, and Continental Airlines all commented that, instead of establishing a prescriptive value of 4 nautical miles horizontal distance from the course to be flown as the basis for identifying the highest obstacle within that space and applying the altitude value above that obstacle as the minimum altitude, the rule should also allow the use of RNP values for determining the space having the highest obstacle therein when applicable navigation performance requirements for routes are established.

The FAA did not propose to establish navigation performance requirements for certain routes. Therefore the commenters' recommendations are outside the scope of the rulemaking.

American Trans Air recommended revising the language in proposed paragraph (a)(1) to remove the words ''provided the applicable navigation signals are available'' and add a new sentence to read, ''Except when using VOR navigation, operations at MOCA beyond 22 nautical miles of the VOR concerned (based on the pilot's reasonable estimate of that distance) is not permitted.'' This change would allow other navigation without further specifying types of avionics, RNAV, GPS, etc.

The FAA does not agree with American Trans Air's suggestion. The suggestion appears to reverse the proposal and prohibit the use of navigation facilities other than VOR. The FAA believes that the suggested language could result in unsafe operations because it is essential that the applicable navigation signals for the navigation means used must be available over the route or route segment.

TAOARC recommended adding the phrase ''or when otherwise authorized by the Administrator'' to the proposed language in paragraph (a) of the proposal, but did not provide rationale; therefore, the FAA declines further consideration of this recommendation.

Section 97.1 Applicability

The FAA proposed to change § 97.1 to describe the applicability of part 97 as follows:

(1) Expand part 97 to include obstacle departure procedures;

(2) Clarify that civil takeoff weather minimums at certain airports are based on a specified route, and that pilots must comply with that route unless an alternative route has been assigned by ATC; and

(3) Minor editorial changes.

In the NPRM, the FAA referred to departure procedures generally, which includes obstacle departure procedures (ODPs) as well as non-regulatory departure procedures issued by ATC. The FAA's intention was only to include obstacle departure procedures in this rulemaking.

In addition to the comments received on § 91.175(f) (discussed above), Boeing, Airbus, and Continental Airlines stated that § 97.1(b) would not be the appropriate regulation in which to require compliance with obstacle departure procedures.

The FAA agrees with the commenters and has amended § 91.175(f) to require compliance with ODPs when applicable. (See discussion of § 91.175(f).)

Section 97.3 Symbols and Terms Used in Procedures

The FAA proposed to revise § 97.3 to organize the terms alphabetically. In addition, the FAA proposed to revise several of the terms in the section, and to add others.

The FAA received comments on the proposed definitions of ''height above touchdown (HAT),'' ''helipoint,'' ''minimum safe altitude (MSA),'' and ''visibility minimum.'' These comments, and the FAA's responses, are discussed under ''II.B. Terminology and Definitions.''

The FAA included the term ''Aircraft approach category'' in the proposed revision of § 97.3 so that the text of the section could be shown in its entirety for the convenience of the reader. The text of that definition was not different from that in the CFR at the time that the NPRM was drafted. However, in a separate rulemaking (unrelated to RNAV) on November 26, 2002 (67 FR 70828), the FAA amended the lead-in text of the definition, but inadvertently omitted the amended text from the NPRM. The FAA therefore is including the current text of ''Aircraft approach category'' in this final rule.

Section 97.10 General

The FAA proposed to remove and reserve § 97.10 because it prescribes standard instrument approach procedures ''other than those based on the criteria contained in FAA Order 8260.3, U.S. Standard for Terminal Instrument Approach Procedures (TERPS).'' The FAA proposed to remove § 97.10 because these types of approach procedures no longer exist.

American Trans Air, Continental Airlines, Boeing, ATA, and American Airlines recommended leaving the text in § 97.10, as it is currently written to allow for the development of instrument approaches based on criteria other than that stated in the U.S. TERPS.

The FAA disagrees. The sole purpose of § 97.10 was to allow procedures developed pre-TERPS to remain in effect until they came into compliance with TERPS criteria; however, the section is no longer valid. All public instrument approach procedures published are in compliance with current FAA criteria. The FAA may authorize special procedures using non-standard criteria on a case-by-case basis. These special procedures are usually for private use only and are authorized under § 91.175(a). Thus, the FAA is removing and reserving the text of § 97.10, as proposed.

Section 97.20 General

The NPRM proposed to incorporate FAA Orders 8260.3 and 8260.19 by reference into § 97.20, as well as the terminal aeronautical charts. On April 8, 2003, the FAA adopted this amendment (68 FR 16948). The incorporation by reference (IBR) of the two above-referenced orders and the aeronautical charts was in error and resulted in the inappropriate designation of certain material as regulatory. The FAA subsequently corrected this error in a final rule adopted on May 3, 2005 (70 FR 23002) that removed those FAA orders from § 97.20. Also, in that final rule, the FAA instead incorporated by reference into part 97 the information documented on FAA Forms 8260–3, 8260–4, 8260–5, and 8260–15A, which are the forms that depict instrument procedures and the associated weather takeoff minimums.

As discussed in § 91.175(f) and unless specifically excluded, this rule requires a pilot to use an ODP if such a procedure is prescribed under part 97. ODPs are depicted on form 8260–15A. This rule provides for the IBR of the ODPs on form 8260.15A in § 97.20. The Director of the Federal Register approved the IBR of the material on August 6, 2007.

IV. Rulemaking Analyses and Economic Evaluation

IV.A. Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) requires that the FAA consider the impact of paperwork and other information collection burdens imposed on the public. The FAA has determined that there is no current or new requirement for information collection associated with these amendments.

IV.B. International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has reviewed the corresponding ICAO Standards and Recommended Practices and has identified no differences with these regulations.

IV.C. Regulatory Evaluation Summary

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 (Pub. L. 96–354) requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (Pub. L. 96–39) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, the Trade Act requires agencies to consider international standards and, where appropriate, that they be the basis of U.S. standards. Fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of $100 million or more annually (adjusted for inflation with base year of 1995). This portion of the preamble summarizes the FAA's analysis of the economic impacts of this final rule.

Department of Transportation Order DOT 2100.5 prescribes policies and procedures for simplification, analysis, and review of regulations. If the expected cost impact is so minimal that a proposed or final rule does not warrant a full evaluation, this order permits that a statement to that effect, and the basis for it, be included in the preamble if a full regulatory evaluation of the cost and benefits is not prepared. Such a determination has been made for this final rule.

The final rule will impose minimal costs on aircraft operators because it does not require changes to current navigation systems. Cost savings may result because the rule will enable the use of advanced RNAV navigation routes the FAA has been developing. These routes are typically more direct and shorter than current Federal airways and jet routes and therefore may result in less fuel and time for aircraft to reach their destinations.

The FAA has, therefore, determined that this final rule is not a ''significant regulatory action'' as defined in section 3(f) of Executive Order 12866, and is not ''significant'' as defined in DOT's Regulatory Policies and Procedures.

IV.D. Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (Pub. L. 96–354) (RFA) establishes ''as a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration.'' The RFA covers a wide-range of small entities, including small businesses, not-for-profit organizations, and small governmental jurisdictions.

Agencies must perform a review to determine whether a rule will have a significant economic impact on a substantial number of small entities. If the agency determines that it will, the agency must prepare a regulatory flexibility analysis as described in the RFA. However, if an agency determines that a rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the RFA provides that the head of the agency may so certify and a regulatory flexibility analysis is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

This rule is definitionally clarifying, incorporates existing orders, and provides cost saving as it enables more direct routes requiring less time and fuel. Therefore, as the FAA Administrator, I certify that this rule will not have a significant economic impact on a substantial number of small entities.

IV.E. International Trade Impact Assessment

The Trade Agreements Act of 1979 (Pub. L. 96–39) prohibits Federal agencies from establishing any standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. The FAA has assessed the potential effect of this final rule and has determined that it will impose the same costs on domestic and international entities and thus has a neutral affect on international trade.

IV.F. Unfunded Mandate Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in an expenditure of $100 million or more (adjusted annually for inflation with the base year 1995) in any one year by State, local, and tribal governments, in the aggregate, or by the private sector; such a mandate is deemed to be a ''significant regulatory action.'' The FAA currently uses an inflation-adjusted value of $128.1 million in lieu of $100 million. This final rule does not contain such a mandate.

IV.G. Executive Order 13132, Federalism

The FAA has analyzed this final rule under the principles and criteria of Executive Order 13132, Federalism. The FAA has determined that this action will not have a substantial direct effect on the States, or the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government, and therefore does not have federalism implications.

IV.H. Environmental Analysis

FAA Order 1050.1E identifies FAA actions that are categorically excluded from preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act (NEPA) in the absence of extraordinary circumstances. The FAA has determined this rulemaking action qualifies for the categorical exclusion identified in paragraph 312f and involves no extraordinary circumstances.

IV.I. Regulations That Significantly Affect Energy Supply, Distribution, or Use

The FAA has analyzed this final rule under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). The

FAA has determined that it is not a ''significant energy action'' under the executive order because it is not a ''significant regulatory action'' under Executive Order 12866, and it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

V. Availability of Rulemaking Documents

You can get an electronic copy of rulemaking documents using the Internet by—

1. Searching the Department of Transportation's electronic Docket Management System (DMS) Web page (*http://dms.dot.gov/search*);

2. Visiting the FAA's Regulations and Policies Web page at *http://www.faa.gov/regulations_policies/*; or

3. Accessing the Government Printing Office's Web page at *http://www.gpoaccess.gov/fr/index.html.*

You can also get a copy by sending a request to the Federal Aviation Administration, Office of Rulemaking, ARM–1, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267–9680. Be sure to identify the amendment number or docket number of this rulemaking.

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477–78) or you may visit *http://dms.dot.gov.*

VI. Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. If you are a small entity and you have a question regarding this document, you may contact your local FAA official, or the person listed under the **FOR FURTHER INFORMATION CONTACT** heading at the beginning of the preamble. You can find out more about SBREFA on the Internet at *http://www.faa.gov/regulations_policies/rulemaking/sbre_act/*.

List of Subjects

14 CFR Part 1

Air transportation.

14 CFR Part 91

Agriculture, Air traffic control, Aircraft, Airmen, Airports, Aviation safety, Freight, Noise control, Reporting and recordkeeping requirements.

14 CFR Part 97

Air traffic control, Airports, Incorporation by Reference, Navigation (air), Weather.

14 CFR Part 121

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

14 CFR Part 125

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

14 CFR Part 129

Air carriers, Aircraft, Aviation safety, Reporting and recordkeeping requirements, Security.

14 CFR Part 135

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

The Amendments

■ In consideration of the foregoing, the Federal Administration Aviation amends chapter I of 14 CFR as follows:

PART 1—DEFINITIONS AND ABBREVIATIONS

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

Authority: 49 U.S.C. 106(g), 40113, 44701.

■ 2. Amend § 1.1 as follows:

■ a. Remove the definitions of ''Decision height'' and ''Minimum descent altitude''.

■ b. Add definitions for ''Decision altitude (DA)'', ''Decision height (DH)'', ''Final approach fix (FAF)'', ''Instrument approach procedure (IAP)'', ''Minimum descent altitude (MDA)'', and ''Suitable RNAV system'' in alphabetical order to read as set forth below.

§ 1.1 General definitions.

* * * * *

Decision altitude (DA) is a specified altitude in an instrument approach procedure at which the pilot must decide whether to initiate an immediate missed approach if the pilot does not see the required visual reference, or to continue the approach. Decision altitude is expressed in feet above mean sea level.

Decision height (DH) is a specified height above the ground in an instrument approach procedure at which the pilot must decide whether to initiate an immediate missed approach if the pilot does not see the required visual reference, or to continue the approach. Decision height is expressed in feet above ground level.

Final approach fix (FAF) defines the beginning of the final approach segment and the point where final segment descent may begin.

* * * * *

Instrument approach procedure (IAP) is a series of predetermined maneuvers by reference to flight instruments with specified protection from obstacles and assurance of navigation signal reception capability. It begins from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point:

(1) From which a landing can be completed; or

(2) If a landing is not completed, to a position at which holding or en route obstacle clearance criteria apply.

* * * * *

Minimum descent altitude (MDA) is the lowest altitude specified in an instrument approach procedure, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering until the pilot sees the required visual references for the heliport or runway of intended landing.

* * * * *

Suitable RNAV system is an RNAV system that meets the required performance established for a type of operation, e.g. IFR; and is suitable for operation over the route to be flown in terms of any performance criteria (including accuracy) established by the air navigation service provider for certain routes (e.g. oceanic, ATS routes, and IAPs). An RNAV system's suitability is dependent upon the availability of ground and/or satellite navigation aids that are needed to meet any route performance criteria that may be prescribed in route specifications to navigate the aircraft along the route to be flown. Information on suitable RNAV systems is published in FAA guidance material.

* * * * *

■ 3. Amend § 1.2 by adding the abbreviations ''NM'' and ''RNAV'' in alphabetical order to read as follows:

§ 1.2 Abbreviations and symbols.

* * * * *

NM means nautical mile.

* * * * *

RNAV means area navigation.

* * * * *

PART 91—GENERAL OPERATING AND FLIGHT RULES

■ 4. The authority citation for part 91 continues to read as follows:

Authority: 49 U.S.C. 106(g), 1155, 40103, 40113, 40120, 44101, 44111, 44701, 44704, 44709, 44711, 44712, 44715, 44716, 44717, 44722, 46306, 46315, 46316, 46504, 46506–46507, 47122, 47508, 47528–47531, articles 12 and 29 of the Convention on International Civil Aviation (61 stat. 1180).

■ 5. Amend § 91.129 by revising paragraph (e) to read as follows:

§ 91.129 Operations in Class D airspace.

* * * * *

(e) *Minimum altitudes when operating to an airport in Class D airspace.* (1) Unless required by the applicable distance-from-cloud criteria, each pilot operating a large or turbine-powered airplane must enter the traffic pattern at an altitude of at least 1,500 feet above the elevation of the airport and maintain at least 1,500 feet until further descent is required for a safe landing.

(2) Each pilot operating a large or turbine-powered airplane approaching to land on a runway served by an instrument approach procedure with vertical guidance, if the airplane is so equipped, must:

(i) Operate that airplane at an altitude at or above the glide path between the published final approach fix and the decision altitude (DA), or decision height (DH), as applicable; or

(ii) If compliance with the applicable distance-from-cloud criteria requires glide path interception closer in, operate that airplane at or above the glide path, between the point of interception of glide path and the DA or the DH.

(3) Each pilot operating an airplane approaching to land on a runway served by a visual approach slope indicator must maintain an altitude at or above the glide path until a lower altitude is necessary for a safe landing.

(4) Paragraphs (e)(2) and (e)(3) of this section do not prohibit normal bracketing maneuvers above or below the glide path that are conducted for the purpose of remaining on the glide path.

* * * * *

■ 6. Amend § 91.131 by revising paragraph (c)(1) to read as follows:

§ 91.131 Operations in Class B airspace.

* * * * *

(c) * * *

(1) *For IFR operation.* An operable VOR or TACAN receiver or an operable and suitable RNAV system; and

* * * * *

■ 7. Amend § 91.175 by revising paragraphs (a), (b), (c) introductory text, (e)(1)(ii), (f), and (k) to read as follows:

§ 91.175 Takeoff and landing under IFR.

(a) *Instrument approaches to civil airports.* Unless otherwise authorized by the FAA, when it is necessary to use an instrument approach to a civil airport, each person operating an aircraft must use a standard instrument approach procedure prescribed in part 97 of this chapter for that airport. This paragraph does not apply to United States military aircraft.

(b) *Authorized DA/DH or MDA.* For the purpose of this section, when the approach procedure being used provides for and requires the use of a DA/DH or MDA, the authorized DA/DH or MDA is the highest of the following:

(1) The DA/DH or MDA prescribed by the approach procedure.

(2) The DA/DH or MDA prescribed for the pilot in command.

(3) The DA/DH or MDA appropriate for the aircraft equipment available and used during the approach.

(c) *Operation below DA/ DH or MDA.* Except as provided in paragraph (l) of this section, where a DA/DH or MDA is applicable, no pilot may operate an aircraft, except a military aircraft of the United States, below the authorized MDA or continue an approach below the authorized DA/DH unless—

* * * * *

(e) * * *

(1) * * *

(ii) Upon arrival at the missed approach point, including a DA/DH where a DA/DH is specified and its use is required, and at any time after that until touchdown.

* * * * *

(f) *Civil airport takeoff minimums.* This paragraph applies to persons operating an aircraft under part 121, 125, 129, or 135 of this chapter.

(1) Unless otherwise authorized by the FAA, no pilot may takeoff from a civil airport under IFR unless the weather conditions at time of takeoff are at or above the weather minimums for IFR takeoff prescribed for that airport under part 97 of this chapter.

(2) If takeoff weather minimums are not prescribed under part 97 of this chapter for a particular airport, the following weather minimums apply to takeoffs under IFR:

(i) For aircraft, other than helicopters, having two engines or less—1 statute mile visibility.

(ii) For aircraft having more than two engines—½ statute mile visibility.

(iii) For helicopters—½ statute mile visibility.

(3) Except as provided in paragraph (f)(4) of this section, no pilot may takeoff under IFR from a civil airport having published obstacle departure procedures (ODPs) under part 97 of this chapter for the takeoff runway to be used, unless the pilot uses such ODPs.

(4) Notwithstanding the requirements of paragraph (f)(3) of this section, no pilot may takeoff from an airport under IFR unless:

(i) For part 121 and part 135 operators, the pilot uses a takeoff obstacle clearance or avoidance procedure that ensures compliance with the applicable airplane performance operating limitations requirements under part 121, subpart I or part 135, subpart I for takeoff at that airport; or

(ii) For part 129 operators, the pilot uses a takeoff obstacle clearance or avoidance procedure that ensures compliance with the airplane performance operating limitations prescribed by the State of the operator for takeoff at that airport.

* * * * *

(k) *ILS components.* The basic components of an ILS are the localizer, glide slope, and outer marker, and, when installed for use with Category II or Category III instrument approach procedures, an inner marker. The following means may be used to substitute for the outer marker: Compass locator; precision approach radar (PAR) or airport surveillance radar (ASR); DME, VOR, or nondirectional beacon fixes authorized in the standard instrument approach procedure; or a suitable RNAV system in conjunction with a fix identified in the standard instrument approach procedure. Applicability of, and substitution for, the inner marker for a Category II or III approach is determined by the appropriate 14 CFR part 97 approach procedure, letter of authorization, or operations specifications issued to an operator.

* * * * *

■ 8. Amend § 91.177 by revising paragraph (a) to read as follows:

§ 91.177 Minimum altitudes for IFR operations.

(a) *Operation of aircraft at minimum altitudes.* Except when necessary for takeoff or landing, no person may operate an aircraft under IFR below—

(1) The applicable minimum altitudes prescribed in parts 95 and 97 of this chapter. However, if both a MEA and a MOCA are prescribed for a particular route or route segment, a person may operate an aircraft below the MEA down to, but not below, the MOCA, provided the applicable navigation signals are available. For aircraft using VOR for navigation, this applies only when the aircraft is within 22 nautical miles of that VOR (based on the reasonable

estimate by the pilot operating the aircraft of that distance); or

(2) If no applicable minimum altitude is prescribed in parts 95 and 97 of this chapter, then—

(i) In the case of operations over an area designated as a mountainous area in part 95 of this chapter, an altitude of 2,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown; or

(ii) In any other case, an altitude of 1,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown.

* * * * *

■ 9. Amend § 91.179 by adding introductory text to read as follows:

§ 91.179 IFR cruising altitude or flight level.

Unless otherwise authorized by ATC, the following rules apply—

* * * * *

§ 91.181 [Amended]

■ 10. Amend § 91.181 by removing the words ''a Federal airway'' and adding in their place the words ''an ATS route'' in paragraph (a).

■ 11. Amend § 91.183 by revising the heading and the introductory text to read as follows:

§ 91.183 IFR communications.

Unless otherwise authorized by ATC, the pilot in command of each aircraft operated under IFR in controlled airspace must ensure that a continuous watch is maintained on the appropriate frequency and must report the following as soon as possible—

* * * * *

§ 91.189 [Amended]

■ 12. Amend § 91.189 (c) and (d) by removing the term ''DH'' and adding in its place the term ''DA/DH'' wherever it appears.

■ 13. Amend § 91.205 by revising paragraphs (d)(2) and (e) to read as follows:

§ 91.205 Powered civil aircraft with standard category U.S. airworthiness certificates: Instrument and equipment requirements.

* * * * *

(d) * * *

(2) Two-way radio communication and navigation equipment suitable for the route to be flown.

* * * * *

(e) *Flight at and above 24,000 feet MSL (FL 240).* If VOR navigation equipment is required under paragraph (d)(2) of this section, no person may operate a U.S.-registered civil aircraft within the 50 states and the District of Columbia at or above FL 240 unless that aircraft is equipped with approved DME or a suitable RNAV system. When the DME or RNAV system required by this paragraph fails at and above FL 240, the pilot in command of the aircraft must notify ATC immediately, and then may continue operations at and above FL 240 to the next airport of intended landing where repairs or replacement of the equipment can be made.

* * * * *

§ 91.219 [Amended]

■ 14. Amend § 91.219 (b)(5) by removing the term ''DH'' and adding in its place the term ''DA/DH''.

■ 15. Amend 91.511 by revising the heading and paragraph (a)(1) introductory text to read as follows:

§ 91.511 Communication and navigation equipment for overwater operations.

(a) * * *

(1) Radio communication equipment appropriate to the facilities to be used and able to transmit to, and receive from, at least one communication facility from any place along the route:

* * * * *

■ 16. Amend § 91.711 by revising paragraphs (c)(1)(ii) and (e) introductory text to read as follows:

§ 91.711 Special rules for foreign civil aircraft.

* * * * *

(c) * * *

(1) * * *

(ii) Navigation equipment suitable for the route to be flown.

* * * * *

(e) *Flight at and above FL 240.* If VOR navigation equipment is required under paragraph (c)(1)(ii) of this section, no person may operate a foreign civil aircraft within the 50 States and the District of Columbia at or above FL 240, unless the aircraft is equipped with approved DME or a suitable RNAV system. When the DME or RNAV system required by this paragraph fails at and above FL 240, the pilot in command of the aircraft must notify ATC immediately and may then continue operations at and above FL 240 to the next airport of intended landing where repairs or replacement of the equipment can be made. A foreign civil aircraft may be operated within the 50 States and the District of Columbia at or above FL 240 without DME or an RNAV system when operated for the following purposes, and ATC is notified before each takeoff:

* * * * *

PART 97—STANDARD INSTRUMENT PROCEDURES

■ 17. The authority citation for part 97 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40103, 40106, 40113, 40114, 40120, 44502, 44514, 44701, 44719, and 44721–44722.

■ 18. Revise the heading for part 97 to read as set forth above.

■ 19. Revise § 97.1 to read as follows:

§ 97.1 Applicability.

(a) This part prescribes standard instrument approach procedures to civil airports in the United States and the weather minimums that apply to landings under IFR at those airports.

(b) This part also prescribes obstacle departure procedures (ODPs) for certain civil airports in the United States and the weather minimums that apply to takeoffs under IFR at civil airports in the United States.

■ 20. Revise § 97.3 to read as follows:

§ 97.3 Symbols and terms used in procedures.

As used in the standard instrument procedures prescribed in this part—

Aircraft approach category means a grouping of aircraft based on a speed of VREF, if specified, or if VREF is not specified, 1.3 V_{so} at the maximum certificated landing weight. VREF, V_{so}, and the maximum certificated landing weight are those values as established for the aircraft by the certification authority of the country of registry. The categories are as follows—

(1) Category A: Speed less than 91 knots.

(2) Category B: Speed 91 knots or more but less than 121 knots.

(3) Category C: Speed 121 knots or more but less than 141 knots.

(4) Category D: Speed 141 knots or more but less than 166 knots.

(5) Category E: Speed 166 knots or more.

Approach procedure segments for which altitudes (minimum altitudes, unless otherwise specified) and paths are prescribed in procedures, are as follows—

(1) Initial approach is the segment between the initial approach fix and the intermediate fix or the point where the aircraft is established on the intermediate course or final approach course.

(2) Initial approach altitude is the altitude (or altitudes, in high altitude procedure) prescribed for the initial

approach segment of an instrument approach.

(3) Intermediate approach is the segment between the intermediate fix or point and the final approach fix.

(4) Final approach is the segment between the final approach fix or point and the runway, airport, or missed approach point.

(5) Missed approach is the segment between the missed approach point, or point of arrival at decision altitude or decision height (DA/DH), and the missed approach fix at the prescribed altitude.

Ceiling means the minimum ceiling, expressed in feet above the airport elevation, required for takeoff or required for designating an airport as an alternate airport.

Copter procedures means helicopter procedures, with applicable minimums as prescribed in § 97.35. Helicopters may also use other procedures prescribed in subpart C of this part and may use the Category A minimum descent altitude (MDA), or decision altitude or decision height (DA/DH). For other than ''copter-only'' approaches, the required visibility minimum for Category I approaches may be reduced to one-half the published visibility minimum for Category A aircraft, but in no case may it be reduced to less than one-quarter mile prevailing visibility, or, if reported, 1,200 feet RVR. Reduction of visibility minima on Category II instrument approach procedures is prohibited.

FAF means final approach fix.

HAA means height above airport and is expressed in feet.

HAL means height above landing and is the height of the DA/MDA above a designated helicopter landing area elevation used for helicopter instrument approach procedures and is expressed in feet.

HAS means height above the surface and is the height of the DA/MDA above the highest terrain/surface within a 5,200-foot radius of the missed approach point used in helicopter instrument approach procedures and is expressed in feet above ground level (AGL).

HAT means height above touchdown.

HCH means helipoint crossing height and is the computed height of the vertical guidance path above the helipoint elevation at the helipoint expressed in feet.

Helipoint means the aiming point for the final approach course. It is normally the center point of the touchdown and lift-off area (TLOF).

Hold in lieu of PT means a holding pattern established under applicable FAA criteria, and used in lieu of a procedure turn to execute a course reversal.

MAP means missed approach point.

More than 65 knots means an aircraft that has a stalling speed of more than 65 knots (as established in an approved flight manual) at maximum certificated landing weight with full flaps, landing gear extended, and power off.

MSA means minimum safe altitude, expressed in feet above mean sea level, depicted on an approach chart that provides at least 1,000 feet of obstacle clearance for emergency use within a certain distance from the specified navigation facility or fix.

NA means not authorized.

NOPT means no procedure turn required. Altitude prescribed applies only if procedure turn is not executed.

Procedure turn means the maneuver prescribed when it is necessary to reverse direction to establish the aircraft on an intermediate or final approach course. The outbound course, direction of turn, distance within which the turn must be completed, and minimum altitude are specified in the procedure. However, the point at which the turn may be begun, and the type and rate of turn, is left to the discretion of the pilot.

RA means radio altimeter setting height.

RVV means runway visibility value.

SIAP means standard instrument approach procedure.

65 knots or less means an aircraft that has a stalling speed of 65 knots or less (as established in an approved flight manual) at maximum certificated landing weight with full flaps, landing gear extended, and power off.

T means nonstandard takeoff minimums or specified departure routes/procedures or both.

TDZ means touchdown zone.

Visibility minimum means the minimum visibility specified for approach, landing, or takeoff, expressed in statute miles, or in feet where RVR is reported.

■ 21. Amend § 97.5 by revising the heading and paragraph (a) to read as follows:

§ 97.5 Bearings, courses, tracks, headings, radials, miles.

(a) All bearings, courses, tracks, headings, and radials in this part are magnetic, unless otherwise designated.

* * * * *

§ 97.10 [Removed and reserved]

■ 22. Remove and reserve § 97.10.

■ 23. Revise § 97.20 to read as follows:

§ 97.20 General.

(a) This subpart prescribes standard instrument approach procedures and takeoff minimums and obstacle departure procedures (ODPs) based on the criteria contained in FAA Order 8260.3, U.S. Standard for Terminal Instrument Procedures (TERPs), and other related Orders in the 8260 series that also address instrument procedure design criteria.

(b) Standard instrument approach procedures and associated supporting data adopted by the FAA are documented on FAA Forms 8260–3, 8260–4, 8260–5. Takeoff minimums and obstacle departure procedures (ODPs) are documented on FAA Form 8260–15A. These forms are incorporated by reference. The Director of the Federal Register approved this incorporation by reference pursuant to 5 U.S.C. 552(a) and 1 CFR part 51. The standard instrument approach procedures and takeoff minimums and obstacle departure procedures (ODPs) are available for examination at the FAA's Rules Docket (AGC–200) and at the National Flight Data Center, 800 Independence Avenue, SW., Washington, DC 20590, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*.

(c) Standard instrument approach procedures and takeoff minimums and obstacle departure procedures (ODPs) are depicted on aeronautical charts published by the FAA National Aeronautical Charting Office. These charts are available for purchase from the FAA's National Aeronautical Charting Office, Distribution Division, 6303 Ivy Lane, Suite 400, Greenbelt, MD 20770.

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

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

Authority: 49 U.S.C. 106(g), 1153, 40101, 40102, 40103, 40113, 41721, 44105, 44106, 44111, 44701–44717, 44722, 44901, 44903, 44904, 44906, 44912, 44914, 44936, 44938, 46103, 46105.

■ 25. Amend § 121.99 by revising paragraphs (a) and (b) to read as follows:

§ 121.99 Communications facilities—domestic and flag operations.

(a) Each certificate holder conducting domestic or flag operations must show that a two-way communication system, or other means of communication approved by the FAA certificate holding

district office, is available over the entire route. The communications may be direct links or via an approved communication link that will provide reliable and rapid communications under normal operating conditions between each airplane and the appropriate dispatch office, and between each airplane and the appropriate air traffic control unit.

(b) Except in an emergency, for all flag and domestic kinds of operations, the communications systems between each airplane and the dispatch office must be independent of any system operated by the United States.

* * * * *

■ 26. Revise § 121.103 to read as follows:

§ 121.103 En route navigation facilities.

(a) Except as provided in paragraph (b) of this section, each certificate holder conducting domestic or flag operations must show, for each proposed route (including to any regular, provisional, refueling or alternate airports), that suitable navigation aids are available to navigate the airplane along the route within the degree of accuracy required for ATC. Navigation aids required for approval of routes outside of controlled airspace are listed in the certificate holder's operations specifications except for those aids required for routes to alternate airports.

(b) Navigation aids are not required for any of the following operations—

(1) Day VFR operations that the certificate holder shows can be conducted safely by pilotage because of the characteristics of the terrain;

(2) Night VFR operations on routes that the certificate holder shows have reliably lighted landmarks adequate for safe operation; and

(3) Other operations approved by the certificate holding district office.

■ 27. Revise § 121.121 to read as follows:

§ 121.121 En route navigation facilities.

(a) Except as provided in paragraph (b) of this section, no certificate holder conducting supplemental operations may conduct any operation over a route (including to any destination, refueling or alternate airports) unless suitable navigation aids are available to navigate the airplane along the route within the degree of accuracy required for ATC. Navigation aids required for routes outside of controlled airspace are listed in the certificate holder's operations specifications except for those aids required for routes to alternate airports.

(b) Navigation aids are not required for any of the following operations—

(1) Day VFR operations that the certificate holder shows can be conducted safely by pilotage because of the characteristics of the terrain;

(2) Night VFR operations on routes that the certificate holder shows have reliably lighted landmarks adequate for safe operation; and

(3) Other operations approved by the certificate holding district office.

■ 28. Amend § 121.347 by revising the heading, paragraphs (a) introductory text, (a)(1), (a)(2), and (b) to read as follows:

§ 121.347 Communication and navigation equipment for operations under VFR over routes navigated by pilotage.

(a) No person may operate an airplane under VFR over routes that can be navigated by pilotage unless the airplane is equipped with the radio communication equipment necessary under normal operating conditions to fulfill the following:

(1) Communicate with at least one appropriate station from any point on the route;

(2) Communicate with appropriate air traffic control facilities from any point within Class B, Class C, or Class D airspace, or within a Class E surface area designated for an airport in which flights are intended; and

* * * * *

(b) No person may operate an airplane at night under VFR over routes that can be navigated by pilotage unless that airplane is equipped with—

(1) Radio communication equipment necessary under normal operating conditions to fulfill the functions specified in paragraph (a) of this section; and

(2) Navigation equipment suitable for the route to be flown.

■ 29. Revise § 121.349 to read as follows:

§ 121.349 Communication and navigation equipment for operations under VFR over routes not navigated by pilotage or for operations under IFR or over the top.

(a) *Navigation equipment requirements—General.* No person may conduct operations under VFR over routes that cannot be navigated by pilotage, or operations conducted under IFR or over the top, unless—

(1) The en route navigation aids necessary for navigating the airplane along the route (e.g., ATS routes, arrival and departure routes, and instrument approach procedures, including missed approach procedures if a missed approach routing is specified in the procedure) are available and suitable for use by the aircraft navigation systems required by this section;

(2) The airplane used in those operations is equipped with at least—

(i) Except as provided in paragraph (c) of this section, two approved independent navigation systems suitable for navigating the airplane along the route to be flown within the degree of accuracy required for ATC;

(ii) One marker beacon receiver providing visual and aural signals; and

(iii) One ILS receiver; and

(3) Any RNAV system used to meet the navigation equipment requirements of this section is authorized in the certificate holder's operations specifications.

(b) *Communication equipment requirements.* No person may operate an airplane under VFR over routes that cannot be navigated by pilotage, and no person may operate an airplane under IFR or over the top, unless the airplane is equipped with—

(1) At least two independent communication systems necessary under normal operating conditions to fulfill the functions specified in § 121.347 (a); and

(2) At least one of the communication systems required by paragraph (b)(1) of this section must have two-way voice communication capability.

(c) *Use of a single independent navigation system for operations under VFR over routes that cannot be navigated by pilotage, or operations conducted under IFR or over the top.* Notwithstanding the requirements of paragraph (a)(2)(i) of this section, the airplane may be equipped with a single independent navigation system suitable for navigating the airplane along the route to be flown within the degree of accuracy required for ATC if:

(1) It can be shown that the airplane is equipped with at least one other independent navigation system suitable, in the event of loss of the navigation capability of the single independent navigation system permitted by this paragraph at any point along the route, for proceeding safely to a suitable airport and completing an instrument approach; and

(2) The airplane has sufficient fuel so that the flight may proceed safely to a suitable airport by use of the remaining navigation system, and complete an instrument approach and land.

(d) *Use of VOR navigation equipment.* If VOR navigation equipment is used to comply with paragraph (a) or (c) of this section, no person may operate an airplane unless it is equipped with at least one approved DME or suitable RNAV system.

(e) *Additional communication system equipment requirements for operators subject to § 121.2.* In addition to the requirements in paragraph (b) of this section, no person may operate an airplane having a passenger seat configuration of 10 to 30 seats, excluding each crewmember seat, and a maximum payload capacity of 7,500 pounds or less, under IFR, over the top, or in extended over-water operations unless it is equipped with at least—

(1) Two microphones; and

(2) Two headsets, or one headset and one speaker.

■ 30. Amend § 121.351 by revising the heading and paragraphs (a) and (c)(1) to read as follows:

§ 121.351 Communication and navigation equipment for extended over-water operations and for certain other operations.

(a) Except as provided in paragraph (c) of this section, no person may conduct an extended over-water operation unless the airplane is equipped with at least two independent long-range navigation systems and at least two independent long-range communication systems necessary under normal operating conditions to fulfill the following functions—

(1) Communicate with at least one appropriate station from any point on the route;

(2) Receive meteorological information from any point on the route by either of two independent communication systems. One of the communication systems used to comply with this paragraph may be used to comply with paragraphs (a)(1) and (a)(3) of this section; and

(3) At least one of the communication systems must have two-way voice communication capability.

* * * * *

(c) * * *

(1) The ability of the flightcrew to navigate the airplane along the route within the degree of accuracy required for ATC,

* * * * *

§ 121.419 [Amended]

■ 31. Amend § 121.419 (a)(1)(vii) by removing the term ''DH'' and adding in its place the term ''DA/DH''.

§ 121.559 [Amended]

■ 32. Amend § 121.559 (c) by removing the words ''ground radio station'' and adding in their place the words ''communication facility''.

■ 33. Amend § 121.561 by revising the heading as set forth below and by amending paragraph (a) by removing the words ''ground or navigational facility'' and adding in their place the words ''ground facility or navigation aid''.

§ 121.561 Reporting potentially hazardous meteorological conditions and irregularities of ground facilities or navigation aids.

* * * * *

§ 121.565 [Amended]

■ 34. Amend § 121.565 (c) by removing the words ''ground radio station'' and adding in their place the words ''communication facility'' and by removing the word ''station'' and adding in its place the word ''facility''.

§ 121.579 [Amended]

■ 35. Amend § 121.579 (b) introductory text by removing the words ''decision height'' and adding in their place the term ''DA/DH''.

§ 121.651 [Amended]

■ 36. Amend § 121.651 by replacing the term ''DH'' with the term ''DA/DH'' wherever it appears in paragraphs (c) and (d).

§ 121.652 [Amended]

■ 37. Amend § 121.652 (a) by removing the term ''DH'' and adding in its place the term ''DA/DH''.

PART 125—CERTIFICATION AND OPERATIONS: AIRPLANES HAVING A SEATING CAPACITY OF 20 OR MORE PASSENGERS OR A MAXIMUM PAYLOAD CAPACITY OF 6,000 POUNDS OR MORE; AND RULES GOVERNING PERSONS ON BOARD SUCH AIRCRAFT

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

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

■ 39. Revise § 125.51 to read as follows:

§ 125.51 En route navigation facilities.

(a) Except as provided in paragraph (b) of this section, no certificate holder may conduct any operation over a route (including to any destination, refueling or alternate airports) unless suitable navigation aids are available over the route to navigate the airplane along the route within the degree of accuracy required for ATC. Navigation aids required for routes outside of controlled airspace are listed in the certificate holder's operations specifications except for those aids required for routes to alternate airports.

(b) Navigation aids are not required for any of the following operations—

(1) Day VFR operations that the certificate holder shows can be conducted safely by pilotage because of the characteristics of the terrain;

(2) Night VFR operations on routes that the certificate holder shows have reliably lighted landmarks adequate for safe operations; and

(3) Other operations approved by the certificate holding district office.

■ 40. Revise § 125.203 to read as follows:

§ 125.203 Communication and navigation equipment.

(a) *Communication equipment—general.* No person may operate an airplane unless it has two-way radio communication equipment able, at least in flight, to transmit to, and receive from, appropriate facilities 22 nautical miles away.

(b) *Navigation equipment for operations over the top.* No person may operate an airplane over the top unless it has navigation equipment suitable for the route to be flown.

(c) *Communication and navigation equipment for IFR or extended over-water operations—General.* Except as provided in paragraph (f) of this section, no person may operate an airplane carrying passengers under IFR or in extended over-water operations unless—

(1) The en route navigation aids necessary for navigating the airplane along the route (e.g., ATS routes, arrival and departure routes, and instrument approach procedures, including missed approach procedures if a missed approach routing is specified in the procedure) are available and suitable for use by the aircraft navigation systems required by this section;

(2) The airplane used in those operations is equipped with at least the following equipment—

(i) Except as provided in paragraph (d) of this section, two approved independent navigation systems suitable for navigating the airplane along the route within the degree of accuracy required for ATC;

(ii) One marker beacon receiver providing visual and aural signals;

(iii) One ILS receiver;

(iv) Two transmitters;

(v) Two microphones;

(vi) Two headsets or one headset and one speaker; and

(vii) Two independent communication systems, one of which must have two-way voice communication capability, capable of transmitting to, and receiving from, at least one appropriate facility from any place on the route to be flown; and

(3) Any RNAV system used to meet the navigation equipment requirements of this section is authorized in the certificate holder's operations specifications.

(d) *Use of a single independent navigation system for operations under IFR—not for extended overwater operations.* Notwithstanding the requirements of paragraph (c)(2)(i) of this section, the airplane may be equipped with a single independent navigation system suitable for navigating the airplane along the route to be flown within the degree of accuracy required for ATC if—

(1) It can be shown that the airplane is equipped with at least one other independent navigation system suitable, in the event of loss of the navigation capability of the single independent navigation system permitted by this paragraph at any point along the route, for proceeding safely to a suitable airport and completing an instrument approach; and

(2) The airplane has sufficient fuel so that the flight may proceed safely to a suitable airport by use of the remaining navigation system, and complete an instrument approach and land.

(e) *Use of VOR navigation equipment.* If VOR navigation equipment is required by paragraph (c) or (d) of this section, no person may operate an airplane unless it is equipped with at least one approved DME or a suitable RNAV system.

(f) *Extended over-water operations.* Notwithstanding the requirements of paragraph (c) of this section, installation and use of a single long-range navigation system and a single long-range communication system for extended over-water operations in certain geographic areas may be authorized by the Administrator and approved in the certificate holder's operations specifications. The following are among the operational factors the Administrator may consider in granting an authorization:

(1) The ability of the flight crew to navigate the airplane along the route to be flown within the degree of accuracy required for ATC;

(2) The length of the route being flown; and

(3) The duration of the very high frequency communications gap.

■ 41. Amend § 125.321 by revising the heading to read as set forth below and by removing the words ''ground or navigational facility'' and adding in their place the words ''ground facility or navigation aid''.

§ 125.321 Reporting potentially hazardous meteorological conditions and irregularities of ground facilities or navigation aids.

* * * * *

§ 125.379 [Amended]

■ 42. Amend § 125.379 (a) by removing the term ''DH'' wherever it appears and adding in its place the term ''DA/DH''.

§ 125.381 [Amended]

■ 43. Amend § 125.381 (c)(2) by revising the reference to ''DH'' to read ''DA/DH''.

PART 129—OPERATIONS: FOREIGN AIR CARRIERS AND FOREIGN OPERATORS OF U.S.-REGISTERED AIRCRAFT ENGAGED IN COMMON CARRIAGE

■ 44. The authority citation for part 129 continues to read as follows:

Authority: 49 U.S.C. 1372, 40113, 40119, 44101, 44701–44702, 44705, 44709–44711, 44713, 44716–44717, 44722, 44901–44904, 44906, 44912, 46105, Pub. L. 107–71 sec.

■ 45. Revise § 129.17 to read as follows:

§ 129.17 Aircraft communication and navigation equipment for operations under IFR or over the top.

(a) *Aircraft navigation equipment requirements—General.* No foreign air carrier may conduct operations under IFR or over the top unless—

(1) The en route navigation aids necessary for navigating the aircraft along the route (e.g., ATS routes, arrival and departure routes, and instrument approach procedures, including missed approach procedures if a missed approach routing is specified in the procedure) are available and suitable for use by the aircraft navigation equipment required by this section;

(2) The aircraft used in those operations is equipped with at least the following—

(i) Except as provided in paragraph (c) of this section, two approved independent navigation systems suitable for navigating the aircraft along the route to be flown within the degree of accuracy required for ATC;

(ii) One marker beacon receiver providing visual and aural signals; and

(iii) One ILS receiver; and

(3) Any RNAV system used to meet the navigation equipment requirements of this section is authorized in the foreign air carrier's operations specifications.

(b) *Aircraft communication equipment requirements.* No foreign air carrier may operate an aircraft under IFR or over the top, unless it is equipped with—

(1) At least two independent communication systems necessary under normal operating conditions to fulfill the functions specified in § 121.347(a) of this chapter; and

(2) At least one of the communication systems required by paragraph (b)(1) of this section must have two-way voice communication capability.

(c) *Use of a single independent navigation system for operations under IFR or over the top.* Notwithstanding the requirements of paragraph (a)(2)(i) of this section, the aircraft may be equipped with a single independent navigation system suitable for navigating the aircraft along the route to be flown within the degree of accuracy required for ATC if:

(1) It can be shown that the aircraft is equipped with at least one other independent navigation system suitable, in the event of loss of the navigation capability of the single independent navigation system permitted by this paragraph at any point along the route, for proceeding safely to a suitable airport and completing an instrument approach; and

(2) The aircraft has sufficient fuel so that the flight may proceed safely to a suitable airport by use of the remaining navigation system, and complete an instrument approach and land.

(d) *VOR navigation equipment.* If VOR navigation equipment is required by paragraph (a) or (c) of this section, no foreign air carrier may operate an aircraft unless it is equipped with at least one approved DME or suitable RNAV system.

■ 46. Revise § 129.21 to read as follows:

§ 129.21 Control of traffic.

(a) Subject to applicable immigration laws and regulations, each foreign air carrier must furnish sufficient personnel necessary to provide two-way voice communications between its aircraft and stations at places where the FAA finds that communication is necessary but cannot be maintained in a language with which station operators are familiar.

(b) Each person furnished by a foreign air carrier under paragraph (a) of this section must be able to speak English and the language necessary to maintain communications with its aircraft and must assist station operators in directing traffic.

■ 47. Add § 129.22 to read as follows:

§ 129.22 Communication and navigation equipment for rotorcraft operations under VFR over routes navigated by pilotage.

(a) No foreign air carrier may operate a rotorcraft under VFR over routes that can be navigated by pilotage unless the rotorcraft is equipped with the radio communication equipment necessary under normal operating conditions to fulfill the following:

(1) Communicate with at least one appropriate station from any point on the route;

(2) Communicate with appropriate air traffic control facilities from any point within Class B, Class C, or Class D airspace, or within a Class E surface area designated for an airport in which flights are intended; and

(3) Receive meteorological information from any point en route.

(b) No foreign air carrier may operate a rotorcraft at night under VFR over routes that can be navigated by pilotage unless that rotorcraft is equipped with—

(1) Radio communication equipment necessary under normal operating conditions to fulfill the functions specified in paragraph (a) of this section; and

(2) Navigation equipment suitable for the route to be flown.

■ 48. Amend Appendix A to part 129 by revising paragraph (b), Section IV, to read as follows:

Appendix A to Part 129—Application for Operations Specifications by Foreign Air Carriers

* * * * *

(b) * * *

Sec. IV. Communications facilities. List all communication facilities to be used by the applicant in the conduct of the proposed operations within the United States and over that portion of the route between the last point of foreign departure and the United States.

* * * * *

PART 135—OPERATING REQUIREMENTS: COMMUTER AND ON DEMAND OPERATIONS AND RULES GOVERNING PERSONS ON BOARD SUCH AIRCRAFT

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

Authority: 49 U.S.C. 106(g), 41706, 44113, 44701–44702, 44705, 44709, 44711–44713, 44715–44717, 44722, 45101–45105.

■ 50. Amend § 135.67 by revising the heading to read as set forth below and by removing the words ''ground communications or navigational facility'' and adding in their place the words ''ground facility or navigation aid''.

§ 135.67 Reporting potentially hazardous meteorological conditions and irregularities of ground facilities or navigation aids.

* * * * *

■ 51. Add § 135.78 to read as follows:

§ 135.78 Instrument approach procedures and IFR landing minimums.

No person may make an instrument approach at an airport except in accordance with IFR weather minimums and instrument approach procedures set forth in the certificate holder's operations specifications.

§ 135.79 [Amended]

■ 52. Amend § 135.79 (a)(3) by removing the words ''radio or telephone communications'' and adding in their place the word ''communications''.

■ 53. Revise § 135.161 to read as follows:

§ 135.161 Communication and navigation equipment for aircraft operations under VFR over routes navigated by pilotage.

(a) No person may operate an aircraft under VFR over routes that can be navigated by pilotage unless the aircraft is equipped with the two-way radio communication equipment necessary under normal operating conditions to fulfill the following:

(1) Communicate with at least one appropriate station from any point on the route;

(2) Communicate with appropriate air traffic control facilities from any point within Class B, Class C, or Class D airspace, or within a Class E surface area designated for an airport in which flights are intended; and

(3) Receive meteorological information from any point en route.

(b) No person may operate an aircraft at night under VFR over routes that can be navigated by pilotage unless that aircraft is equipped with—

(1) Two-way radio communication equipment necessary under normal operating conditions to fulfill the functions specified in paragraph (a) of this section; and

(2) Navigation equipment suitable for the route to be flown.

■ 54. Revise § 135.165 to read as follows:

§ 135.165 Communication and navigation equipment: Extended over-water or IFR operations.

(a) *Aircraft navigation equipment requirements—General.* Except as provided in paragraph (g) of this section, no person may conduct operations under IFR or extended over-water unless—

(1) The en route navigation aids necessary for navigating the aircraft along the route (e.g., ATS routes, arrival and departure routes, and instrument approach procedures, including missed approach procedures if a missed approach routing is specified in the procedure) are available and suitable for use by the navigation systems required by this section:

(2) The aircraft used in extended over-water operations is equipped with at least two-approved independent navigation systems suitable for navigating the aircraft along the route to be flown within the degree of accuracy required for ATC.

(3) The aircraft used for IFR operations is equipped with at least—

(i) One marker beacon receiver providing visual and aural signals; and

(ii) One ILS receiver.

(4) Any RNAV system used to meet the navigation equipment requirements of this section is authorized in the certificate holder's operations specifications.

(b) *Use of a single independent navigation system for IFR operations.* The aircraft may be equipped with a single independent navigation system suitable for navigating the aircraft along the route to be flown within the degree of accuracy required for ATC if:

(1) It can be shown that the aircraft is equipped with at least one other independent navigation system suitable, in the event of loss of the navigation capability of the single independent navigation system permitted by this paragraph at any point along the route, for proceeding safely to a suitable airport and completing an instrument approach; and

(2) The aircraft has sufficient fuel so that the flight may proceed safely to a suitable airport by use of the remaining navigation system, and complete an instrument approach and land.

(c) *VOR navigation equipment.* Whenever VOR navigation equipment is required by paragraph (a) or (b) of this section, no person may operate an aircraft unless it is equipped with at least one approved DME or suitable RNAV system.

(d) *Airplane communication equipment requirements.* Except as permitted in paragraph (e) of this section, no person may operate a turbojet airplane having a passenger seat configuration, excluding any pilot seat, of 10 seats or more, or a multiengine airplane in a commuter operation, as defined in part 119 of this chapter, under IFR or in extended over-water operations unless the airplane is equipped with—

(1) At least two independent communication systems necessary under normal operating conditions to fulfill the functions specified in § 121.347(a) of this chapter; and

(2) At least one of the communication systems required by paragraph (d)(1) of this section must have two-way voice communication capability.

(e) *IFR or extended over-water communications equipment requirements.* A person may operate an aircraft other than that specified in paragraph (d) of this section under IFR or in extended over-water operations if it meets all of the requirements of this section, with the exception that only one communication system transmitter

is required for operations other than extended over-water operations.

(f) *Additional aircraft communication equipment requirements.* In addition to the requirements in paragraphs (d) and (e) of this section, no person may operate an aircraft under IFR or in extended over-water operations unless it is equipped with at least:

(1) Two microphones; and

(2) Two headsets or one headset and one speaker.

(g) *Extended over-water exceptions.* Notwithstanding the requirements of paragraphs (a), (d), and (e) of this section, installation and use of a single long-range navigation system and a single long-range communication system for extended over-water operations in certain geographic areas may be authorized by the Administrator and approved in the certificate holder's operations specifications. The following are among the operational factors the Administrator may consider in granting an authorization:

(1) The ability of the flight crew to navigate the airplane along the route within the degree of accuracy required for ATC;

(2) The length of the route being flown; and

(3) The duration of the very high frequency communications gap.

§ 135.225 [Amended]

■ 55. Amend § 135.225(c)(2) and (e) by revising the reference ''DH'' to read ''DA/DH''.

§ 135.345 [Amended]

■ 56. Amend § 135.345(a)(7) by removing the term ''DH'' and adding in its place the term ''DA/DH''.

§ 135.371 [Amended]

■ 57. Amend § 135.371(c)(2) by removing the word ''radio''.

§ 135.381 [Amended]

■ 58. Amend § 135.381(b)(2) by removing the word ''radio''.

Issued in Washington, DC, on May 24, 2007.

Marion C. Blakey,

Administrator.

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