

Captain Chester L. Ekstrand
Vice President
Regulatory Affairs
Commercial Airplanes

The Boeing Company
P.O. Box 3707 MC 67-UX
Seattle, WA 98124-2207

July 7, 2003

U.S. Department of Transportation
Docket Management System
Docket No. FAA-2002-14002
Room PL 401
400 Seventh Street SW
Washington, DC 20590-0001



Subject: Comments to **Docket No. FAA-2002-14002**, Notice of Proposed Rulemaking (NPRM) Notice 02-20, "Area Navigation (RNAV) and Miscellaneous Amendments"

Reference: NPRM published in the Federal Register on December 17, 2002 (67 FR 77326) and Partial Reopening of Comment Period published on April 8, 2003 (68 FR 16992)

Dear Sirs:

Boeing Commercial Airplanes has reviewed the subject NPRM and, in general, we support its goal and intent, which is to update obsolete provisions of current rules related to RNAV and instrument approach, and to provide technology incentives for airspace evolution where technically valid. Its proposed changes, such as updating regulatory provisions to accept use of RNAV based systems where only navaid specific systems were formerly acceptable, is very appropriate. Similarly, updating concepts to improve the safety of instrument flight operations, such as recommended by the Commercial Aviation Safety Team (CAST) or Aviation Rulemaking Advisory Committee (ARAC) and international All-Weather Operations Harmonization effort, is also appropriate.

However, the concepts in this NPRM will have adverse effects in relation to technology evolution and safety. A final rule addressing the family of provisions in this NPRM should not be issued without major revisions along the lines suggested in the enclosures to this letter.

Because of the nature of the concerns with the current wording of the NPRM, we suggest that any subsequent revisions to the NPRM be coordinated through both the All-Weather Operations Harmonization process (AWO) and FAA Terminal Area Operations Review (TAOARC) processes, and should be consistent with other related NPRMs.

Examples of the critical areas of the NPRM for which we have concern include, but are not limited to, the following:

1. The proposed changes to 14 CFR §91.175 for takeoff and landing minima are inconsistent with air carrier operations specifications criteria and widely accepted FAA Advisory Circulars 120-28D and 120-29A. They do not leave adequate allowance for anticipated technological developments. We have proposed an alternative text for §91.175 in the attachments to this letter.
2. The NPRM retains or introduces inappropriate terms, such as "non-precision approach," and uses new and non-standard terms where industry-accepted terms are already available for use [for example, failing to use accepted terms such as DA(H)].
3. The NPRM introduces requirements for air carriers to follow certain departure paths that
 - contradict other regulatory requirements (for example, contradicting paths required by §121.189),
 - could be unsafe in non-normal circumstances, and
 - could have significant adverse economic impact for little or no safety benefit.
4. The NPRM fails to address needed changes to support Required Navigation Performance (RNP) operations, such as allowing RNP credit in lieu of using the current fixed 4-mile route widths, or appropriately updating autopilot use rules to support evolving RNP operations. (See needed changes to §121.579 proposed by the ARAC- and JAA-sponsored Flight Guidance Harmonization Working Group.)
5. The NPRM's provisions are inconsistent with movement toward a performance-based International Airspace System (INAS), and are inconsistent with important applications of RNP.
6. The NPRM sets precedents with regard to inappropriate definitions and concepts that are inconsistent with, and adversely interfere with, necessary "global" navigation systems evolution (for example, inappropriate introduction of terms like "PFAF," and incorrect and inappropriate conceptual use of instrument approach Categories such as "Category I, II, and III.")
7. The NPRM is not currently consistent with some key FAA criteria (for example, 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"), or the direction towards which key large aircraft manufacturers and operators need to evolve for future navigation systems or operational capability. If adopted without significant change, any final rule based on this NPRM could unnecessarily restrict and inhibit beneficial and necessary evolution of GNSS and RNP related systems and applications.



8. The NPRM unnecessarily proposes changes to aircraft equipment requirements for provisions such as §121.349, and inappropriately revises provisions such as distance measuring equipage (DME) requirements above FL180, instead of the current FL240.
9. The NPRM inappropriately attempts to incorporate criteria such as FAA Order 8260.3, "TERPS," into the regulations by reference, to the presumed exclusion of other criteria that may be more appropriate and safer.



In light of these concerns, we request that the FAA take the following specific actions:

- Delegate the editing of this NPRM to both the AWO and TAOARC groups, so that a subsequent Notice can be issued that will incorporate and integrate provisions of a significantly revised NPRM, replacing both this RNAV NPRM and the previously-issued Alaska GNSS NPRMs. Adjust any comment deadlines and revision proposals to a mutually consistent milestone timeline. Do not issue this rule alone, and particularly do not issue it in a condition inconsistent with the AWO and TAOARC-revised NPRM.
- Assure that any revised or amended NPRM is consistent with evolving provisions for international harmonization and GLS, RNP, and a "performance-based INAS."

Our detailed comments are included in the three enclosures. We trust that the FAA will full consider them prior to further action on this rulemaking project.

Please direct any comments or questions to Ms. Jill DeMarco of this office at (425) 965-2015.

Sincerely,

A handwritten signature in black ink, appearing to read 'Chet Ekstrand', written over a white background.

Captain Chet Ekstrand
Vice President, Regulatory Affairs
Boeing Commercial Airplanes

3 Enclosures:

1. **Enclosure 1** - Comment summary and general comments on NPRM
2. **Enclosure 2** - Line-by -Line detailed comments and recommendations for revising NPRM
3. **Enclosure 3** - Recommended revised text of §91.175

ENCLOSURE 1

Comments from Boeing Commercial Airplanes: Comment Summary and General Comments

Boeing has identified several issues within the NPRM that require reconsideration, revision, or deletion. In addition, we consider that certain concepts should be excluded from the regulations, but included instead in reference material; doing so would permit more appropriate and flexible responses to advancing procedure design where criteria and capabilities are likely to significantly evolve in the near future. Some of the proposed regulatory elements in the NPRM are unnecessary, and would unduly constrain procedural and technical evolution. Some should be further coordinated through both the AWO and TAOARC processes to ensure usability and harmonization with international standards. These items are explained in detail below:

1. Required Navigational Performance (RNP) operation:

The NPRM should be revised to make specific accommodations for RNP operation in its preamble and throughout the associated rules. As written, the FAA is missing an opportunity in this NPRM to leverage advancements in flight management systems (there have been numerous successful implementations of this valuable development). Specific mention of RNP should be made in several locations (as noted in Enclosure 2). Provisions especially should be made to allow RNP-based route width considerations, instead of specifying a 4nm lateral clearance requirement.

2. Category I, II, and III Definitions:

Definitions for Category I, II, and III should be deleted entirely from the regulations and retained only in guidance materials, such as AC 120-28D, AC 120-29A, the Airman's Information Manual (AIM) and, as necessary, new or revised ACs related to RNP (such as the upcoming revision to AC 90-45A, "Approval of Area Navigation Systems for use in the U.S. National Airspace System." If adopted, this NPRM will likely cause significant harm to evolution of low visibility landing programs and airborne systems. Category I is not currently limited to, and should not in the future be limited to, use of only one sensor system or technique, such as ILS. This is to ensure consistent application of harmonized criteria for minima across systems, procedures, and methods.

Additionally, the definitions in the NPRM are inconsistent with current standard Operations Specifications usage, and are different from those used in current FAA Advisory Circulars AC 120-28D and AC 120-29A (which contain appropriate and correct definitions).

3. Precision Approach (PA) and Non-Precision Approach (NPA):

The terms “precision approach” and “non-precision approach” are outdated and have lost their meanings. Their use should be discontinued beginning with this rule, and they should be removed from the NPRM. These obsolete terms and concepts do not appropriately address modern avionic systems, flight procedure methods, criteria used (e.g., linear versus angular criteria), safety risk, path-following performance, necessary flight path provisions, failure responses, or nav aids/ sensor systems used. We suggest the use instead of the more general term “instrument approach” where necessary in the rule. Until removed or revised, any references to “non-precision approach” that remain in other sections of 14 CFR should now be interpreted to mean any type of instrument approach other than Instrument Landing System (ILS), Microwave Landing System (MLS), or GPS Landing System (GLS).

4. Approach Procedure with Vertical Guidance (APV):

The new term “approach procedure with vertical guidance (APV)” and the criteria proposed to be used in conjunction with it are unnecessary and contradictory to existing harmonized guidance material. Further, they are not consistent with other important criteria related to RNAV and RNP that are either currently entering use, or have already been used for aircraft design for key elements of the future air carrier fleet (including RNP and Baro VNAV). The term “APV” and text related to it should be removed from this NPRM.

5. Decision Height (DH):

All references to “decision height” and “DH” should be replaced with “decision altitude (height)” or “DA(H).” Similarly, usage of the term “minimum decision height” would become “minimum decision altitude (height)” or “MDA(H).” Further, the use of “DA/DH” should be dropped, as well as the distinction of its definition with respect to non-precision approaches. This would clearly cover situations where minimums are based upon barometric altitude (decision altitude) in feet above mean sea level (MSL) and where minimums are based upon height above ground level (AGL) or height above the touchdown zone (decision height.) With these changes, the FAA’s regulations would then be consistent with ICAO and harmonized terminology, and would more accurately describe when visual reference requirements apply to continue an approach below the authorized minima or make a missed approach. Further, use of the commonly applied terms “DA(H)” and “MDA(H)” in existing operators procedures manuals and training programs would save any unnecessary economic burden of revision of large numbers of existing documents unnecessarily.

6. Change of Meaning of “Height Above Touchdown (HAT)”:

The proposed change of meaning of “height above touchdown (HAT)” should not be adopted via this NPRM. It needs additional discussion among the AWO and TAOARC. It is not merely a terminology change. For applications like procedure construction, autoland, or head-up display (HUD) landing capability design, or other uses, it could have adverse consequences that need to be technically considered and addressed. If any change is to be made at all, it first should be addressed via AWO

coordination; then subsequently via coordinated changes to FAA ACs 120-28D and AC120-29A, JAA references; and then finally updated in other related US references, such as FAA Order 8430.6

7. Redefinition of “Night”:

The proposed redefinition of "night" is unnecessary and should be removed from this NPRM. The distinctions being drawn or inferred between day and night for instrument procedure design or specification are inappropriate. If instrument procedures are properly designed, there is no need to draw this subtle distinction or make a change. Either the visual reference requirements of §91.175 are met at minima, or they are not. This re-definition of “night” risks introducing retroactive confusion with millions of pilots’ and operators’ logbook systems and time calculations, and provides no safety benefit.

8. Proposed Revisions to Section 91.175, Takeoff and Landing Under IFR

Section 91.175 should be restructured to accommodate comments in this letter. We have provided proposed version in Enclosure 2. Further, an additional paragraph should be added to explicitly facilitate introduction of new technology for low visibility approach and landing, when it can be shown to be safe and appropriate, and specifically allowing the Administrator to make such authorizations through Operations Specifications or other means.

9. Proposed Section 71.11, Air Traffic Service (ATS) Routes

The introduction to FAR 71.11 should be revised to include language to allow the FAA to use alternative criteria when necessary, or alternative means of authorization, or alternative provisions in addition to Order FAA 8260.3

10. Lowering Altitude Above Which DME is Required:

The altitude above which DME is required should not be lowered from FL240 to FL180, as proposed in the NPRM [i.e., §91.205(e)]. The reason DME was originally specified above FL240 was to address lead turn radius at high true airspeed, not necessarily to correlate with airspace definition. FL240 should be retained, and RNAV methods should also be permitted in lieu of DME as proposed.

11. Proposed Section 97.1(b), Departure Procedures:

The proposed §97.1(e) is in conflict with §121.189 (Airplanes: Turbine engine powered: Takeoff limitations) and should not be adopted without major revision. It would create significant air carrier safety problems and takeoff weight penalties with no safety benefit in return. It essentially invalidates current air carrier takeoff analyses at many locations where §121.189 compliance requires use of a different safe engine-out flight path than is specified for ATS departure procedures, or by an

all-engine departure defined path using criteria of U.S. TERPS. As written, it does not appear to accommodate elements of safe flight, including necessary weather deviations and non-normal situations such as engine failure. If the objective is intended to be coordinated with air traffic control, then it would not be appropriate to be specified in Part 97. If specified at all, it would need to be cited in Part 91, or alternatively in Part 121, 135, 125, or 129.

12. Section 97.10, (Standard Instrument Approach) Procedures: General:

Section 97.10, which describes standard instrument procedures “other than those based on the...TERPS,” should be retained, rather than removed as proposed, for later application of internationally harmonized criteria.

13. Section 97.20, General:

FAA Orders 8260.3 and 8260.19 should not be incorporated into the Code of Federal Regulations, as proposed in §97.20. The requirements for developing and processing instrument procedures do not need to be included in the regulations, where they would become even more difficult to change, thus unduly constraining procedural and technical evolution. We request that the FAA explain need for the change and the safety benefits to be derived from it, since this is not clearly explained in the preamble and is not otherwise apparent.

14. Section 121.99, Communications Facilities:

The proposed “4-minute” response time stated in this section is arbitrary and is inappropriate for many ordinary circumstances. In the preamble to the FAA, the FAA cites a 26-year-old regional legal opinion as the basis for this time period does not recognize modern operational procedures or technical capabilities. The assumptions made about communication methods, limitations, and capabilities are incorrect -- not all Part 121 operators even need have a dispatch function, per se. Further, we maintain that the FAA reconsider requiring “two-way voice communication” as the only permissible communication method, as this unduly restrains use of advancing technologies.

15. Section 121.351, Communication and Navigation Equipment for Extended Over-Water Operations and for Certain Other Operations

Proposed §121.351(c)(3), which addresses VHF communication gaps, should be revised to add specific accommodation of SATCOM, broadband, or other specialized communication system gaps, as well as VHF.

16. Section 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

- In response to the FAA's specific request for comments on one portion of §121.349, we maintain that the FAA should always strive to adopt a broad performance-based rule language rather than a narrow, prescriptive language requiring specific systems. This principle should be applied in general, and not be limited to §121.349, in order to encourage safe and efficient technical advancements without continually having to revise the regulations to accommodate them.
- The proposed language of §121.349 could be construed to restrict operations with GPS to areas that are within the service volume of the VOR/DME network. This would be an unacceptable and unproductive limitation against implementation of RNAV and RNP. Regarding independence of navigation systems, allowance for flying instrument approaches with a single navigation system should place an obligation on operators to ensure safe operations following failure of that single system. There are no standards for determining which systems are independent and which are not. Two GPS (or other satellite navigation) receivers should be considered independent.

17. Section 121.579, Minimum Altitudes for Use of Autopilot

It is important that the FAA take the opportunity created by issuing this NPRM to revise §121.579 by adopting text provided by the FAA/JAA/Industry Flight Guidance System Harmonization Working Group. The proposed revision to change only the usage of decision height is not sufficient and does not reflect current industry thinking. The detailed proposed text is provided in Enclosure 2..

18. Pilot vs. Person

We maintain that it is not necessary to change the word "pilot" to "person" in various locations in the proposed text. Pilots fly aircraft. The present term and definition are perfectly clear and adequate.

ENCLOSURE 2

Comments from Boeing Commercial Airplanes: Line-by-Line Detailed Comments and Recommendations for Revising NPRM

This enclosure contains our recommended line-by-line text changes for the NPRM. We have imbedded our comments directly in the NPRM document and have highlighted them as follows:

- ~~Strike-through~~ text = Text recommended to be deleted
 - **Red/Italic/Underlined** text = Text to be added
 - **Blue** text = Comment
-

[Federal Register: December 17, 2002 (Volume 67, Number 242)]
[Proposed Rules
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr17de02-20

Part II

Federal Aviation Administration

14 CFR Parts 1, et al.

Area Navigation (RNAV) and Miscellaneous Amendments; Proposed Rule

[[Page 77326]]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 1, 71, 91, 95, 97, 121, 125, 129, and 135

[Docket No. FAA-2002-14002; Notice No. 02-20]
RIN 2120-AH77

Area Navigation (RNAV) and Miscellaneous Amendments

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA is proposing to amend its regulations to reflect technological advances that support area navigation (RNAV); make certain terms consistent with those of the International Civil Aviation Organization; remove the middle marker as a required component of instrument landing systems; and clarify airspace terminology. The proposed changes are intended to facilitate the transition from ground-based navigation to new reference sources, enable advancements in technology, and increase efficiency of the National Airspace System.

DATES: Send your comments on or before ~~January~~ **October** 31, 2003.

ADDRESSES: Address your comments to the Docket Management System, U.S. Department of Transportation, Room PL 401, 400 Seventh Street, SW., Washington, DC 20590. You must identify the Docket number FAA-2002-14002 at the beginning of your comments, and you should submit two copies. If you wish to receive confirmation that FAA has received your comments, include a self-addressed, stamped postcard on which the Docket number appears.

You may also submit comments through the Internet to <http://dms.dot.gov>. You may review the public docket containing comments to these proposed regulations in person in the Dockets Office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The Dockets Office is on the plaza level of the Nassif Building at the Department of Transportation at the above address. Also, you may review public dockets on the Internet at <http://dms.dot.gov>.

FOR FURTHER INFORMATION CONTACT: Lawrence Buehler, 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:

Comments Invited

The FAA invites interested persons to participate in this rulemaking by submitting written comments, data, or views. The FAA also invites comments on the environmental, energy, federalism, or economic impacts that might result from adopting the proposals in this document. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA asks that you send two copies of written comments.

The FAA will file all comments received, as well as a report summarizing each substantive public contact with FAA personnel in the docket. The docket for this rulemaking is available for public inspection before and after the comment closing date. You can review the docket in person or using the Internet (see Addresses above).

Before acting on this proposal, the FAA will consider all comments it receives on or before the closing date for comments. The FAA will consider comments filed late if it is possible to do so without incurring expense or delay. The FAA may change this proposal in light of comments.

Availability of Rulemaking Documents

You can get an electronic copy of this document by taking the following steps:

(1) Go to the search function of the Department of Transportation's electronic Docket Management System (DMS) Web Page (<http://dms.dot.gov/search>).

(2) On the search page, type in the last digits of the docket number shown at the beginning of this notice. Click on "search."

(3) On the next page, which contains the docket summary information for the docket you selected, click on the document number of the item you wish to review.

You can also get an electronic copy using the Internet through the Office of Rulemaking's Web Page at <http://www.faa.gov/avr/armhome.htm> or the Government Printing Office's Web Page at http://www.access.gpo.gov/su_docs/aces/aces140.html

You can also get a copy by submitting 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 docket number, or notice number with amendment number, of this rulemaking.

Guide to Terms and Acronyms Used in This Document

AGL--Above ground level

~~APV--Approach procedures with vertical guidance~~ [\[Rationale for revision is explained later in comments\]](#)

ASR--Airport surveillance radar

ATS--Air Traffic Service

~~DA--Decision altitude~~ [\[Rationale for revision is explained later in comments\]](#)

~~DH--Decision height~~ [\[Rationale for revision is explained later in comments\]](#)

DA(H) Decision Altitude (Height)

DME--Distance measuring equipment

FL--Flight level

GPS--Global Positioning System

ICAO--International Civil Aviation Organization

IAP--Instrument approach procedure

IFR--Instrument flight rules

ILS--Instrument landing system

MAA--Maximum authorized IFR altitude

MCA--Minimum crossing altitude

MDA--Minimum descent altitude

MEA--Minimum en route IFR altitude

MOCA--Minimum obstruction clearance altitude

MSL--Mean sea level

NAS--National Airspace System

NAVAID--Navigational aid

NDB--Nondirectional beacon

NM--Nautical mile

OEP--Operational Evolution Plan

Over the top--Over the top of clouds

PANS--Procedures for Air Navigation Services

PAR--Precision approach radar

RNAV--Area navigation

RVR--Runway visual range

SARPs--International Standards and Recommended Practices

SIAP--Standard Instrument Approach Procedure

~~TLOF--Touchdown and lift-off area~~ [\[Rationale for revision is explained later in comments\]](#)

VOR--Very high frequency omnidirectional range

VORTAC--VOR omnidirectional range/tactical air navigation

Outline of the Preamble

[Update outline per discussions to follow in the body of these comments:]

- I. Background
 - I.A. Area Navigation (RNAV)
 - I.B. Recent Technological Improvements
 - I.C. International Standardization
 - I.D. Middle Markers and Outer Markers
 - I.D.1. Elimination of Middle Markers
 - I.D.2. Substitutes for Outer Markers
 - I.E. Operational Evolution Plan (OEP)
- II. General Discussion of the Proposals
 - II.A. RNAV
 - II.B. ICAO
 - II.C. Middle and Outer Markers
 - II.D. Changes in Terminology
 - II.D.1. Decision **Altitude (Height) (DA(H))** and ~~Decision Altitude (DA)~~
[rationale for revision is explained later in comments]
 - II.D.2. RNAV
 - II.D.3. En Route
 - II.D.4. Approach and Landing Using Instrument Approach Procedures
- III. Section-by-Section Discussion of the Proposed Changes
- IV. Paperwork Reduction Act
- V. International Compatibility

[[Page 77327]]

- VI. Economic Evaluation
- VII. Regulatory Flexibility Determination
- VIII. International Trade Impact Analysis
- IX. Unfunded Mandate Assessment
- X. Executive Order 13132, Federalism
- XI. Environmental Analysis
- XII. Energy Impact

I. Background

I.A. Area Navigation (RNAV)

Historically, the principal means of air navigation for instrument flight rules (IFR) operations in the United States National Airspace System (NAS) has been a system of ground-based navigation aids (NAVAIDs), including nondirectional beacon (NDB), very high frequency omnidirectional range (VOR), and distance measuring equipment (DME). Airways and instrument procedures were developed using these NAVAIDs; however, this has required pilots to fly directly toward, or away from, the NAVAID. This limitation has resulted in less-than-optimal routes and instrument procedures, and contributed to an inefficient use of airspace.

The advent of area navigation (RNAV) in the 1960's provided enhanced navigation capabilities to the pilot. Early RNAV allowed properly equipped aircraft to navigate via a user-defined track without the need to fly directly toward or away from a ground-based navigation aid. Early RNAV systems still relied, however, on signals from a ground-based NAVAID for source information to calculate navigational position information. To take advantage of this improved navigation capability, in the 1970's, the FAA began to publish a series of instrument approach procedures (IAPs) and routes for use by RNAV-equipped aircraft. A nationwide system of high-altitude RNAV routes was established consisting of approximately 156 route segments.

These fixed routes still depended on reference to ground-based NAVAIDs. The FAA later determined that most aircraft using RNAV in the en route system were doing so on a random basis using inertial navigation systems (INS) with little use being made of the fixed high altitude RNAV route structure. Operators were using RNAV by going from point to point. They were not using the high-altitude RNAV route structure that was designed and published by the FAA. This minimal use of the charted RNAV routes proved insufficient to justify their retention on a cost-benefit basis. As a result, in January 1983, the FAA revoked all high altitude RNAV routes in the coterminous United States. The RNAV routes in the State of Alaska were retained and remain in use today because of the scarcity of ground-based navigational aids there.

I.B. Recent Technological Improvements

The technology that evolved over the past 40 years gave avionics systems increased positional accuracy, which provided users with a greater ability to fly direct routes between any two points. **The increasing use of Flight Management Systems (FMS) and electronic map displays in the 1980s significantly increased the ability of the mainstream IFR air carrier and business aircraft fleets to fly both direct routings and RNAV arrival, departure, and instrument approach procedures. Significant fractions of the air carrier fleet were equipped with lateral navigation and vertical navigation RNAV capability (LNAV and VNAV), for which corresponding suitable instrument procedures allowing airspace use benefits were slow to be introduced in the national and international airspace system.** In recent years, satellite navigation using the Global Positioning System (GPS) has provided even greater flexibility in defining routes, establishing instrument procedures, and designing airspace. When GPS is combined with existing RNAV system capabilities, continuous course guidance is available over longer routes than are possible with ground-based NAVAIDs, which have limited coverage due to terrain or signal reception restrictions. **The move toward international acceptance of Global Navigation Satellite Systems (GNSS), which include both the US GPS system and prospective new systems like Europe's Galileo hold the prospect for a yet more robust source of navigation information for RNAV systems including FMS.** Augmented GPS also introduces the ability to provide **improved accuracy and integrity for RNAV operations, particularly for operations near or at an airport,** vertical guidance information for nonprecision instrument approaches. **Additionally, use of VNAV in conjunction with area navigation, whether using barometric altimetry with RNAV (e.g., Baro VNAV) or GNSS based paths have** This has the potential to significantly reduce the risk of accidents caused by controlled flight into terrain (CFIT), **by providing safe defined vertical and lateral paths descending to a runway, or departing from a runway.**

Major new advances in navigation systems and procedures definition and airspace use have been introduced in the past decade with the introduction of Required Navigation Performance (RNP) capability with FMS, for both instrument approach and departure procedures, and for enroute operations. This is consistent with both global plans for navigation evolution specified by ICAO, and with many states or global regions navigation plans. Current new air carrier aircraft of major global air carrier operators are virtually all being delivered with RNP capability, and airspace plans worldwide are now basing future evolution on use of RNP capability, for areas of operation, routes, or procedures.

As a result of these technological advances, the FAA has implemented a number of RNAV routes for use by air carriers operating suitably equipped aircraft in the northeast, southeast, and southwest regions of the United States. The results so far have demonstrated the potential of RNAV, when used with new navigation reference sources, such as **RNAV systems such as FMS or** GPS. The entire NAS can be realigned by using more direct and user-preferred routes,

thus achieving greater system flexibility, efficiency, and capacity. **Instrument approach and departure capability and safety can be improved by increasingly implementing RNP capability.**

Air navigation is expected to become increasingly dependent on RNAV systems that navigate with reference to geographic positions specified in latitude and longitude coordinates, **consistent with RNP,** rather than to or from a ground-based navigation aid. Reliance on RNAV, **and RNP** in the NAS will expand as enhancements to GPS are developed and deployed, increasing its accuracy and reliability.

The changes proposed in this NPRM would facilitate the use of RNAV **and RNP** throughout all phases of flight (departure, en route, and approach), which is a goal of the Free Flight program. The Free Flight program is designed to enhance the safety and efficiency of the NAS. It moves the NAS from a centralized command-and-control system between pilots and air traffic controllers to a system that allows pilots, whenever practical, to choose their own routes and file flight plans that follow the most efficient and economical routes. The changes proposed in this NPRM would result in greater flexibility in air traffic routing, instrument approach procedure design, and airspace use than is now possible under a ground-based system structure. The improved navigation accuracy and flexibility would enhance both system capacity and overall flight safety, and would promote the Free Flight concept in the NAS by enabling the NAS to move from **exclusive** reliance on ground-based NAVAIDs.

I.C. International Standardization

The International Civil Aviation Organization (ICAO) is an agency of the United Nations that promotes the development of uniform worldwide procedures and standardization to ensure the safety and efficiency of international civil aviation operations. ICAO's standards are found in the 18 Annexes to the Convention on International Civil Aviation. To achieve this standardization, ICAO publishes various International Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS). This proposal is part of a continuing effort to recognize the advent of new technologies and international efforts to create a seamless air traffic system by making the terms used in FAA's regulations consistent with ICAO terminology, **where appropriate. It also establishes a basis for recommendations for continued evolution of ICAO terminology or procedures where that terminology or those procedures are outdated or no longer suitable.**

I.D. Middle Markers and Outer Markers

Middle and outer markers are beacons that define points along the glide path on an instrument landing system (ILS) approach. An outer marker is usually located at or near the glide path intercept point of an ILS approach, normally 4 to 7 miles from the runway threshold. A middle marker indicates a position approximately 3,500 feet from the landing threshold. This is normally located near the point where an aircraft on the glide path will be at an altitude of approximately 200 feet above the elevation of the runway touchdown zone. For a ~~Category I~~ **an** ILS approach **to Category I minima,** this coincides with the decision height, or the height at which a pilot must decide whether to continue the approach to landing or execute a missed approach procedure **established visual reference to continue to landing.** This proposal would eliminate the middle marker as a required ILS component and would enable the use of other navigation means to substitute for the outer marker beacon.

I.D.1. Elimination of Middle Markers

According to instrument procedure design criteria, all required components must be operational in order for the pilot to fly the ILS to the lowest authorized approach minimums. Originally, the

middle marker was a required component of an ILS. Terminal instrument procedure design criteria required that, when the middle marker was inoperative, a penalty was applied to increase the published landing minimums to compensate. The higher minimums imposed by these penalties could result in the pilot being unable to land at that destination.

In January 1988, through Operations Specifications, the FAA eliminated the landing penalties of increased landing minimums for 14 CFR part 121 and part 135 operators conducting ILS approaches with inoperative middle markers. The justification for this change was the long-term operational success experienced by European air carriers and the U.S. Department of Defense when not using middle markers and when not applying penalties for inoperative middle markers. On December 4, 1990, therefore, the FAA removed the inoperative middle marker landing minimum penalties for all operators through change 10 to the Terminal Instrument Procedures (TERPS).

~~In June 1992, the FAA completed an evaluation of the operational effectiveness and safety benefits of middle markers during ILS operations and issued a document entitled "Middle Marker Evaluation Project." A copy of the evaluation has been placed in the docket for this rulemaking. That evaluation studied 165 missed approaches—83 with the middle marker operative, and 82 with the middle marker inoperative. The approaches were conducted by 18 pilots. Two pilots worked for the FAA, and 16 worked, or had worked, in corporate aviation. None of the pilots was told the objective of the flight test until after the flight test. The result of the evaluation was that there was no significant difference in pilot performance while conducting an ILS approach with or without a middle marker. Consequently, on~~

COMMENT: The above referenced study was a controversial and significantly technically flawed study, and therefore should not be referenced. The real reason why the MMs were removed as an ILS requirement at that time was principally because the air carrier experience with the revised Op-Spec was entirely satisfactory, and the reasons for requiring the MM had diminished. Additionally most air carrier aircraft and many GA business aircraft were equipped with one or more of RA, DME, or RNAV systems. Further, there were many global ILS approach procedures that were safely being used which did not even have a MM installed (e.g., "over water" approaches) .

On October 15, 1992, the landing minima penalties for conducting an ILS approach with an inoperative middle marker were removed for the Standard Instrument Approach Procedures (SIAPs). This action was taken because the FAA has determined that middle markers are redundant and are no longer needed for safety. The FAA is therefore proposing that the requirement for middle markers be removed from its regulations.

I.D.2. Substitutes for Outer Markers

The outer marker is another required component of the ILS. In lieu of a marker beacon, a compass locator transmitter, DME, or airport surveillance radar (ASR) may be used to identify the outer marker position. This proposal would allow the use of waypoints for outer markers, resulting in additional flexibility in airspace utilization and procedure design.

I.E. Operational Evolution Plan (OEP)

This proposal would address a portion of the FAA's Operational Evolution Plan (OEP), which is the FAA's overall plan to modernize the NAS. The OEP has several components, including ones to alleviate en route congestion, increase arrival and departure rates at airports, improve response to en route severe weather, and improve operational procedures and tools for operations in poor airport weather conditions. Task 3.2 of the OEP states that arrival and departure routes should be constructed independent of navigation aids. A subordinate task is to review and update the Code of Federal Regulations to allow for routing independent of ground-based navigation aids.

II. General Discussion of the Proposals

II.A. RNAV

The expanded use of RNAV, RNP, and GPS navigation would fully support the FAA's Free Flight concept. RTCA's Task Force 3 issued a report in 1995 in which it defined the implementation of a concept to move from today's largely ground-based system by applying current technologies. (See "Final Report of RTCA Task Force 3, Free Flight Implementation," October 26, 1995/November 1995. Copies are available for purchase from RTCA, 1828 L St. NW., Suite 805, Washington, DC 20036 (telephone 202-833-9339).

COMMENT: If RTCA TF3 is referenced here, so too should RTCA TF4's important report, which noted FAA's need to modernize instrument procedures and procedure development such as using RNP and VNAV for approach. Similarly, CAST should be referenced in terms of its support for RNAV, RNP, and VNAV for approach.

Although the immediate effect of the proposed amendments would be to allow increased use of RNP and VNAV, using GPS as a sensor, the proposed terminology changes would also be broad enough to allow for new technologies as they become available and are approved for use.

II.B. ICAO

As an ICAO Contracting State, the United States strives to adhere to the rules and procedures set forth in the ICAO SARPs and PANS as much as to the extent appropriate or possible. For example, in 1993, the United States reclassified its domestic airspace to adopt, in part, the ICAO airspace classifications (i.e., Class A, Class B, etc.) outlined in Annex 11 to the Convention. In formulating this NPRM, the FAA has an opportunity to make additional terminology in its regulations consistent with ICAO. The current U.S. terminology for naming routes differs from that used by ICAO. Through this proposal, the United States would adopt the ICAO term "Air Traffic Service (ATS) Route" to describe the U.S. en route structure. Other examples of how this proposal would promote compatibility with ICAO include the proposed addition of the term "decision altitude **(height) [DA(H)]** (DA)," and the proposed change of the abbreviation of HAT from "height above touchdown" to "height above threshold." The proposed changes would be a step in bringing U.S. terminology closer to fulfilling the United States' responsibilities as an ICAO member.

COMMENT: This proposed change of meaning of "HAT" needs additional AWO and TAOARC discussion. This is not just a terminology change. For applications like procedure construction, autoland, or HUD landing capability design, or other uses, it could have more far reaching adverse consequences that need to be technically considered and addressed. Hence, this change should not be adopted via this NPRM. If done at all later, it should be first addressed via AWO coordination, then subsequently via coordinated changes to FAA ACs 120-28D and AC120-29A, JAA references, and then finally updated in other related US references such as FAA Order 8430.6.

II.C. Middle and Outer Markers

In addition to the proposed amendments regarding RNAV, the FAA is proposing to update its regulations to eliminate the middle marker as a required basic ground component of an ILS, and to increase the number of acceptable substitutes for the outer marker component of an ILS. These amendments would facilitate flexibility in the development of new instrument approach procedures.

II.D. Changes in Terminology

The following are subject areas in which the FAA is proposing to change the terminology in its regulations. For specific sections that are amended, see "III. Section-by-Section Discussion of the Proposed Changes" in this preamble. II.D.1. Decision Altitude (Height) [DA(H)] (DH) and Decision Altitude (DA)

References to "decision height" and "DH" are being replaced with references to "decision altitude (height)" and "DA," [DA(H)] respectively. W, where minimums are based upon barometric altitude this is applied as a decision altitude, which is expressed in feet above mean sea level (MSL). In contrast, where minimums are based upon height above ground level (AGL) or height above the touchdown zone, the term decision height (DH) is used. These changes are being proposed to make the FAA's regulations consistent with ICAO and international terminology and to more accurately describe when the decision visual reference requirements apply to continue the an approach below the authorized minima or make a missed approach is made. II.D.2. RNAV

The FAA is proposing to revise the definition of "area navigation (RNAV)." The FAA is also proposing to remove references to the words "ground" and "radio" where using these words restricts the type of navigation and communication systems persons can use. The amendments would either replace those words with less restrictive language or remove them entirely, which would allow the expanded use of RNAV systems and permit persons to take advantage of future changes in technology.

[[Page 77329]]

II.D.3. En Route

The FAA is proposing new terms, Air Traffic Service (ATS) route and "area navigation (RNAV) route."

"Air Traffic Service (ATS) route" would be used to describe the U.S. en route structure. The term "ATS route" would include Federal airways, jet routes, and area navigation routes in the United States.

"Area navigation (RNAV) route" would refer to ATS routes established for the use of aircraft capable of using area navigation.

Note that not all RNAV-capable aircraft are suitably equipped to operate on all RNAV routes. The FAA would determine the means to qualify aircraft for various RNAV operations and the method for promulgating the requirements to operate on RNAV routes. These requirements would be promulgated similarly to the way part 71 routes and part 97 procedures are currently promulgated, or via other regulatory means such as applicability of Operations-Specifications for air carriers.

In addition, the FAA is proposing to change the current definition of "route segment" to facilitate RNAV operations.

II.D.4. Approach and Landing Using Instrument Approach Procedures

The FAA is proposing to amend delete and discontinue use of the following definitions or terms--

- (Delete) Nonprecision approach procedure.
- (Delete) Precision approach procedure.

The FAA is proposing to add or revise the following terms--

- ~~Approach procedure with vertical guidance (APV).~~
- Area navigation route.
- ~~Category I operations Decision altitude (height) [DA(H)] (DA).~~
- **Minimum Descent Altitude (Height) [MDA(H)]**
- ~~Instrument approach procedure (IAP).~~

The FAA is proposing to re**vis** **e the following definitions--**

- Category **I**, II, III, IIIa, IIIb, and IIIc operations
- ~~Decision height (DH).~~
- ~~Minimum descent altitude (MDA).~~

NOTE: Rationale for these important changes is provided in later discussion.

III. Section-By-Section Discussion of the Proposed Changes

Section 1.1 General definitions

Air Traffic Service (ATS) route: The FAA is proposing to adopt the term "Air Traffic Service (ATS) route" to describe the U.S. route structure. The term ATS route would include jet routes, area navigation (RNAV) routes, and arrival and departure routes. An ATS route would be defined by route specifications. These route specifications may include an ATS route designator, the path to or from fixes, distance between fixes, reporting requirements, and the lowest safe altitude determined by the appropriate authority.

~~Approach procedure with vertical guidance (APV): This new term would mean an instrument approach procedure based on lateral path and glide path. These approach procedures are flown to a decision altitude (DA). Although these procedures include glide path information, they may not meet the requirements currently established for precision approach and landing operations. This includes the vertical navigation performance and airport infrastructure requirements (i.e., ICAO Annex 14 and FAA Advisory Circular (AC) 150/5300-16). Safety for these procedures is maintained by increasing the required obstacle clearance height or required visibility. An example of an APV approach is the LNAV/VNAV (lateral navigation/vertical navigation) approach minima currently published on RNAV approach plates.~~

COMMENT: This term and the criteria proposed to be used in conjunction with it are inappropriate, unnecessary, confusing, contradictory, and are not consistent with other important criteria related to RNAV and RNP currently entering use, or which have already been used for aircraft design for key elements of the future air carrier fleet (RNP, and Baro VNAV).

Area navigation low route and Area navigation high route: These terms would be removed and replaced with the term "area navigation (RNAV) route." See discussion of "area navigation (RNAV) route" below.

Area navigation (RNAV): The definition of "area navigation (RNAV)" would be broadened by removing the words "station-referenced navigation signals," which refer to ground-based signals, and adding the words "flight path" to cover operations in both the lateral and vertical planes (i.e. lateral navigation (LNAV) and vertical navigation (VNAV)).

Area navigation (RNAV) route: The new term "area navigation (RNAV) route" would refer to those ATS routes established for aircraft capable of using area navigation equipment suitable for those routes.

COMMENT: These proposed definitions for Category I, II, and III are inappropriate, incorrect, unnecessarily limiting and constraining, inconsistent with current Operations-Specifications usage, are inappropriately different than current FAA advisory Circulars AC120-28D and AC120-29A which have appropriate and correct definitions, and if adopted are likely to cause significant harm to evolution of low visibility landing programs and airborne systems. Consistent with current Standard Operations-Specifications, and Advisory Circulars AC120-28D and AC120-29A, Category I needs to apply to all instrument approaches with minima down to a 200' HAT DA(H) or 1800 RVR. This is to assure consistent application of harmonized criteria for minima across systems, procedures, and methods. The term "Category I" is not currently limited to, and should not in the future be limited to, use of only one sensor system or technique (e.g., ILS). Further, the terms precision approach and non-precision approach are inappropriate and use should be discontinued. They should not be incorporated in the rule. Those obsolete terms and concepts do not appropriately address modern avionic systems, flight procedure methods, criteria used (e.g., linear versus angular criteria), safety risk, path following performance, necessary flight path provisions, failure responses, or nav aids or sensor systems used. Instead, definitions for Category I, II, and III should be retained only in references like ACs 120-28D, AC120-29A, the AIM, and as necessary, new, or revised ACs related to RNP (e.g., AC90-45B)

Category I (CAT I) operation: The term "Category I operation" commonly has been used in the aviation industry and in the preambles of FAA regulatory documents for years, but it has never been defined in the CFR. The FAA is therefore proposing to add a definition of this term. The proposed definition of "Category I (CAT I) operation" is "a precision approach 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 one half statute mile (800 meters) or a runway visual range (RVR) of not less than 1,800 feet (550 meters)."

—Category II (CAT II) operation, Category III (CAT III) operation, Category IIIa (CAT IIIa) operation, Category IIIb (CAT IIIb) operation, and Category IIIc (CAT IIIc) operation: These definitions would be revised to incorporate the concept of precision RNAV. In each of these definitions, the terms "ILS approach" or "ILS instrument approach" would be replaced with the terms "precision approach" and "precision instrument approach," respectively. The definitions would also be updated to be compatible with the Joint Aviation Authorities (JAA) terminology.

Decision altitude (height) DA(H) (DA): The FAA proposes to add the definition for "decision altitude (height) DA(H)" (DA) to describe the mean sea level altitude at which the decision to continue the approach below the authorized minima or make a missed approach is made application of this term to instrument approach operations. This term would be consistent with ICAO terminology.

Decision height (DH): The definition of "decision height" would be revised to specify that it applies only to Category II and III approaches rather than Category I approaches, which would refer to decision altitude. See discussion under "II.D.1. Decision Height (DH) and Decision Altitude (DA)."

—Final approach fix (FAF): This term would be added to indicate that a final approach fix is associated with a nonprecision approach.

COMMENT: It is inappropriate to refer to the outdated and obsolete notion of "non-precision approach" in the regulations. If the term FAF needs to continue to be used at all, it can be specified or defined in other technical references such as in ACs or FAA orders, as necessary, and need not be constrained as defined in the regulations. This permits more appropriate and flexible response to evolving procedure design where criteria for

such points or fixes are likely to significantly evolve over the coming decade. To specify it in the regulations is unnecessary, and unduly constraining for procedure evolution.

~~Instrument approach procedure (IAP): This term would be added. It is a general term that applies to all types of approach procedures.~~

COMMENT: It is unnecessary to define this term in the regulations.

Minimum descent altitude ***(height) [MDA(H)]*** (MDA): The definition of "minimum descent altitude" would be revised to ***MDA(H)*** change the words "final approach" to "nonprecision final approach," and to remove the references to "standard instrument approach procedure" and "electronic glide slope." This change would clarify the definition, as an MDA is applicable to a SIAP without electronic glide slope ***to update the concept and align this formulation of minima more closely with ICAO terminology.***

COMMENT: The entire notion of NPA and NPA final approach is inappropriate and should not be incorporated in the regulations in this manner. MDA(H) simply refers to the vertical component of minima to be used for instrument procedures which do not have vertical path guidance, and which do not otherwise have a DA(H) specified. Its definition and use can adequately be addressed by other existing references such as AC120-29A, or extensions of that AC or reference to that AC, as may subsequently be repeated in the AIM.

~~Night: The FAA is proposing to revise the definition of the term "night" to reflect that local night may differ from the times published in the American Air Almanac. This concept of local night could limit operations at a particular location when the FAA determines it to be necessary for the safety of operations, for example, when terrain causes sunset significantly earlier than the Almanac indicates.~~

COMMENT: this redefinition of "Night" is unnecessary, and is even conceptually inappropriate. The distinctions being drawn or inferred here between day and night, for instrument procedure design or specification, are inappropriate. If instrument procedures are properly designed, there is no need to draw this subtle distinction or make this change. Either §91.175 visual reference requirements are met at minima, or they are not. This re-definition of night is inappropriate, risks introducing ex post facto confusion with millions of pilot's and operators logbook systems and time calculations, and provides absolutely no safety benefit. Its consideration should be removed from this NPRM.

~~Nonprecision approach procedure (NPA): The FAA is proposing to revise the definition of this term so that there would be no reference to "electronic glide slope." The term would apply to navigation systems that provide lateral (but not vertical) path deviation guidance.~~

COMMENT: The term "non-precision approach" should be stricken from the regulation. The entire concept is now obsolete, inappropriate, and when flown using former techniques, has been shown by operating experience to have less than a desirable level of operational safety. Until removed or revised, any references to "NPA" that remains in other sections of the regulations should now be interpreted to mean any instrument approach type other than ILS, MLS, or GLS.

~~Precision approach procedure (PA): The FAA is proposing to revise the definition so that there would be no references to "standard instrument approach procedure" and "electronic glide slope." The revised term, however, [[Page 77330]]would still be based on lateral course and track information with vertical glide path information. Currently, ILS, microwave landing systems~~

(MLS), Global Navigation Satellite System (GNSS) landing systems (GLS) and precision approach radar (PAR) are recognized precision approach systems.

COMMENT: The term precision approach should also be stricken from the regulations. The entire concept of precision is now also obsolete, inappropriate, and misleading (e.g., ILS approaches are far less "precise" laterally and vertically than RNP based RNAV procedures using linear sensors and criteria for most IMC portions of an instrument procedure). Until removed or revised, any references to PA that remain in other sections of the regulations should now be interpreted to mean "any ILS, MLS, or GLS instrument approach (e.g., xLS)."

Precision final approach fix (PFAF): This term would be added to indicate that a precision final approach fix is associated with a precision or APV approach procedure.

COMMENT: This definition is unnecessary and inappropriate. It should be removed from further consideration in this revised notice.

RNAV waypoint: The FAA proposes to remove the definition of "RNAV way point (W/P)" because it is overly restrictive.

Route segment: The definition of "route segment" would be revised to mean a portion of a route bounded on each end by a fix or NAVAID. The proposed change would facilitate the development of RNAV routes.

Section 1.2 Abbreviations and Symbols

The FAA proposes to add the following acronyms to the list of abbreviations and symbols in Sec. 1.2:

- ~~APV means approach procedure with vertical guidance.~~

COMMENT: See above discussion.

- NM means nautical mile.
- ~~NPA means nonprecision approach.~~

COMMENT: See above discussion.

- ~~PA means precision approach.~~

COMMENT: See above discussion.

- RNAV means area navigation.

Part 71 Amended

The current part 71 is limited to ground-based navigation systems, includes extraneous information, and is not organized clearly. Although the amendments would not be related directly to the RNAV proposals, the FAA proposes to take this opportunity to improve the readability of part 71 by separating the sections that provide general information about part 71 (Sec. Sec. 71.1 through 71.15) from the sections that apply only to Class A airspace, and by combining or realigning the sections in part 71 in a more efficient way. These changes are discussed in further detail below.

Part 71 Heading Revised

The FAA proposes to revise the heading of part 71. The current title, "Designation Of Class A, Class B, Class C, Class D, And Class E Airspace Areas; Airways; Routes; And Reporting Points," would be revised to read "Designation of Class A, Class B, Class C, Class D, and Class E Airspace Areas: Air Traffic Service Routes; and Reporting Points." In the new heading, the words "Airways; Routes" would be replaced with the words "Air Traffic Service Routes," which would cover jet routes, VOR Federal airways, Colored Federal airways, and area navigation routes. This would be consistent with ICAO's use of the term "air traffic service routes."

Subpart A--Class A Airspace

The FAA proposes to move the heading of subpart A so that it appears directly before Sec. 71.31 and revise it to read, "Class A Airspace." As a result, sections appearing at the beginning of part 71 would provide general information on multiple sections in part 71, and sections in the newly designated subpart A (Sec. Sec. 71.31 and 71.33) would contain regulations pertinent only to Class A airspace. This would make subpart A consistent with the rest of part 71, where subpart designations correspond to the airspace classes covered. For example, subpart A would cover Class A airspace; subpart B would cover class B airspace, and so forth.

Section 71.11 Air Traffic Service (ATS) Routes

The FAA proposes to add Sec. 71.11, Air Traffic Service (ATS) routes. The text for the new section would come from the current Sec. 71.75, Extent of Federal airways, paragraphs (a), (b)(1), and (d). This text would be revised to apply to ATS routes in general. The FAA is proposing this change to include ATS route terminology and to improve the organization of part 71.

Paragraph (a) of Sec. 71.11 would differ from the text of Sec. 71.75 in that the words "navigational aid or intersection" that are currently in Sec. 71.75, would read, "navigation aid, fix, or intersection" for defining route segments. These changes would accommodate the development of ATS routes that are not linked to ground-based navigation aids.

Paragraph (b) of Sec. 71.11 would differ from the text of Sec. 71.75 by referencing FAA Order 8260.3, "U.S. Standard for Terminal Instrument Procedures (TERPS)," as the source for criteria regarding ATS route dimensions and protected airspace.

Finally, the introduction to Section 71.11 now includes the language "Unless otherwise specified." This is to permit FAA to use alternate criteria when necessary, alternate means of authorization, or to use alternate provisions to paragraphs (a) through (c).

Paragraph (c) would differ from the text of Sec. 71.75 by stating that all ATS routes exclude the airspace of prohibited areas, rather than just Federal airways. This would mean that if the route passed through a prohibited area (i.e., a type of special use airspace designated under 14 CFR part 73), the FAA would write an exclusion into the legal description of the route that stated that the prohibited area airspace was excluded from the route.

Section 71.13 Classification of Air Traffic Service (ATS) Routes

The FAA proposes to use the current text of Sec. 71.73, Classification of Federal airways, as a basis for proposed new Sec. 71.13, Classification of Air Traffic Service (ATS) routes, and expand the scope of it to classify the Federal airway, jet route, and area navigation route components of the U.S. route structure as ATS routes. The FAA is proposing this change to improve the

organization of part 71 and to facilitate the development of RNAV routes that are not linked to ground-based navigation aids.

Section 71.15 Designation of Jet Routes and VOR Federal Airways

The text of proposed Sec. 71.15 would come from current Sec. 71.79, with information added to ensure that the stated place name criteria apply to jet routes as well as VOR Federal airways. This change is proposed to consolidate similar information and to reorganize part 71 for clarity.

Section 71.73 Classification of Federal Airways

Section 71.73 would be removed and used as a basis for new Sec. 71.13. This change would result in classifying the various types of ATS routes in one section for clarity and would improve the organization of part 71. See discussion of Sec. 71.13 above.

Section 71.75 Extent of Federal Airways

Section 71.75 would be removed and parts of it used as a basis for new Sec. 71.11. This change would consolidate related information, remove information that is not needed, and improve the organization of part 71. See discussion of Sec. 71.11 above.

Section 71.79 Designation of VOR Federal Airways

The FAA proposes to remove Sec. 71.79 and move the information to the proposed new Sec. 71.15, Designation of jet routes and VOR Federal airways. This change improves the organization of part 71 by consolidating related information. See discussion of Sec. 71.15 above.

Section 91.129 Operations in Class D Airspace

The FAA is proposing to revise Sec. 91.129(e) in clearer language. Although substantive changes would be made only in paragraph (e)(2) (discussed below), the FAA is taking this opportunity to propose clearer language for the rest of (e).

Currently, Sec. 91.129(e)(2) requires that when a pilot of a large or turbine-powered airplane is approaching to land on a runway served by an ILS and within Class D airspace, the pilot must fly at an altitude at or above the glide slope between the outer marker (or the point of interception with the glide slope, if compliance with the applicable distance-from-cloud-criteria requires interception closer in) and the middle marker. The proposed rule would require that ***when consistent with use of a safe flight path***, a person operate ***at on*** or above the glide path ***between after passing*** the precision final approach fix (or ***equivalent*** point of interception with the glide slope, if compliance with the applicable distance-from-cloud-criteria requires interception closer in) and the published decision altitude or decision height. Specifically, changes to (e)(2) would be as follows—

—(1) The phrase “served by an instrument landing system (ILS)” would read “served by an APV or precision approach procedure.” The reason for the change is that ILS is not the only type of approach with a glide path.

—(2) The term “glide slope” would read “glide path” because the term “glide slope” is generally used with respect to ILS, whereas the term “glide path” includes both ILS and APV.

—(3) The reference to “outer marker” would be replaced with “precision final approach fix.” This would facilitate determining aircraft position as appropriate (e.g., DME, RNAV, or radar) and would make the paragraph consistent with proposed Sec. 91.175(k). The term “middle marker” would be replaced by “decision altitude or decision height.”

Section 91.131 Operations in Class B Airspace

The FAA is proposing to revise Sec. 91.131(c)(1) by adding the words "suitable RNAV system" to provide another option for meeting the communications and navigation equipment requirement. This change would be consistent with the proposed definition of RNAV.

Section 91.175 Takeoff and Landing Under IFR

The FAA is proposing to revise Sec. 91.175(a) by replacing the term "instrument letdown" with the term "instrument approach" because "letdown" is outdated terminology.

The FAA is proposing to revise paragraph (b) to change the term "DH" to "DA/DH." See discussion "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above. **DA(H). See discussion above.**

~~Paragraph (c) would be amended to change the term "DH" to "DA/DH." See discussion "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above.~~

~~The FAA is proposing to amend the introductory text of paragraph (e) by changing the word "pilot" to "person" to make the regulation consistent with the definition of "person" currently in Sec. 1.1. In addition, paragraph (e)(1)(ii) would be revised to replace the term "DH" with "DA/DH." See discussion "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above.~~

~~The FAA is proposing to revise paragraph (f) to clarify that published takeoff minimums are associated with a particular departure procedure. Takeoff minimums are determined from the analysis of a particular runway environment. Thus, the departure procedure must be followed for a particular runway to ensure adequate obstacle clearance.~~

COMMENT: This proposal as formulated by FAA is most inappropriate and unsafe. In the event of engine failure, air carriers must follow the obstacle clearance path identified and required by regulations such as §121.189 for safety, not the all-engine path addressed by departure procedures otherwise produced and published for specifying non-Part 121 or Part 135 takeoff procedures and minima. This inappropriate provision, if sustained and implements, could potentially invalidate a significant fraction of US operators current runway takeoff analysis, significantly reduce available gross weights for takeoff, have significant adverse economic consequence, and lead to use of unsafe flight paths.

~~Paragraph (h) would be amended by removing the RVR table from paragraph (h)(2) and replacing it with a reference to FAA Order 8260.3, "U.S. Standard for Terminal Instrument Procedures (TERPS)," which contains the RVR table. This would eliminate duplication, and ensure that the public has information based on on-going changes in technology. In addition to appearing in FAA Order 8260.3, the RVR table also appears in the Aeronautical Information Manual (AIM), the Instrument Flying Handbook, and in the Flight Information Publications.~~

COMMENT: The above references are currently inappropriate or incorrect. The only relevant current RVR tables or values are those included in Standard Operations Specifications, and those coordinated through the AWO activity and presently listed in AC 120-28D and AC 120-29A. Otherwise the reference here in the current rule should be retained as is, except with the new exception permitting use of alternate values through Operations Specifications.

~~Paragraph (j) would be amended by changing the word "pilot" to "person" to make the regulation consistent with the definition of "person" currently in Sec. 1.1.~~

COMMENT: "Pilots" fly aircraft. This is unnecessary, confusing, and inappropriate.

Paragraph (k) would be amended to allow certain locations on the ILS to be fixed by other-than-ground-based navigation aids. As technology develops, these points could be indicated by fix instead of actual markers. Finally, middle markers would be deleted from this paragraph, as they are no longer a basic component of an ILS. Although some middle markers are still in use, no additional middle markers are being installed at new ILS sites.

A new paragraph (l) is now added, to explicitly facilitate introduction of new technology for low visibility approach and landing, when it can be shown to be safe and appropriate. This does not preclude the administrator also or alternately making such authorizations under the auspices of §91.175 (a) provision for "unless other authorized by the administrator."

Section 91.177 Minimum Altitudes for IFR Operations

The FAA is proposing to amend Sec. 91.177 (a) by adding language to clarify that the section would apply when both a minimum en route IFR altitude (MEA) and a minimum obstruction clearance altitude (MOCA) are prescribed for a particular route or route segment. The sentence that currently appears as concluding text of paragraph (a)(2) would be moved to paragraph (a)(1) and amended by adding the phrase, "using VOR for navigation." This proposed change would clarify that a person could travel at the MOCA for the full route segment if the person is using another navigation system that meets navigation requirements and is available, e.g. GPS-based RNAV. If, however, a person were using VOR for navigation then the person would have to operate at the MEA except within 22 NM of the VOR facilities. If a person were using a navigation system other than VOR or GPS, the person would have to take positive action to ensure that he or she was receiving a suitable navigation signal along the full route. This change would allow operations at the MOCA, provided the applicable navigation signals were available. Although the change would be permissive, it would not change the requirements for communication and surveillance along the route. Therefore, the FAA may require a higher altitude to meet all the requirements of communication, navigation, and surveillance.

For obstacle clearance, aircraft with airborne systems capable of RNP navigation may alternately use a lateral clearance area related to the applicable level of RNP, rather than to the standard 4 nautical mile value.

Section 91.179 IFR Cruising Altitude or Flight Level

The FAA is proposing to amend Sec. 91.179 by adding introductory text to read, "Unless otherwise authorized by the ATC, the following rules apply." While the FAA recognizes that there will be an ATC clearance associated with an IFR operation, adding this clause would facilitate the future implementation of new technology by giving the FAA the flexibility to allow alternatives to current altitude assignment procedures.

Section 91.181 Course To Be Flown

The FAA proposes to amend Sec. 91.181(a) by removing the words "a Federal airway" and adding in their place "an ATS route," since the proposed changes in Sec. 71.13 define an ATS route to include Federal airways and the new RNAV routes.

Section 91.183 IFR Communications

The FAA would amend Sec. 91.183 by removing the word "radio" from the heading and from the introductory text of paragraph (a). Paragraph (a) introductory text would also be changed by adding at the beginning the phrase, "Unless otherwise authorized by the FAA, * * *" This phrase would facilitate the use of advanced communications by means other than voice.

Section 91.185 IFR Operations: Two-Way Communications Failure

Section 91.185 would be amended by removing the word "radio" from the heading and from paragraph (a). This would eliminate reliance on radio technology.

Section 91.189 Category II and III Operations: General Operating Rules

The FAA proposes to amend Sec. 91.189 (c) by replacing the term "DH" and adding the term "DA/DH **DA(H)**." See discussion under "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above.

~~The FAA would also amend paragraph (d) by changing the word "pilot" to "person" to make the regulation consistent with the definition of "person" currently in Sec. 1.1.~~

COMMENT: "Pilots" fly aircraft. This change to "person" is unnecessary, confusing, and inappropriate.

Section 91.205 Powered Civil Aircraft with Standard Category U.S. Airworthiness Certificates: Instrument and Equipment Requirements

Currently, Sec. 91.205 (d)(2) states that, for IFR flight, "two-way radio communications system and navigation equipment appropriate to the ground facilities to be used" are required. The FAA is proposing to amend (d)(2) by removing references to radio and ground facilities to facilitate future developments in communications. As amended, the paragraph would prescribe for IFR flight, "two-way communication and navigation systems suitable for the route to be flown."

COMMENT: Good revision!

Paragraph (e) would be revised to require that aircraft operating at and above ~~48~~**24**,000 feet (flight level (FL) ~~480~~**240**) would have to be equipped with DME **or equivalent**. The current rule sets the limit at 24,000 feet MSL (FL 240). ~~On October 14, 1971, the FAA completed the lowering of the base of the positive control area (now called Class A airspace) from 24,000 feet to 18,000 feet MSL over the entire 48 contiguous States. (See 36 FR 15743; Aug. 18, 1971.) This proposed change would make this section consistent with the current floor of Class A airspace. While this proposed rule change would extend the equipment requirements for civil aircraft to FL 180, most affected aircraft already meet these standards. The FAA specifically seeks comments on this proposed change.~~

COMMENT: The underlying assumption in this change is incorrect. The reason for DME was originally specified was to address lead turn radius at high TAS, not necessarily to correlate with airspace definition. Hence FL240 should be retained, but RNAV methods should now also be permitted, in lieu of DME.

In addition, paragraph (e) would be amended to include suitable RNAV system as an alternative to DME. Modern RNAV systems provide distance from the active waypoint as an integral function. This distance readout can serve any purpose that DME serves.

Section 91.219 Altitude Alerting System or Device: Turbojet-Powered Civil Airplanes

The FAA is proposing to amend Sec. 91.219 (b)(5) by replacing the term "DH" with the term "DA/DH **DA(H)**." See discussion under "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above.

Section 91.511 Communication and Navigation Equipment for Over-Water Operations

The FAA is proposing to amend Sec. 91.511 by changing the heading from "Radio equipment for over-water operations" to "Communication and navigation equipment for over-water operations." Paragraph (a)(1) would be amended by changing the term "radio communication equipment" to "communication equipment." This change would facilitate future developments in technology. Also, in this paragraph the term "surface facility" would be changed to "communication facility" because, in the future, communication facilities may not be on the surface.

COMMENT: Good Change!

Section 91.711 Special Rules for Foreign Civil Aircraft

The FAA is proposing to amend Sec. 91.711 (c)(1)(ii) by changing the term "radio navigational equipment appropriate to the navigational facilities to be used" to "navigation equipment suitable for the route to be flown." This change would facilitate future developments in navigation technology.

Paragraph (e) would be amended by changing the specified flight level and by adding reference to "an IFR-approved RNAV system." As amended, the paragraph would state that foreign aircraft operating at and above ~~48~~**24,000** feet (FL ~~480~~**240**) must be equipped with DME or an IFR-approved RNAV system. ~~The current rule sets the limit at 24,000 feet MSL (FL 240); however, the altitude defining the base of Class A airspace (formerly the positive control area) was lowered from 24,000 feet (FL 240) to 18,000 feet (FL 180) in October 1971. While this rule change would increase the requirements for foreign civil aircraft, the FAA believes that the affected aircraft already meet these standards. The FAA specifically seeks comments on this proposed change. In addition, t.~~ **The** provision for a suitable RNAV system is being added because modern RNAV systems provide distance from the active waypoint as an integral function in lieu of DME. This distance readout from a RNAV system can serve any purpose that DME serves.

COMMENT: See above discussion for §91.205 regarding the rationale for this change.

Section 95.1 Applicability

The FAA is proposing to revise Sec. 95.1. In paragraphs (a), (b), and (d), references to "Federal airway(s), jet route(s), area navigation low or high route(s)" would be changed to "ATS route(s)." The use of the term "ATS route" would make the FAA's regulations consistent with ICAO.

Paragraph (d) would be further amended in the second sentence by adding the phrase, "Unless otherwise specified," to the beginning, and by changing the term "radio fixes" to "navigation fixes." These changes would increase the flexibility of the FAA to allow the use of other-than-ground-based navigation systems.)

Current paragraph (e) uses 25 miles as the distance for reception of navigation signals. The FAA proposes to revise the paragraph to allow air navigation along the entire route (subject to air traffic restrictions) at the MOCA when using suitable navigation systems (e.g., **RNP or** GPS). Also, because nautical miles are the standard unit of measurement in air navigation, the reference to "25 miles" would be converted to "22 nautical miles."

Paragraph (f) would be revised to specify that an MRA is applicable only to intersections defined by ground-based navigation aids. In paragraph (g), the term "facility or way point" would be changed to "ground-based navigation aid." Current paragraph (g)(1), which addresses reception requirements, would be retained in proposed paragraph (g), and the term "facilities" would be changed to "signals." Finally, the text of current paragraph (g)(2) would be removed. These changes would increase the flexibility of the rule to allow the use of other-than-ground-based navigation systems.

Part 97--Heading Revised

The heading for part 97, now reading "Standard Instrument Approach Procedures" would be revised to read "Standard Instrument Procedures" because the part is not limited to approach procedures.

Section 97.1 Applicability

The FAA is proposing to revise Sec. 97.1 to provide a more accurate and complete description of the applicability of part 97. The words "standard instrument approach procedures" would be changed to "standard instrument procedures" to reflect the fact that part 97 refers to takeoffs and approaches. The proposed rules also would expand the scope of part 97 to include departure procedures, since those departure procedures are used as the basis for takeoff weather minimums. Proposed Sec. 97.1 would clarify that published civil takeoff weather minimums are based on a specified route, and that pilots must comply with that route ~~unless~~ **or with** an **acceptable** alternative route **applicable to the departure otherwise required by applicable operating rules such as §121.189** ~~has been assigned by ATC.~~ The section would be further amended by deleting the words "for instrument letdown," which is obsolete terminology.

COMMENT: This section has MAJOR conceptual problems as originally written, is inappropriate, and cannot be adopted as written without major revision. As originally proposed it poses major adverse consequence to both air carrier operations economics and safety. It essentially invalidates current air carrier takeoff analysis at many locations where §121.189 compliance requires use of a different safe engine-out flight path than is specified for an ATS DP, or by an all-engine departure defined path using criteria of US TERPS. Further, this inappropriately worded rule as originally proposed doesn't even appear to accommodate things like necessary weather deviations, let alone non-normal situations such as engine failure.

COMMENT: The mandatory compliance provision with a DP unless approved by ATC is not appropriate for safety. Further, even if something like this was intended, to coordinate with ATC, it would not be appropriate to be specified in Part 97. If specified at all it would need to be cited in Part 91, or alternatively in Parts 121, 135, 125 or 129.

Section 97.3 Symbols and Terms Used in Procedures

The FAA is proposing to revise Sec. 97.3 by removing the paragraph designations and to organize the terms alphabetically. In addition, the following terms would be revised:

The terms "A" (alternate airport weather minimum) in paragraph (a), "C" (circling landing minimum) in paragraph (d), and "S" (straight in minimum) in paragraph (s), would be removed in the proposed revision of Sec. 97.3. These items are more appropriately spelled in full in the legend of the approach charts.

The term "approach procedure segments" would be modified to include specification of a path to accommodate RNAV approaches, and "DH" would be replaced with "~~DA/DH~~ DA(H)." The term "ceiling minimum" in paragraph (e) would be changed to "ceiling" and clarified to refer to airport elevation rather than the current general term "surface of the airport." The term "D" (day) in paragraph (f) would be removed, as the term is no longer used.

The term "decision height" that appears in the definition of "missed approach" in paragraph (c)(5), and in the definition of "copter procedures" in paragraph (d)(1), would be changed to "decision altitude (height DA(H) or decision height (~~DA/DH~~)." See discussion "II.D.1.-Decision Height (DH) and Decision Altitude (DA)" above.

The term "copter procedures" would further be revised to clarify the circumstances under which the reduction of the charted visibility is authorized. It is also important to highlight that the one-quarter mile prevailing visibility and the 1200-foot RVR mentioned in the proposed definition are minimum limits. Although both are specified to permit the application of reduced visibility minimums if either visibility or RVR is reported, no equivalency between one-quarter mile and the 1200-foot RVR is intended. For equivalency for copter procedures, see the RVR tables in Flight Information Publications.

The term "HAA" (height above airport) in paragraph (h) would be revised to add the words, "expressed in feet." The term "HAL" (height above landing) in paragraph (h)(1) would be revised to read, "height of the ~~DA/MDA~~ DA(H) or MDA(H) above a designated helicopter landing area elevation used for helicopter instrument approach procedures." This proposed definition would include references to decision altitude (see II.D.1. above) and MDA (see discussion of Sec. 1.1 above), and would facilitate future ~~Wide Area Augmentation Systems (WAAS)~~ RNAV and RNP operations, including those using GBAS or SBAS sensors.

The term "HAS" would be added to read, "height of the ~~DA/MDA~~ DA(H) or MDA(H) 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 AGL." This definition would support point-in-space operations and provide additional information for maneuvering in the vicinity of a heliport.

The term "HAT" (height above touchdown), which currently appears in paragraph (i), would be revised to read, "height above ~~threshold~~ touchdown expressed in feet." ~~This would be a nomenclature change to make the FAA's regulations consistent with ICAO and is not considered operationally significant.~~ Changes to approach charts and affected FAA documents will be made during regular review process.

The term "HCH" would be added to read, "heliport crossing height and is the computed height of the vertical guidance path above the heliport elevation at the heliport expressed in feet." This is a new technical term used in the construction of helicopter instrument approach procedures. The HCH affects the size of the obstacle evaluation area for the copter instrument approach and is another means of providing a margin of safety to the operator.

This proposal would also add the term "heliport," which is normally the center point of the touchdown and lift-off area (TLOF). It is usually a designated arrival and departure point located in the center of an obstacle-free area, 150-foot square, overlying an approved landing area, where the approach may be terminated in a hover or touchdown. The helipad of intended landing may not be located at the heliport, however.

The term "MSA" (minimum safe altitude) would be revised in more general wording. The proposed wording allows for any navigation aid or fix to be the reference point, which would provide greater flexibility in procedure construction. The distance is specified on the approach chart.

The term "N" (night) in paragraph (m) would be removed from Sec. 97.3 because the abbreviation is no longer in use.

The term "point in space approach" in paragraph (o)(1) would be removed because the definition is out of date. The term is accurately defined in FAA Order 8260.3 "U.S. Standard for Terminal Instrument Procedures (TERPS)" (incorporated by reference in proposed Sec. 97.20), and, therefore, would not need to be duplicated in Sec. 97.3.

The term "shuttle" in current paragraph (t), would be removed because it is obsolete. It would be replaced with the term "hold in lieu of PT," meaning a holding pattern established under applicable FAA criteria, and used in lieu of a procedure turn (PT) to execute a course reversal. By adding this new term, the FAA intends to codify current procedures for using a holding pattern in lieu of a procedure turn for course reversal.

The term "SIAP" (standard instrument approach procedure) would be added to the section because it is a commonly used acronym.

The term "T" (takeoff minimum) would be revised for clarity and accuracy to mean nonstandard takeoff minimums or specified departure routes/procedures, or both.

Section 97.5 Bearings, Courses, Headings, Radials, Miles

The FAA is proposing to amend Sec. 97.5 by adding the word "tracks" to the heading and to paragraph (a). The word "tracks" is used to describe the type of information provided by GPS and RNAV systems. Also, paragraph (a) would be amended by adding the phrase "unless otherwise designated" to the end of the paragraph. This change would allow for future changes in technology and flexibility in route construction and assignment.

Section 97.10 General

The FAA is proposing to remove Sec. 97.10, General. This section prescribes standard instrument procedures "other than those based on the criteria contained in the U.S. Standard for Terminal Instrument Approach Procedures (TERPS)." ~~These types of approach procedures no longer exist.~~ **This should be retained, for later application of internationally harmonized criteria.**

Section 97.20 General

The FAA is proposing to revise Sec. 97.20 to incorporate FAA Order 8260.3, "U.S. Standard for Terminal Instrument Procedures (TERPS)," and FAA Order 8260.19, "Flight Procedures and Airspace" into the Code of Federal Regulations. These orders would be added to include the requirements for the developing and processing of instrument procedures. The proposed text is shown in the regulation, and the FAA would get approval from the Director of the Federal Register if it is adopted as final.

Section 121.99 Communications Facilities

The FAA is proposing to amend Sec. 121.99(a) by changing the term "two-

[[Page 77334]]

way radio communication system" to "two-way communication system." In addition, the term "point-to-point circuits" would be changed to "communication links." These changes would make the regulation more flexible for modern means of communication and would allow for future changes in technology. ~~In addition, the FAA is proposing to add a requirement for a~~

~~communication system that would have two-way voice communication capability for use between each airplane and the appropriate dispatch office, and between each airplane and the appropriate ATC unit, for non-normal and emergency conditions. The FAA believes it would be necessary from the pilot workload and flight safety standpoints to retain two-way voice communication capability for non-normal and emergency conditions. Data link communication systems currently require a pilot to use a keyboard to communicate between the airplane and the stations described above. Reliance on data link communications alone during an emergency could cause an unsafe condition.~~

~~— Additionally, with respect to communications between the airplane and the dispatch office, the FAA is proposing to add a definition of "rapid communications" that is based on a legal interpretation issued by the Regional Counsel of the FAA's southern region on May 26, 1977. A copy of this interpretation can be found in the public docket for this rulemaking. Generally speaking, rapid communication means that the calling party must be able to establish communication with the called party in less than 4 minutes.~~

COMMENT: The above deleted text is incorrect and inappropriate. For example, not all Part 121 operators even need have a dispatch function, per se. Further, the assumptions made about communication methods, limitations, and capability are incorrect, and the intended response time is inappropriate for many circumstances.

Section 121.103 En Route Navigation Systems

The FAA is proposing to revise Sec. 121.103 by changing the heading from "En route navigational facilities" to "En route navigation systems." In addition, the term "nonvisual ground aids" would be changed to "navigation aids" in paragraphs (a) and (b). The wording would be changed to make the regulation performance-based by requiring that the navigation aids are available over the route to navigate the airplane along the route with the required accuracy, so that any suitable navigation system could be used. Demonstration of compliance to this requirement would be specific to the operator, the aircraft navigation system (e.g., GPS, DME/DME, DME/DME/INS), the available navigation aids, and the route (including planned contingencies such as alternates). The required accuracy is defined by the route specifications (including route width) or as defined by ATC if not operating on a route.

Finally, the section would be revised to permit "other operations approved by the FAA" to be conducted without navigation aids. These revisions would allow for changes in technology.

COMMENT: Good change!

Section 121.121 En Route Navigation Facilities

The FAA is proposing to revise Sec. 121.121 by changing the title from "En route navigational facilities" to "En route navigation systems," and the section would be formatted to be consistent with Sec. 121.103. In addition, the term "nonvisual ground aids" would be changed to "navigation aids" in paragraphs (a) and (b). The wording would be changed to make the regulation performance-based by requiring that adequate navigation aids are available to navigate the airplane along the route with the required accuracy, so that any suitable navigation system could be used. "Lighted airways" also would be removed because it is an obsolete term. Finally, paragraph (b)(3) would be revised, consistent with the proposed change to Sec. 121.103(b)(3), to permit "other operations approved by the FAA." This revision would allow for future changes in technology.

Section 121.344 Digital Flight Data Recorders for Transport Category Airplanes

The FAA proposes to amend Sec. 121.344 (a)(54) by replacing the term "decision height" with the term "decision altitude ~~(height)~~~~decision height~~." See discussion "II.D.1.-Decision Height (DH) and Decision Altitude (DA)" above.

Section 121.345 Communication Equipment

Section 121.345 would be revised by replacing the word "radio" in the heading and in paragraphs (a) and (b), with the word "communication." This would eliminate the reliance on voice technology and allow for future developments in technology.

Section 121.347 Communication and Navigation Equipment for Operations Under VFR Over Routes Navigated by Pilotage

The FAA is proposing to amend Sec. 121.347 by changing the term "radio equipment" to "communication and navigation equipment" in the heading. In addition, the FAA would amend paragraph (a) to change "radio equipment" to "communication equipment," remove the word "ground" from (a)(1), and clarify (a)(2) by removing words "lateral boundaries of the surface areas of."

Paragraph (b) would be revised to separate the communication and navigation equipment requirements, and the requirement for navigation equipment would be made more generic to accommodate RNAV systems. A marker beacon receiver or ILS receiver would not be required under the proposed rule since ~~precision~~~~instrument~~ approaches are not appropriate to specifically necessary for VFR operations, so the last phrase of this paragraph would be deleted.

These changes would allow for communications that are not "voice" communications, would make the regulation more flexible for modern means of communication, and would allow for future changes in technology.

Section 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

The FAA is proposing to revise Sec. 121.349 to recodify and clarify existing requirements. The proposed paragraph (a) would replace the requirement for two independent receivers with a requirement for two independent navigation systems. The two independent navigation systems must be suitable for the route to be flown, so that they both support compliance with the requirements proposed in Sec. 121.103(a) or Sec. 121.121(a). There would be no requirement for the two systems to be identical, so that a single VOR and a single suitable RNAV system would satisfy this requirement on a Victor airway. The intent of this rule is to ensure that there is no single point of failure or event affecting aircraft navigation systems that causes loss of the ability to navigate along the intended route or to navigate to a suitable diversion airport. The change is also intended to address the potential vulnerability of GPS GNSS, which may uses very weak signals that are be susceptible to interference. For example, two minimum GPS (or other satellite navigation) receivers may not be considered "independent," since both are so vulnerable to interference. However, the proposed rule would be performance-based rather than prescriptive; thus, it is possible that two GPS receivers with an anti-jam capability could be considered independent, since they would not be so vulnerable to interference. Systems are considered independent if there is no probable failure or event that could affect both systems. In addition, the allowance for a single ILS and marker beacon would be extended to any ~~precision~~ approach or APV suitably authorized navigation system that was used in an environment or with procedures providing for safe continued operations after a failure of that navigation system.

The paragraph would also be revised to broaden the exception for two independent navigation systems in paragraph (b) to allow for the use of any single navigation system consistent with the provisions in proposed Sec. 121.349(c). In addition, for non-normal and emergency operating conditions, the FAA proposes to add a requirement for at least one of the independent communication systems to have two-way ~~voice~~ communication capability. The requirement to report DME failures has been removed since it is required in current Sec. 91.187. These changes would make the regulation more flexible for modern means of communication and navigation and would allow for future changes in technology.

The proposed changes to Sec. 121.349 are intended to be broad in scope. The proposed wording would allow for the future evolution of navigation system technology. Presently the FAA sees a need for a full DME infrastructure and a minimal VOR network to remain for the foreseeable future. However, as the NAS evolves and navigation technology improves, a satellite-based system may become the core of the aviation navigation system.

The proposed rule language is designed to provide the most flexibility for the operator rather than being prescriptive. It would be through the operations specification process that the operator would indicate the suitability of its equipment. The FAA sees a benefit to the use of a performance-based rule for both the operator and the regulator, as this would be a way to address the variety of navigation equipment installed in the various fleets. ~~The FAA seeks comments on whether to adopt a broad, performance-based rule language or a narrow, prescriptive language requiring specific systems.~~

Section 121.351 Communication and Navigation Equipment for Extended Over-Water Operations and for Certain Other Operations

The FAA is proposing to amend Sec. 121.351 by changing the words "radio equipment" to "communication and navigation equipment" in the heading, and the words "radio communication" to "communication and navigation" in paragraph (a). This would permit the use of data link communications systems for normal operating conditions. Also, paragraph (a) would be revised to require at least one of the independent communication systems to have two-way voice communication capability for non-normal and emergency operating conditions. In addition, references would be changed to be consistent with other proposed changes and requirements would be explained in full instead of referring the reader to another section of the CFR.

Also, paragraph (c)(1) would be revised to use terminology consistent with the proposed changes to Sec. Sec. 121.103 and 121.121, and paragraph (c)(3) would be revised to apply to aircraft equipped with only VHF communications equipment.

Provision (c) (3) would also be revised to accommodate SATCOM, broadband, or other specialized communication system gaps as well as HF.

Section 121.419 Pilots and Flight Engineers: Initial, Transition, and Upgrade Ground Training

The FAA proposes to amend Sec. 121.419(a)(1)(vii) by replacing the term "DH" with the term "DA/DH **(H)**." See discussion "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above.

Section 121.559 Emergencies: Supplemental Operations

The FAA is proposing to amend Sec. 121.559(c) by replacing the term "ground radio station" with the term "communication facility. The term "communications facility" is more accurate than the term "ground radio station." See discussion for Sec. 121.565 below.

Section 121.561 Reporting Potentially Hazardous Meteorological Conditions and Irregularities of Ground and Navigation Facilities

The FAA is proposing to amend Sec. 121.561 by revising the heading to replace the words "ground and navigation facilities" with "ground facilities and navigation aids." The same change is proposed for paragraph (a). The term "navigation aids" is used throughout this proposal.

Section 121.565 Engine Inoperative: Landing; Reporting

The FAA is proposing to amend Sec. 121.565(c) by replacing the term "ground radio station" with the term "communication facility" and the term "station" with "facility." The term "communication facility" is more accurate than "ground radio station" since the communication facility could be other than ATC. For example, if a pilot sent a report to dispatch or to the Aeronautical Radio, Inc. (ARINC) service provider, then dispatch or the ARINC service provider would forward the report to ATC.

Section 121.579 Minimum Altitudes for Use of Autopilot

The FAA is proposing to amend Sec. 121.579 **by adopting the recommended text provided by the FAA/JAA/Industry Flight Guidance Harmonization working group through the FAA sponsored ARAC activity.**

~~(b) by replacing the term "decision height" with the term "DA/DH." See discussion "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above. In addition, the FAA is proposing to replace the term "ILS" with the word "precision" in (b)(1) and (b)(2). This would be consistent with the proposed definition of "precision approach procedure" in Sec. 1.1.~~

Section 121.651 Takeoff and Landing Weather Minimums: IFR: All Certificate Holders

The FAA proposes to amend Sec. 121.651 by replacing the term "DH" with "DA **(H)**/DH" in paragraph (c). See discussion "II.D.1. ~~Decision Height (DH) and Decision Altitude (DA)" above.~~

Current paragraph (d) sets forth requirements for a final approach segment of an instrument approach procedure (other than a Category II or Category III procedure) at an airport with less-than-certain visibility minimums where the ILS and an operative PAR are collocated and coincident. The FAA is proposing to amend the paragraph to expand it from only ILS to include an operative PAR and any other ~~precision~~ **FAA-approved** instrument approach system **specifically listed in Operations Specifications, such as GLS.**

Section 121.652 Landing Weather Minimums: IFR: All Certificate Holders

The FAA proposes to amend Sec. 121.652 by replacing the term "DH" with "DA **(H)**/DH" in paragraph (a). See discussion "II.D.1. ~~Decision Height (DH) and Decision Altitude (DA)" above.~~

Appendix M to Part 121

The FAA proposes to amend Appendix M to part 121 by replacing the words, "Selected decision height" with the words "Selected decision altitude **(height), AH, or RA height** ~~decision height~~" in Parameter Number 54. See discussion "II.D.1. ~~Decision Height (DH) and Decision Altitude (DA)" above.~~

COMMENT: Coordinated and compatible changes as noted above, should then be made to the below sections of Part 125, 129, and 135.

Section 125.51 En Route Navigational Facilities

The FAA proposes to revise the heading to read "En route navigation aids" and to amend paragraphs (a) and (b) of Sec. 125.51 by replacing the words "nonvisual ground aids" with "navigation aids" to allow for navigation by other-than-ground-based navigation aids, and to change the heading from "en route navigational facilities" to "en route navigation systems."

Section 125.203 Radio and Navigational Equipment

Section 125.203 would be revised. In the heading, the words "Radio and navigational" would be replaced with the words "Communication and navigation." Throughout the rest of the section, proposed changes would mirror proposed Sec. Sec. 121.349, 129.17 and 135.165 requirements. These are described in the discussion of proposed Sec. 121.349. In addition, because nautical miles are the standard unit of measurement in air navigation, the words "25 miles" in paragraph (a) would be replaced with the words "22 nautical miles."

For the purposes of Sec. 125.203, a system that provides both communication and navigation may be used in place of separate communications and navigation systems. However, existing Sec. 125.203(d) would be removed because it does not contain a requirement and is merely guidance.

Section 125.321 Reporting Potentially Hazardous Meteorological Conditions and Irregularities of Ground and Navigation Facilities

The FAA is proposing to revise Sec. 125.321 so that it would be identical to proposed Sec. 121.561.

Section 125.379 Landing Weather Minimums: IFR

The FAA proposes to amend Sec. 125.379(a) by replacing the term "DH" with "DA/DH" in paragraph (a). See discussion "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above.

Section 125.381 Takeoff and Landing Weather Minimums: IFR

The FAA is proposing to amend Sec. 125.381(a) and (b) by changing the word "pilot" to "person" to make the regulation consistent with the definition of "person" currently in Sec. 1.1.

The FAA is also proposing to revise Sec. 125.381(c) to update the terminology and to reorganize the paragraph to improve its clarity. As proposed, the term "outer marker" would be replaced with the more accurate term "precision final approach fix" in paragraph (c)(1). In addition, the FAA is proposing to change the term "DH" to "DA/DH." See discussion under "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above.

Section 129.16 Communication and Navigation Equipment for Rotorcraft Operations Under VFR Over Routes Navigated by Pilotage

The FAA is proposing to add new Sec. 129.16 to mirror the requirements of Sec. 121.347 for part 129 rotorcraft VFR operations. This would impose no burden on operators of those rotorcraft because they are already equipped with the communication equipment, and the communication and navigation equipment needed for night VFR operations, that would meet the proposed requirements. These changes would make the regulation more flexible for modern means of communication and navigation and would allow for future changes in technology.

Section 129.17 Radio Equipment

The FAA is proposing to revise the heading of Sec. 129.17 to replace "radio equipment" with "aircraft communication and navigation equipment for operations under IFR or over the top." Throughout the rest of the section, proposed changes would mirror proposed Sec. Sec. 121.347, 121.349, and 135.165 requirements. These are described in the explanation of changes to Sec. 121.349. The change would impose no burden on operators of those aircraft because they are already equipped with the communication and navigation equipment that would meet the proposed requirements. These changes would make the regulation more flexible for modern means of communication and navigation and would allow for future changes in technology.

Section 129.21 Control of Traffic

The FAA is proposing to revise Sec. 129.21 to remove references to "ground" and "voice." This revision would enable air carriers to take advantage of advances in technology.

Appendix A to Part 129

The FAA is proposing to revise paragraph (b), Section IV, of part 129, Appendix A, to replace the words "Radio Facilities: Communications" with "Communications Facilities" in the paragraph heading, and by replacing the words "ground radio communication facilities" with "communication facilities" in the text. This would allow those facilities to be located wherever appropriate.

Section 135.67 Reporting Potentially Hazardous Meteorological Conditions and Irregularities of Communications or Navigation Facilities

The FAA is proposing to amend Sec. 135.67 so that the section would be identical to proposed Sec. 121.561.

Section 135.78 Instrument Approach Procedures and IFR Landing Minimums

The FAA is proposing to add new Sec. 135.78 to be consistent with the requirements in Sec. Sec. 121.567 and 125.325. This would give the FAA a regulatory basis for authorizing in the certificate holder's operations specifications for new kinds of approaches and revising weather minimums for certain conditions.

Section 135.79 Flight Locating Requirements

The FAA is proposing to amend Sec. 135.79(a)(3) by replacing the term "radio or telephone communications" with the term "communications." By using less specific language, certificate holders would have greater flexibility in determining what type of communication equipment to use, and thus be able to take advantage of changes in technology.

Section 135.93 Autopilot: Minimum Altitudes for Use

The FAA is proposing to replace the words "When using an instrument approach facility other than ILS," at the beginning of Sec. 135.93(b) with the words "For other than precision approaches, * * *" This would eliminate the use of the word "facility." Under the existing language, paragraph (b) already allows for approach and landing operations with vertical guidance (APV) by using the phrase "other than ILS." The term "facility" is not necessary and would be removed to improve clarity.

Paragraph (c) would be amended to facilitate future technology by replacing the words "For ILS approaches" in the beginning of the paragraph with "For precision approaches."

Section 135.152 Flight Recorders

The FAA proposes to amend Sec. 135.152 (h)(54) by replacing the words "decision height" with the words "decision altitude/decision height" in paragraph (a). See discussion "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above.

Section 135.161 Communication and Navigation Equipment for Aircraft Operations Under VFR Over Routes Navigated by Pilotage

The FAA is proposing to revise Sec. 135.161 to mirror the requirements of Sec. 121.347 (a) and (b) for operations conducted under VFR over routes navigated by pilotage. This would not result in a substantive change to the existing requirements in the section. These changes would make the regulation more flexible for modern means of communication and would allow for future changes in technology. In addition, the FAA is proposing to remove the words "carrying passengers" to make the section applicable to all VFR operations, including all-cargo.

Section 135.165 Radio and Navigational Equipment: Extended Over-Water or IFR Operations

The FAA is proposing to revise the heading of Sec. 135.165 and to amend the section by removing the words "radio communication and navigational equipment appropriate to the facilities to be used" and using the words "communication systems," "navigation systems" and "suitable for the route to be flown."

Throughout the rest of the section, proposed changes would mirror proposed Sec. Sec. 121.349, 125.203, and 129.17 requirements. These are described in the discussion of proposed Sec. 121.349. Also, for non-normal and emergency conditions, the FAA would add a requirement that aircraft used in extended over-water or IFR operations be equipped with at least one independent communication system having two-way voice communication capability. These changes would make the regulation more flexible for modern means of communication and navigation and would allow for future changes in technology. For the purposes of Sec. 135.165, a system that provides both communication and navigation may be used in place of separate communications and navigation systems. However, existing Sec. 135.165(c) would be removed because it does not contain a requirement and is merely guidance.

Section 135.225 IFR: Takeoff, Approach and Landing Minimums

The FAA is proposing to amend Sec. 135.225 (a), (b), (e), (f), and (g) by changing the word "pilot" to "person" to make the regulation consistent with the definition of "person" currently in Sec. 1.1.

The FAA is also proposing to amend paragraph (c)(1) by changing the term "an ILS final approach" to the term "a precision or APV approach." This would broaden the term to address any precision approach and the new APV approaches, not only ILS.

In the introductory text of paragraph (c)(3), the words "on a final approach using a VOR, NDB, or comparable approach procedure" would be changed to "on a nonprecision final approach."

In paragraphs (c)(3)(ii) and (d), the term "DH" would be changed to "DA/DH." See discussion "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above.

Section 135.345 Pilots: Initial, Transition, and Upgrade Ground Training

The FAA proposes to amend Sec. 135.345(a)(7) by replacing the term "DH" with "DA/DH" in paragraph (a). See discussion "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above.

Section 135.371 Large Transport Category Airplanes: Reciprocating Engine Powered: En Route Limitations: One Engine Inoperative

The FAA is proposing to amend Sec. 135.371(c)(2) by removing the word "radio." This would eliminate the reliance on ground-based navigational aid fixes and permit the use of other means such as RNAV waypoints to identify such fixes.

Section 135.381 Large Transport Category Airplanes: Turbine Engine Powered: En Route Limitations: One Engine Inoperative

The FAA is proposing to amend Sec. 135.381(b)(2) by removing the word "radio." This would eliminate the reliance on voice technology.

Appendix F to Part 135

The FAA proposes to amend Appendix F to part 135 by replacing the words, "Selected decision height" with the words "Selected decision altitude/decision height" in Parameter Number 54. See discussion "II.D.1. Decision Height (DH) and Decision Altitude (DA)" above.

IV. 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. We have determined that there are no new information collection requirements associated with this proposed rule.

V. International Compatibility

In keeping with United States obligations under the Convention on International Civil Aviation, it is the FAA's policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has determined that there are no ICAO Standards and Recommended Practices that corresponded to these proposed regulations.

VI. Economic Evaluation

Proposed and final rule changes to federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency 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 requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (19 U.S.C. 2531 through 2533) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, the Trade Agreements Act also requires agencies to consider international standards and, where appropriate, use them as the basis of U.S. standards. Fourth, the Unfunded Mandates Reform Act of 1995 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).

In conducting these analyses, the FAA has determined that this NPRM: (1) Would not be "a significant regulatory action" as defined in the Executive Order, and would not be "significant" as defined in the Department of Transportation's Regulatory Policies and Procedures; (2) would not have a significant impact on a substantial number of small entities; (3) would not impose barriers to international trade; and (4) would not impose an unfunded mandate on state, local, or tribal governments, or on the private sector. These analyses are available in the docket, and are summarized below.

Benefits and Costs

The proposed rule expands the use of area navigation systems to allow for technological advances that support RNAV, such as GPS, while retaining the current ground-based systems. The proposed rule would not impose an obligation to change current navigation systems, and therefore, the proposed rule would mandate no costs on aircraft operators. The proposed rule would also add language that would codify current practice and, therefore, would not impose costs. To enhance safety, the proposed rule would revise the definition of "night," which would allow the FAA to limit operations at locations where terrain might result in an earlier nightfall than published in the American Air Almanac. This could affect a very small number of airports in the United States, and, while the FAA does not expect any cost impact, the agency asks for comments.

Cost savings might result because the proposed rule would enable the use of advanced RNAV navigation routes that the FAA has been developing. These routes are typically more direct, and therefore, shorter than the current Federal Airways and jet routes and in following these advanced RNAV routes aircraft may require less fuel and time to reach their destinations. Advanced area navigation routes have not been planned, so cost savings cannot be reliably estimated at this time. However, estimates of cost savings from flying advanced RNAV test routes that the FAA has established are in excess of \$30 million annually.

In addition, the proposed rule would amend the current regulation and eliminate the middle marker as a required ILS component, as indicated in Sec. 91.175 (k) of the proposed amendments. In 1992, the FAA completed an evaluation of the operational effectiveness and safety benefits provided by a middle marker during ILS operations. The evaluation concluded that a middle marker makes no significant difference in pilot performance while conducting an ILS approach. Elimination of the middle marker as a required ILS component would result in net cost savings to owners of middle marker facilities who choose to decommission their middle marker facilities. Owners of middle marker facilities would save a total of \$2.3 million per year if all the 672 middle marker facilities are decommissioned. The total operating cost savings over 15 years would be \$34 million (approximately \$20 million discounted). However, there are costs to decommission the facilities and these costs range from \$10,000 to \$30,000 per facility. The FAA assumes that half the middle markers would be decommissioned at the end of 2003 and the other half at the end of 2004. The total cost to decommission all the middle marker facilities would range from a total of \$6.7 million (\$6.0 million discounted) to approximately \$20.2 million (\$18.2 million discounted). The net cost savings would be \$27.2 million (\$13.5 million discounted) over the 15 year period given the low estimate of decommissioning costs to \$13.8 million (\$1.3 million discounted) given the high estimate.

In addition, the proposed amendments would expand the number of acceptable substitutes for the outer marker. This would allow more flexibility in the design of future instrument approaches.

VII. Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and

governmental jurisdictions subject to regulation." To achieve that principle, the RFA requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. 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 proposed or final rule will have a significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a regulatory flexibility analysis as described in the RFA .

However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 Act 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 proposed rule may effect those privately owned small airports that would be allowed to decommission their middle marker facilities. There are an estimated 38 non-Federal middle marker facilities. For the purposes of this regulatory flexibility determination, the FAA assumes that all 38 middle marker facilities are at airports operated by small entities. The estimated cost to decommission a middle marker facility ranges from \$10,000 to \$30,000 per facility. On the other hand, the non-Federal navigation facilities would save operating costs by no longer having to maintain and operate these middle marker facilities. These savings would be about \$3,400 annually per facility. Over a period of 15 years, each facility would save \$51,000 in operating costs if it decommissioned its middle markers. However, the proposed rule would not mandate that the middle marker facilities be decommissioned. The private facility owners would not be required to decommission their facilities; therefore they would only do so if they believed it to be cost-beneficial. Consequently, the FAA certifies that the proposed rule would not have a significant economic impact on a substantial number of small entities. The FAA solicits comments from the public regarding this finding.

VIII. International Trade Impact Analysis

The Trade Agreement Act of 1979 prohibits Federal agencies from engaging in any standards or 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.

This action proposes to impose requirements on foreign air carriers operating in the United States that would mirror the communication and navigation equipment requirements placed on domestic air carriers operating in the United States. This would mean that the requirements imposed on foreign air carriers operating in the United States would be consistent with those that are imposed on U.S. commercial operators and air carriers operating domestically. For example, proposed Sec. Sec. 121.349, 125.203, and 135.165 would impose substantially the same communication and navigation system requirements for operations in the United States under IFR or over the top as proposed in Sec. 129.17 for foreign air carriers that conduct IFR or over the top operations in the United States. Therefore the FAA has determined that the proposed rule would have a neutral impact on foreign trade and would create no obstacles to the foreign commerce of the United States.

IX. Unfunded Mandate Assessment

The Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104-4 on March 22, 1995 is intended, among other things, to curb the practice of imposing unfunded Federal mandates on State, local, and tribal governments. Title II of the Act 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 a \$100 million or more expenditure (adjusted annually for inflation) 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." This proposed rule would not contain such a mandate. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

X. Executive Order 13132, Federalism

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

XI. Environmental Analysis

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental impact statement. In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(j), this proposed rulemaking action qualifies for a categorical exclusion.

XII. Energy Impact

The energy impact of this proposed rule has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) (Pub. L. 94-163, as amended; 42 U.S.C. 6362) and FAA Order 1053.1. The FAA has determined that the proposed rule is not a major regulatory action under the provisions of the EPCA.

List of Subjects

14 CFR Part 1

Air transportation.

14 CFR Part 71

Airspace, Navigation (air).

14 CFR Part 91

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

14 CFR Part 95

Air traffic control, Airspace, Alaska, Navigation (air), Puerto Rico.

14 CFR Part 97

Air traffic control, Airports, Navigation (air), Weather.

14 CFR Part 121

Air carriers, Aircraft, Airmen, Aviation safety, Charter flights,

Drug testing, 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, Smoking.

14 CFR Part 135

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

The Proposed Amendments

In consideration of the foregoing, the Federal Administration Aviation proposes to amend 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 Sec. 1.1 as follows:

a. Remove the definitions of Area navigation high route, Area navigation low route, Category II operations, Category III operations, Category IIIa operations, Category IIIb operations, Category IIIc operations, Decision height, Minimum descent altitude, Nonprecision approach procedure, Precision approach procedure, and RNAV way point.

b. Add definitions for Air Traffic Service (ATS) route, ~~Approach procedure with vertical guidance (APV)~~, Area navigation (RNAV) route, Category I (CAT I) operation, Category II (CAT II) operation, Category III (CAT III) operation, ~~Category IIIa (CAT IIIa) operation, Category IIIb (CAT IIIb) operation, Category IIIc (CAT IIIc) operation,~~ Decision altitude (DA), Decision height (DH), Final approach fix (FAF), ~~Instrument approach procedure (IAP)~~, Minimum descent altitude (MDA), ~~Nonprecision approach procedure (NPA), Precision approach procedure (PA), and Precision final approach fix (PFAF)~~ in alphabetical order to read as set forth below.

c. Revise the definitions of Area navigation (RNAV), Night, and Route segment to read as set forth below.

Sec. 1.1 General definitions.

* * * * *

Air Traffic Service (ATS) route is a specified route designated for channeling the flow of traffic as necessary for the provision of air traffic services. The term "ATS route" refers to a variety of

airways, including jet routes, area navigation (RNAV) routes, and arrival and departure routes. An ATS route is defined by route specifications, which may include:

- (1) An ATS route designator;
- (2) The path to or from significant points;
- (3) Distance between significant points;
- (4) Reporting requirements; and
- (5) The lowest safe altitude determined by the appropriate authority.

* * * * *

~~Approach procedure with vertical guidance (APV) is an instrument approach procedure based on lateral path and vertical glide path. These procedures may not conform to requirements for precision approaches.~~

* * * * *

~~Area navigation (RNAV) is a method of navigation that permits aircraft operations on any desired flight path.~~

~~Area navigation (RNAV) route is an ATS route based on RNAV that can be used by suitably equipped aircraft.~~

* * * * *

Category I (Cat I) - An instrument approach or approach and landing with a decision altitude (height) or minimum descent altitude (height) not lower than 60m (200 ft) and with either a visibility not less than 1/2 statute mile (800m), or a runway visual range not less than 550m (1800 ft). 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 1/2 statute mile (800 meters), or a runway visual range of not less than 1,800 feet (550 meters).

Category II (Cat II) - An instrument approach or approach and landing with a decision height lower than 60m (200 ft) but not lower than 30m (100 ft) and a runway visual range not less than 350m (1200 ft).

~~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) - An instrument approach or approach and landing with a decision height lower than 30m (100 ft), or no decision height, or a runway visual range less than 350m (1200 ft).

~~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 1,200 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). * * * * * Decision altitude (DA) is a specified altitude at which a person must initiate a missed approach if the person does not see the required visual reference. Decision altitude is expressed in feet above mean sea level.

Decision Altitude (Height) (DA(H)) - A specified minimum altitude (height) in an instrument approach by which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

—Decision height (DH) is a specified height above the 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.

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

* * * * *

—Instrument approach procedure (IAP) is a 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.

* * * * *

Minimum Descent Altitude (MDA) - A specified altitude in an approach without vertical path guidance or in a circling approach, below which descent must not be made without the required visual reference. Minimum Descent Altitude (MDA) is referenced to mean sea level.

Minimum descent altitude (MDA) is 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 Sec. 91.175(c) of this chapter are met. Minimum descent altitude is expressed in feet above mean sea level.

* * * * *

Night is the time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time or such other period between sunset and sunrise, as may be prescribed by the FAA.

COMMENT: We question why this change in the definition of night needed? What effect does it have on existing logbooks or operations? Why is local time computation necessary or particularly relevant? If it is dark between evening civil twilight and morning civil twilight, it can still be considered night if described and logged by Z time rather than local time. Definitions like this should not be changed unless absolutely necessary because such changes can have adverse effect on pilot's logbooks, and have legal consequences beyond FAA. It causes "night" time already logged using the earlier definition to be in conflict with night time logged under the new definition. It can have adverse consequence for pilot rating qualification computations, and even have legal consequence for things like insurance qualification. If a change to the definition of night is to be made, the reason(s) needs to be made clear and agreed to by the industry, and the correlation with ICAO, military usage, and other countries usage of the term "night" needs to be further considered and addressed.

* * * * *

~~— Nonprecision approach procedure (NPA) is an instrument approach procedure based on a lateral path and no vertical glide path.~~

* * * * *

~~Precision approach procedure (PA) is an instrument approach procedure based on a lateral path and a vertical glide path.— Precision final approach fix (PFAF) defines the beginning of the precision or APV final approach segment, and denotes the location where the glide path intersects the intermediate segment altitude; i.e., where final segment descent on glide path may begin.~~

* * * * *

~~— Route segment is a portion of a route bounded on each end by a fix or navigation aid (NAVAID).~~

COMMENT: We disagree. Why does a route segment necessarily need to be specifically bounded by a fix or navaid? What about a segment between 2 impromptu points, or multiple such segments, that are FMS created to circumnavigate WX (e.g., MLP02)? What about certain types of an FMS legs not necessarily ending at a fix or navaid (e.g., VA legs, speed transition points, RTA calculated speed change points, ...). This change is too limiting and constraining, for future applications, and we consider it inappropriate for inclusion in the regulations.

* * * * *

3. Amend Sec. 1.2 by adding the following abbreviations in alphabetical order to read as follows:

Sec. 1.2 Abbreviations and symbols.

* * * * *

~~APV means approach procedure with vertical guidance.~~

COMMENT: This attempted definition is most inappropriate. Any flight path in space can essentially have vertical path guidance, even if it is only a flight director showing a command vertical speed. Hence, this definition if treated generally, at best is ambiguous, and if treated with the specific meaning of proposed TERPS usage is incorrect,

contradictory, and inappropriate. It (APV) is not only a term unsuited for incorporation in a regulation at this time, but is even unsuited for incorporation in advisory or guidance material. Instead, the recently issued FAA AC 120-29A comprehensively addresses all aspects of vertical path definition and authorization for air carriers, without reference to or use of the (APV) term or any such similar term. Yet that AC fully addresses vertical aspects of both current and future instrument approach operations comprehensively. The same principles, definitions, and terminology as in AC 120-29A and AC 120-28D could be -- and should be -- applied to ALL instrument approach operations. Further, the definitions of Appendix 1 of those two ACs should be introduced by both FAA and JAA (via the AWO Harmonization process) to ICAO.

* * * * *

NM means nautical mile.

~~NPA means nonprecision approach procedure.~~

COMMENT: This attempted definition is most inappropriate. Any instrument procedure needs to be flown with precision. It is misleading and inappropriate to imply that any instrument procedure should or can be flown without precision. Further, most aspects of procedures such as RNAV formerly considered as "non-precision" actually now use a DA(H) and have higher accuracy for much of the flight profile than ILS (formerly considered as precision). Hence ILS is truly the less precise procedure, and RNAV with VNAV and RNP is the greater precision procedure, for most critical aspects(e.g., long straight in parallel approachs, and for MAP).

The definitions (both NPA and PA), if treated generally, are at best ambiguous. If treated with the specific meaning of proposed TERPS usage, they are most incorrect, contradictory, and inappropriate. They (both PA and NPA) are terms not only unsuited for incorporation in a regulation at this time, but they are even unsuited for incorporation in advisory or guidance material. Instead, the recently issued FAA AC 120-29A comprehensively addresses all aspects of instrument approach classification and definition and authorization for air carriers, without reference to or use of the (NPA or PA) terms or any such similar terms. AC 120-28D and AC 120-29A simply use descriptions for "instrument approach", ILS approach, GLS approach (e.g., xLS), or approaches other than xLS. Further this is consistent with the evolving direction of flight manual documentation of modern aircraft (e.g., all Boeing AFMs, FCOMs, and FCTMs).

ACs 120-28D and AC120-29A fully address vertical aspects of both current and future instrument approach operations comprehensively. The same principles, definitions, and terminology as in AC120-29A and AC120-28D could and should be applied to ALL instrument approach operations. Further the definitions of Appendix 1 of those two ACs should be introduced by both FAA and JAA (via the AWO Harmonization process) to ICAO.

In light of this, any further reference to the term PA or NPA by FAA, or ICAO, is obsolete, unnecessary, and ambiguous; can confuse future operations concepts, and thus should be discontinued.

* * * * *

~~PA means precision approach procedure.~~

COMMENT: This attempted definition is most inappropriate. Any instrument procedure needs to be flown with precision. It is misleading and inappropriate to imply that any

instrument procedure should or can be flown without precision. Further, aspects of procedures such as ILS formerly considered as "precision" actually now use an MDA(H) (e.g., for circling), are offset by significant amounts (LDA, SDF, or IGS), have lesser accuracy for much of the flight profile than RNAV and RNP (formerly considered as non-precision), or have ill-defined or inadequate missed approach protection (e.g., at high minima mountain airports). Hence, ILS is truly the less precise procedure, and RNAV with VNAV and RNP is the greater precision procedure, for most critical aspects (e.g., long straight in parallel approaches, mountain airports, converging procedures, and particularly for MAP).

The definitions (both PA and NPA) if treated generally, are at best ambiguous. If treated with the specific meaning of proposed TERPS usage, they are most incorrect, contradictory, and inappropriate. They (both PA and NPA) are not only terms unsuited for incorporation in a regulation at this time, but they are even unsuited for incorporation in advisory or guidance material. Instead, the recently issued FAA AC120-29A comprehensively addresses all aspects of instrument approach classification and definition and authorization for air carriers, without reference to or use of the (PA or NPA) terms or any such similar terms. AC 120-28D and AC 120-29A simply use descriptions for "instrument approach", ILS approach, GLS approach (e.g., xLS), or approaches other than xLS. Further, this is consistent with the evolving direction of flight manual documentation of modern aircraft (e.g., all Boeing AFMs, FCOMs, and FCTMs).

AC 120-28D and AC 120-29A fully address vertical aspects of both current and future instrument approach operations comprehensively. The same principles, definitions, and terminology as in AC 120-29A and AC 120-28D could and should be applied to ALL instrument approach operations. Further the definitions of Appendix 1 of those two ACs should be introduced by both FAA and JAA (via the AWO Harmonization process) to ICAO.

Any further reference to the term PA or NPA by FAA, or ICAO, is obsolete, unnecessary, and ambiguous; can confuse future operations concepts; and thus should be discontinued.

* * * * *

RNAV means area navigation.

* * * * *

PART 71--DESIGNATION OF CLASS A, CLASS B, CLASS C, CLASS D, AND CLASS E AIRSPACE AREAS; AIR TRAFFIC SERVICE ROUTES; AND REPORTING POINTS

4. The authority citation for part 71 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40103, 40113, 40120; E.O. 10854, 24 FR 9565, 3 CFR, 1959-1963 Comp., p. 389.

5. Revise the heading of part 71 to read as set forth above.

Subpart A--Class A Airspace

6. Transfer the heading "Subpart A--General; Class A Airspace" from where it appears preceding Sec. 71.1 to preceding Sec. 71.31 and revise it to read as set forth above.

7. Add Sec. 71.11 to read as follows:

Sec. 71.11 Air Traffic Service (ATS) routes.

Unless otherwise specified, the following apply:

(a) An Air Traffic Service (ATS) route is based on a centerline that extends from one navigation aid, fix, or intersection, to another navigation aid, fix, or intersection (or through several navigation aids, fixes, or intersections) specified for that route.

(b) ATS routes include the primary protected airspace dimensions defined in FAA Order 8260.3, "United States Standard For Terminal Instrument Procedures (TERPS)." Order 8260.3 is incorporated by reference in Sec. 97.20 of this chapter.

(c) An ATS route does not include the airspace of a prohibited area.

8. Add Sec. 71.13 to read as follows:

Sec. 71.13 Classification of Air Traffic Service (ATS) routes.

Unless otherwise specified, ATS routes are classified as follows:

(a) In subpart A of this part:

- (1) Jet routes.
- (2) Area navigation (RNAV) routes.

(b) In subpart E of this part:

- (1) VOR Federal airways.
- (2) Colored Federal airways.
 - (i) Green Federal airways.
 - (ii) Amber Federal airways.
 - (iii) Red Federal airways.
 - (iv) Blue Federal airways.
- (3) Area navigation (RNAV) routes.

9. Add Sec. 71.15 to read as follows:

Sec. 71.15 Designation of jet routes and VOR Federal airways.

Unless otherwise specified, the place names appearing in the descriptions of airspace areas designated as jet routes in subpart A of FAA Order 7400.9, and as VOR Federal airways in subpart E of FAA Order 7400.9, are the names of VOR or VORTAC navigation aids. FAA Order 7400.9 is incorporated by reference in Sec. 71.1.

Sec. 71.73 [Removed]

10. Remove Sec. 71.73.

Sec. 71.75 [Removed]

11. Remove Sec. 71.75.

Sec. 71.77 [Removed]

12. Remove Sec. 71.77.

Sec. 71.79 [Removed]

13. Remove Sec. 71.79.

PART 91--GENERAL OPERATING AND FLIGHT RULES

14. 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, 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).

15. Amend Sec. 91.129 by revising paragraph (e) to read as follows:

Sec. 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 person 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 person operating a large or turbine-powered airplane that is performing approach and landing operations in accordance with an instrument approach procedure specifying vertical path guidance (APV) or a precision approach procedure must, when using that guidance:

(i) Operate at an altitude at on or above the glide path specified, after passing between the published precision applicable final approach fix or equivalent and the decision altitude (DA), or decision height (DH), as applicable; or

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

(3) Each person operating an airplane approaching to land on a runway served

[[Page 77341]]

by a visual approach slope indicator must maintain an altitude at on or above the glide path ~~until~~ unless a lower altitude flight path 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 slope that are conducted for the purpose of remaining on the glide path, or use of a different flight path when necessary for safety of flight operations or to safely land.

* * * * *

16. Amend Sec. 91.131 by revising paragraph (c)(1) to read as follows:

Sec. 91.131 Operations in Class B airspace.

* * * * *

(c) * * *

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

* * * * *

17. Amend Sec. 91.175 by amending paragraphs (a) through (f), and by adding a new paragraph (l) (e) introductory text and (j) by removing the word "pilot" and adding in its place the word "person," by revising paragraphs (a), (b), (c) introductory text, (e)(1)(ii), (f) introductory text, (h), and (k) to read as follows:

Sec. 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 an approach procedure requires the use of 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 for which the aircraft is equipped.~~

~~—(e) Operation below DA/DH or MDA. Where a DA/DH or MDA is applicable, no pilot may operate an aircraft, except a military aircraft of the United States, at any airport 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. Unless otherwise authorized by the FAA, no person operating an aircraft under part 121, 125, 129, or 135 of this chapter may takeoff from a civil airport under IFR unless weather conditions are at or above the weather minimums for IFR takeoff prescribed for that airport under part 97 of this chapter. Where published civil takeoff minimums are based on a specified route, persons operating that aircraft must comply with that route unless an alternative route has been assigned by ATC. If takeoff minimums are not prescribed under part 97 of this chapter for a particular airport, the following minimums apply to takeoffs under IFR for aircraft operating under part 121, 125, 129, or 135 of this chapter:~~

~~*****~~

~~—(h) Comparable values of RVR and ground visibility. Except for Category II or Category III minimums, if RVR minimums for takeoff or landing are prescribed in an instrument approach procedure, but RVR is not reported for the runway of intended operation, the RVR minimum must be converted to ground visibility in accordance with the Comparable Values of RVR and Ground Visibility table in FAA Order 8260.3, "United States Standard for Terminal Instrument Procedures (TERPS)" (incorporated by reference in Sec. 97.20 of this chapter). This visibility is the minimum for takeoff or landing on that runway.~~

~~*****~~

~~—(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; and 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 specification pertinent to the operation.~~

COMMENT: Replace the entire above text regarding §91.175 with the following revised text for a proposed revision to §91.175:

§91.175 Takeoff and landing under IFR.

(a) Instrument approaches to civil airports.

Unless otherwise authorized by the Administrator, when an instrument approach to a civil airport is necessary, each person operating an aircraft, except a military

aircraft of the United States, shall use a standard instrument approach procedure prescribed for the airport in part 97 of this chapter.

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

- (1) The DA(H) or MDA(H) prescribed by the approach procedure.*
- (2) The DA(H) or MDA(H) prescribed for the pilot in command.*
- (3) The DA(H) or MDA(H) for which the aircraft is equipped.*

(c) Operation below DA(H) or MDA(H). Where a DA(H) or MDA(H) is applicable, no pilot may operate an aircraft, except a military aircraft of the United States, at any airport below the authorized MDA(H) or continue an approach below the authorized DA(H) unless -

(1) The aircraft is continuously in a position from which a descent to a landing on the intended runway can be made at a normal rate of descent using normal maneuvers, and for operations conducted under part 121 or part 135 unless that descent rate will allow touchdown to occur within the touchdown zone of the runway of intended landing;

(2) The flight visibility is not less than the visibility prescribed in the standard instrument approach being used; and

(3) Except for a Category II or Category III approach where any necessary visual reference requirements are specified by the Administrator, at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:

- (i) The approach light system.*
- (ii) The threshold.*
- (iii) The threshold markings.*
- (iv) The threshold lights.*
- (v) The runway end identifier lights.*
- (vi) The visual approach slope indicator.*
- (vii) The touchdown zone or touchdown zone markings.*
- (viii) The touchdown zone lights.*
- (ix) The runway or runway markings.*
- (x) The runway lights.*

(d) Landing. No pilot operating an aircraft, except a military aircraft of the United States, may land that aircraft when the flight visibility is less than the visibility prescribed in the standard instrument approach procedure being used.

(e) Missed approach procedures. Each pilot operating an aircraft, except a military aircraft of the United States, shall immediately execute an appropriate missed approach procedure when either of the following conditions exist:

(1) Whenever the requirements of paragraph (c) of this section are not met at either of the following times:

(i) When the aircraft is being operated below MDA(H); or

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

(2) Whenever an identifiable part of the airport is not distinctly visible to the pilot during a circling maneuver at or above MDA(H), unless the inability to see an identifiable part of the airport results only from a normal bank of the aircraft during the circling approach.

(f) Civil airport takeoff minimums. Unless otherwise authorized by the Administrator, no pilot operating an aircraft under parts 121, 125, 127, 129, or 135 of this chapter may takeoff from a civil airport under IFR unless weather conditions are at or above the weather minimum for IFR takeoff prescribed for that airport under part 97 of this chapter. If takeoff minimums are not prescribed under part 97 of this chapter for a particular airport, IFR takeoff minima for aircraft operating under those parts are 1/2 statute mile visibility.

(g) Military airports. Unless otherwise prescribed by the Administrator, each person operating a civil aircraft under IFR into or out of a military airport shall comply with the instrument approach procedures and the takeoff and landing minimum prescribed by the military authority having jurisdiction of that airport.

(h) Comparable values of RVR and ground visibility.

(1) Except for Category II or Category III minimums, if RVR minimums for takeoff or landing are prescribed in an instrument approach procedure, but RVR is not reported for the runway of intended operation, the RVR minimum shall be converted to ground visibility in accordance with approved Operations Specifications for that operator, if Operations Specifications are applicable, or in accordance with the following table.

<i>RVR (feet)</i>	<i>Visibility (statute miles)</i>
<i>1,600</i>	<i>1/4</i>
<i>2,400</i>	<i>1/2</i>
<i>3,200</i>	<i>5/8</i>
<i>4,000</i>	<i>3/4</i>
<i>4,500</i>	<i>7/8</i>

5,000 1
6,000 1 1/4

(i) Operations on unpublished routes and use of radar in instrument approach procedures. When radar is approved at certain locations for ATC purposes, it may be used not only for surveillance and precision radar approaches, as applicable, but also may be used in conjunction with instrument approach procedures predicated on other types of radio navigational aids. Radar vectors may be authorized to provide course guidance through the segments of an approach to the final course or fix. When operating on an unpublished route or while being radar vectored, the pilot, when an approach clearance is received, shall, in addition to complying with § 91.177, maintain the last altitude assigned to that pilot until the aircraft is established on a segment of a published route or instrument approach procedure unless a different altitude is assigned by ATC. After the aircraft is so established, published altitudes apply to descent within each succeeding route or approach segment unless a different altitude is assigned by ATC. Upon reaching the final approach course or fix, the pilot may either complete the instrument approach in accordance with a procedure approved for the facility or continue a surveillance or precision radar approach to a landing.

(j) Limitation on procedure turns. In the case of a radar vector to a final approach course or fix, a timed approach from a holding fix, or an approach for which the procedure specifies "No PT," no pilot may make a procedure turn unless cleared to do so by ATC.

(k) Instrument Procedure Component substitution. Fixes, components, or navigation methods may be substituted in an instrument approach procedure as noted by that instrument procedure, as noted by Operations Specifications, or as otherwise authorized by the administrator. If not otherwise restricted or limited, a compass locator or precision radar may be substituted for the outer or middle marker. RNAV, DME, VOR, or nondirectional beacon fixes authorized in the standard instrument approach procedure or surveillance radar may be substituted for the outer marker. Applicability of, and substitution for an inner marker for Category II or III approaches is determined by the appropriate Part 97 approach procedure, letter of authorization, or operations specification pertinent to the operations.

(l) Notwithstanding provisions of paragraphs c(2), (d), and (e) above, the Administrator may approve use of systems and procedures meeting requirements other than those specified, if:

(1) The systems and procedures proposed are shown to have equivalent or better performance than other approved systems, are operationally safe, effective, and reliable for approach, landing, missed approach, or takeoff, as applicable, and,

(2) If visual reference requirements apply, the pilot is able to determine that flight visibility is adequate for safe takeoff or landing.

18. Amend Sec. 91.177 by revising paragraph (a) to read as follows:

Sec. 91.177 Minimum altitudes for IFR operations.

(a) Operation of aircraft at minimum altitudes. Except when necessary for takeoff or landing, **or when otherwise authorized by the administrator**, 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 alternately for RNP capable navigation systems, within two times the applicable level of RNP**; 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, **or alternately for RNP capable navigation systems, within two times the applicable level of RNP**.

* * * * *

19. Amend Sec. 91.179 by adding introductory text to read as follows:

Sec. 91.179 IFR cruising altitude or flight level.

Unless otherwise authorized by ATC, the following rules apply--

* * * * *

20. Amend Sec. 91.181 by removing the words ``a Federal airway" and adding in their place the words ``an ATS route" in paragraph (a).

Sec. 91.181 [Amended]

21. Amend Sec. 91.183 by revising the heading and the introductory text to read as follows:

Sec. 91.183 IFR communications.

Unless otherwise authorized by the FAA, the pilot in command of each aircraft operated under IFR in controlled airspace must monitor the appropriate frequency and must report the following as soon as possible--

* * * * *

22. Amend Sec. 91.185 heading and paragraph (a) by removing the word ``radio.''

Sec. 91.185 [Amended]

23. Amend Sec. 91.189 (c) by removing the term ``DH'' and adding in its place the term ``DA/DH DA(H)'' wherever it appears. and amend paragraph (d) by removing the word ``pilot'' and inserting the word ``person.''

Sec. 91.189 [Amended]

24. Amend Sec. 91.205 by revising paragraphs (d)(2) and (e) to read as follows:

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

* * * * *

(d) * * *

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

* * * * *

(e) Flight at and above ~~18,000~~ 24,000 feet MSL (FL ~~180~~ 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 ~~180~~ 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 ~~180~~ 240, the pilot in command of the aircraft must notify ATC ~~immediately~~, and then may continue operations at and above FL ~~180~~ 240 to the next airport of intended landing where repairs or replacement of the equipment can be made.

* * * * *

25. Amend Sec. 91.219(b)(5) by removing the term ``DH'' and adding in its place the term ``DA/DH DA(H).''

Sec. 91.219 [Amended]

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

Sec. 91.511 Communication and navigation equipment for over-water operations.

(a) * * *

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

* * * * *

27. Amend Sec. 91.711 by revising paragraphs (c)(1)(i), (c)(1)(ii), and (e) introductory text to read as follows:

Sec. 91.711 Special rules for foreign civil aircraft.

* * * * *

(c) * * *

(1) * * *

(i) Communication equipment.

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

* * * * *

(e) Flight at and above FL ~~480~~**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 ~~480~~**240**, unless the aircraft is equipped with DME or an IFR-approved RNAV system. When the DME or RNAV system required by this paragraph fails at and above FL ~~480~~**240**, the pilot in command of the aircraft must notify ATC ~~immediately~~ and may then continue operations at and above FL ~~480~~**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 180 without DME or an IFR-approved RNAV system when operated for the following purposes, and ATC is notified before each takeoff:

* * * * *

PART 95--IFR ALTITUDES

28. The authority citation for part 95 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40103, 40113, and 14 CFR 11.49(b)(2).

29. Revise Sec. 95.1 to read as follows:

Sec. 95.1 Applicability.

(a) This part prescribes altitudes governing the operation of aircraft under IFR on ATS routes, or other direct routes for which an MEA is designated in this part. In addition, it designates mountainous areas and changeover points.

(b) The MAA is the highest altitude on an ATS route, or other direct route for which an MEA is designated, at which adequate reception of VOR signals is assured.

(c) The MCA applies to the operation of an aircraft proceeding to a higher minimum en route altitude when crossing specified fixes.

(d) The MEA is the minimum en route IFR altitude on an ATS route, ATS route segment, or other direct route. The MEA applies to the entire width of the ATS route, ATS route segment, or other direct route between fixes defining that route. Unless otherwise specified, an MEA prescribed for an off airway route or route segment applies to the airspace 4 nautical miles on each side of a direct course between the navigation fixes defining that route or route segment **or if based on RNP, to two times the applicable level of RNP for that route or segment.**

(e) The MOCA assures obstruction clearance on an ATS route, ATS route segment, or other direct route, and adequate reception of VOR navigation signals within 22 nautical miles of a VOR station used to define the route.

(f) The MRA applies to the operation of an aircraft over an intersection defined by ground-based navigation aids. The MRA is the lowest altitude at which the intersection can be determined using the ground-based navigation aids.

(g) The changeover point (COP) applies to operation of an aircraft along a Federal airway, jet route, or other direct route; for which an MEA is designated in this part. It is the point for transfer of the airborne navigation reference from the ground-based navigation aid behind the aircraft to the next appropriate ground-based navigation aid to ensure continuous reception of signals.

PART 97--STANDARD INSTRUMENT PROCEDURES

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

Authority: 49 U.S.C. 106(g), 40103, 40113, 40120, 44701; and 14 CFR 11.49(b)(2).

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

32. Revise Sec. 97.1 to read as follows:

Sec. 97.1 Applicability.

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

(b) Departure procedures. This part also prescribes departure procedures (DPs) developed for aircraft operating under parts 121, 125, 129, and 135 of this chapter to avoid obstacles **when not otherwise addressed by operations specifications, or when not otherwise addressed by takeoff analysis and obstacle clearance required by other operating rules in Parts 121, 125, or 135. It**, and establishes weather minimums that apply for takeoff under IFR at civil airports **if not otherwise specified by Operations Specifications.** Where published civil takeoff weather minimums are based on a specified route, persons operating that aircraft must comply with that route unless an alternative route has been assigned by ATC.

COMMENT: This type of compliance provision is NOT APPROPRIATE. Further, even if something like this was intended, it would not be appropriate in Part 97. If specified at all, it would need to be in Part 91, or alternatively in Part 121, 135, 125 or 129.

33. Revise Sec. 97.3 to read as follows:

Sec. 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 1.3 V_{so} (at maximum certificated landing weight). V_{so} and the maximum certificated landing weight are those values established for the aircraft by the certifying 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 (~~height~~) 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 Sec. 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 (~~height~~) 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~~ DA(H) or MDA(H) 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~~ DA(H) or MDA(H) 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 AGL.

HAT means height above ~~threshold~~ touchdown expressed in feet.

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 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.

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.

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

COMMENT: There may be cases in the future where we also elect to depict alternative units, such as metric-based minima, for compatibility with, and to facilitate, international operations.

34. Amend Sec. 97.5 by revising the heading and paragraph (a) to read as follows:

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

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

* * * * *

35. Remove and reserve Sec. 97.10.

Sec. 97.10 ~~[Removed and reserved]~~

COMMENT: This provision should be revised, simplified, and retained, as a place holder for future OpSpecs based procedures not using TERPS criteria, or for application of internationally harmonized criteria.

36. Revise Sec. 97.20 to read as follows:

Sec. 97.20 General.

(a) This subpart prescribes standard instrument procedures based on the criteria contained in FAA Order 8260.3, "U.S. Standard for Terminal Instrument Procedures (TERPS)" and FAA Order 8260.19, "Flight Procedures and Airspace." These standard instrument procedures and FAA Orders were approved for incorporation by reference by the Director of the Federal Register pursuant to 5 U.S.C. 552(a) and 1 CFR part 51. They may be examined at the following locations:

(1) FAA Orders 8260.3 and 8260.19 may be examined at the Federal Aviation Administration, Flight Standards Service, Flight Technologies and Procedures Division (AFS-420), 6500 S. MacArthur Blvd., Oklahoma City, OK, and at the Office of the Federal Register, 800 North Capitol Street, NW, suite 700, Washington, DC. These Orders are available for purchase from the U.S. Government Printing Office, 710 N. Capitol Street, NW, Washington, DC 20401.

(2) Standard instrument procedures may be examined at the Federal Aviation Administration, National Flight Data Center (ATA-110), 800 Independence Avenue, S.W., Washington, DC, and at the Office of the Federal Register, 800 North Capitol Street, NW, suite 700, Washington, DC.

(b) Standard instrument procedures and associated supporting data are documented on specific forms under FAA Order 8260.19 and are promulgated by the FAA through the National Flight Data Center (NFDC) as the source for aeronautical charts and avionics databases. These procedures are then portrayed on aeronautical charts and included in avionics databases prepared by the National Aeronautical Charting Office (AVN-500) and other publishers of aeronautical data for use by pilots using the NFDC source data. The terminal aeronautical charts published by the U.S. Government were approved for incorporation by reference by the Director of the Federal Register pursuant to 5 U.S.C. 552(a) and 1 CFR part 51. They may be examined at the Federal Aviation Administration, National Flight Data Center (ATA-110), 800

Independence Avenue, SW., Washington, DC, and at the Office of the Federal Register, 800 North Capitol Street, NW, suite 700, Washington, DC. These charts are available for purchase from the FAA National Aeronautical Charting Office, Distribution Division AVN-530, 6303 Ivy Lane, Suite 400, Greenbelt, MD 20770.

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

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

Authority: 49 U.S.C. 106(g), 40113, 40119, 41706, 44101, 44701-44702, 44705, 44709-44711, 44713, 44716-44717, 44722, 44901, 44903-44904, 44912, 46105.

38. Amend Sec. 121.99 by revising paragraph (a) to read as follows:

Sec. 121.99 Communications facilities.

(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, is available over the entire route under normal operating conditions. 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, ***if applicable***, the appropriate dispatch office, and between each airplane and the appropriate air traffic control unit, except as specified in Sec. 121.351(c). ~~For non-normal and emergency operation conditions, the communication system for use between each airplane and the appropriate dispatch office and between each airplane and the appropriate ATC unit must have two-way voice communication capability. For the purpose of communications between the airplane and the dispatch office under this section, the term "rapid communications" means that the caller must be able to establish communications with the called party in less than four minutes.~~

* * * * *

39. Revise Sec. 121.103 to read as follows:

Sec. 121.103 En route navigation systems.

(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 over the route to navigate the airplane along the route with the required accuracy. 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 FAA.

40. Revise Sec. 121.121 to read as follows:

Sec. 121.121 En route navigation systems.

(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 over the route to navigate the airplane along the route with the required accuracy. 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 FAA.

41. Amend Sec. 121.344 by removing the words ``decision height'' and adding in their place the words ``decision altitude (height)'' in paragraph (a)(54).

Sec. 121.344 [Amended]

42. Amend Sec. 121.345 by removing the word ``radio'' in the heading and in paragraphs (a) and (b) and adding in its place the word ``communication.''

Sec. 121.345 [Amended]

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

Sec. 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 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; and

(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 airspace surface area designated for an airport in which flights are intended.

* * * * *

(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) 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.

44. Revise Sec. 121.349 to read as follows:

Sec. 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. Except as provided in paragraph (c) of this section, 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 the airplane used in those operations is equipped with at least two approved independent navigation systems suitable for the route to be flown and authorized in the certificate holder's operations specifications. However, only one navigation system need be provided for ~~precision-~~instrument approach and APV operations **if provision has been made to assure safe operations following failure of that single system.** Equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals.

(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) For normal operating conditions, at least two independent communication systems that fulfill the functions specified in Sec. 121.347(a); and

(2) Except as required in Sec. 121.99, for non-normal and emergency operating conditions, **unless otherwise authorized,** at least one of the two independent communication systems that fulfills the functions specified in Sec. 121.347(a), and has two-way voice communication capability.

(c) Use of a single independent navigation system. Notwithstanding the requirements in paragraph (a) of this section, the airplane may be equipped with a single independent navigation system suitable for the route to be flown if:

(1) 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 system at any point along the route, **including approach or missed approach if applicable,** for **either safely continuing to land if weather conditions permit, or** navigating safely to a suitable airport and completing an instrument approach;

(2) Both navigation systems are authorized by the FAA in the certificate holder's operations specifications; and

(3) 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 IFR approved RNAV system.

(e) Additional communication system equipment requirements. 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.

45. Amend Sec. 121.351 by revising the heading and paragraphs (a), (c)(1), and (c)(3) to read as follows:

Sec. 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 communication **and navigation** systems that meet the following requirements--

- (1) The communication equipment necessary under normal operating conditions to communicate with at least one appropriate station from any point on the route;
- (2) The communication equipment necessary under normal operating conditions to 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;
- (3) For non-normal and emergency operating conditions, one communication system having two way voice communication capability; and
- (4) Two **or more suitable RNAV or other** LRNSs ~~when~~ **if** VOR, or ADF, **or equivalent** radio navigation equipment **capability, as applicable to the aircraft and route,** is unusable along a portion of the route.

* * * * *

(c) * * *

(1) The ability of the flightcrew to navigate the airplane along the route with the required accuracy,

* * * * *

(3) The duration of the very high frequency communications gap, **or equivalent**, if only very high frequency communication equipment, **or other specialized communication equipment,** is installed.

46. Amend Sec. 121.419(a)(1)(vii) by removing the term ``DH'' and adding in its place the term ``DA(H)/DH''.

Sec. 121.419 [Amended]

47. Amend Sec. 121.559(c) by removing the words "ground radio station" and adding in their place the words "communication facility".

Sec. 121.559 [Amended]

48. Amend Sec. 121.561 by revising the heading to read 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".

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

* * * * *

49. Amend Sec. 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".

Sec. 121.565 [Amended]

50. Amend Sec. 121.579 by adopting the following text as provided by the FAA/JAA/Industry Flight Guidance Harmonization working group to ARAC.

~~(b) introductory text by removing the words "decision height" and adding in their place the term "DAVDH" and amend paragraphs (b)(1) and (b)(2) by removing the term "ILS" and adding in its place the word "precision".~~

Sec. 121.579 [Amended]

§ 121.579 Minimum heights for use of autopilot.

Unless otherwise approved by the Administrator, an autopilot may not be used lower than the applicable heights specified below. Enroute altitudes or heights are considered to be above terrain as applicable to the route flown. For takeoff, approach, or landing, the heights are above the runway touchdown zone elevation, runway elevation, or airport elevation, as applicable.

(a) Takeoff and initial climb. Except as provided in (a)(3) below, an autopilot may not be used for takeoff or initial climb below the following height:

(1) Below the value specified in the approved AFM for takeoff, or

(2) If a minimum engagement height is not specified by the AFM, an autopilot may not be used below 500' above the departure airport elevation.

(3) If the Administrator determines that an autopilot minimum engagement height lower than 500 feet above airport elevation, or a minimum engagement height different than that specified by the AFM is necessary, and can be safely

used, operations specifications may be issued authorizing use of an alternate minimum engagement height, provided:

(i) The aircraft is operated in accordance with flight crew procedures determined to be acceptable to the administrator, considering the autopilot and aircraft system's normal and failure characteristics, autopilot modes to be used, and any applicable aircraft conditions or configurations, and

(ii) That autopilot system's use is otherwise determined to be consistent with assuring safe takeoff obstacle clearance requirements as specified by Par 121, Subpart I.

(b) Enroute. Except as provided in paragraphs (a), (c), (d) and (e) of this section, no person may use an autopilot enroute, including climb and descent, at height above the terrain, considering route width applicable to the route of flight and navigation capability, that is less than the maximum height loss specified in the Airplane Flight Manual (AFM) for a malfunction of the autopilot under the applicable mode or condition. If no height loss value is specified by the AFM, or if a height loss value cannot otherwise be determined by methods found acceptable to the administrator, the autopilot may not be used at a height less than twice the AFM demonstrated cruise height loss following a malfunction, or twice the applicable approach height loss, or 500 feet above the terrain, whichever is higher.

(c) Approach. Except in accordance with section (d) below, no person may use an autopilot during approach at a height that is less than the following, as applicable:

(1) The minimum height specified in the AFM for autopilot approach for the mode(s) used, or

(2) Not lower than a height equal to twice the maximum height loss specified in the Airplane Flight Manual for a malfunction of the autopilot under applicable approach conditions, or less than 50 feet above the landing runway touchdown zone, whichever is higher, or

(3) For systems that are demonstrated to have negligible or zero height loss (below the intended descent flight path) for applicable failure conditions, the autopilot may not be used below 50 feet above the landing runway touchdown zone, runway elevation or airport elevation; or

(4) For systems where a minimum use height, or height loss for approach is not specified in the AFM, an autopilot may not be used at any altitude less than 50 feet below the lowest applicable DA(H) or MDA(H) for the instrument procedure being used, except as follows:

(i) If the pilot determines that suitable visual reference, as specified in § 91.175 of this chapter, has been established during an instrument approach, and can reasonably be expected to be maintained, or

(ii) If weather conditions do not require use of an approved instrument approach procedure, an autopilot may be used for approach no lower than the greatest of the applicable minimum use height specified in the AFM, or twice the applicable height loss, or 50 feet above the landing runway touchdown zone elevation, runway elevation, or airport elevation, as applicable, or

(iii) If an approved and appropriately functioning autoland capability is used in accordance with section (d) below, or

(iv) If the Administrator issues operations specifications authorizing use of a lower autopilot minimum use height, but not less than 50 feet above the landing runway touchdown zone elevation, runway elevation, or airport elevation, as applicable. Issuance of operations specifications based on this provision requires that the certificate holding office determine that a lower minimum use height can be safely used by that operator, for that operators type(s) of aircraft, authorized airport(s), underlying approach terrain, instrument procedures used, applicable DA(H) or MDA(H), and flight crew procedures, or

(v) If executing an autopilot coupled go-around or missed approach, using an appropriately certificated and functioning autopilot with go-around capability.

(d) Landing. Notwithstanding paragraph (c) of this section, autopilot minimum use height provisions do not apply to autopilot operations when an approved automatic landing system mode is used. Automatic landing systems may not be used except in accordance with approved operations specifications.

(e) Go-Around. Following a go-around, unless an automatic go-around is accomplished, an autopilot may not be engaged below the minimum height specified in section (a) above for takeoff or initial climb. For an automatic go-around initiated with an autopilot already engaged, an autopilot minimum use height does not apply. Use of automatic go-around capability must not adversely affect safe obstacle clearance.

[Doc. No. 6258, 29 FR 19219, Dec. 31, 1964, as amended by Amdt. 121-13, 30 FR 14781, Nov. 30, 1965; Amdt. 121-33, 32 FR 13912, Oct. 6, 1967; Amdt. 121-130, 41 FR 47229, Oct. 28, 1976; Amdt. 121-206, 54 FR 34331, Aug. 18, 1989; Amdt. 121-265, 62 FR 27922, May 21, 1997; Amdt. 121-xxx, YY FR ZZZZZ, June 1, 2002]

51. Amend Sec. 121.651 by replacing the term ``DH'' with the term ``DA(H)/DH'' wherever it appears in paragraph (c) and by revising paragraph (d) introductory text to read as follows:

Sec. 121.651 Takeoff and landing weather minimums: IFR: All certificate holders.

* * * * *

(d) A pilot may begin the final approach segment of a Category I ~~precision~~-approach procedure at an airport when the visibility is less than the visibility minimums prescribed for that procedure if that airport is served by an operative PAR and another operative ~~precision~~-approved instrument approach system, and both the PAR and the ~~precision~~-alternative instrument system are used by the pilot. However, no person may continue an approach below the authorized DA(H), unless--

* * * * *

52. Amend Sec. 121.652(a) by removing the term ``DH" wherever it appears and adding in its place the term ``DA(H)/DH".

Sec. 121.652 [Amended]

53. Amend Appendix M by removing the words ``Selected decision height" and adding in their place the words ``Selected decision altitude (*height*)~~decision height~~". Alert Height ("AH") or "RA height", in Parameter number 54.

Appendix M to Part 121 [Amended]

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

54. 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.

55. Amend Sec. 125.51 by revising the heading to read as set forth below and amend paragraphs (a) and (b) by removing the words ``nonvisual ground aids" and adding in their place the words ``navigation aids".

Sec. 125.51 En route navigation aids.

* * * * *

56. Revise Sec. 125.203 to read as follows:

Sec. 125.203 Communication and navigation equipment.

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

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

(c) No person may operate an airplane carrying passengers under IFR or inextended over-water operations unless the airplane has at least the following equipment:

- (1) Two transmitters;
- (2) Two microphones;
- (3) Two headsets or one headset and one speaker;

(4) 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

(5) Two approved independent navigation systems suitable for the route to be flown and authorized in the certificate holder's operations specifications. However, only one navigation system need be provided for precision approach and APV operations. Equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals.

(d) Use of a single independent navigation system. Notwithstanding the requirements in paragraph (c) of this section, the airplane may be equipped with a single independent navigation system suitable for the route to be flown if--

(1) 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 system at any point along the route, for navigating safely to a suitable airport and completing an instrument approach;

(2) Both navigation systems are authorized by the FAA in the certificate holder's operations specifications; and

(3) 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 IFR approved RNAV system.

(f) Notwithstanding the requirements of paragraph (c) of this section, installation and use of a single LRNS and a single LRCS 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 with the required accuracy;

(2) The length of the route being flown with a single navigation or communication system; and

(3) The duration of the very high frequency communications gap, if only very high frequency communication equipment is installed.

57. Amend Sec. 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''.

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

* * * * *

58. Amend Sec. 125.379(a) by removing the term ``DH'' wherever it appears and adding in its place the term ``DA(H)/DH''.

Sec. 125.379 [Amended]

59. Amend Sec. 125.381 (a) and (b) by removing the word "pilot" and adding in its place the word "person", and by revising paragraph (c) to read as follows:

Sec. 125.381 Takeoff and landing weather minimums: IFR.

* * * * *

(c) If a pilot initiates an instrument approach procedure based on a weather report that indicates that the specified visibility minimums exist and subsequently receives another weather report that indicates that conditions have worsened to below the minimum requirements, then the pilot may continue with the approach and landing only if both of the following conditions are met--

(1) The later weather report is received when the airplane is in one of the following landing phases:

(i) The airplane is on a precision approach or APV and has passed the precision final approach fix.

(ii) The airplane is on the final approach segment using a nonprecision approach procedure.

(iii) The airplane is on a PAR final approach and has been turned over to the final approach controller.

(2) The pilot in command finds, on reaching the authorized MAP or DA/DH, that the actual weather conditions are at or above the minimums prescribed in the certificate holder's operations specifications.

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

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

Authority: 49 U.S.C. 106(g), 40104-40105, 40113, 40119, 41706, 44701-44702, 44712, 44716-44717, 44722, 44901-44904, 44906.

61. Add Sec. 129.16 to read as follows:

Sec. 129.16 Communication and navigation equipment for rotorcraft operations under VFR over routes navigated by pilotage.

(a) No person may operate a rotorcraft under VFR over routes that can be navigated by pilotage unless the rotorcraft is equipped with the 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 airspace 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 a rotorcraft at night under VFR over routes that can be navigated by pilotage unless that rotorcraft is equipped with--

(1) 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.

62. Revise Sec. 129.17 to read as follows:

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

(a) Aircraft navigation equipment requirements. No person may conduct operations under IFR or over the top unless the aircraft used in those operations is equipped with at least two approved independent navigation systems suitable for the route to be flown and authorized in the certificate holder's operations specifications. However, only one navigation system needs to be provided for precision approach and APV operations. Equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals.

(b) Aircraft communication equipment requirements. No person may operate an aircraft under IFR or over the top, unless it is equipped with--

(1) For normal operating conditions, at least two independent communication systems that fulfill the functions specified in Sec. 121.347(a) of this chapter; and

(2) For non-normal and emergency operating conditions, at least one of the two independent communication systems that fulfills the functions specified in Sec. 121.347(a) of this chapter must have two-way voice communication capability.

(c) Use of a single independent navigation system. Notwithstanding the requirements in paragraph (a) of this section, the aircraft may be equipped with a single independent navigation system suitable for the route to be flown if--

(1) 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 system at any point along the route, for navigating safely to a suitable airport and completing an instrument approach.

(2) Both navigation systems are authorized by the FAA in the certificate holder's operations specifications; and

(3) 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 person may operate an aircraft unless it is equipped with at least one approved DME or suitable IFR approved RNAV system.

63. Revise Sec. 129.21 to read as follows:

Sec. 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 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.

64. 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**

65. 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.

66. Amend Sec. 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".

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

* * * * *

67. Add Sec. 135.78 to read as follows:

Sec. 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.

68. Amend Sec. 135.79(a)(3) by removing the words ``radio or telephone communications" and adding in their place the word ``communications".

Sec. 135.79 [Amended]

69. Amend Sec. 135.93(b) by removing the words "When using an instrument approach facility other than ILS," and adding in their place the words "For other than precision approaches," and amend paragraph (c) by removing the words "For ILS approaches," and adding in their place the words "For precision approaches,".

Sec. 135.93 [Amended]

70. Amend Sec. 135.152(h)(54) by removing the words "decision height" and adding in their place the words "decision altitude/decision height".

Sec. 135.152 [Amended]

71. Revise Sec. 135.161 to read as follows:

Sec. 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 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 airspace surface area designated for an airport in which flights are intended.

(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) 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.

72. Revise Sec. 135.165 to read as follows:

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

(a) Aircraft navigation equipment requirements. No person may conduct operations under IFR or extended over-water unless the aircraft used in those operations is equipped with at least two approved independent navigation systems suitable for the route to be flown and authorized in the certificate holder's operations specifications. However, only one navigation system need be provided for precision approach and APV operations. Equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals.

(b) Use of a single independent navigation system. Notwithstanding the requirements in paragraph (a) of this section, the aircraft may be equipped with a single independent navigation system suitable for the route to be flown if:

(1) 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 system at any point along the route, for navigating safely to a suitable airport and completing an instrument approach;

(2) Both navigation systems are authorized by the FAA in the certificate holder's operations specifications; and

(3) 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 IFR approved RNAV system.

(d) Aircraft 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 it is equipped with--

(1) For normal operating conditions, at least two independent communication systems that fulfill the functions specified in Sec. 121.347(a) of this chapter; and

(2) For non-normal and emergency operating conditions, at least one of the two independent communication systems that fulfills the functions specified in Sec. 121.347(a) of this chapter 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), (b), (d) and (e) of this section, installation and use of a single LRNS and a single LRCS 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 with the required accuracy,

(2) The length of the route being flown with a single navigation or communication system; and

(3) The duration of the very high frequency communications gap, if very high frequency communications equipment is installed.

73. Amend Sec. 135.225 (a), (b), (e), (f), and (g) by removing the word "pilot" and adding in its place the word "person", and by revising paragraphs (c)(1), (c)(3) introductory text, (c)(3)(ii), and (d) to read as follows:

Sec. 135.225 IFR: Takeoff, approach and landing minimums.

* * * * *

(c) * * *

(1) On a precision or APV approach and has passed the precision final approach fix; or

* * * * *

(3) On a nonprecision final approach; and the aircraft--

* * * * *

(ii) Where a final approach fix is not specified, has completed the procedure turn and is established inbound toward the airport on the final approach course within the distance prescribed in the procedure. The approach may be continued, and a landing made, if the pilot finds, upon reaching the authorized MDA or DA/DH, that actual weather conditions are at or above the minimums prescribed for the procedure.

(d) For each pilot in command of a turbine-powered airplane who has not served at least 100 hours as pilot in command in that type of airplane, the MDA or DA/DH and visibility landing minimums prescribed in part 97 of this chapter or in the certificate holder's operations specifications for a particular approach must be increased by 100 feet and one half statute mile, respectively, but not to exceed the ceiling and visibility minimums for that approach when used as an alternate airport.

* * * * *

74. Amend Sec. 135.345(a)(7) by removing the term "DH" and adding in its place the term "DA/DH".

Sec. 135.345 [Amended]

75. Amend Sec. 135.371(c)(2) by removing the word "radio".

Sec. 135.371 [Amended]

76. Amend Sec. 135.381(b)(2) by removing the word "radio".

Sec. 135.381 [Amended]

77. Amend Appendix F by removing the words "Selected decision height" and adding in their place the words "Selected DA/DH" in Parameter number 54.

ENCLOSURE 3

Comments from Boeing Commercial Airplanes: Recommended Text for Amended §91.175

Based on our comments in Enclosures 1 and 2, we recommend that the text of 14 CFR §91.175 be revised to read as shown below: We have highlighted the verbiage as follows:

- Black Text shows the current rule
 - **Red Underlined Text** shows the recommended revised text.
-

§ 91.175 Takeoff and landing under IFR.

(a) Instrument approaches to civil airports.

Unless otherwise authorized by the Administrator, when an instrument **approach** to a civil airport is necessary, each person operating an aircraft, except a military aircraft of the United States, shall use a standard instrument approach procedure prescribed for the airport in part 97 of this chapter.

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

- (1) The **DA(H) or MDA(H)** prescribed by the approach procedure.
- (2) The **DA(H) or MDA(H)** prescribed for the pilot in command.
- (3) The **DA(H) or MDA(H)** for which the aircraft is equipped.

(c) Operation below **DA(H) or MDA(H)**. Where a **DA(H) or MDA(H)** is applicable, no pilot may operate an aircraft, except a military aircraft of the United States, at any airport below the authorized **MDA(H)** or continue an approach below the authorized **DA(H)** unless -

- (1) The aircraft is continuously in a position from which a descent to a landing on the intended runway can be made at a normal rate of descent using normal maneuvers, and for operations conducted under part 121 or part 135 unless that descent rate will allow touchdown to occur within the touchdown zone of the runway of intended landing;
- (2) The flight visibility is not less than the visibility prescribed in the standard instrument approach being used; and
- (3) Except for a Category II or Category III approach where any necessary visual reference requirements are specified by the Administrator, at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:

(i) The approach light system.

- (ii) The threshold.
- (iii) The threshold markings.
- (iv) The threshold lights.
- (v) The runway end identifier lights.
- (vi) The visual approach slope indicator.
- (vii) The touchdown zone or touchdown zone markings.
- (viii) The touchdown zone lights.
- (ix) The runway or runway markings.
- (x) The runway lights.

(d) Landing. No pilot operating an aircraft, except a military aircraft of the United States, may land that aircraft when the flight visibility is less than the visibility prescribed in the standard instrument approach procedure being used.

(e) Missed approach procedures. Each pilot operating an aircraft, except a military aircraft of the United States, shall immediately execute an appropriate missed approach procedure when either of the following conditions exist:

(1) Whenever the requirements of paragraph (c) of this section are not met at either of the following times:

- (i) When the aircraft is being operated below **MDA(H)**; or
- (ii) Upon arrival at the missed approach point, including a **DA(H)** where a **DA(H)** is specified and its use is required, and at any time after that until touchdown.

(2) Whenever an identifiable part of the airport is not distinctly visible to the pilot during a circling maneuver at or above **MDA(H)**, unless the inability to see an identifiable part of the airport results only from a normal bank of the aircraft during the circling approach.

(f) Civil airport takeoff minimums. Unless otherwise authorized by the Administrator, no pilot operating an aircraft under parts 121, 125, 127, 129, or 135 of this chapter may takeoff from a civil airport under IFR unless weather conditions are at or above the weather minimum for IFR takeoff prescribed for that airport under part 97 of this chapter. **If takeoff minimums are not prescribed under part 97 of this chapter for a particular airport, IFR takeoff minima for aircraft operating under those parts are 1/2 statute mile visibility.**

(g) Military airports. Unless otherwise prescribed by the Administrator, each person operating a civil aircraft under IFR into or out of a military airport shall comply with the instrument approach procedures and the takeoff and landing minimum prescribed by the military authority having jurisdiction of that airport.

(h) Comparable values of RVR and ground visibility.

- (1) Except for Category II or Category III minimums, if RVR minimums for takeoff or landing are prescribed in an instrument approach procedure, but RVR is not reported for the runway of intended operation, **the RVR minimum shall be converted to**

ground visibility in accordance with approved Operations Specifications for that operator, if Operations Specifications are applicable, or in accordance with the following table.

<u>RVR (feet)</u>	<u>Visibility (statute miles)</u>
1,600	1/4
2,400	1/2
3,200	5/8
4,000	3/4
4,500	7/8
5,000	1
6,000	1 1/4

- (i) Operations on unpublished routes and use of radar in instrument approach procedures. When radar is approved at certain locations for ATC purposes, it may be used not only for surveillance and precision radar approaches, as applicable, but also may be used in conjunction with instrument approach procedures predicated on other types of radio navigational aids. Radar vectors may be authorized to provide course guidance through the segments of an approach to the final course or fix. When operating on an unpublished route or while being radar vectored, the pilot, when an approach clearance is received, shall, in addition to complying with § 91.177, maintain the last altitude assigned to that pilot until the aircraft is established on a segment of a published route or instrument approach procedure unless a different altitude is assigned by ATC. After the aircraft is so established, published altitudes apply to descent within each succeeding route or approach segment unless a different altitude is assigned by ATC. Upon reaching the final approach course or fix, the pilot may either complete the instrument approach in accordance with a procedure approved for the facility or continue a surveillance or precision radar approach to a landing.
- (j) Limitation on procedure turns. In the case of a radar vector to a final approach course or fix, a timed approach from a holding fix, or an approach for which the procedure specifies "No PT," no pilot may make a procedure turn unless cleared to do so by ATC.
- (k) Instrument Procedure Component substitution. Fixes, components, or navigation methods may be substituted in an instrument approach procedure as noted by that instrument procedure, as noted by Operations Specifications, or as otherwise authorized by the administrator. If not otherwise restricted or limited, a compass locator or precision radar may be substituted for the outer or middle marker. RNAV, DME, VOR, or nondirectional beacon fixes authorized in the standard instrument approach procedure or surveillance radar may be substituted for the outer marker. Applicability of, and substitution for an inner marker for Category II or III approaches is determined by the appropriate part 97 approach procedure, letter of authorization, or operations specification pertinent to the operations.
- (l) Notwithstanding provisions of paragraphs c(2), (d), and (e) above, the Administrator may approve use of systems and procedures meeting requirements other than those specified, if:**
- (1) The systems and procedures proposed are shown to have equivalent or better performance than other approved systems, are operationally safe, effective, and reliable for approach, landing, missed approach, or takeoff, as applicable, and,**
- (2) If visual reference requirements apply, the pilot is able to determine that flight visibility is adequate for safe takeoff or landing.**