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PART V

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

■

AIR TAXI OPERATORS AND COMMERCIAL OPERATORS

[4910-13-M]

Title 14—Aeronautics and Space

CHAPTER I—FEDERAL AVIATION ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

See Correction

[Docket No. 16097; Amdt. Nos. 121-147, 127-35, and Rev. [redacted]]

REGULATORY REVIEW PROGRAM; AIR TAXI OPERATORS AND COMMERCIAL OPERATORS

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: These amendments substantially revise requirements for operations by persons holding air taxi/commercial operator (ATCO) operating certificates issued by the FAA. They will result in a higher level of safety and greater operational flexibility. They are necessary to keep the FAA's regulation of this vital segment of the industry consistent with the state-of-the-art from both a technological and operating standpoint. These amendments respond to the demand for commuter and air taxi operators to operate larger and more complex aircraft.

EFFECTIVE DATE: December 1, 1978.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION:

History

These amendments are based on notice of proposed rulemaking 77-17 (42 FR 34390; Aug. 29, 1977). Notice 77-17 also included five proposed amendments to current part 135 originally proposed in notice 76-28 (41 FR 56280; Dec. 27, 1976). Notice 77-17 also considered and disposed of the petition of Air Illinois, Inc., Golden West Airlines, Inc., and Swift Aire Lines, Inc., to amend part 135 (docket No. 15733).

After notice 77-17 was issued, notice 77-17A (42 FR 56702; Oct. 27, 1977) withdrew proposed § 135.169(e). The same day, advance notice of proposed rulemaking 77-25 (42 FR 56702; Oct. 27, 1977) requested comments on possible changes in the certification requirements for certain small airplanes used by air taxi operators and commercial operators. Advance notice 77-25 will be disposed of in a separate rulemaking action.

All interested persons have been given an opportunity to participate in the making of these amendments and due consideration has been given to all matters presented. Except for the changes discussed below, these amendments and the reasons for their adoption are the same as those stated in notices 76-28 and 77-17.

Public Participation

The FAA completed the last general upgrading of part 135 in amendment 135-12 issued on November 26, 1969 (34 FR 19130; Dec. 3, 1969). That amendment took effect on April 1, 1970. Operating experience and changes in the air taxi industry soon required another effort to further improve part 135. The FAA began working on a project to propose further regulatory changes in May 1972. By the spring of 1976, the basic drafting of this massive project to amend part 135 was finished. That draft included recommendations the National Transportation Safety Board made in its "Air Taxi Safety Study" of September 27, 1972. The draft also included proposals received during the operations review program that was announced in February 1975.

During a "listening session" with the Commuter Airline Association of America on June 8, 1976, a review conference was suggested to receive ideas from anybody who had an interest and that those ideas be used in developing a notice of proposed rulemaking to amend part 135. Because of the merit of that suggestion, the FAA prepared proposals which served as a basis for discussions at the conference. Notice 76-18 announcing the part 135 Regulatory Review Conference was issued on September 9, 1976 (41 FR 38778; Sept. 13, 1976).

The conference was held at Denver, Colo., for 4 days beginning November 8, 1976. More than 400 persons attended the conference and 112 proposals were discussed. More than 100 written comments were received subsequent to the conference. After reviewing the conference transcripts and the written comments and suggestions, changes were made to conference proposals. Many were withdrawn, others were substantially modified and several new proposals were developed.

Notice 77-17 was issued on August 19, 1977. Comments were requested by November 28, 1977. More than 1,600 comments were received and numerous changes are made in response to them. They are discussed in detail below.

The revision and upgrading of part 135 is the largest, most complex safety rulemaking project that the Federal Aviation Administration has ever undertaken. We wish to acknowledge and express our appreciation for the participation of, and assistance from, members of the public, individual pilots, mechanics, flight attendants, and other aviation personnel, individual ATCO certificate holders, consumer interest groups, labor organizations, air taxi and commuter industry organizations, State governments, State and Federal legislators, manufacturers, the military services, transportation organizations, other agencies of the Federal Government and others too numerous to mention. Each commenter made our product better and the rules more workable.

Reasons for Revising Part 135

The primary objective of this revision of part 135 is to upgrade the level of safety for operations conducted by commuter air carriers,[1] on-demand air taxi operators and commercial operators. While the comments on each rule are discussed later in this preamble, the principal reasons for this action are summarized here.

First, in recent years the commuter air carrier industry has become an increasingly important part of the Nation's air transportation system. These carriers have experienced a strong 10.3 percent average annual passenger traffic increase since 1970. Most recently, Civil Aeronautics Board statistics for 1977 compared to 1976 show the number of passengers carried by commuters increased 16.5 percent to 8.5 million, passenger miles increased 22.8 percent to 946.2 million and passenger markets served increased 12.9 percent to 1,594. One factor contributing to the increase is growing public acceptance of this segment of the industry. Another factor is a decline in the service to the smaller cities rendered by trunk and local service air carriers. Since 1960, these carriers have discontinued service to 179 points. The commuter air carriers have stepped in and provided service at 96 of these points. Many commuter passengers connect with trunk, regional and local service air carriers. They expect to travel at a level of safety substantially similar to part 121, the safety rules applicable to air carriers. This revision of part 135 provides that level of safety.

Second, in the National Transportation Safety Board's "Air Taxi Safety Study," the Board analyzed accidents involving part 135 certificate holders.

[1] Under § 298.2(f) of the Civil Aeronautics Board (CAB) regulations (14 CFR 298.2(f)), " 'Commuter air carrier' means, an air taxi operator which (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed, or (2) transports mail by air pursuant to contract with the United States Postal Service."

Part 135 Review

That study included specific recommendations from the Board to the FAA intended to upgrade safety in part 135. The Board's recommendations were considered and many were included in notice 77-17. There has been some improvement in the part 135 accident rate since the Board completed its 1972 report. The Board's statistics show that the fatal accident rate for each 100,000 hours flown still remains higher than the rate achieved by certificated route air carriers under part 121. Indeed, in 1976 the air taxi fatal accident rate increased significantly from the 1975 rate. The Board's preliminary statistics for 1977 indicate that the fatal accident rate remains above the 1975 rate. This revision of part 135 should reduce the accident rates in air taxi operations.

Third, many part 135 certificate holders have pointed up a need for greater operational flexibility in the size of aircraft they operate under part 135. The new rule raises the part 135 size limit to aircraft having a maximum passenger seating configuration of 30 seats or less and a maximum payload capacity of 7,500 pounds or less. This is the same size aircraft which certificate holders have been able to operate under the blanket exemption authority of part 298 of the Economic Regulations of the Civil Aeronautics Board (14 CFR Part 298). This increase allows certificate holders to operate larger and more complex aircraft capable of flying higher and faster with increased passenger loads. In turn, this should result in greater productivity. Revised part 135 adopts the changes necessary to deal with the operation of these larger, more complex aircraft. The FAA is aware that the CAB is considering changes to the aircraft size limits under part 298 to 60 seats and 18,000 pounds payload capacity. Aircraft operating within these capacity levels are already covered by part 121. To date, there has been no showing that there is any requirement for the FAA to hold the operation of these aircraft to a lesser standard. The FAA will continue to monitor the commuter/air taxi operating environment and, if a reasonable case is found for some changes as a result of the CAB's proposed amendments, an appropriate rulemaking proceeding will be initiated.

Fourth, since 1939 when part 135 was last upgraded, there has been substantial increase in the number of certificate holders conducting operations in small airplanes carrying 10 or more passengers and in multiengine turbine-powered airplanes. For example, in the 12-month period ending June 30, 1977, the number of turbine-powered aircraft operated by commuter air carriers grew 61.7 percent from 225 to 364. A characteristic of the air taxi business is that operations are conducted to a broad spectrum of airports ranging from remote, infrequently used airports, to those which are high density air carrier facilities. Aircraft operated under part 135 must be adequately equipped and maintained and pilots must be properly trained to meet these varied circumstances.

Highlights of Revised Part 135

A major goal of this revision of part 135 is to provide the passenger traveling on an on-demand air taxi flight or a commuter air carrier flight with a level of safety comparable to part 121, considering the differences between these operations, the costs versus benefits and the overall feasibility of implementation. Balancing the safety considerations, the public interest, the economic consequences, and the feasibility of the rule requires that hard judgments be made. One of these judgments is whether to apply the upgraded standards equally to all aircraft types and all operations. The extensive public comment received by the FAA plus the FAA's own experience has shown this not to be practicable. The complexity of the problem stems in large measure from the varied nature of the aircraft operated and markets served by the commuter/air taxi market. To give but one example, there are approximately 25 and 118 aircraft types, respectively, operated by commuters and on-demand operators. This compares to approximately 13 aircraft types being operated by the trunk and local service carriers. In recognition of these facts, the FAA has designed a rule which, where possible, takes account of the varied nature of the part 135 operations.

Since both commuter and air taxi operations are governed by part 135, it is useful to analyze the safety impact on these two different types of operations separately. Focusing on the commuter air carrier, largely because of the scheduled nature of the operator's service and its increasingly important role as a replacement carrier for local service and trunk carriers, the significant safety impact of this rule is readily apparent. Commuters account for over 68 percent of all the revenue passenger miles (RPM's) operated by part 135 certificate holders.

Based upon the FAA's analysis of RPM's operated by commuters in 1976, the FAA has determined that under this rule approximately 75 percent of the RPM's flown by commuters will be in aircraft having either weather radar or thunderstorm detection equipment. Approximately 97 percent of the total RPM's flown by commuters will be in aircraft flown by a pilot in command having an air transport pilot certificate. To give but one other example, 67 percent of the commuter RPM's will be in aircraft maintained to part 121 type maintenance programs. The remaining 33 percent, all involving aircraft of nine or less seats, will be subject to more stringent maintenance programs than currently required. As the commuters continue to upgrade and modernize their fleets, these percentages will likely increase. A chart illustrating the impact of this safety upgrade is set forth in appendix A.

There are many factors that lead to differences in impact levels between the various rule changes. One of the principal reasons is the distinction in the final rules between aircraft capable of carrying 10 or more passengers and those capable of transporting only nine or less passengers. In each instance, the FAA has taken into account the relative complexity of the aircraft from an operational and maintenance standpoint with a view toward achieving levels of safety equal to part 121 to the maximum extent possible. The 10-passenger seating configuration point differentiation represents the FAA's best judgment, after considerable study, of the most realistic point at which to design differing standards.[2]

It is significant to note the increasing trend in the use of higher capacity aircraft. In 1976, commuter air carriers operated 344 airplanes having 10-30 seats. In 1971, only 175 airplanes having 10-30 seats were operated by commuter air carriers. This represents a 97-percent increase between 1971 and 1976.

Turning to individual items, revised part 135 requires aircraft that are type certificated for 10 or more passenger seats to be maintained under a continuous airworthiness maintenance program similar to that required under part 121. Aircraft that are type certificated for nine or less passenger seats will be maintained under a maintenance program upgraded from present standards.

The rule upgrades training, testing, and proficiency requirements to ensure that passengers on aircraft operated under part 135 are flown by well qualified crewmembers.

Under this rule, a ground proximity warning system (GPWS), or an approved alternate system, is required on turbojets capable of carrying 10 or

[2] It might be argued that some operators could remove one or two seats from aircraft that carry slightly more than the 10 passengers to avoid the otherwise applicable regulations. This is unlikely to present a problem for at least two reasons: (1) There are only 11 aircraft types that have 10 or 11 seats as a standard configuration, so seat removal is a relatively limited possibility; and (2) seat removal precludes the realization of aircraft's full productivity potential and results in a significant economic penalty to the operator.

more passengers. These airplanes descend rapidly if attitude control is inadvertently neglected. They do not recover as quickly as propeller-driven airplanes because of the relatively slow response of the jet engine to throttle settings for increased power. In this connection, the FAA is emphasizing installation of a visual approach slope indicator (VASI) system on all runways with a non-precision approach. This system should materially reduce the number of accidents occurring during landing approaches.

Revised part 135 requires a shoulder harness for each pilot crewmember on all turbojets and all aircraft capable of carrying 10 or more passengers. The FAA has found this to be an important safety feature. However, the rule makes allowance for the serious retrofit problems encountered on smaller aircraft. In addition, § 91.33(b)(13) requires a shoulder harness for each front seat of small civil airplanes manufactured after July 18, 1978. Thus, new airplanes capable of carrying less than 10 passengers coming into service under part 135 will be equipped with shoulder harnesses when delivered by the manufacturer.

A third attitude gyro is required on all turbojets because of the performance characteristics of those airplanes. Requiring this instrument on turbopropeller airplanes was considered, but that was found to be unnecessary because immediate information showing loss of attitude control is less important for turbopropeller airplanes.

Operational flexibility has been enhanced in the rule. One example is that ATCO certificate holders will be allowed to operate larger aircraft under the rules of part 135. Another example is the provision for a minimum equipment list for multiengine aircraft which will increase schedule reliability and decrease out of service time.

Finally, under the rules of the Federal Election Commission (FEC), a candidate in a Federal election must pay for carriage in an aircraft (11 CFR Chapter 1). Ordinarily, receipt of payment for carriage is an operation for compensation or hire and requires a part 135 certificate. However, carriage of candidates is infrequent and the operator does not intend to engage in the business of an air carrier or commercial operator. This carriage would not be subject to new part 135 if (1) the principal business of the operator is not as an air carrier or commercial operator, and (2) the payment for the carriage is required by the FEC rules.

Revised part 135 does not require a flight data recorder (FDR). Requirements for a cockpit voice recorder (CVR) and ground proximity warning system (GPWS) apply to turbojets capable of carrying 10 or more passengers. In its letter of April 13, 1978, to the Administrator, the National Transportation Safety Board recommended new standards be developed for the FDR and CVR. Two of the Board's three specific recommendations were as follows:

Develop, in cooperation with industy, flight recorder standards (FDR/CVR) for complex aircraft which are predicated upon intended aircraft usage.

Draft specifications and fund research and development for a low cost FDR, CVR, and composite recorder which can be used on complex general aviation aircraft. Establish guidelines for these recorders, such as maximum cost, compatible with the cost of the airplane on which they will be installed and with the use for which the airplane is intended.

The FAA is developing proposed rules to carry out the Board's recommendations. The Board also recommended that, until new standards are developed, turbine-powered aircraft capable of carrying six or more passengers which must have two pilots, be required to have a CVR. The current FAA study of revising the part 91 rules for general aviation operations will consider this recommendation. This is a more appropriate forum since it will have broader applicability and is more generally geared to the aircraft requirements. Because of this, the FAA concludes that the public interest is served best by not requiring an FDR under part 135 at this time and by requiring a CVR on turbojets capable of carrying 10 or more passengers.

Proposals Withdrawn or Deferred

In response to comments received on notice 77-17, three proposed sections to part 135 have been withdrawn completely. One proposal, flight and duty time regulations, is being deferred for reasons discussed below.

Periodic financial status review (proposed § 135.37)

The more than 80 commenters on this proposed rule were almost unanimously opposed. They believe that FAA has neither the right nor the justification to periodically examine their books. They are concerned that the financial information acquired during this review would be released to the public under the Freedom of Information Act. Upon further consideration, the FAA has determined that a periodic review of an operator's financial records is not necessary. The FAA has general authority to conduct surveillance and investigations under the Federal Aviation Act, and may secure access to any records (including financial records) of an operator when necessary to carry out its safety responsibilities [§§ 313(a), 601(a)(6), and 604(a) of the Federal Aviation Act (49 U.S.C. 1354(a), 1421(a)(6), and 1424(a))]. This specific rule is not required and therfore it is withdrawn.

Flight information: facilities and services (proposed § 135.51)

Nearly all commenters oppose this proposed rule. It was based on § 121.603 which is among the dispatch and flight release rules in subpart U of part 121. There are no dispatch or flight release requirements in revised part 135. Therefore, proposed § 135.51 is withdrawn.

Helicopter operations: emergency landing areas (current § 135.89)

The Helicopter Association of America (HAA) petitioned the FAA to revoke this section. HAA argues that the rule discriminates against helicopters because the minimum safe altitude requirements in § 91.79 apply to all aircraft including helicopters. Notice 77-17 proposed to revoke current § 135.89 and no opposing comments were received. Current § 135.89 is no longer necessary and is revoked.

Flight and duty time regulations (proposed subpart F)

An entire subpart dealing with flight crewmember flight and duty time limitations has been deferred for further consideration while the rulemaking proposed in notice 78-3 is completed. That notice proposed changes in flight and duty time limitations governing parts 121 and 123 operators. Since many of the concepts presented in notice 87-3 are similar to those proposed in notice 77-17, information received in response to notice 78-3 will be helpful to the FAA in completing the part 135 flight and duty time limitations rulemaking action. In view of the deferral, the present regulation is retained.

Regulatory Analysis

This revision imposes on all part 135 operators more stringent operating requirements. They are similar in certain respects to those being met by part 121 operators or by air taxi operators and commuter air carriers operating under § 135.2. The FAA has undertaken an extensive analysis to determine the monetary impact of the final rule. Careful attention was paid to determining alternative methods of achieving equivalent levels of safety with a view toward the cost impact of the alternatives. The analytical process is presented in appendix B and the full study is in docket 16097.

After factoring out the deferred flight time and duty regulations, the initial cost of equipment, manuals, programs, and other new require-

ments, plus annual recurring cost of the NPRM, less revenue offsets was $52,483,000. A comparable figure for the final rule is $33,398,000. Thus, the analysis performed after the receipt of public comment on the notice pared $19,085,000 from the impact of the rule. This is a 36-percent cost reduction. This cost will be spread over approximately 2,200 commuter/air taxi operators who operate 9,496 airplanes. It must be kept in mind that the various public steps which led up to the notice, and which were detailed above, had already helped focus the FAA on the most cost effective methods of achieving the needed safety levels.

The cost savings between the notice and the final rule are primarily from adjustments to the proposed requirements as to periodic financial reviews, management personnel, weather reports and forecasts and IFR requirements, and operations in icing conditions. These comparisions are shown in table I.

TABLE I

RESULTS OF COST IMPACT ASSESSMENT: FINAL RULE VERSUS NPRM 77-17 (MEAN VALUES)
($000)

Item No.	Rule Section No.	NPRM Section No.	Section Title	Total Cost Final Rule Basis	Total Cost NPRM Basis	Difference
1	135.2	(135.2)	Air Taxi Operations with Large Aircraft	-120	-120	0
2	135.21	(135.23)	Manual Requirements	1,819	1,819	0
3	Deleted	(135.37)	Periodic Financial Status Review	0	2,354	2,354
4	135.37, .39	(135.39, .41)	Management Personnel Required and Qualifications	9,581	15,690	6,109
5	135.63	(135.49)	Recordkeeping Requirements	3/	3/	
6	135.65	(135.53)	Reporting Mechanical Irregularities	526	526	0
7	135.69	(135.57)	Restriction or Suspension of Operations: Continuation of Flight in an Emergency	1,595	1,595	0
8	135.75	(135.63)	Inspection Credentials: Admission to Pilots Compartment: Forward Observers Seat	200	332	132
9	135.87,	(135.75)	Carriage of Cargo Including Carry on Baggage	697	697	0
10	135.89, .157	(135.77, .129)	Pilot Requirements: Use of Oxygen and Oxygen Equipment Requirements	0	385	385
11	135.97	(135.85)	Aircraft and Facilities for Recent Flight Experience	29	29	0
12	135.149, .151, .153	(135.125)	Equipment Requirements: General and Cockpit Voice Recorders and Ground Proximity Warning System	1,350	1,890 1/	540
13	135.155	(135.127)	Fire Extinguishers: Passenger-Carrying Aircraft	0	167	167
14	135.165	(135.137)	Radio and Navigation Equipment: Extended Overwater or IFR Operations	323	323	0
15	135.167	(135.139)	Emergency Equipment: Extended Overwater Operations	3	3	0
16	135.171	(135.143)	Shoulder Harness Installation at Flight Crewmember Stations	201	201	0

TABLE I

RESULTS OF COST IMPACT ASSESSMENT: FINAL RULE VERSUS NPRM 77-17 (MEAN VALUES)
($000)
(Continued)

Item No.	Rule Section No.	NPRM Section No.	Section Title	Total Cost Final Rule Basis	Total Cost NPRM Basis	Difference
17	135.173	(135.145)	Airborne Thunderstorm Detection Equipment Requirements	1,410	1,410	0
18	135.177	(135.147)	Emergency Equipment Requirements for Aircraft Having a Passenger Seating Configuration of More than 19 Passengers	0	0	0
19	135.179	(135.149)	Inoperable Instruments and Equipment for Multi-Engine Aircraft	16	16	0
20	135.213, .225	(135.171, .185)	Weather Reports and Forecasts and IFR: Takeoff, Approach and Landing Minimums	11,301	17,744	6,443
21	135.215	(135.175)	IFR: Operating Limitations	-2,133	-2,133	0
22	135.219	(135.179)	IFR: Destination Airport Weather Minimums	-2,140	-2,140	0
23	135.223	(135.183)	IFR: Alternate Airport Requirements	-544	-544	0
24	135.227	(135.187)	Icing Conditions: Operating Limitations	0	2,015	2,015
25	135.243	(135.193)	Pilot in Command Qualifications	485	485	0
26	135.245	(135.197)	Second in Command Qualifications	400	1,340	940
27	135.261	(135.200-.219)	Flight and Duty Time Limitations	2/	2/	
28	135.293	(135.225)	Initial and Recurrent Pilot Testing Requirements	-2,191	-2,191	0
29	135.297	(135.229)	Pilot in Command: Instrument Proficiency Check Requirements	-294	-294	0
30	135.299	(135.231)	Pilot in Command: Line Checks: Routes and Airports	586	586	0
31	135.321-.351	(135.237-.267)	Training	2,966	2,966	0
32	135.411-.443	(135.333-.365)	Maintenance, Preventive Maintenance, and Alterations	7,332	7,332	0
	TOTAL			33,398	52,483	19,085

1/ These costs are from a special "off-line" analysis because the sample of small air taxi operators did not include operators of affected turbojet aircraft.

2/ Flight and duty time limitation and associated recordkeeping deferred for further rulemaking action. See discussion in accompanying text.

3/ Major cost impacts in recordkeeping relate to flight and duty time and are, therefore, deferred. Other cost impacts are negligible.

NOTE: For a discussion of the derivation and additional analyses of these estimates, see the Regulatory Analysis appendix to this preamble.

REVIEW OF REVISED PART 135

The FAA will announce an evaluation of revised part 135 early in 1980. By then, more than 1 year will have passed since these amendments take effect. The review will enable the public to discuss any problems relating to the implementation and application of the revised part. Ways to further improve the rules also will be discussed. In addition, comments submitted on notice 77-17 which could not be considered within the scope of that notice can be raised during this discussion. This action is in keeping with the spirit of Executive Order 12044, "Improving Government Regulations" (43 FR 12661; Mar. 24, 1978).

FORM OF REVISED PART 135

SECTION NUMBERS

Revised part 135 sections are renumbered so this part is consistent with the form of other Federal Aviation Regulations. In the following discussion of comments, the section number assigned in this revision is the one used. The section numbers in this revision differ from the numbers proposed for those sections in notice 77-17 in almost every instance. So that readers may refer back to discussion in the preamble to notice 77-17, the obsolete proposed section numbers are cited parenthetically after the new section number and title in the discussion that follows. A reference table is published at the end of the part which shows each section in the revised part and the comparable section in the current part.

EDITORIAL CHANGES

In adopting this revision of part 135, the drafters carefully reviewed the rule for both clarity and internal consistency. The rule has been extensively edited to improve it without changing substance. Nonsubstantive editorial changes are not discussed in the preamble. Clarifying changes are indicated where that is appropriate. In addition, the rule was extensively revised to eliminate personal pronouns indicating gender.

OTHER CHANGES

In addition to these editorial changes, the rule contains some changes that were not discussed in notice 77-17. These changes were made in the spirit of Executive Order 12044, "Improving Government Regulations," and the Department of Transportation implementing policies and procedures (43 FR 9582; Mar. 8, 1978). The reasons for each change are detailed in the following discussion. Because these changes are necessary for safety, are in the public interest, clarify the rules proposed, or relax a burden, I find that notice and public procedure are not necessary and good cause exists for adopting them in this revision of part 135.

DISCUSSION OF COMMENTS

Several sections are merely redesignated from current part 135. Comments were not requested on these redesignated sections. Other sections that notice 77-17 proposed to change drew only favorable comment or no comment at all. They are not mentioned in the discussion that follows. These sections are §§ 135.7, 135.15, 135.17, 135.27, 135.29, 135.31, 135.33, 135.35, 135.41, 135.61, 135.71, 135.73, 135.79, 135.83, 135.97, 135.99, 135.101, 135.107, 135.111, 135.113, 135.119, 135.141, 135.147, 135.183, 135.185, 135.201, 135.203, 135.205, 135.207, 135.209, 135.211, 135.217, 135.221, 135.241, 135.291, 135.303, 135.329, 135.365, 135.367, 135.369, 135.371, 135.373, 135.375, 135.377, 135.381, 135.383, 135.385, 135.387, 135.389, 135.391, 135.393, 135.395, 135.419, and 135.441.

COMPLIANCE TIME

As discussed earlier in the preamble, this revision of part 135 is the largest, most complex safety rulemaking project that the FAA has undertaken. Revised part 135 takes effect on December 1, 1978. Because of the scope of this rulemaking, a flexible mechanism is essential to provide for an orderly transition from the current rules to the new rules. Several provisions are added to allow this. They are patterned on the procedures used when part 135 was upgraded in 1970.

In general, an operator who holds a part 135 operating certificate on December 1, 1978, has 60 days (until February 1, 1979) during which to apply for new operations specifications under new part 135. If an operator elects not to apply for new operations specifications, then the operating certificate held expires on February 1, 1979, and must be returned to the Administrator. If an operator applies for new operations specifications, the FAA will ask for a schedule that reflects the operator's plan for compliance with the new rules. The operator also will be asked to select a date on which it will meet new part 135 and will be ready for an FAA inspection to determine that it, in fact, does so. When the inspection is completed and the operator is in compliance, the FAA will issue new operations specifications. During this time, the existing operating certificate and operations specifications continue in effect.

However, the existing operations specifications expire in any case on: (1) the date the new operations specifications are issued; (2) the date the application is denied; or (3) August 1, 1979, whichever date is the earliest. Section 135.9(d) provides that, if the certificate holder cannot comply by the extension date due to circumstances beyond its control, that date in § 135.9(c) may be extended to December 1, 1979. The certificate holder must apply to the Director, Flight Standards Service, before July 1, 1979, and submit an acceptable schedule for compliance. Any expired operating certificate must be returned to the Administrator.

Certain part 135 certificate holders now operate large aircraft under operations specifications that require compliance with rules in part 121. Under § 135.2(d), they may continue these operations indefinitely if they wish. If they choose to apply for operations specifications under § 135.9(b), their authority to operate large aircraft continues until they are issued new operations specifications authorizing those operations.

Section 135.10 is added to establish separate compliance dates for certain rules which will require additional time to meet. Under § 135.10(a), certificate holders have until June 1, 1979, to comply with the requirements for a third attitude gyro (§ 135.149(c)), for shoulder harnesses (§ 135.171(a)), for airline transport pilot certificates (§ 135.243(a)) and for instrument ratings (§ 135.243(b)(ii)). Under § 135.10(b), certificate holders have until December 1, 1979, to comply with the requirements for CVR (§ 135.151), for GPWS (§ 135.153) and for airborne thunderstorm detection equipment (§ 135.173). These compliance dates are established to avoid placing an undue burden on certificate holders and pilots.

Section 135.10(c) provides that the Director, Flight Standards Service, may extend these specific compliance dates, but not beyond December 1, 1980. To get an extension, the certificate holder or pilot must: (1) Show it cannot comply due to circumstances beyond its control; and (2) submit before the original compliance date a schedule which indicates it will comply at the earliest practicable date.

FAA Flight Standards Inspectors are being given training in the differences between the current rules and revised part 135. Extensive guidance material has been prepared to assist them during the transition. Advisory material is also being prepared for operators and it will become available shortly. Several specific subjects of this material are discussed in detail under the rules involved. This training, written guidance, and advisory material and the changes made in §§ 135.2, 135.9, and 135.10 should ensure a smooth transition to the improved safety rules.

AIRCRAFT SIZE

Commenters generally state that the use of different terms in part 135 to describe passenger-carrying capacity is confusing. These comments have merit and the standard phase "maximum passenger seating configuration, excluding any pilot seat" is used throughout subparts A through I of revised part 135. Using the actual seating configuration of an airplane is the easiest way to determine the applicability of the operating rules because all the FAA or certificate holder need do is count the seats.

However, a different term is used to determine the applicability of the maintenance rules in subpart J (see the discussion of § 135.411). This is the number of seats which forms the type certification base of the aircraft. This is done because the certification basis of an aircraft is used to determine the maintenance requirements which will apply.

EXERCISE OF AUTHORITY

Under current §§ 135.15(d) and 135.17(d), a part 135 operator may petition the Administrator for reconsideration within 30 days after receiving a refusal to amend its certificate or operations specifications. Authority to consider these petitions for reconsideration is delegated to the Director, Flight Standards Service. This delegation is reflected in §§ 135.15(d) and 135.17(d) as adopted in this revision. Also, for uniformity in part 135, the term "FAA Flight Standards District Office charged with the overall inspection of the certificate holder" is used to describe the responsible FAA office.

APPENDIX A

	THUNDERSTORM DETECTION/ WEATHER RADAR EQUIP	ATP CERTIFICATE FOR PILOT IN COMMAND	PART 121 TYPE MAINTENANCE PROGRAM	PILOT SHOULDER HARNESS
COMMUTER RPMs				
- Total - % covered	76	97	67	76
actual (millions)	515.4	659.6	457.0	515.5
- Multiengine - % covered	79	99	69	78
actual (millions)	515.4	659.6	457.0	515.5
- Turboprop - % covered	97	100	99	99
actual (millions)	347.1	356.2	354.8	354.8
ON-DEMAND RPMs				
- Total - % covered	20	23	11	24
actual (millions)	69.4	76.7	35.2	78.4
- Multiengine - % covered	37	42	18	42
actual (millions)	69.1	76.7	33.5	76.6
- Turboprop - % covered	69	71	71	71
actual (millions)	26.7	27.3	27.3	27.3

This table illustrates the substantial increase in the level of safety under new Part 135.

APPENDIX B—REGULATORY ANALYSIS

ECONOMIC CONSEQUENCES

In analyzing the economic consequences of this final rule and its major alternative, primary emphasis was placed on the burdens placed on the commuter and on-demand air taxi operators in the domestic fleet. This analysis was accomplished in several phases. First, preliminary data on the industry cost impact of the part 135 changes in notice 77-17 of August 29, 1977, as amended on October 27, 1977, were developed through a scientific sample of commuter and on-demand air taxi operators conducted under contract. These estimates by sampled operators were then subjected to a detailed statistical analysis to enhance the precision of industrywide cost impacts. The industry cost estimates were then adjusted for changes between the notice and the final rule. The reasonableness of the final rule estimates developed through this statistical sampling technique was then tested by comparison to an independently derived set of judgmental estimates based on FAA staff expertise in commuter and on-demand air taxi operations. Finally, the relationship of these industry cost estimates to other more general economic consequences was assessed.

INITIAL COST IMPACT ASSESSMENT

To obtain information on all factors relevant to a determination of which proposed part 135 changes were appropriate for final rulemaking, the FAA required more detailed and consistent data on industry cost impacts than it had previously developed or received through the notice and public comment process. The FAA, therefore, commissioned an independent and comprehensive assessment of the cost impacts likely to result from the proposed changes. This assessment, which examined the impact of individual proposed changes as well as of all changes taken together, was conducted between February 6, 1978, and April 20, 1978, by the Aerospace Corp. with support from Gellman Research Associates, Inc.

OUTLINE OF STUDY

The cost impact assessment was structured to include the following major elements:

- Identification, classification and characterization of potential cost impact areas, through a detailed analysis of the notice and by comparison with the existing part 135, in light of known industry practices and procedures.
- Analysis and test of a classification system for air commuter and air taxi operators designed to differentiate the varying cost impacts of the proposed changes across the diverse elements of the industry.
- Development and implementation of an optimal allocation method for choosing a scientific sample of operators with reasonable assurance of achieving high statistical significance of the results.
- Conduct of 64 air commuter and 20 on-demand air taxi operator interviews, utilizing an interview format designed to produce data on the specifically identified cost impacts.
- Processing of the collected data to produce preliminary assessments of cost impacts of the air commuter and on-demand air taxi industries for individual and aggregated proposed changes to part 135.

Information on the structure, conduct, and results of this cost impact study, along with discussions of limitations on the data developed, are provided in the sections that follow. Full documentation of the study and its associated data bases is provided in the three-volume report, "Cost Impacts of FAR Part 135 Changes on the Commuter and Air Taxi Industries," May 1978, the Aerospace Corp., which is in the docket.

IDENTIFICATION OF PART 135 CHANGES

To begin the cost impact assessment process, it was necessary to develop an indepth analysis of existing part 135 and the changes proposed in notice 77-17. For this purpose, a matrix was prepared to:

- Identify specific changes to part 135 proposed in the notice;
- Summarize the proposed changes to each affected subpart of part 135;
- Appraise the potential for cost impacts to air commuter and on-demand air taxi operators according to size of aircraft and fleet size; and
- Define the data required to assess and quantify the potential operator cost impacts.
- Two additional steps were taken to assure that all proposed changes resulting in operator cost impacts were properly identified:
- First, comments received by the FAA under the notice and public comment process from industry members, trade associations, and others, were reviewed and incorporated into the cost impact matrix.
- Second, the draft cost impact classifications were reviewed by three major air commuters and two major on-demand air taxi operators with aircraft in the size ranges affected by the proposed changes.

As a result of the analysis and review process, 32 specific proposed part 135 changes were identified that were likely to impose operator cost impacts. These rules are listed in table 1 according to the four cost source categories: Equipment, Maintenance and Training, Revenue Loss (Gain), and Personnel Duty Time and Proficiency.

TABLE 1

NPRM 77-17 RULE CHANGES WITH COST IMPACTS

EQUIPMENT		MAINTENANCE/TRAINING		REVENUE LOSS (GAIN)		PERSONNEL DUTY TIME/PROFICIENCY	
NPRM NO.	DESCRIPTION	NPRM NO.	DESCRIPTION	NPRM NO.	DESCRIPTION	NPRM NO.	DESCRIPTION
135.63	FAA Inspector Seat	135.2	30-Passenger Size Allowance	135.57	Continuation of Flight Criteria	135.39,.41	Management Qualifications
						135.49	Flight and Duty Records
135.75	Baggage Restraints	135.23	Procedure Manual	135.149	Minimum Equipment List	135.85	Aircraft to Maintain Proficiency
						135.193	Pilot in Command ATP Requirements
135.77, .129	Oxygen Requirements	135.37	Financial Review	135.171, .185	Airport-Specific Weather Reports	135.197	Second in Command Ratings
135.125	Large Aircraft, Turbojet Equipment	135.53	Flight Irregularity Records	135.175	IFR Outside of Controlled Airspace	135.200-.219	Duty Time Limitations
135.127	Fire Extinguishers	135.237-.267	Training Program	135.179	Weather Reports and/or Forecasts	135.225	Competency Checks
135.137	IFR Equipment Requirements	135.333-.365	Maintenance Program	135.183	Alternate Airport Fuel	135.229	IFR Proficiency Checks
135.139	Life Preservers			135.187	Icing Condition Operations	135.231	VFR Line Checks
135.143	Shoulder Harnesses						
135.145	Thunderstorm Detection Equipment						
135.147	Crash Axe, etc.						

Preliminary analysis also indicated that industry cost impacts could be differentiated into the following categories according to the type of cost that would be incurred by the air commuter or on-demand air taxi operator:

- Initial cost (the one-time charge for purchase and installation of equipment, for launch of a new training program, for preparation of manuals, and so forth).
- Annual normal recurring cost (continuing costs to maintain additional equipment, for upkeep of new manuals, for continuing new proficiency checks, for salaries of added personnel, and so forth).
- Annual revenue loss (attributable to curtailed operations due to equipment downtime, reduced numbers of revenue passengers or amount of cargo, and so forth) or revenue gain (realized from improved operations resulting from added flights permissible with more flexible weather reporting, added revenue passengers or cargo because of lower fuel requirements, and so forth).

INDUSTRY CHARACTERIZATION

In parallel with the cost impact identification activity, a major effort was undertaken to acquire the data base needed to identify and characterize the air commuter and on-demand air taxi groups and then divide them into more definitive subcategories for analytical purposes. Data was gathered from various FAA, Civil Aeronautics Board (CAB), and other sources. For purposes of this cost impact assessment, the CAB form 298 series data proved to be the single most useful source, although data collected on several FAA forms relating to aircraft registration, certification, and airport development also provided needed supplementary information. Additional data from several industry associations provided further information on specific air commuter and on-demand air taxi characteristics.

The FAA report "Commuter Air Carrier Operators as of September 1976" was used as the basis for identifying the air commuter population. The report was compiled from CAB form 298-C data for the third quarter of 1976. Adjustments were made to the 181 operators listed to correct for three duplicate listings and for the inclusion of six operators utilizing large (over 30-passenger) aircraft not relevant for this analysis. Consequently, the net population of air commuter operators was set at 172. While this population was known to be incomplete to a small degree because of late filings of quarterly information, the selection population of 172 operators does comprise those air commuters accounting for over 95 percent of operations performed by the portion of the air commuter industry affected by part 135 changes.

Population data for on-demand air taxis were derived from CAB form 298-D filings for calendar year 1976. A computerized data base for this information was developed for the first time to conduct this cost impact assessment. The data base indicates that there is a total domestic on-demand air taxi population of 2,273 operators. Thus, on-demand industry is an order of magnitude larger than the air commuter industry in terms of numbers of operators.

Based on an analysis of these data bases, it was determined that the total commuter population could be categorized into three groups according to the size of the fleet operated in commuter service: 1-4 aircraft, 4-10 aircraft, and more than 10 aircraft. Similarly, size of aircraft operated by air commuters could be grouped into three convenient categories: 0-9 seats, 10-19 seats, and 20-30 seats. The break points in aircraft size groupings correspond to the differing regulatory requirements proposed for each of these categories under the part 135 notice. Finally, to assess whether geographic differences were important in the incidence of

United States was divided into five areas corresponding to the following aggregations of the 11 FAA regions:

Area 1: Alaska, Northwest, Rocky Mountain regions.

Area 2: Pacific, Southwest, Western regions.

Area 3: Southern region, including Caribbean.

Area 4: Great Lakes and New England regions.

Area 5: Central and Eastern regions.

These groupings were based on the likelihood of the geographic areas exhibiting similar weather and terrain characteristics.

A scientific sampling procedure was developed for selecting those air commuters and on-demand air taxis to be interviewed. Based on priorities established by the FAA, about 75 percent of study team resources during the cost impact data collection process were devoted to the air commuter industry; thus, the air commuter sampling procedure was defined to yield 64 carriers, representing more than one-third of the identified population. On the other hand, the on-demand air taxi sampling procedure was defined to yield only 20 carriers. While this sample size is less than 1 percent of the industry, an analysis of the industry and the likely cost impacts indicated that it would be sufficiently representative for purposes of this study, except for helicopter and turbine aircraft operators, who were analyzed by nonsample techniques.

The air commuter sample was optimally allocated across the total population by utilizing a 45-cell matrix (three fleet sizes, three aircraft sizes, and five geographical regions). The on-demand air taxi sample was optimally allocated utilizing a 15-cell matrix (three aircraft sizes and five geographical regions). In accomplishing the on-demand air taxi allocation, the available data base required the use of a surrogate measure for aircraft size. For this purpose, passengers per departure was selected.

CONDUCT OF INTERVIEWS

The interview process was structured by the development of a comprehensive interview guide designed to obtain from each sampled operator: (1) Confirming demographic information, (2) raw cost data concerning individual proposed changes to part 135, and (3) confirming information from operators for use in validating the consistency of raw cost impact estimates. Some operators contacted found it inconvenient to participate because of the limited time available. Several of the on-demand air taxi operators selected had gone out of business. More than a dozen substitutions were identified for these various reasons, using a replacement algorithm in the scientific selection process.

ANALYSIS OF DATA

The data obtained through the interview process consisted of operator cost impact estimates for each of the 32 proposed regulatory changes. For each change, cost data was elicited in three categories: Initial cost; normal recurring cost; and recurring revenue loss (gain). A data processing computer program was developed to permit the aggregation of cost impacts over any specified subset of the changes for any specified population subset. The computer program developed expected (mean) value estimates of cost impacts, the standard error of those estimates, and a 0.9 confidence interval of the cost impact.

A number of instances were found where air commuter and on-demand air taxi operators indicated that a cost impact would result but were unable to make a specific cost estimate. These instances occurred most frequently where equipment items, such as shoulder harnesses and thunderstorm detection devices, would be required under the proposed part 135 change. For those cases, independent cost estimates were developed utilizing data from manufacturers of this equipment. In some instances, it was also found that an occasional operator estimate would be extremely high. These observations were carried through the calculations and reflected as operator estimates. Each such case was, howev-

er, given special consideration, and when it was determined that there was no peculiar characteristic of the operator that would justify the higher cost, an independent cost estimate was made based on manufacturer or industry data and a second cost impact calculation performed. Several "off-line" analyses were also made to acquire information on operators of turbojet equipment, large aircraft, and helicopters, because most of the sampled operators did not operate such equipment.

STATISTICAL ANALYSIS

The preliminary industry cost impact estimates were then subjected to a comprehensive analysis that included the following steps: (1) Examination of the sampling and estimating methods used in the preliminary analysis; (2) analysis of the probability distribution of the data; (3) determination of the sensitivity of the preliminary estimates to analytical methods employed in sampling and impact; (4) enhancement of the data to satisfy the initial conditions necessary for the application of various statistical techniques; (5) estimation of costs and benefits for various combinations of subgroups within the sample of commuters and on-demand air taxi industries; and (6) tests of significance for various estimates of the cost of the proposed rule changes as a whole and of the costs due to individual rule changes. This analysis is documented in the report "Analysis of the Relationship of Costs and Benefits Estimated for proposed revision to FAR Part 135," Gellman Research Associates, Inc., June 1978, which is in the docket.

RESULTS OF INDUSTRY COST ASSESSMENT

The results of the above analysis are presented in table 2 for each rule change proposed in the notice with an industry cost impact. In addition to totals for each of the commuter and on-demand air taxi sectors, detailed breakouts are proyided according to the cost categories of initial, normal recurring and revenue loss (gain), as defined above. The major results are summarized below.

TABLE 2

RESULTS OF INDUSTRY COST IMPACT ASSESSMENT OF NPRM 77-17
(MEAN VALUES)

Item No.	NPRM Change No.	Description	Cost Element ($000)											
			Initial			Normal Recurring			Revenue Loss			Total		
			Commuters	Air Taxi	Total	Commuters	Air Taxi	Total	Commuters	Air Taxi	Total	Commuters	Air Taxi	Total
1	135.2	30-Passenger Size Allowance	0	0	0	-120	0	-120	0	0	0	-120	0	-120
2	135.23	Procedure Manual	110	1,463	1,573	108	138	246	0	0	0	218	1601	1,819
3	135.37	Financial Review	9	690	699	53	1,602	1,655	0	0	0	62	2292	2,354
4	135.39, .41	Management Qualifications	10	1,187	1,197	829	13,664	14,493	0	0	0	840	14851	15,690
5	135.49	Flight and Duty Time Records	0	0	0	298	3,464	3,762	0	0	0	298	3464	3,762
6	135.53	Flight Irregularity Records	4	0	4	94	428	522	0	0	0	98	428	526
7	135.57	Continuation of Flight Criteria	0	0	0	69	1,327	1,396	187	12	199	256	1339	1,595
8	135.63	FAA Inspector Seat	46	2	48	0	0	0	284	0	284	330	2	332
9	135.75	Baggage Restraints	224	473	697	0	0	0	0	0	0	224	473	697
10	135.77, .129	Oxygen Requirements	0	369	369	0	16	16	0	0	0	0	385	385
11	135.85	Aircraft to Maintain Proficiency	0	0	0	29	0	29	0	0	0	29	0	29
12	135.125	Large Aircraft & Turbojet Equipment	0	0	0	0	0	0	0	0	0	0	0	0
13	135.127	Fire Extinguishers	22	142	164	1	2	3	0	0	0	23	144	167
14	135.137	IFR Equipment Requirements	311	0	311	12	0	12	0	0	0	323	0	323
15	135.139	Life Preservers	3	0	3	0	0	0	0	0	0	3	0	3
16	135.143	Shoulder Harnesses	148	14	162	39	0	39	0	0	0	187	14	201

TABLE 2 (cont'd.)

Item No.	NPRM Change No.	Description	Cost Element ($000)											
			Initial			Normal Recurring			Revenue Loss			Total		
			Commuters	Air Taxi	Total	Commuters	Air Taxi	Total	Commuters	Air Taxi	Total	Commuters	Air Taxi	Total
17	135.145	Thunderstorm Detection Equipment	1,136	0	1,136	90	0	90	184	0	184	1,409	0	1,409
18	135.147	Crash Axe, etc.	0	0	0	0	0	0	0	0	0	0	0	0
19	135.149	Minimum Equipment List	0	16	16	0	0	0	0	0	0	0	16	16
20	135.171, .185	Airport Specific Weather Reports	18	473	491	22	81	103	1,043	16107	17,150	1,083	16661	17,744
21	135.175	IFR Outside of Controlled Airspace	0	0	0	-153	-1,890	-2,043	-90	0	-90	-243	-1890	-2,133
22	135.179	Weather Reports and/or Forecasts	0	0	0	69	-158	-89	-161	-1890	-2051	-92	-2048	-2,140
23	135.183	Alternate Airport Fuel	0	0	0	-218	0	-218	-11	-315	-326	-229	-315	-544
24	135.187	Icing Condition Operations	59	0	59	81	0	81	299	1576	1,875	439	1576	2,015
25	135.193	Pilot in Command ATP Requirements	143	0	143	342	0	342	0	0	0	485	0	485
26	135.197	Second in Command Rating	0	0	0	484	856	1,340	0	0	0	484	856	1,340
27	135.200-.219	Duty Time Limitations	0	0	0	5,648	19,287	24,935	165	7951	8,116	5,813	27238	33,051
28	135.225	Competency Checks	0	0	0	-176	-2,015	-2,191	0	0	0	-176	-2015	-2,191
29	135.229	IFR Proficiency Checks	0	0	0	-73	-221	-294	0	0	0	-73	-221	-294
30	135.231	VFR Line Checks	22	0	22	244	320	564	0	0	0	266	320	586
31	125.237-.267	Training Program	269	1,077	1,346	894	726	1,620	0	0	0	1,163	1803	2,966
32	135.333-.365	Maintenance Program	302	12	314	1,349	5,669	7,018	0	0	0	1,650	5681	7,331
		TOTAL	2,835	5,918	8,753	10,014	43,296	53,310	1,901	23441	25,342	14,750	72655	87,405

Total first year cost impact on the air commuter industry for the proposals in the notice would be approximately $14.7 million, 81 percent of which would be expected to recur each year thereafter. The corresponding on-demand air taxi industry total first year costs would be approximately $72.7 million, 92 percent of which would be expected to recur annually.

For air commuters, the individual changes proposed to part 135 with the greatest first year cost impacts would be those related to duty time limitations, upgraded maintenance programs, thunderstorm detection equipment, training programs, and airports specific weather reports. For air taxis, the greatest first year cost impacts would be those related to duty time limitations, airport specific weather reports, revised management qualifications, the upgraded maintenance program, and flight and duty time records.

Individual rule changes affect different portions of the commuter air carrier and on-demand air taxi industries differently. For example, 34 percent of the proposed changes would affect less than 10 percent of commuter operators, while 25 percent of the proposed changes would have no effect on on-demand air taxis. Furthermore, the duty time limitation would affect three-quarters of both commuter and on-demand air taxi operators and account for approximately 47 percent of total estimated normal recurring net costs and 38 percent of total costs.

Some of the changes proposed to part 135 in the notice produce important operator cost savings, including, for example, the effects of greater flexibility in uncontrolled airspace IFR operations, new alternate airport fuel requirements, greater flexibility in interpreting weather reports, and greater proficiency-check flexibility. The total of cost savings identified by the operators would be $7.4 million, of which 87 percent would accrue to on-demand air taxi operators.

The estimates of initial and recurring costs developed in this study are aggregate, making it difficult to judge the intensity of the impact on the operators, either as a group or subdivided into specific subgroups. To facilitate interpretation of the cost impact data, a comparison of costs and revenues was developed for the air commuters. From this analysis, it was determined that the greatest potential cost impacts in relation to revenues would be on those operators using the smallest aircraft (0-9 passengers) and having the smallest fleet size (1-4 aircraft). Air commuter operators of small fleets of large aircraft (20-30 passengers) would also experience relatively large cost impacts. Taken as a whole, air commuter industry cost impacts would represent about 4½-percent of revenues.

ADJUSTMENTS FOR CHANGES TO NOTICE PROPOSALS

Of the 32 proposed rule changes in the notice with a total cost impact of $52,483,000, nine items had changes that produced lower estimates of industry impact in the development of the final rule by $19,035,000. Two of these changes resulted from the deletion of the proposed requirement and seven changes resulted from a modification of the proposed rule that lessened its economic impact. Only two changes involved clarification of assumptions regarding availability of alternative means to meeting the proposed rule. Two other items were deferred for further rulemaking action. The comparison of industry costs impacts for the final rule and its major alternative (notice 77-17), detailing these adjustments in cost impacts, is discussed below and summarized in table 3 by cost item.

TABLE 3

RESULTS OF COST IMPACT ASSESSMENT: FINAL RULE VERSUS NPRM 77-17 (MEAN VALUES)

Item No.	Rule Section No.	NPRM Section No.	Section Title	Final Rule Cost Impact ($000)												Total Cost NPRM Basis
				Initial			Normal Recurring			Revenue Loss			Total			
				Commuters	Air Taxi	Total	Commuters	Air Taxi	Total	Commuters	Air Taxi	Total	Commuters	Air Taxi	Total	
1	135.2	(135.2)	Air Taxi Operations with Large Aircraft	0	0	0	-120	0	-120	0	0	0	-120	0	-120	-120
2	135.21	(135.23)	Manual Requirements	110	1,463	1,573	108	138	246	0	0	0	218	1,601	1,819	1,819
3	Deleted	(135.37)	Periodic Financial Status Review	0	0	0	0	0	0	0	0	0	0	0	0	2,354
4	135.37, .39	(135.39, .41)	Management Personnel Required and Qualifications	8	712	720	663	8,198	8,861	0	0	0	671	8,910	9,581	15,690
5	135.63	(135.49)	Recordkeeping Requirements													3/
6	135.65	(135.53)	Reporting Mechanical Irregularities	4	0	4	94	428	522	0	0	0	98	428	526	526
7	135.69	(135.57)	Restriction or Suspension of Operations: Continuation of Flight in an Emergency	0	0	0	69	1,327	1,396	187	12	199	256	1,339	1,595	1,595
8	135.75	(135.63)	Inspection Credentials: Admission to Pilots Compartment: Forward Observers Seat	28	2	30	0	0	0	170	0	170	198	2	200	332
9	135.87,	(135.75)	Carriage of Cargo Including Carry on Baggage	224	473	697	0	0	0	0	0	0	224	473	697	697
10	135.89, .157	(135.77, .129)	Pilot Requirements: Use of Oxygen and Oxygen Equipment Requirements	0	0	0	0	0	0	0	0	0	0	0	0	385
11	135.97	(135.85)	Aircraft and Facilities for Recent Flight Experience	0	0	0	29	0	29	0	0	0	29	0	29	29
12	135.149, .151, .153	(135.125)	Equipment Requirements: General and Cockpit Voice Recorders and Ground Proximity Warning System	0	1,200	1,200	0	150	150	0	0	0	0	1,350	1,350	1,890 1/
13	135.155	(135.127)	Fire Extinguishers: Passenger-Carrying Aircraft	0	0	0	0	0	0	0	0	0	0	0	0	167
14	135.165	(135.137)	Radio and Navigation Equipment: Extended Overwater or IFR Operations	311	0	311	12	0	12	0	0	0	323	0	323	323
15	135.167	(135.139)	Emergency Equipment: Extended Overwater Operations	3	0	3	0	0	0	0	0	0	3	0	3	3
16	135.171	(135.143)	Shoulder Harness Installation at Flight Crewmember Stations	148	14	162	39	0	39	0	0	0	187	14	201	201

TABLE 3 (Continued)

RESULTS OF COST IMPACT ASSESSMENT: FINAL RULE VERSUS NPRM 77-17 (MEAN VALUES)

Item No.	Rule Section No.	NPRM Section No.	Section Title	Final Rule Cost Impact ($000)												Total Cost NPRM Basis
				Initial			Normal Recurring			Revenue Loss			Total			
				Commuters	Air Taxi	Total	Commuters	Air Taxi	Total	Commuters	Air Taxi	Total	Commuters	Air Taxi	Total	
17	135.173	(135.145)	Airborne Thunderstorm Detection Equipment Requirements	1,136	0	1,136	90	0	90	184	0	184	1,410	0	1,410	1,410
18	135.177	(135.147)	Emergency Equipment Requirements for Aircraft Having a Passenger Seating Configuration of More than 19 Passengers	0	0	0	0	0	0	0	0	0	0	0	0	0
19	135.179	(135.149)	Inoperable Instruments and Equipment for Multi-Engine Aircraft	0	16	16	0	0	0	0	0	0	0	16	16	16
20	135.213, .225	(135.171, .185)	Weather Reports and Forecasts and IFR: Takeoff, Approach and Landing Minimums	18	473	491	22	81	103	1,043	9,664	10,707	1,083	10,218	11,301	17,744
21	135.215	(135.175)	IFR Operating Limitations	0	0	0	-153	-1,890	-2,043	-90	0	-90	-243	-1,890	-2,133	-2,133
22	135.219	(135.179)	IFR: Destination Airport Weather Minimums	0	0	0	69	-158	-89	-161	-1,890	-2,051	-92	-2,048	-2,140	-2,140
23	135.223	(135.183)	IFR: Alternate Airport Requirements	0	0	0	-218	0	-218	-11	-315	-326	-229	-315	-544	-544
24	135.227	(135.187)	Icing Conditions Operating Limitations	0	0	0	0	0	0	0	0	0	0	0	0	2,015
25	135.243	(135.193)	Pilot in Command Qualifications	143	0	143	342	0	342	0	0	0	485	0	485	485
26	135.245	(135.197)	Second in Command Qualifications	0	0	0	200	200	400	0	0	0	200	200	400	1,340
27	135.261	(135.200-.219)	Flight and Duty Time Limitations													2/
28	135.293	(135.225)	Initial and Recurrent Pilot Testing Requirements	0	0	0	-176	-2,015	-2,191	0	0	0	-176	-2,015	-2,191	-2,191
29	135.297	(135.229)	Pilot in Command: Instrument Proficiency Check Requirements	0	0	0	-73	-221	-294	0	0	0	-73	-221	-294	-294
30	135.299	(135.231)	Pilot in Command: Line Checks: Routes and Airports	22	0	22	244	320	564	0	0	0	266	320	586	586
31	135.321-.351	(135.237-.267)	Training	269	1,077	1,346	894	726	1,620	0	0	0	1,163	1,803	2,966	2,966
32	135.411-.443	(135.333-.365)	Maintenance, Preventive Maintenance, and Alterations	302	12	314	1,349	5,669	7,018	0	0	0	1,651	5,681	7,332	7,332
	TOTAL			2,726	5,442	8,168	3,484	12,953	16,437	1,322	7,471	8,793	7,532	25,866	33,398	52,483

1/ These costs are from a special "off-line" analysis because the sample of small air taxi operators did not include operators of affected turbojet aircraft.

2/ Flight and duty time limitation and associated recordkeeping deferred for further rulemaking action. See discussion in accompanying text.

3/ Major cost impacts in recordkeeping relate to flight and duty time and are, therefore, deferred. Other cost impacts are negligible.

NOTE: The estimates provided in this table are refined from the preliminary figures provided in the study "Cost Impact of FAR Part 135 Changes on the Commuter and Air Taxi Industries, May 1978." The revised estimates for cost impacts of the proposed rule can be found in the study "Analysis of the Relationships of Costs and Benefits Estimated for Proposed Revisions to FAR Part 135, June 1978." Comparison of the preliminary and revised estimates are shown in Figure 4-23, pages 83 to 85 of the latter report. A discussion of the methods of estimation and data base enhancement are included in Sections III and IV of that report. These reference reports are available for review in docket number 16097.

Cost reductions resulting from the deletion of requirements between the notice and the final rule total $4,369,000 and involves financial reviews and icing conditions operations (items 3, 24).

The proposed rule on management requirements (item 4) was modified to be more flexible. In addition, FAA believes that operator estimates took inadequate consideration of the cost reducing option for deviations that would be authorized for equivalent experience. Since on-demand air taxis would normally have less equipment and personnel and would benefit more by combining management positions, their cost impact was reduced more than that for the commuters. Similarly, the cost impact of the proposed rule on airport weather reports (item 20) was reduced for the on-demand air taxi estimate of revenue loss because of inadequate consideration by the operators of alternative means available including amendment of operating specifications for alternative sources of weather reports. These two adjustments resulted in cost impact reductions of $6,109,000 and $6,443,000, respectively.

Item 8, § 135.75, providing a forward observer seat for FAA inspectors, drew negative comment. The final rule was written to state what type of communication equipment was required to be furnished to the FAA inspector. In addition, the preamble clarified that it would not be FAA policy to "bump" revenue passengers unnecessarily. This resulted in a reduction of the estimated cost impact from $332,000 to $200,000.

Item 10, §§ 135.89 and 135.157, pilot requirements for use of oxygen and oxygen equipment requirements, was modified from the notice to the final rule in light of the comments received. This resulted in a reduction of the estimated cost impact from $385,000 to zero.

Item 13, § 135.155, fire extinguishers, was changed from requiring a fire extinguisher in the passenger compartment of each aircraft seating at least six passengers to an aircraft seating at least 10 passengers. This resulted in a reduction of the cost impact from $167,000 to zero.

Item 12, §§ 135.149, 135.151, and 135.153, equipment requirements, was reduced from the original notice by $540,000 by eliminating the flight data recorder requirement. Safety of flight will not be compromised by such a withdrawal.

It was estimated that § 135.245, second in command qualifications, would have an estimated cost of $1,340,000. The FAA believes that this figure is too high since only a few operators out of a very small sample reported an impact. When extrapolated to the total population, the estimated cost has been reduced to $400,000 (item 26). Also, many pilots currently serving in part 135 operations already possess the necessary rating since the ratings are required under the present rule for certain type operations.

FINAL RULE COST IMPACT ANALYSIS

When all adjustments to the notice are considered, the estimated first year costs to the industry will be $33,398,000. Of this total, $8,168,000, or 25 percent, will be initial costs; $16,437,000, or 49 percent, will be normal recurring costs; and $8,793,000, or 26 percent, will be from estimated revenue loss. The estimated cost of the significant changes to commuter air carriers is $2,726,000 in initial costs and $5,808,000 in annual recurring costs. The annual recurring costs are partially offset by estimated annual recurring savings of $1,002,000. The estimated initial cost to the air taxi segment is $5,442,000 with an annual recurring cost of $26,913,000. The annual recurring costs are partially offset by estimated annual recurring savings to the air taxi industry of $6,489,000.

In addition to the cost estimates derived from the scientific sampling of air commuter and on-demand air taxi operator estimates, the FAA conducted its own independent analysis of these proposed rules and their likely industry cost impacts. These estimates closely approximate the operator estimates taken as a whole across all rule changes. Estimates for individual cost items vary to some extent, reflecting differences primarily in assumptions as to current industry equipage and practice and the availability of alternative means for meeting proposed requirements.

In notice 77-17, four major proposals were highlighted as having major additional costs. Following a review of the response to notice 77-17 and the study of other pertinent data, the cost estimates of the economic impact of revised part 135 rules were reevaluated. These proposals are discussed below.

The first proposed to require airborne thunderstorm detection equipment for all equipment for all multiengine aircraft conducting passenger-carrying operations and having a passenger seating configuration of 10 seats or more, excluding any pilot seat. The FAA estimates that the airborne thunderstorm detection equipment requirement would result in an initial cost of $1,136,000 and an annual recurring cost including the loss of revenue of $274,000 (item 17).

The second proposed to require the use of a continuous maintenance program for all aircraft certificated to carry 10 passengers or more, exclusive of flight crew. The FAA estimates the initial cost to comply with this program will be $314,000 and the annual recurring cost will be $7,018,000 (item 32).

The third proposed to require all aircraft carrying 10 or more passengers to be type certificated in the transport category by 1984. This proposal was withdrawn by notice 77-17A.

The fourth proposed to require all turbojet aircraft, with a passenger seating configuration, excluding any pilot seat, of 10 passengers or more, to have a CVR, FDR, and GPWS installed. The requirement for an FDR is deleted in the final rule. Section 135.153 provides for approval of an alternate GPWS to that required. The initial cost is estimated to be $1,200,000 and the annual recurring cost to be $150,000 (item 12).

There were other sections of the proposed rules which, on further evaluation, do have a cost impact which should be discussed. These cost estimates are based on an analysis of imput received from part 135 operators and FAA evaluation. The following rules are expected to have an impact.

Section 135.21 (item 2) requires a manual setting forth the certificate holder's procedures and policies. Since a manual is already required by current part 135, there is only an incremental cost required to include additional information in the manual regarding the crew training program, the maintenance personnel data, and other company policy. In addition, some costs will be incurred for printing and distributing the revised manual. The FAA estimates this requirement will initially cost $1,573,000 and annual recurring costs will be $246,000.

Item 4, §§ 135.37 and 135.39 regarding management personnel requirements and qualifications will also increase costs to the operators. The rule has been revised from the notice to allow the director of operations and chief pilot to have a commercial pilot certificate instead of an ATP certificate. An ATP certificate would only be required if the certificate holder is conducting operators which would require the pilot in command to hold an ATP certificate. This would involve only a small portion of the certificate holders. The management personnel of many of these operators already meet this requirement. It should be noted that the rule provides for deviation authority from the FAA in combining positions or authorizing different positions when the size of the organization cannot support the type and number of positions in the rule. The FAA can also grant deviations from the experience requirements. Many operators were concerned that

deviations would not be granted except in very unusual cases. Consequently, it appears they overestimated the cost impact.

A majority of the operators now have a management organization to some extent, thus, only minor changes would be required to meet the new rules regarding the number of persons and additional qualifications. The estimated additional cost to initially meet this requirement is $720,000 and annual recurring costs are estimated to be $8,861,000.

The recordkeeping changes as required by § 135.63 (item 5) also involve quantifiable cost increases. The primary additional cost factor in this area is in maintaining records for flight and duty time limitations. The proposals in subpart F dealing with flight and duty time limitations are deferred; consequently, the additional recordkeeping provision is also deferred and cost impacts, being minimal, are deleted.

A new requirement in § 135.69 to restrict or suspend operations, if conditions hazardous to safe operations are known to exist, is estimated to result in annual recurring costs of $1,595,000 (item 7).

New subpart H sets forth requirements for training and for the development of a training program. The estimated cost to initially meet these requirements is $1,346,000, with estimated annual recurring costs of $1,620,000 (item 31).

Section 135.87 (item 9), regarding the stowage of cargo and carry-on baggage, will require some modifications to be made to certain aircraft, especially in the stowage of under seat baggage. The estimated initial cost to industry is $697,000 with little annual recurring costs.

The proposals in subpart F (item 27), dealing with flight and duty time limitations, are deferred. Consequently, all potential cost impacts have been deleted.

Under the provisions of § 135.213, weather reports and forecasts and § 135.225, IFR: takeoff, approach and landing minimums (item 20), no pilot may begin an instrument approach to an airport unless the airport has designated weather reporting facilities. The weather reporting facility must be operated by the U.S. National Weather Service, a source approved by it, or a source approved by the Administrator. However, an operator's operations specifications may be amended, under certain circumstances, to allow weather observations to be taken at a location other than on that airport, thus allowing an operation to be conducted into that airport. The FAA estimates this rule change will result in an initial cost of $491,000 and an annual recurring cost including revenue loss of $10,810,000.

There are other rule changes, such as reporting mechanical irregularities (§ 135.65), aircraft and facilities for recent flight experience (§ 135.97), radio and navigation equipment requirements (§ 135.165), emergency equipment: extended overwater operations (§ 135.167), shoulder harness installation (§ 135.171), minimum equipment list (§ 135.179), pilot in command qualifications (§ 135.243), second in command qualifications (§ 135.245), and line checks (§ 135.299), which will have a total initial estimated cost of $661,000 and a total annual recurring cost of $1,908,000 (items 6, 11, 14, 15, 16, 19, 25, 26, 30).

Various changes were proposed to the current part 135 rules which will result in a cost savings to the part 135 operators. The implementation of §§ 135.1 and 135.2 will result in a savings because of the authorization to use larger aircraft under part 135 rules with the advantage of carrying more passengers or heavier payloads.

Section 135.177 (item 18), regarding the use of a minimum equipment list for multiengine aircraft, will result in an overall cost savings to the operators, especially commuter air carriers, who elect to take advantage of its provisions. However, if an ATCO certificate holder elects not to apply for such approval, no costs savings would be realized.

Another section where savings will be realized is that regarding IFR operating limitations, § 135.215 (item 21). This rule contains provisions relaxing IFR operations outside of controlled airspace and at airports that do not have approved procedures. The majority of the savings will accrue to on-demand air taxi operators.

The relief granted operators regarding destination airport requirements for IFR operations in § 135.219 will also result in cost savings to both commuter air carriers and air taxi operators. The rule allows over-the-top operations and the use of weather reports or forecasts or any combination of them for landing minimums at the destination airport (item 22).

In § 135.223 (item 23), the alternate airport weather minimum requirements for IFR operations have been amended to allow operators more flexibility in determining when an alternate airport would be necessary in flight planning. Reduction in fuel weight will reduce operating costs.

Section 135.293 (item 28) pertains to initial and recurrent pilot flight testing requirements. The use of simulators and relaxation of the requirements pertaining to each type of aircraft to be flown by the pilot for the check and the extent of maneuvers to be given, should result in a cost savings.

The last item deals with pilot in command, instrument proficiency checks, § 135.297 (item 29). Savings would result because a simulator could be used for a portion of the check. Additionally, only three typical instrument approach procedures need to be demonstrated in order for the pilot to be issued a letter of competency for all types of instrument approach procedures.

It is estimated that these changes (items 1, 18, 21, 22, 23, 28, and 29) will save commuter air carriers and on-demand air taxi operators $7,442,000 annually.

PART 121

§ 121.9 *Operations of airplanes having a maximum passenger seating configuration of 30 seats and a maximum payload capacity of 7,500 pounds or less.*

One commenter suggests that § 121.9 should except part 121 certificated air carriers from compliance with §§ 135.37 and 135.39 on management personnel requirements and qualifications. The commenter claims these requirements now are in part 121, those certificate holders already meet them and the part 121 rules meet or exceed those in part 135. The commenter submits safety would not be enhanced by requiring compliance with §§ 135.37 and 135.39 and compliance would be burdensome. These comments have merit, although the parallel part 121 rules apply only to supplemental air carriers and commercial operators. However, the corporate structure and management personnel qualifications of the domestic and flag air carriers are sufficient and the rule excepts those sections.

One commenter states that scheduled air carriers operating airplanes qualifying under part 135 should have an option to conduct their scheduled operations with those aircraft under either part 135 or part 121. Section 135.2(d) allows an operator who is now conducting operations in aircraft having a maximum passenger seating configuration, excluding any pilot seat, of 30 seats or less and a maximum payload capacity of 7,500 pounds or less, to continue operating under part 121 rules for supplemental air carriers, if the operator elects to do that.

Two commenters suggest that part 121 and part 135 operators should have the option to selectively apply appropriate provisions of part 121 with the approval of the Administrator. They state that this provides a higher level of safety. The revision of part 135 achieves an appropriate level of safety and the suggestion would create administrative difficulties in

the uniform application of the rules to part 135 operators.

One commenter recommends that the maximum number of passengers and the maximum payload of each aircraft should be limited by Aircraft Flight Manual data, instead of specifying a passenger seating configuration or payload capacity in the rule. This comment is discussed at length under § 135.1.

One commenter suggests changing the title of part 135 to "Air Charter Operators and Commercial Operators" because the term "Air Taxi" is demeaning. The Civil Aeronautics Board established this classification of exempt air carriers and designated them as "Air Taxi Operators" in 14 CFR Part 298. The term now is widely used by the aviation industry and the traveling public. This segment of aviation offers both on-demand and scheduled service. The term "Air Taxi" is not generally described or known as demeaning in aviation circles or by users.

Current § 121.9(b) is no longer needed since the dates have passed and it is deleted.

§ 121.13 *Rules applicable to helicopter operations: Deviation authority.*

Revised part 135 applies to aircraft having a maximum passenger seating configuration of 30 seats or less and a maximum payload capacity of 7,500 pounds or less. Current part 135 applies to "small aircraft," as defined in § 1.1. The reference in § 121.13 to the operation of a "small helicopter" is changed to be consistent with revised part 135.

PART 127

§ 127.5 *Operation of airplanes having a maximum passenger seating configuration of 30 seats or less and a maximum payload capacity of 7,500 pounds or less.*

Section 127.5 is amended to be consistent with §§ 121.9, 121.11 and revised part 135 for the reasons just discussed. Current § 127.5(b) is no longer needed since the dates have passed and it is deleted.

SPECIAL FEDERAL AVIATION REGULATIONS (SFAR)

SFAR 23, "Airworthiness Standards; Small Airplanes Capable of Carrying More Than 10 Occupants," was issued on December 27, 1968 (34 FR 189; January 7, 1969). SFAR 23 is deleted from Title 14 CFR because it no longer is of current effect. Appendix A of part 135 supersedes SFAR 23 for airplanes type certificated after July 19, 1970 (see § 135.169(b)). This deletion does not affect the type certification basis of airplanes which demonstrated compliance with SFAR 23 before July 19, 1970. Appendix A is republished without substantive change in revised part 135.

Sections 135.151 and 135.153 supersede two other SFAR and they are revoked: SFAR 30, "Ground Proximity Warning Systems" and SFAR 33, "Flight Recorders and Cockpit Voice Recorders." Compliance with §§ 135.151 and 135.153 is discussed in detail above.

PART 135

SUBPART A—GENERAL

§ 135.1 *Applicability.* (*Proposed § 135.1.*)

One commenter on § 135.1(a)(3) recommends that the words "other than air carrier" and "commercial operations" be deleted. Part 135 applies both to commercial operator operations for compensation and hire and to air taxi operators who are exempt air carriers under 14 CFR Part 298. They are not the same and § 135.1(a)(3) is necessary.

One commenter on § 135.1(a)(3) states the limitations on the size of aircraft operated under part 135 should be determined under the Aircraft Flight Manual instead of specifying a passenger seating configuration or payload in the rule. An Aircraft Flight Manual contains technical data on operating limitations and flight parameters. The manual applies to a particular aircraft and not to all aircraft of the same make and model. Many manuals may not contain information on maximum passenger seating or payload capacities. A clear standard is necessary so there is no question about the applicability of revised part 135.

One commenter recommends that "on-demand" air taxi certificate holders be designated as category I, that they be considered "single entity charter" flights and that a category II apply to commuter air carriers and large airplane operators. Separating "on-demand" and commuter air taxi operators was considered in developing revised part 135. This concept was included in proposals considered during the part 135 Review Conference held at Denver in 1976. The concept was discussed at length during the conference. As discussed in the preamble of notice 77-17, rules based upon aircraft size (9 passengers or less excluding pilot seats and 10 passengers or more excluding pilot seats) are adopted to insure equal application of revised part 135.

One commenter states that part 135 should apply to sightseeing flights. Current § 135.1(b)(2) excepts sightseeing flights from part 135 and no facts have come to light that justify a change. The part 91 rules on flight operations and maintenance provide adequately for these operations.

Several commenters state that § 135.1(b)(7) is too restrictive. This exception to part 135 allows a limited kind of operation (for example, Santa Claus flights from an airport to a shopping center and back). The restrictions are necessary in the interest of safety. Of course, these operations are subject to part 91.

Another commenter objects to § 135.1(b)(7) because it prohibits sightseeing flights in helicopters. Section 135.1(b)(2) excepts from part 135 "nonstop sightseeing flights that begin and end at the same airport, and are conducted within a 25-statute-mile radius of that airport." This exception applies to sightseeing flights in any aircraft. Section 135.1(b)(7) applies to a more limited operation (for example, Santa Claus flights) that involves one or more stops. Section 135.1(b)(7)(iv) is changed to have the operator notify the "FAA Flight Standards District Office responsible for the geographic area concerned."

One commenter recommends retaining current § 135.1(b)(7) that excepts from part 135 "any other operation approved by the Administrator." The commenter states this rule provides operational flexibility. The commenter does not explain what operational flexibility is needed or cite examples of using that section in its operations. There is no provision like current § 135.1(b)(7) in any other Federal aviation regulation. There is no record of any recent use of that section. Part 11 provides procedures for obtaining exemptions and for petitioning for rulemaking. Several sections in the revised part 135 also contain deviation authority. In this light and in the absence of any persuasive justification from the commenter, current § 135.1(b)(7) is not included in the rule.

Several instances have occurred in which a person desires to carry without charge a candidate in a Federal election. The candidate must pay for the carriage under the rules of the Federal Election Commission (11 CFR Chapter I). Ordinarily, receipt of payment for carriage is an operation for compensation or hire and requires a part 135 certificate. Carriage of candidates is infrequent and the operator does not intend to engage in the business of an air carrier or commercial operator. A new § 135.1(b)(10) is added to except this carriage in an aircraft to which part 135 would otherwise apply. There are two conditions: (1) The principal business of the aircraft operator must not be that of an air carrier or commercial operator; and (2) the payment must be required and may not exceed the amount required by the Federal Election Commission rules. The FAA contemplates issuance of a special Federal aviation regula-

tion which will relax the requirements of part 121 and present part 135 in time for the November 1978 Federal elections.

§ 135.2 *Air taxi operations with large aircraft. (Proposed § 135.2.)*

One commenter on § 135.2 recommends that the maximum passenger seating capacity of the aircraft operated under part 135 should be governed by the economic regulations of the Civil Aeronautics Board (14 CFR Part 298). Changes to the Board's rules then would automatically change the applicability of part 135. This would constitute a derogation of the FAA's responsibility for safety. Each change in the Board's definition of aircraft size could have significant safety implications. To properly discharge its responsibility for aviation safety, the FAA must conduct a thorough evaluation. If a change is appropriate, rulemaking is initiated to amend the Federal aviation regulations. For example, the Board is considering changes to the economic rules (14 CFR Part 298) that would allow larger aircraft to be used in air taxi operations. The FAA is now reviewing those proposals to determine what, if any, changes are appropriate in the safety rules.

One commenter wants the limits specified in the Airplane Flight Manual to determine the size of the airplane, the number of passengers and the payload for operations under § 135.2. This comment is discussed at length under § 135.1.

Two commenters state the definition of "maximum zero fuel weight" in § 135.2(e)(1) is not clear but did not elaborate. The definition of "maximum zero fuel weight" is defined in § 135.2(e)(3) and is the definition of 14 CFR 298.2.

Section 135.2(d) is advised to provide for compliance as discussed above.

§ 135.3 *Rules applicable to operations subject to this part. (Proposed § 135.3.)*

A sentence is added to § 135.3(b) to cite the incorporation of annex 2 by reference in § 91.1(c) and proposed paragraph (c) is withdrawn.

§ 135.5 *Certificate and operations specifications required. (Proposed § 135.7.)*

The commenter of § 135.5 states the limitations on the size of aircraft operated under part 135 should be determined under the Aircraft Flight Manual instead of specifying passenger seating configuration or payload in the rule. This comment is discussed at length under § 135.1.

§ 135.9 *Duration of certificate. (Proposed § 135.11.)*

Most commenters on § 135.9(a) suggest that the time for the certificate holder to return a revoked or suspended certificate should be 10 working days instead of 10 days. This comment has merit and the rule specifies no time for returning the certificate. Section 135.9(b) is added to provide for compliance as discussed above.

§ 135.10 *Compliance dates for certain rules. (New.)*

New § 135.10 is added to provide for compliance as discussed above.

§ 135.11 *Application and issue of certificate and operations specifications. (Proposed § 135.13.)*

Most commenters on § 135.11(b)(2) object to listing the "type" aircraft subject to the maintenance program in the certificate holder's operations specifications. They argue the rule is less flexible than the current rule. They claim delays will result when the operations specifications are amended to add or delete aircraft. They observe that they now must maintain a current list of aircraft that is available to the FAA on request. These comments have merit and this requirement is deleted. However, the make, model, and registration number of each aircraft that is subject to a continuous airworthiness maintenance program must be in the operations specifications to identify these aircraft to which the program applies.

Some commenters on § 135.11(b)(2) object to listing of registration numbers in the operations specifications regardless of the maintenance program required under part 135. Section 135.11(b)(2) requires this listing only for aircraft inspected under § 135.419 (an approved aircraft inspection program) or under § 135.411(a)(2) (a continuous airworthiness maintenance program). This is required under current part 135.

Several commenters on § 135.11(b)(2) object to listing "maintenance items required by the Administrator." Although they do not object to listing "time limitations," they argue the listing of maintenance items is not contained in comparable provisions of part 121. Listing additional maintenance items under § 135.11(b)(2) is limited, by reference to § 135.421, to those aircraft that are type certificated for a passenger seating configuration, excluding any pilot seat, of nine seats or less. This rule is necessary because there now are no time limitations or standards for those items which must be part of a maintenance program under § 135.421.

One commenter states that § 135.11(b)(2) is ambiguous. The comment has merit and § 135.11(b)(2) is reorganized for clarity.

§ 135.13 *Eligibility for certificate and operations specifications. (Proposed § 135.15.)*

Commenters on § 135.13(b)(2) object because the rule prevents an otherwise competent individual from obtaining employment with an applicant for an ATCO operating certificate. Section 135.13(b)(2) is similar to § 121.51(b)(2). Noncompliance data is a significant factor to consider with an application for an ATCO operating certificate. Similar information has been helpful in evaluating air carrier applicants and the persons they propose for management positions. The FAA revokes an operating certificate only for a very serious infraction of the regulations. If a person contributes materially to that infraction, this fact should be considered as a factor in evaluating the new application. This does not mean the approval of the application or employment position will be automatically withheld, but that each situation will be carefully evaluated on its merits.

Some commenters recommend a time limit so an individual is not subject to a "life sentence" due to a past violation. This comment was carefully evaluated but it is too rigid and impractical. After an operating certificate is revoked the FAA evaluates the performance and reliability in aviation employment of the people involved over a reasonable period of time. This varies from case to case.

§ 135.19 *Emergency operations. (Proposed § 135.21.)*

One commenter on § 135.19 states that the FAA should request a report when a deviation occurs. The other commenter suggests the report should be filed in 10 working days. The FAA would not know when a deviation occurs in most cases and thus could not request a report. To allow greater flexibility in filing a report, the reporting period is changed to 10 days excluding Saturdays, Sundays, and Federal holidays.

§ 135.21 *Manual requirements. (Proposed § 135.23.)*

The proposed rule contained too many paragraphs and it is divided into two sections for simplicity. Section 135.21 contains only the manual requirements (proposed paragraphs (a) and (c) through (h)). Section 135.23 contains the manual contents (Proposed paragraph (b)).

Two commenters on § 135.23(a) claim the deviation authority would not be consistently applied by regional and district offices. This provision is in the current rule and is meant to provide relief for smaller operators. No administrative problems have been encountered in dealing with deviation requests in the past.

Several commenters object to the phrase "acceptable to the Administrator" in § 135.21(a) because it gives the FAA too much latitude regarding manuals and uniform nationwide adminis-

tration by the FAA will be a problem. Responsibility for determining whether a manual is acceptable insures that manual contents are correct, are not contrary to the rules and are adequate for the operations the certificate holder proposes to conduct. District offices have extensive experience in reviewing and accepting manuals.

Section 135.21(d) is changed so that a copy of the manual or appropriate portions must be "available" (not "furnished") to ground personnel to reduce the number of copies the certificate holder must prepare.

Section 135.21(g) is revised to allow a certificate holder who performs maintenance at specified stations to keep the appropriate sections of its manual at the station rather than carry it aboard the aircraft. The FAA believes this change is necessary since maintenance, in addition to inspections, may be performed at specified stations where a certificate holder provides the appropriate sections of its manual.

§ 135.23 *Manual contents. (Proposed § 135.23.)*

As discussed under § 135.21, new § 135.23 contains the rules on manual contents. Several commenters on § 135.23 object to requiring the manual to be in a form acceptable to the Administrator. They state the certificate holder should be responsible for the manual's form as long as it contains all of the required information. These comments have merit and that requirement is deleted.

Several commenters on § 135.23(a) state that "identity" requirement for management personnel is ambiguous. Section 135.37(a) identifies the management personnel required to be identified under § 135.23(a). Section 135.23 is clarified to reflect that.

Several commenters argue that § 135.23 (f), (g), and (h) are difficult to understand, should not be in the rules or should be in subpart J. These procedures are necessary in the certificate holder's manual for the pilot in command to report and record discrepencies, to determine the airworthiness status of the aircraft and to arrange for the maintenance or servicing of the aircraft. They are in current part 135.

Three commenters on § 135.23(p) state that the wording is excessive and unclear. This rule requires each certificate holder to train personnel to recognize hazardous material if presented for shipment even though the certificate holder has a policy prohibiting its carriage. This is the minimum training needed to recognize hazardous materials and limits the possibility of inadvertently carrying this material. Certificate holders who carry hazardous material need more extensive training to comply. Section 135.23(p) is revised for clarity.

The regulations of the Department of Transportation governing the transportation of hazardous materials in aircraft are in 49 CFR Parts 171 through 173 and 175. They are issued under the Hazardous Materials Transportation Act (49 U.S.C. 1801-1812). The Secretary of Transportation has delegated to the FAA Administrator (under 49 CFR 1.47(k)) the functions vested in the Secretary under sections 109, 110, and 111 of the Hazardous Materials Transportation Act relating to investigations, records, inspections, penalties, and specific relief for shipment of hazardous materials by air. The FAA's enforcement procedures for cases involving air transportation or shipment of hazardous materials are in part 13 of the Federal Aviation Regulations.

§ 135.25 *Aircraft requirements. (Proposed § 135.25.)*

Two commenters on § 135.25 state that certificate holders should have exclusive use of each aircraft used in their operation. They claim this provides adequate control for proper maintenance and use of the aircraft. Requiring operators to either own or have exclusive use of each aircraft they operate might be desirable. However, the current rule adequately insures proper control over maintenance and also is sufficiently flexible. A more stringent rule is not justified at this time.

One commenter states that § 135.25 should prohibit use of the same aircraft by two different air taxi operators. This practice is acceptable if the operator has a written agreement with the aircraft owner regarding its use which also deals with performing maintenance. If a certificate holder has an exclusive use agreement for an aircraft, that person may authorize another certificate holder to use it. However, only one certificate holder at a time can have an exclusive use contract for a given aircraft.

Another commenter states that § 135.25(b) is not necessary. This rule is in current part 135. There is no justification for changing it in the revision of part 135. An applicant or a certificate holder should reasonably expect to either own or have exclusive use of at least one aircraft and the rule provides positive control for both operation and maintenance of that aircraft.

§ 135.37 *Management personnel required. (Proposed § 135.39.)*

Commenters on § 135.37 object to the management requirements because sufficient justification was not presented, they lack provisions for the small operator and they overly complicate establishing and operating an air taxi operation.

Specific management personnel must be required in this revision of part 135. The increasing complexity of part 135 operations requires a management organization adequate to ensure that the operations are conducted safely. Different kinds and sizes of operations exist. Thus, § 135.37(a) is changed so the rule does not apply when the certificate holder is the only pilot. Also, § 135.37(b) provides for deviations. The Administrator may approve different positions or numbers of positions if the operation can be safely performed with fewer or different positions than § 135.37(a) requires. This flexibility also is necessary because of the varying size and complexity of part 135 operations. The FAA district office handles the request because they are familiar with the scope of the certificate holder's operation. Before approval, an evaluation is made to determine if a safe operation can be conducted.

Several commenters object to requiring the address of persons listed in § 135.37(c)(2). This comment has merit and the requirement is deleted.

One commenter states § 135.37 is more stringent than similar requirements in part 121, but fails to explain that contention.

§ 135.39 *Management personnel qualifications. (Proposed § 135.41.)*

Commenters on §§ 135.39 (a) and (b) object to requiring the director of operations and the chief pilot to hold an airline transport pilot (ATP) certificate. Most of these comments are from small operators or operators who are not authorized to operate under IFR. Not all types of operations require an ATP certificate (see § 135.243(a)). ATP certificates are required for the pilot in command in passenger-carrying operations of turbojet airplanes, multiengine airplanes operated by commuter air carriers and airplanes with a passenger seating configuration, excluding any pilot seat, of 10 or more. The pilot in command of any other operation must hold only a commercial pilot certificate with an instrument rating. The same concept that applies to pilot in command standards should apply to management personnel qualifications.

The director of operations must hold or have held a pilot certificate equal to the chief pilot's for the operations the certificate holder conducts. Although the pilot certificate an individual holds does not reflect the person's management capability, the holder of an ATP certificate has the broader operational background necessary for a more complex operation. Thus, if the certificate holder conducts any operation requiring the pilot in com-

mand to hold an ATP certificate, then the director of operations and the chief pilot must have an ATP certificate. If the certificate holder does not conduct an operation requiring the pilot in command to hold an ATP certificate, then the director of operation and the chief pilot must have only a commercial pilot certificate.

Some commenters claim requiring the director of operations to hold an ATP certificate precludes the use of highly qualified persons who cannot meet first-class medical certification requirements. These commenters suggest the rule allow a person to serve as director of operations if that person has held an ATP certificate in the past. This comment has merit and the rule is changed to allow that.

Many commenters object to requiring both the director of operations and chief pilot to "know" the contents of the manual. They claim this implies that the person must be able to quote the manual verbatim. They state the rule may create liability problems. They recommend the word "familiar" be used instead of "know". The director of operations and the chief pilot should have a good working knowledge of the manual contents and be more than merely "familiar" with it. A larger and more complex certificate holder normally has a director of maintenance who meets the qualifications of § 135.39(c) even when the certificate holder has no maintenance facility and accomplishes its maintenance under contract. The management responsibility is sufficiently complex to require this standard to be met unless the certificate holder shows that a deviation would not compromise safety.

Many commenters on § 135.39(b)(3) state that requiring the director of maintenance to have 1 year of current experience in the "type" of aircraft used by the certificate holder is burdensome. Under part 1, "type" means make and model. The make and model of aircraft used in air taxi operations are changed frequently. The comments have merit and the words "category and class" are substituted for the word "type."

§ 135.43 *Crewmember certificate: International operations: application and issue. (Proposed § 135.45.)*

Commenters object to § 135.43 because it is unnecessary and requires additional paperwork. There is an increasing amount of international activity by U.S. air taxi operators. The crewmember certificate is a convenient means to identify U.S. crewmembers. The certification process is brief and is not necessary unless the operator believes that it would benefit crewmembers. A similar system exists in part 121. However, the proposed rule requires reissuance of a certificate at the conclusion of each assignment. Section 135.43(c) is revised to allow the crewmember to retain the certificate until employment with the certificate holder terminates. Also, § 135.43(c) allows the holder to submit the certificate for cancellation to the Airman Certification Branch, Oklahoma City, Okla.

SUBPART B—FLIGHT OPERATIONS

§ 135.63 *Recordkeeping requirements. (Proposed § 135.49.)*

Most commenters on § 135.63 oppose it. They mainly object to flight and duty time recordkeeping under § 135.63(a)(4)(vii) contending that the rule is too stringent, cannot be equally enforced, is structured for air carrier operations, should not apply to on-demand operators, and imposes an undue burden on certificate holders having two or more pilots. Since flight and duty time limitations proposals have been deferred, associated changes in recordkeeping requirements are also deferred.

The commenters do not cite adequate examples in support of their position. A primary objective of the rule is to produce the minimum records needed for the FAA to objectively judge compliance with the Federal Aviation Regulations and thus insure safety in part 135 operations. These records also provide information that is necessary to conduct daily operations to schedule crews and maintenance and to conduct other activities where current data is needed to operate safely. The rule requires some additional recordkeeping, but that is justified by the broader scope of air taxi operations under revised part 135. This is minimal and is not an undue burden. It is necessary for operators to maintain a safe operation and for the FAA to monitor the operator and to conduct surveillance.

Other commenters object to extending the record retention period to 12 months in § 135.63(b). These comments have merit. The pilot records specified in § 135.63(a)(4) must be kept for at least 12 months to establish a continuity for dates and results of competency and proficiency checks. Some pilots used in part 135 operations must take competency checks only once in each 12-month period under § 135.293(b). A record is necessary to establish that they have accomplished the required check until the next check. Section 135.63(b) is changed to require retention of § 135.63(a)(3) records for at least 6 months and § 135.63(a)(4) records for at least 12 months.

Commenters on § 135.63 (c) and (d) object to preparing a load manifest for multiengine aircraft. They also object to mailing (at the takeoff airport) a copy to the certificate holder or retaining a copy at the airport until completion of the flight. They argue that this generates more paperwork and that many airports have neither mail facilities nor a place to keep a copy of the manifest. Safety requires preparation of a load manifest for multiengine aircraft. The loading characteristics are critical for many multiengine aircraft now in use, or that will be used under revised part 135. Requiring a load manifest be completed before each takeoff insures that critical loading factors for multiengine aircraft are reviewed and the maximum weight and center of gravity are within approved limits. Because the mailing or retention requirement may impose a hardship on some certificate holders, that requirement is deleted. The last sentence of proposed § 135.63(c)(5) is revised to be consistent with the first sentence ("to a loading schedule or other approved method"). Also, § 135.63(a)(4)(i) is revised to be consistent with subpart G.

§ 135.65 *Reporting of mechanical irregularities. (Proposed § 135.53.)*

Several commenters on § 135.65 state that they would welcome a rule patterned on §§ 121.563 and 121.701, but many of their objections also would apply to those sections. Several commenters want an explanation of the difference between a maintenance "log" under § 135.65 (a), (b), and (c) and a maintenance "record" under § 135.65(d). The maintenance "log" is a maintenance "record" as the term is used in § 135.65(d).

Other commenters contend that the rule requires the keeping of duplicate aircraft records. Section 135.65 governs the recording, deferral, and correction of mechanical irregularities on aircraft used under part 135. The rule provides appropriate flight and maintenance personnel with a record of the continuing mechanical performance of the aircraft. Section 135.3(a) applies § 91.173 to operations under part 135. Thus, §§ 91.173 and 135.439 collectively govern all inspections, maintenance, repairs, and alterations under part 135.

Some commenters contend that § 135.65(d) means that the maintenance "log" must be kept aboard an aircraft "forever." Section 135.65(d) requires only that each certificate holder must have a procedure in its manual for keeping copies of the maintenance log in the aircraft. It is intended that this procedure provide for presence in the aircraft of maintenance information necessary for safe operation of a particular flight. It is not intended that unnecessary information be retained in the aircraft.

Several commenters contend that requiring small operators to keep de-

tailed records is a significant burden. No substantial evidence was presented to support that claim. The rule increases the awareness of the certificate holder and its flight and ground personnel concerning the mechanical performance of each aircraft. This rule assists the certificate holder in executing its primary responsibility for maintaining its aircraft in an airworthy condition and in accordance with its manual. This rule also helps insure that mechanical irregularities are noted and corrected without delay.

Several commenters object to § 135.65(b) requiring a flight crewmember to log each irregularity noted and then to look at the same irregularity after landing. The rule is changed to eliminate that. Several other commenters suggest that the words "before each flight" be used in § 135.65(b) and this change also is made. Section 135.65(c) is revised to clearly require a description of the recordation, deferral, or corrective action taken as to a mechanical irregularity in accordance with part 43. Section 135.65(d) is revised to clearly require the aircraft maintenance log to be carried on board the aircraft to which it applies.

§ 135.67 *Reporting potentially hazardous meteorological conditions and irregularities of communications or navigation facilities. (Proposed § 135.55.)*

Almost all commenters on § 135.67 oppose it but agree that it represents good operating practice. They suggest that a good operating practice should not be a regulation but rather a part of the Airman's Information Manual or an advisory circular. Several commenters contend that § 91.125 makes § 135.67 unnecessary. Section 91.125 applies only to flight under IFR in controlled airspace. Section 135.67 applies to all operations conducted under part 135. The rule enhances safety and is consistent with the effort to improve the level of safety in part 135 operations. A similar rule, in part 121, works to insure that these conditions and irregularities are reported and no problems of compliance exist.

§ 135.69 *Restriction or suspension of operations: Continuation of flight in an emergency. (Proposed § 135.57.)*

Commenters on § 135.69(b) recommend that the rule allow a flight to continue toward an airport when the certificate holder or the pilot in command has reasonable assurance that the hazardous condition will be corrected by the estimated time of arrival and that a suitable alternate airport is available to the flight. Another commenter contends that a routine occurrence (for example, a deer on the runway) will give rise to an "emergency" and a report would have to be filed under § 135.19. The first comment has merit if continuation of the flight does not constitute an emergency under § 135.19. However, an alternate airport is not necessary in this situation. Section 135.69(b) is revised to allow this. The change also resolves the concerns of the second commenter.

§ 135.75 *Inspectors credentials: Admission to pilots compartment; forward observer's seat. (Proposed § 135.63.)*

Commenters on § 135.75 are concerned that FAA inspectors would, without notice, "bump" revenue passengers or cause cargo to be removed from the aircraft to accommodate them. They are needlessly alarmed. Proposed en route inspections are coordinated with the certificate holder well ahead of the proposed schedule to avoid, if at all possible, the need for an inspector to occupy a revenue passenger seat. For the FAA to properly discharge its responsibilities to the public, however, FAA inspectors must have the authority for access to the pilot compartment of an aircraft operated under revised part 135.

Some commenters on § 135.75(a) believe that a provision like § 121.547 should be added to indicate that the pilot in command has the authority to exclude any person from the flight deck in the interest of safety. This comment has merit and § 135.75(a) is changed to reflect that.

Some commenters on § 135.75(b) believe the words "appropriate communications equipment" provided for the inspector, mean complete transmitting and receiving capability. They suggest that the language be changed to require only equipment necessary to monitor ATC communications. Section 135.75(b) makes it clear that either a headset or a speaker for the inspector to monitor crew communications is required but that a transmitter is not.

§ 135.77 *Responsibility for operational control. (Proposed § 135.65.)*

Many commenters on § 135.77 ask what the term "operational control" means. "Operational control" is defined in Part 1. Section 135.77 states that the certificate holder is responsible for operational control, but may delegate authority to exercise operational control to another person. This delegation of authority does not relieve the certificate holder of the responsibility for operational control.

Some commenters object to listing each person who exercises operational control for the certificate holder. Operational experience under part 121 shows that this does not lead to an unreasonable number of revisions to manuals.

One commenter states that § 135.77 appears to be more stringent than § 121.537. Section 121.537 requires supplemental air carriers and commercial operators to list each person authorized to exercise operational control, just as § 135.77 does. Section 135.77 is clarified to require the name and title of each person authorized by the certificate holder to exercise operational control to be listed in the manual.

Several commenters believe that authority to exercise operational control confers a labor provision but did not explain their position. The FAA has reviewed this provision in light of this comment. This section provides that the certificate holder is responsible for operational control and must list in the manual the name and title of each person authorized to exercise operational control. The rule does not restrict the certificate holder's exercise of judgment in determining who is authorized to exercise operational control.

§ 135.81 *Informing personnel of operational information and appropriate changes. (Proposed § 135.69.)*

Many commenters on § 135.81 object to proposed paragraph (b). They state that the rule is unacceptable and unmanageable. Some commenters argue the rule will increase the operator's liability but do not explain why. Other commenters suggest changes to make the rule more acceptable. These comments have merit because part 135 does not contain flight following rules and there is no practical means to update the information once a flight departs. Proposed paragraph (b) is withdrawn. Section 135.81(a) is changed to allow use of chart supplements in Alaska and the Pacific instead of the Airman's Information Manual. Section 135.81(c) is revised for consistency.

§ 135.85 *Carriage of persons without compliance with the passenger-carrying provisions of this part. (Proposed § 135.73.)*

Commenters on § 135.85 suggest that proposed paragraph (b) read, "company employee." This comment has merit and the narrow change suggested gives greater flexibility to the operator without compromising safety. The words, "or other employee of the certificate holder" are added to § 135.85(a) and proposed paragraph (b) is withdrawn.

Commenters recommend additional categories of persons who could be carried aboard an aircraft without meeting the passenger-carrying requirements of part 135. Additional exceptions to passenger-carrying requirements beyond the limited exception made above would not be in the public interest and would compromise safety.

§ 135.87 *Carriage of cargo including carry-on baggage. (Proposed § 135.75.)*

Two commenters on § 135.87 object because the rule applies to "any" aircraft. One suggest the section apply to aircraft carrying 10 passengers or more. The other suggests the section apply to aircraft carrying 20 passengers or more. Section 135.87 applies to any aircraft carrying cargo, including carry-on baggage, under part 135. The ability to store carry-on baggage in the passenger compartment of an aircraft certificated under part 25 often is greater than the ability to store carry-on baggage in the passenger compartment of an aircraft certificated under part 23. Loose items in the aisle or at the passenger's feet during flight under part 135 are a potential hazard to occupants of the aircraft in the event of an emergency evacuation.

One commenter objects because the rule is "unrealistic and mechanically impossible because of seat size and design" in small aircraft. If the seat size or design of an aircraft makes the storage of carry-on baggage items beneath the seats on that aircraft impossible or impractical, then those items may not be placed beneath the seats. If the aircraft seat size and design allows the storage of carry-on baggage items beneath the seat, then the certificate holder may allow under-seat storage. If this is done, then the seats must be fitted with a means to prevent articles stowed under them from sliding under crash impacts severe enough to produce the ultimate inertia forces specified in the emergency landing condition regulation under which the aircraft is certificated. The certification criteria in both §§ 23.561 and 25.561 require consideration for forward, sideward and downward motion. Part 135 does not require use of the under-seat area for stowing carry-on baggage, but that is allowed if the stated conditions are met. The rule is changed to clearly reflect its applicability to carry-on baggage. Also, the word "forward" is deleted in § 135.87(d).

One commenter states that it knows of no occasion in which the aisle of an aircraft was blocked by the placement of carry-on baggage. This commenter also states that it is difficult to believe that carry-on baggage could or would hinder the emergency evacuation of a small aircraft such as a four-passenger single-engine airplane. Section 135.87 insures that occupants aboard an aircraft are afforded the highest safety protection reasonably commensurate with the least possible burden. Passengers of an aircraft operated under part 135 should not needlessly be injured by unstowed items and should be able to exit the aircraft as rapidly as possible in the event of a survivable accident. Proper stowage of articles can prevent injuries from flying objects during air turbulence. Section 135.87(c)(1) is changed to distinguish between securing cargo and securing carry-on baggage.

One commenter states § 135.87(e) is unclear and recommends deletion. The rule has been reviewed and it is clear. It prohibits persons from loading cargo in a way that prevents a crewmember from extinguishing a fire in flight.

§ 135.89 *Pilot requirements: Use of oxygen. (Proposed § 135.77.)*

Some commenters oppose combining the requirements for pressurized and unpressurized aircraft. They urge retaining the current requirements. Inherent differences exist in operating characteristics between pressurized and unpressurized aircraft. A distinction should be made between them. Current § 135.77 contains requirements for pilot's use of oxygen and current § 135.129 contains oxygen equipment requirements. Both have separate provisions for pressurized and unpressurized aircraft. Section 135.89 is revised to carry forward this distinction, is limited to the use of oxygen only for pilots and the title is changed. Passenger oxygen equipment requirements are adopted in § 135.157.

Two commenters state § 135.89 should require that at least one pilot must wear an oxygen mask whenever a pressurized aircraft is operating above flight level 350. They cite the potential for rapid depressurization in a relatively small volume aircraft. This comment has merit and § 135.89 remains essentially the same as the current § 135.83.

§ 135.91 *Oxygen for medical use by passengers. (Proposed § 135.79.)*

One commenter on § 135.91 believes the rule should require maintenance of liquid type oxygen only. The problem of possible internal contamination exists with both liquid and gaseous oxygen containers.

One commenter on § 135.91(a)(1)(i) suggests that the rule require the equipment to be both an approved type and in conformity with title 49 CFR because more than one standard appears to be required. Another commenter states § 135.91(a)(1)(i) was not necessary. The rule is more flexible because the certificate holder may either get FAA approval or meet the requirements of Title 49 CFR Parts 171, 172, and 173, except § 173.24(a)(1). Either standard of safety is acceptable for the safe carriage and operation of medical oxygen.

§ 135.93 *Autopilot: Minimum altitudes for use. (Proposed § 135.81.)*

Some airplanes with autopilots do not have, and are not required to have, an airplane flight manual. To reflect this, the words "approved airplane flight manual or equivalent" are used in § 135.93. The words "en route" are deleted from § 135.93(a) because the rule applies to all operations other than approaches.

The rule is rewritten for clarity. Proposed paragraphs (b)(1), (b)(2), and (c) are adopted as §§ 135.93 (b), (c), and (d), respectively. Section 135.93(b) provides for instrument approaches other than ILS. Section 135.93(c) provides for ILS approaches with an approach coupler.

§ 135.95 *Airmen: Limitations on use of services. (Proposed § 135.83.)*

Nearly all of the commenters on proposed paragraph (a)(2) oppose it because it is redundant and because it duplicates §§ 61.3 (a) and (c). They argue that requiring a certificate holder to inspect a pilot's certificate before each operation is unreasonable and will be difficult, if not impossible, to administer. These comments have merit and proposed paragraph (a)(2) is withdrawn.

§ 135.103 *Exception to second in command requirement: IFR operations. (Proposed § 135.91.)*

Commenters on § 135.103 state that it is not understandable, needs to be revised or withdrawn completely, is inappropriate for multiengine aircraft and is frequently abused. The comments of the National Transportation Safety Board cite the field investigation phase of the Board's "Air Taxi Study" (NTSB-AAS 72-9). The Board's comments are similar to others. The Board recommends that § 135.103 either be removed from the rules or rewritten so it is not misunderstood or misapplied.

Current § 135.75 provides flexibility to part 135 operators by allowing limited IFR operations without a second in command. Experience under part 135 shows these operations can be conducted safely. The rule continues to allow them. The comments recommending clarification of this rule have merit. Section 135.103 is rewritten to make it clearer, simpler, and easier to meet. This should make flight planning easier. Sections 135.103 (a), (b), and (c) contain the rules for takeoff, en route and approach operations, respectively. Section 135.103(d) contains the general requirements for the aircraft, pilot and ATC clearances.

Section 135.105(a) is clarified to reflect that a second in command is always required under §§ 135.99 and 135.105.

§ 135.105 *Exception to second in command requirement: Approval for use of autopilot system. (Proposed § 135.93.)*

One commenter on § 135.105 claims the use of an autopilot is no substitute for the increased safety margin two pilots afford for communications, navigation, system monitoring and emergency situations, especially in multiengine aircraft. Section 135.105(c)(2) requires each certificate holder to show that operations using an autopilot can be conducted safely. The commenter presents insufficient evidence of adverse operational experience in single-pilot operations with an autopilot to justify withdrawal of the rule.

One commenter objects to § 135.105(b) because the operations specifications must be amended each time there is a change in aircraft. The commenter believes this is unnecessarily complicated. This comment has merit and that part of § 135.105(b) is withdrawn.

§ 135.103 *Pilot in command or second in command: Designation required. (Proposed § 135.97.)*

Although adoption of subpart F is deferred as discussed there, proposed § 135.215(a) is more germane to flight operations than to flight time limitations. The rule is adopted as § 135.109(b).

§ 135.115 *Manipulation of controls. (Proposed § 135.103.)*

Several commenters on § 135.115(a) suggest that a pilot who manipulates the controls should be qualified in that aircraft. This comment has merit and § 135.115(a) is revised.

One commenter on § 135.115(b) asserts a pilot in command cannot determine whether an authorized safety representative of the Administrator can safely handle the controls of an aircraft. The pilot in command may make any reasonable inquiries which are deemed necessary to ascertain pilot qualifications. Another commenter contends that a safety representative of the Administrator should not manipulate the controls during a passenger-carrying flight. Section 135.115(b) is similar to § 121.545(b) which has not created any problems since it was adopted in 1967.

One commenter opposes the rule because the pilot in command should insure no unauthorized person manipulates the controls. Another commenter suggests the rule allow a prospective aircraft purchaser who is appropriately rated to manipulate the controls. Safety requires strict control of these actions during those flights and additional exceptions are not justified.

One commenter asks what "qualified in the aircraft" means. A person is qualified in the aircraft if that person holds a pilot certificate with the appropriate category, class, and type rating for the aircraft operated and also meets the recency of experience requirements for that aircraft.

§ 135.117 *Briefing of passengers before flight. (Proposed § 135.105.)*

Most commenters on § 135.117(a) object to the word "orally" and assert that printed briefing cards are satisfactory and do not compromise safety. Commenters also contend the rule is more restrictive than part 121 but present no other rationale. Part 121 requires oral briefing of passengers before takeoff. An oral briefing insures that passengers are adequately informed of basic information essential to their safety.

Other commenters are concerned that §§ 135.117(a) (4), (6), and (8) mean that actual demonstrations are required to show the mechanical means for opening doors and exits, the use of flotation gear, and the operation of fire extinguishers. Section 135.117(a) requires only that the pilot in command insure that passengers are orally briefed.

Two commenters state the rule should use the word "crewmember" instead of "pilot in command." The pilot in command is responsible for the operation and safety of the aircraft during flight time. The pilot in command should also be responsible for the briefing before the flight.

The National Transportation Safety Board states that the rule should require both oral briefings and printed cards. The information required under § 135.117(c) (1) and (2) should be available in the form of printed cards to insure clear communication of detailed information. The Board's comments have merit and § 135.117(c) is changed to accomplish this.

Other commenters note that "10,000 feet" in § 135.117(a)(7) should be "12,000 feet" for consistency with other rules in part 135. The comment has merit and the rule is changed.

§ 135.121 *Alcoholic beverages. (Proposed § 135.109.)*

Proposed paragraph (d) requires operators to report within 5 days certain incidents under § 135.121. The requirement was established in current § 135.115 to enable the FAA to determine if changes to the rule would be needed to control the conduct of passengers. The report has served its purpose and is no longer necessary. Proposed paragraph (d) is withdrawn.

§ 135.123 *Emergency and emergency evacuation duties. (Proposed § 135.113.)*

Most commenters object to the words "shall show" in § 135.123(a) because showing each emergency function can be accomplished is unreasonable and impractical. This comment has merit and the word "insure" is substituted for the word "show." Proposed paragraph (b) is withdrawn because it duplicates § 135.21(b)(13).

SUBPART C—AIRCRAFT AND EQUIPMENT

§ 135.143 *General requirements. (Proposed § 135.117.)*

The few commenters on § 135.143(b) were confused by the words "for single engine aircraft." These words are unnecessary and are deleted. However, § 135.179 provides for a minimum equipment list for multiengine aircraft and that is an exception to § 135.143(b). To make that clear, the lead-in phrase of that paragraph is changed to read: "Except as provided in § 135.179, no person may operate an aircraft * * * "

§ 135.145 *Aircraft proving tests. (Proposed § 135.121.)*

The language of §§ 135.145 (a) and (c) is not parallel. To correct this, the phrase "is not considered to be of similar design" is used in § 135.145(c) instead of the phrase "is considered to be materially altered in design." Also, proposed paragraph (d) is obsolete and is withdrawn.

§ 135.149 *Equipment requirements: General. (Proposed § 135.125.)*

A few commenters oppose requiring a third attitude gyro for turbojet airplanes because it is an unacceptable economic burden and it is unnecessary when the aircraft already has two of them, each on a different power source. The third attitude gyro is necessary to provide a margin of safety not otherwise available if the primary instrument system fails. This requirement is retained. Section 135.149(c) is revised to make clear that this third instrument must be electrically powered.

Other commenters object to requiring a lockable door. They state that a locked door has not deterred hijackers of large, air carrier aircraft and that a locked door reduces the possibility of safe egress of passengers under certain conditions after an accident. After reviewing the cost of installing the lockable door against the resulting benefits, the FAA is persuaded that the requirement does not contribute significantly to safety in part 135 operations. The interior design of some aircraft makes installation difficult and expensive to complete. Although the proposal is withdrawn, the FAA encourages operators to not remove a lockable door now installed and to continue to use it.

One commenter suggests that the public address system requirement should apply only to operators of multiengine aircraft under 14 CFR Part 298. Another commenter believes that the distinction should be at the 10 passenger seat level, not at the 19 passenger seat level. Amendment 121-105 (38

FR 21493; Aug. 9, 1973) requires airplanes having a passenger seating capacity of more than 19 to be equipped with an approved public address system and interphone system. Under current § 135.2, this amendment applies to part 135 operators using large airplanes that have a passenger seating capacity greater than 19. Section 135.149(d) achieves consistency in part 135 by not differentiating between small and large aircraft but by using a 19 passenger seating configuration as the dividing point. In smaller aircraft, the crew can easily communicate with the passengers without the use of a public address system and interphone system.

One commenter expresses concern that § 135.149(e) is too open-ended, allows individual FAA inspectors to make arbitrary decisions, and gives them unlimited authority to require any type equipment. The rule gives the Administrator flexibility to require any additional equipment which is necessary in the interest of safety. Specific guidance is furnished to FAA inspectors about the administration of § 135.149.

§ 135.151 *Cockpit voice recorders. (Proposed § 135.125.)*

The majority of commenters strongly oppose requiring a cockpit voice recorder (CVR) and a flight data recorder (FDR). The reasons they cite are: The CVR and FDR impose unacceptable economic burden; they cause aircraft to be out of service during equipment repair; and they provide information for accident investigations "after the fact" and thus do not enhance the safety of a particular flight.

On the other hand, the National Transportation Safety Board recommends that the CVR and FDR requirements should apply to all aircraft capable of carrying 10 or more passengers. The Board states that the data obtained from the CVR and FDR has enabled it to determine the causes of airframe and system failures, environmental effects and operational deficiencies. The Board states that this has led to corrective actions in operational and air traffic control and in product design. The Board mentions that the inability to accurately determine the cause of an accident may result in liability to the manufacturer, the operator, or the Federal Government. One commenter supports the CVR and FDR for scheduled commuter operators because of the importance these devices have in determining the probable cause of an accident. Another commenter believes the CVR has more potential usefulness in accident investigations.

Certain benefits could be realized by the use of the CVR and FDR. The commenters cite no accidents involving commuter aircraft or aircraft capable of carrying 10 or more passengers in which the FDR and CVR information was essential to determining the probable cause of the accident. Experience during accident investigation shows the flight path of an aircraft can be duplicated without the aid of FDR data. On the other hand, CVR recordings provide information about crewmember actions in the pilot compartment before the accident and this record is not otherwise available. Also, CVR equipment is lighter in weight and less costly than FDR equipment.

Considering all the comments received, the justification submitted opposing the FDR requirement, and an analysis of the costs versus benefits, safety of flight is not compromised by withdrawing the requirement for a FDR. However, considering the comments, justification and cost versus benefits of the CVR, and the fact that the CVR provides an acceptable level of accident investigation information for turbojet airplanes with 10 or more passenger seats, the requirement for the CVR is retained in new § 135.151.

§ 135.153 *Ground proximity warning system. (Proposed § 135.125.)*

The majority of the comments received oppose the requirement for a ground proximity warning system (GPWS) because it is not justified based on benefit versus cost. They also state the GPWS has a history of poor performance. One commenter states that all commuter aircraft should be equipped with a CPWS. Another commenter states that a GPWS should be required on all aircraft capable of carrying 10 or more passengers, not just turbojet airplanes of that size.

The GPWS of today reflects the state-of-the-art. Reliable systems are available and their maintenance should pose no significant problem or require excessive downtime. Further, the GPWS contributes directly to the safety of flight. Experience demonstrates that the GPWS is beneficial as a warning device for crews to avoid accidents in large aircraft operations under part 121. Because of the complexity, size, speed, and flight performance characteristics of turbojet airplanes, a GPWS is required for turbojet airplanes with 10 or more passenger seats in new § 135.153. To give more flexibility to the certificate holder, § 135.153(b) allows the use of an alternate warning system to that approved under § 37.201. The alternate system must have the approval of the Director, Flight Standards Service.

Although limited benefits might be realized by requiring the GPWS in all aircraft, installation of the GPWS in smaller aircraft is not warranted at this time based on the cost of installation, maintenance, and operating weight penalties.

§ 135.155 *Fire extinguishers: Passenger-carrying aircraft. (Proposed § 135.127.)*

Most commenters on § 135.155 object to requiring two fire extinguishers in aircraft having a passenger seating configuration of more than 6 but less than 31. Operators now using aircraft carrying six passengers state that the cabin configuration gives the crew easy access to the passenger area in an emergency. The majority of the commenters state that the rule should require two fire extinguishers onboard an aircraft with a passenger seating configuration of 10 or more. Some commenters observe that only one fire extinguisher is needed if it is accessible to both crew and passengers. Others believe the rule should specify the least toxic agent must be used. Comments received on a proposed amendment to current § 135.161 in Notice 76-28 (41 FR 56280; Dec. 27, 1976) were also considered.

Only one fire extinguisher is necessary on an aircraft having a passenger seating configuration of nine or less. It is accessible to passengers or the crew in this size aircraft. However, safety requires two fire extinguishers on an aircraft having a passenger seating configuration of 10 or more, so the extinguishers are readily accessible to crewmembers or passengers.

The matter of toxicity is best left to the judgment of the operator. Many different extinguishing agents exist. Each has its own distinct advantages. With proper procedures and precautions, some toxic fire extinguishing agents can be used effectively. Of course, there is control because the FAA approves the type of fire extinguisher used.

§ 135.157 *Oxygen equipment requirements. (Proposed § 135.129.)*

Some commenters oppose combining the requirements for pressurized and unpressurized aircraft. They urge retaining the current requirements. The commenters also state that if the rule is adopted, certain pressurized aircraft now in service would require costly modifications which are not justified in the interest of safety. Inherent differences exist in operating characteristics between pressurized and unpressurized aircraft. A distinction should be made between them. Current § 135.77 contains requirements for pilot's use of oxygen and current § 135.129 contains oxygen equipment requirements. Both have separate provisions for pressurized and unpressurized aircraft. Section 135.157 is revised to carry forward this distinction.

Several commenters object to requiring pressure demand oxygen breathing equipment. Other commenters note

the rule includes design criteria for oxygen systems already included in parts 23 and 25. The requirement should not be in the operating rules and it is withdrawn.

Numerous commenters object to requiring supplemental oxygen for each passenger above 12,000 feet MSL. These comments have merit and § 135.157(a) is revised to require that 10 percent of the occupants (other than a pilot) must have supplemental oxygen between 10,000 feet and 15,000 feet MSL. Each occupant (other than a pilot) must have supplemental oxygen above 15,000 feet MSL. This parallels current §§ 121.327(c) and 121.329(c).

Section 135.157(b)(1) is adopted in this subpart instead of in § 135.89 because it is a passenger oxygen equipment requirement.

One commenter states § 135.157(c)(3), which allows the flight crewmembers to use undiluted oxygen at their discretion, requires the replacement of crew masks. The commenter claims this is an unreasonable burden. Allowing the flight crewmember to select undiluted oxygen may be a burden to an operator who now uses continuous flow systems which do not have this design feature. However, the potential need for the pilots to select undiluted oxygen is significant at altitudes above 25,000 feet. Thus, § 135.157(c)(3) requires the oxygen equipment to have a means to allow the pilots to use undiluted oxygen at their discretion at altitudes above 25,000 feet.

§ 135.159 *Equipment requirements: Carrying passengers under VFR at night or under VFR over-the-top conditions. (Proposed § 135.131.)*

Most commenters on § 135.159 oppose applying the gyroscopic instrument (gyro) requirement to helicopters. They cite the economic burden resulting from the acquisition, installation, and maintenance of gyros which are not now required for helicopter VFR operations. Only a relatively small percentage of the helicopter operators conduct VFR night or over-the-top operations. The cost of this additional equipment would not be large because of the small number of aircraft affected. The installation cost for each helicopter is not high.

Some commenters note that the history of helicopter operations does not support this rule. To provide an acceptable level of safety in passenger-carrying operations, a helicopter must be controllable during loss of visual ground reference.

New § 135.159(f) is added for clarity and contains the last sentence in paragraph (e)(3) proposed in notice 77-17.

§ 135.161 *Radio and navigational equipment: Carrying passengers under VFR at night or under VFR over-the-top. (Proposed § 135.133.)*

Most commenters on § 135.161 oppose requiring radio and navigational equipment for helicopters operating under VFR at night. They claim that the limited range of helicopter operations makes radio and navigational equipment unnecessary for safety and that the acquisition and installation of that equipment is an undue economic burden. The requirement for radio navigational equipment for helicopter VFR night operations is not necessary and § 135.133 is changed to reflect that. However, helicopter VFR over-the-top night operations must be equipped with proper radio and navigational equipment to provide an appropriate level of safety in passenger-carrying operations.

§ 135.163 *Equipment requirements: Aircraft carrying passengers under IFR. (Proposed § 135.135.)*

One commenter on § 135.163 notes that an acceptable practice is to mount generators on the main transmission of helicopters, rather than on the engine. Section 135.163(g) is revised to allow this.

Other commenters state that § 135.163 prohibits "splitting" gyro instruments between electrical and vacuum sources and that defeats safety. For instrument panels with both electric and vacuum instruments, a pump or generator is unable to drive all gyroscopic instruments. The pilot must be able to select an energy source which will drive all gyros if the other source fails. Anything less under IFR conditions would derogate safety. Where a split panel is desired, each engine must have both a generator and a vacuum pump.

§ 135.165 *Radio and navigational equipment: Extended overwater or IFR operations. (Proposed § 135.137.)*

One commenter on § 135.165 requests relief for inoperative equipment so that a flight does not have to be terminated. The commenter suggests that deviation be allowed or that the minimum equipment list in § 135.179 apply. The equipment in § 135.165 is essential to safe extended overwater and IFR operations. The need for maintaining communications during these operations is essential.

Another commenter states some radio equipment is unable to transmit and receive from at least one ground facility in certain remote areas. This may occur, but safety requires that this communications and navigational capability exist during extended overwater and IFR operations.

One commenter asks why two radio transmitters are required under § 135.165(a)(1) when only one is required under part 121. Two transmitters are required under part 121. To provide equipment flexibility, § 135.165(a)(5) no longer requires the navigational receivers to be VOR receivers.

§ 135.167 *Emergency equipment: Extended overwater operations. (Proposed § 135.139.)*

One commenter states that § 135.167(a)(1) should read "an approved life preserver." The word "approved" is added.

One commenter believes that "other flotation means" should not be allowed in place of life preservers. Another commenter states that "other approved flotation devices" derogate safety but provides no rationale. Other flotation means (such as buoyant seat cushions) are approved so safety is not compromised when they are used. The rule clearly requires that a life preserver or other flotation means be easily accessible to the occupants. If a flotation means other than a life preserver is used, it must be readily removable from the aircraft.

§ 135.169 *Additional airworthiness requirements. (Proposed § 135.141.)*

Notice 77-17A (42 FR 56702; October 27, 1977) withdrew proposed paragraph (e). The same day, the FAA issued advance notice of proposed rulemaking 77-25 (42 FR 56702; October 27, 1977) requesting recommendations concerning possible changes in certification requirements for certain small airplanes used in part 135 operations.

Proposed paragraph (c) prohibited the introduction of a new small airplane, with a passenger seating configuration of 10 or more, into part 135 operation after August 19, 1977, unless that airplane was type certificated in the transport category. That proposal is withdrawn at this time. This issue will be considered in the rulemaking based on the public response to notice 77-25.

For nonpart 25 small airplanes type certificated for 10 or more seats, proposed paragraph (d) prohibited an increase in the passenger seating configuration in part 135 operations above the number of seats approved for part 135 service prior to August 19, 1977. As adopted, § 135.169(c) also allows seating increases up to 19 seats, if the airplane is shown to comply with appendix A. This change allows operators to increase the number of passenger seats in their existing airplanes, but requires them to demonstrate compliance with the additional airworthiness requirements in appendix A. The rule advances safety in part 135 operation while not unduly inhabiting the growth of the air taxi industry. The FAA expects to propose rules based on notice 77-25 in the near future and

may be considered further during that rulemaking.

§ 135.171 *Shoulder harness installation at flight crewmember stations. (Proposed § 135.143.)*

A few commenters on § 135.171 suggest that the shoulder harness requirement apply to all operations under part 135. This alternative was considered during the development of notice 77-17, but the study revealed this action would have a significant economic impact on part 135 operators. Therefore, § 135.171 is limited to turbojets and larger passenger-carrying airplanes (10 seats or more). Section 91.33(b)(13) requires each standard category small airplane manufactured after July 18, 1978, to have both front seats equipped with shoulder harnesses. If an airplane is equipped with a shoulder harness, a flight crewmember must fasten the shoulder harness for each takeoff and landing unless the crewmember cannot perform necessary duties with the harness fastened. This applies to all part 135 operations.

A considerable number of aircraft now in use have shoulder harnesses installed. Other owners are encouraged to install shoulder harnesses since they are a proven safety item. Although it might be desirable to have all part 135 aircraft meet the standard, § 135.171 is realistic.

For consistency, "front seat" is changed to "flight crewmember station" in § 135.171(a) and "seat" is changed to "station" in § 135.171(b).

§ 135.173 *Airborne thunderstorm detection equipment requirements. (Proposed § 135.145.)*

While some commenters generally support it, most commenters oppose § 135.173(a). They cite the cost of procuring, installing, and maintaining the equipment, the lack of a corresponding increase in safety benefits, and the weight penalty. After considering the cost factors during the development of notice 77-17, the use of airborne thunderstorm detection equipment was proposed instead of radar. Airborne thunderstorm detection equipment can be installed at a more reasonable cost and it is somewhat lighter than airborne weather radar.

Revised part 135 authorizes the use of larger, more complex aircraft with a greater passenger-carrying capacity. Despite the objection to § 135.173, requiring thunderstorm detection equipment is justified for these expanded operations. The rule is limited to turbojet and 10 or more passenger multiengine aircraft. They are used in operations that generate millions of revenue passsenger miles each year. Thus, a significant segment of the traveling public is benefitted by this advance in safety of flight.

Some commenters misunderstand the applicability of § 135.173(b). This rule applies only to the aircraft described in § 135.173(a). Also, § 135.173(a) allows operators to conduct operations when the equipment is inoperative if current weather reports indicate thunderstorms or other hazardous weather is not expected during the flight. This helps reduce flight cancellations due to equipment problems. To clarify the applicability of § 135.173(b), the words "required by paragraph (a) of this section" are inserted after the word "equipment."

Numerous commenters object to requiring thunderstorm detection equipment for VFR night operations. This equipment is beneficial for night operations because considerable thunderstorm activity occurs at night and this equipment aids in locating hazardous unseen storm activity. This rule contributes to greater safety in operations because it enables the pilot to detect and locate severe adverse weather areas early. The equipment also enables the pilot to avoid these areas or take other action necessary for safety of flight.

Commenters object to applying this rule to helicopter operations. The helicopter is as susceptible to thunderstorm hazards as the airplane if the pilot fails to avoid severe weather areas. Therefore, the rule applies to helicopters.

§ 135.175 *Airborne weather radar equipment requirements. (New.)*

Some commenters on § 135.173 state that airborne weather radar is more appropriate equipment than airborne thunderstorm detection equipment because radar can detect more than thunderstorms. The comment has merit. Aircraft now required under §§ 121.357 and 135.2 to have airborne weather radar equipment installed and operating should continue to meet that requirement. New § 135.175 is added to retain the current requirement for large, transport category aircraft.

§ 135.177 *Emergency equipment requirements for aircraft having a passenger seating configuration of more than 19 passengers. (Proposed § 135.147.)*

The few commenters on § 135.177 have only minor objections. One commenter opposes § 135.177(a)(4) which requires compliance with § 121.310 because that is an economic burden and not practical. Safety would be derogated by deleting the requirement to comply with § 121.310. The safety benefits outweigh the costs. Section 121.310 is not unduly burdensome for the operation of the higher passenger volume airplanes described. Aircraft now operating under part 135 have a seating capacity of 19 passengers or less. They do not have to meet § 121.310. The large aircraft that are now operating under part 121 of this chapter, and that will be operated under revised part 135 (30 seats or less and payload capacity of 7,500 pounds or less), already comply with § 121.310. New aircraft entering service under part 135 will comply with § 121.310 as part of their type certification.

Two commenters question the 19 or more passenger breakpoint. Current § 135.54 requires a flight attendant for an aircraft that has a passenger seating capacity of more than 19. The same distinction is appropriate for § 135.177 emergency equipment because a flight attendant is available to operate it.

§ 135.179 *Inoperable instruments and equipment for multiengine aircraft. (Proposed § 135.149.)*

Most commenters fully support § 135.179. This section relieves part 135 operators of a significant burden without compromising safety. The rule also reduces the potential for unnecessary delays to the traveling public. Part 135 does not now provide for the use of an approved minimum equipment list (MEL) to allow operations under certain conditions with inoperable equipment and instruments. Because of this, part 135 operators do not have the same operational flexibility as part 121 operators. This was a significant burden because they were required to make expedited repairs to provide scheduled service. In addition, passengers were delayed because of need to repair or replace inoperable instruments or equipment that was not necessary for the safe operation of a particular flight.

Section 135.179 relaxes that requirement and allows an operator to dispatch aircraft when certain pieces of equipment or instruments are inoperable. The MEL allows them to maintain schedule reliability and still maintains the necessary level of safety. The rule is a significant step forward that benefits both certificate holders and the traveling public.

The FAA Flight Standards Divisions of the region responsible for the type certification of a particular multiengine aircraft will administer the rule. This insures that each request for an MEL is handled properly and standardization is maintained for each aircraft. The responsible FAA District Office will give guidance to certificate holders about MEL requests and coordinate their approval.

Section 135.179(a)(1) is clarified to reflect the MEL may not include equipment and instruments that are essential for safe operation under all operating conditions and that are required, either specifically or otherwise, for the aircraft to meet the airworthi-

ness standards under which it was type certificated. For instruments and equipment to be included on an MEL, the operator will show that the aircraft can comply with the airworthiness standards with those instruments and equipment inoperable. Proposed paragraph (a)(3) is deleted as unnecessary.

§ 135.181 *Performance requirements: Aircraft operated over-the-top or in IFR conditions. (Proposed § 135.151.)*

Some commenters on § 135.181 indicate the rule is inappropriate and hard to understand. They recommend it be rewritten. The National Transportation Safety Board cites the field investigation phase of its "Air Taxi Study" (NTSB-AAS 72-9) and also states the rule may be misunderstood and misapplied. The Board recommends that § 135.181 (currently § 135.145) be either withdrawn or rewritten so that it cannot be misunderstood or misapplied.

The rule is complex and is difficult to meet because it may be misunderstood. The rule is clarified and simplified in the interest of safety. The change allows an en route IFR operation and an IFR approach at the destination airport if unforecast weather conditions do not allow a VFR operation. The 15-mile distance is changed to 15 minutes of flying time because the 15-mile criterion does not lend itself to the current state-of-the-art and methods for forecasting and reporting weather conditions.

One commenter states § 135.181 is undesirable for helicopter operations because it imposes performance requirements on helicopters which exceed type certification requirements. The increasing number of helicopters certificated for flight under IFR in part 135 operations justifies their inclusion in this rule. Helicopters must be treated the same as airplanes under these circumstances to insure safe operation under IFR.

A few commenters are confused by §§ 135.181(c) (1) and (2) for a descent under VFR from an over-the-top flight. Section 135.181(c)(1) allows a multiengine aircraft that cannot meet the single-engine en route climb performance standards to operate over-the-top if adequate weather conditions exist. Section 135.181(c)(2) allows a single-engine aircraft to operate over-the-top if broken clouds exist that enable the aircraft to make an emergency descent clear of clouds when required due to an inoperative engine.

SUBPART D—VFR/IFR OPERATING LIMITATIONS AND WEATHER REQUIREMENTS

§ 135.213 *Weather reports and forecasts. (Proposed § 135.171.)*

Many commenters contend that requiring current weather to be available at an airport where an IFR approach is conducted is unduly restrictive. They argue that this would preclude service to many airports that have approved instrument approach procedures. Several commenters recommend higher approach minimums for airports where weather reports are not available. Others believe the pilot's decision to make the approach should be based only on pilot reports and an area forecast. some commenters want to allow IFR operations at airports that are clustered within a certain radius of an airport having weather reporting facilities.

The National Transportation Safety Board in *Administrator* v. *Sandoval* (SE-2084) found current § 135.105 is not clear regarding weather requirements at destination airports. Section 135.213 is intended to rectify this problem. Weather observations used for IFR operations at an airport must be taken at that airport to insure an appropiate level of safety. Section 135.213 insures that IFR operations are not conducted unless reliable weather information for the specific airport is available to the pilot.

Several commenters suggest that § 135.213 allow the use of U.S. military weather reports and forecasts. The U.S. National Weather Service recognizes only military weather observations and not their forecasts. Thus, use of U.S. military weather sources is not allowed under § 135.213.

One commenter states an experienced commercial, instrument rated pilot is qualified to assume responsibilities for weather observations. The current rules provide for pilot observation for operations under VFR. However, for IFR operations, weather information from persons trained and knowledgeable in weather reporting and forecasting is essential to maintain safety.

A few commenters object to the time needed to investigate and approve each source of weather reporting information and to issue amendments to the operations specifications. They believe this procedure is impractical for on-demand operators. Because of the changing nature of weather conditions and the influence of different geographic locations, amendments to the operations specifications must be contingent upon an investigation. This investigation establishes that the weather conditions at an airport that has no weather reporting facility do not differ significantly from a nearby airport that has a weather reporting facility, and that this otherwise allows a safe operation.

One commenter asks what the term "IFR operations" means in § 135.213. The term "IFR operations" includes operations in VFR weather under an IFR flight plan as well as IFR operations in instrument meteorological conditions.

§ 135.215 *IFR: Operating limitations. (Proposed § 135.175.)*

Several commenters want § 135.215 changed to accommodate on-demand air taxi operations but they did not elaborate. Section 135.215 provides sufficient flexibility for each certificate holder, including an on-demand air taxi operator.

One commenter does not believe § 135.215(c) is meant to require approval for IFR operations and suggests deleting the portion of the last sentence after the semicolon. Section 135.215(c) allows a part 135 certificate holder to operate under IFR outside of controlled airspace when necessary to use an approved instrument approach or departure procedure or when necessary to climb into controlled airspace during an approved missed approach procedure, if those operations are approved.

One commenter believes the term "IFR" in § 135.215 limits operations to instrument meteorological conditions. That limitation would be difficult to administer. The term "Instrument Flight Rules (IFR)" is not limited to operations in instrument meteorological conditions.

§ 135.219 *IFR: Destination airport weather minimums. (Proposed § 135.179.)*

One commenter states that § 135.219 is unduly restrictive and should be deleted because weather reports and forecasts are not always accurate. While weather conditions can change from those covered in reports and forecasts, § 135.219 is necessary to establish the minimum weather conditions for the destination airport which must exist before IFR or over-the-top operations may be conducted. The only change to the current rule is to include over-the-top operations and to allow the use of weather reports or forecasts, or any combination of them, as an indication of the weather at the next airport of intended landing. This makes the rule more liberal. The current rule requires the use of both weather reports and forecasts without regard to any favorable combination.

§ 135.223 *IFR: Alternate airport requirements. (Proposed § 135.183.)*

One commenter recommends that § 135.223(a)(3) allow helicopter operators to have a 30-minute fuel reserve, instead of the 45-minute reserve now required beyond the alternate airport for all aircraft. The FAA considered making the fuel reserve for IFR operations similar to that for VFR operations in helicopters. Although helicopters are more maneuverable than

airplanes, the FAA concluded that the limited experience with helicopters in IFR operations under part 135 does not warrant reducing fuel requirements at this time.

To clarify the rule, the word "approach" is inserted after the word "circling" in § 135.223(b)(1), and words "instrument approach" are inserted after "circling" in § 135.223(b)(2).

§ 135.225 *IFR: Takeoff, approach and landing minimums. (Proposed § 135.185.)*

One commenter recommends using the phrase "the aircraft has passed the final approach fix," in § 135.225(c)(1) to clarify the rule and this is done.

Two commenters indicate the word "latest" could be interpreted differently as to weather reporting. They recommend using the word "current" in § 135.225. The word "latest" is used elsewhere in the Federal Aviation Regulations and is retained to achieve consistency of interpretation.

Two commenters believe that § 135.225 should be revised to eliminate repetitious use of the phrase "the U.S. National Weather Service, or a source approved by the U.S. National Weather Service, or a source approved by the Administrator." They also believe that current § 135.185(h)(4) should be deleted because it is unnecessary to repeat the same admonition that is given in § 135.227. These changes are made. Also, § 135.225(h)(2) is clarified to reflect that the ground installations (not the airborne equipment) are what "the landing minimums are predicated" upon. The requirements for operable airborne equipment are prescribed in subpart C.

§ 135.227 *Icing conditions: Operating limitations. (Proposed § 135.187.)*

Many commenters object to prohibiting IFR flights into known or forecast light or moderate icing conditions with present deicing or anti-icing equipment that is not certificated under part 23. They stated that the expense of meeting part 23 is unjustified and would impose an undue economic burden. One commenter suggests a "grandfather" clause for present aircraft. Other commenters believe IFR flight to VFR-on-top should be allowed under known or forecast light or moderate icing conditions. One commenter states the proposed rule is extremely restrictive for helicopters because there is no approved anti-icing or deicing equipment for main and tail rotor blades.

Based on these comments and after further deliberation, the FAA concludes the proposed rule is unworkable without major changes. Because of their magnitude, the proposed rule is withdrawn at this time and current § 135.85 is adopted as § 135.229. The reference to SFAR No. 23 in §§ 135.227 (b) and (c) is changed to the identical provision in section 34 of appendix A.

§ 135.229 *Airport requirements. (Proposed § 135.189.)*

Many commenters object to the words "properly equipped" and "facilities and public protection" in § 135.229(a). They contend that this language would place an air taxi operator in the position of qualifying an airport. Other commenters state that the rule would create an economic hardship to some operators and general aviation airports in meeting these requirements, if they mean security, fencing, crash, or rescue. Some commenters state there is not a clear definition of these required items and suggest they be deleted. These comments are accepted and the words are deleted.

Several commenters object to precluding the use of flare pots or lanterns, especially in remote areas where there is no electrical power available. They believe that approving the use of flare pots or lanterns should be left to the discretion of the local FAA district office or regional office. Other commenters recommend allowing the use of reflective material, or at least providing a mechanism for approval of its use in certain operations. A few commenters indicate that proposed paragraphs (b), (c), and (d) are not clear and recommended that current § 135.87 be reinstated.

These comments have merit. Current § 135.87 is retained and proposed paragraphs (b), (c), and (d) are withdrawn. The use of flare pots or lanterns for aircraft operations and reflective material for helicopter operations is allowed for marking the limits of the takeoff and landing areas. The use of flare pots or lanterns must be specifically approved.

One commenter believes the section should continue to apply to the carrying of passengers at night and § 135.229(b) provides for that.

SUBPART E—FLIGHT CREWMEMBER REQUIREMENTS

§ 135.243 *Pilot in command qualifications. (Proposed § 135.193.)*

Several commenters object to § 135.243(a). One commenter contends the airline transport pilot (ATP) certificate requirement is not justified because the part 135 6-month instrument proficiency check is equivalent to the ATP flight check and the ATP written examination now administered under part 121 serves no useful purpose in part 135 operations. Other commenters state that their objection to the ATP requirement would be reduced if the ATP written test were revised to relate it to part 135 operations. An ATP written exam more closely related to part 135 operations is appropriate and the FAA is developing one.

Each person who takes the part 135 instrument proficiency check need not be tested to the extent required for the original issuance of an ATP certificate. While the procedures and maneuvers required for the ATP certificate are included in the instrument proficiency check test, the check is not as extensive or comprehensive as an ATP certificate flight test. The purpose of the periodic instrument proficiency check is to determine that the pilot is competent to continue to be a pilot in command under IFR in part 135 operations.

A few commenters contend that § 135.243(a) is appropriate for large aircraft but not for air taxi operations conducted in small aircraft. A few commenters object because of the kinds of aircraft operations that are affected by § 135.243(a). This revision of part 135 makes the operation of certain large aircraft (those of more than 12,500 pounds maximum certificated takeoff weight having a maximum passenger seating configuration of 30 seats or less and a maximum payload capacity of 7,500 pounds or less) subject to the rules of part 135. The ATP requirement is based on the complexity of aircraft currently in use and those to be approved for operations under revised part 135, as well as on their passenger-carrying capability. In establishing the need for this requirement, all known relevant factors were considered, including the classification of aircraft operations that are affected by § 135.243(a). Increased safety benefits will be provided by requiring pilots in command of the more complex operations under part 135 to hold an ATP certificate. A number of commenters state that they now require their pilots in command to possess an ATP certificate for part 135 operations. There is no indication that this voluntary action to increase the competence level of part 135 pilot personnel imposes an unnecessary burden on either these operators or their pilots.

Two commenters contend that an ATP certificate is not practical in Alaska and will not necessarily bring about a higher level of safety in the air taxi industry there. There is no reason to distinguish the part 135 pilot in command requirements in Alaska from the part 135 pilot in command requirements anywhere else.

One commenter contends that the requirements for an ATP have no resemblance to the kinds of flying conducted by commuter air carrier pilots and that the requirements for an ATP should be postponed until the ATP written test is more appropriate to part 135 operations. This commenter also recommends that if the require-

ment for an ATP certificate is adopted, it should be limited to commuter air carriers who hold authority to operate under IFR. The public interest is served by requiring pilots in command of the more complex part 135 operations to hold an ATP certificate. For this purpose, complex operations are operations conducted in turbojet airplanes, commuter air carrier operations conducted in mutiengine airplanes, and operations conducted in airplanes having a seating configuration, excluding any pilot seat, of 10 seats or more. Many of these operations are conducted under IFR into and out of the major terminal areas which have high volumes of air traffic. The requirement for ATP certificated pilots in command during these operations is essential to safety.

One commenter suggests that § 135.243(a) be extended to cover all multiengine air taxi operations. That action is unnecessary and not justified at this time. On-demand air taxi operations conducted in nonturbojet multiengine airplanes having a seating configuration, excluding any pilot seat, of nine seats or less are not affected.

Several commenters claim that the hours of flight experience required under § 135.243(b)(ii) are excessive. These requirements are unchanged from the present part 135 and no reduction is justified.

One commenter claims the requirement for pilots to hold an instrument rating under § 135.243(b)(iii) is an undue burden. Two other commenters contend that an instrument rating is not practical for many small singleengine airplanes with limited instrumentation and no radios that are operated in VFR conditions. Under current part 135, minimally equipped aircraft may be operated under VFR day conditions without benefit of either navigational or communications equipment. Sections 135.145 and 135.161 allow those operations to continue. However, a pilot's awareness of significant weather phenomena is enhanced if the pilot holds an instrument rating. Also, the present requirements of part 61 for a commercial pilot certificate (which is required before a pilot may fly for compensation or hire) include an instrument rating. This requirement is appropriate and necessary to achieve the desired level of safety in operations under part 135.

Throughout this subpart, the rules are revised to reflect that the certificate holder is held responsible for insuring the use of a qualified flight crewmember. For consistency, the words "No certificate holder may use any person, nor may any person serve as * * *" are used in each section.

§ 135.245 *Second in command qualifications. (Proposed § 135.197.)*

Several commenters on § 135.245 generally agree with the rule but object to requiring a class rating. Some of these commenters contend requiring a class rating and recent instrument flight experience places an unreasonable burden on the air taxi industry. There is ample justification for imposing those requirements because they insure the use of a more competent crewmember as a second in command. Under the rule, any person who acts as second in command of an aircraft is required to hold an appropriate category and class rating. The current rule does not require pilots acting as second in command to hold other than a commercial pilot certificate unless part 135 requires a second in command. Section 135.245 not only contributes to raising the level of safety in part 135, but also enhances crewmember qualifications.

One commenter contends that § 135.245 could be inflationary and redundant because § 135.293(b) requires a second in command to demonstrate proficiency in type (for multiengine airplanes). Section 135.245 is substantially the same as current § 135.127 except for the deletion of the words "when a second in command is required by this chapter." The requirement for a second in command to have an instrument rating is consistent with the current requirements of Part 61. The proficiency check requirement in § 135.293(b) is an annual competency check, in contrast to the recent instrument experience requirements of part 61 which must be met every 6 months.

One commenter states that the rule is more restrictive than part 121. Another commenter argues that the rule would discourage the use of a second in command when none is required, would result in a lower level of safety, and would cause the loss of valuable training experience for future second in command pilots. These requirements are now in part 135. They minimize crew errors because more qualified and proficient pilots are used as second in command. The more efficient use of qualified crewmembers does not significantly increase the burden on either the pilot or operator.

§ 135.247 *Pilot qualifications: Recent experience. (Proposed § 135.199.)*

One commenter contends that under § 135.247, a pilot may be current for night landings in a small multiengine airplane by virtue of currency in a large multiengine airplane even though the flight characteristics of the two airplanes are quite different. This comment ignores the initial and recurrent pilot testing requirements of § 135.293. They also must be met in a particular aircraft before a pilot may be used in operations under this part.

One commenter suggests that § 135.247 should apply only to passenger-carrying operations and should allow the carriage of cargo without the pilot having to make three takeoffs and landings within the preceeding 90 days. This comment has merit and § 135.247(a) is revised.

Two commenters object to requiring the second in command to meet the same recent experience requirements as the pilot in command. They contend that imposes an unnecessary burden on the operator. As stated in notice 77-17, § 135.247 is patterned on § 61.57, which applies to the pilot in command. Consequently, it was not intended to apply this provision to the second in command. The rule is revised to carry out that intent.

Night recency of experience requirements were inadvertently omitted from § 135.247(a). Since they are essential to safety and § 61.57(d) does not apply to operations requiring an airline transport pilot certificate, § 135.247(a) is revised to include a night recency of experience requirements.

SUBPART F—FLIGHT CREWMEMBER FLIGHT AND DUTY TIME LIMITATIONS

§ 135.261 *Flight and duty time limitations. (Current § 135.136.)*

The FAA has decided to defer adoption of new flight and duty time limitations governing part 135 operators. As a result, current § 135.136 is retained and redesignated as § 135.261.

In notice 78-3 (43 FR 8070; Feb. 27, 1978), the FAA proposed to amend the flight and duty time limitations governing parts 121 and 123 operators. Notice 78-3 contains many of the same concepts proposed earlier in notice 77-17 for subpart F of part 135. Notice 78-3 has generated extensive public comment. As a result of these comments, and those submitted in response to notice 77-17 on proposed subpart F, the FAA has received a considerable amount of information which will be useful in formulating final flight and duty time rules.

The differences which exist between part 121 and part 135 operations justify separate rulemaking actions to revise the current flight and duty time limitations. However, some of the concepts involved are fundamental and should be treated consistently. These include the definitions of flight time, duty time, and rest period; the treatment of deadhead transportation; and the method for determining applicable flight and duty time limitations when a flight crewmember serves with more than one flight crew.

Therefore, the public interest is best served by deferring adoption of the part 135 flight and duty time limitations until the comments on notice 78-3 are received and evaluated. In this

way, the agency would benefit by having additional information, views, and arguments to consider before adopting appropriate final rules governing part 135 operators.

SUBPART G—CREWMEMBER TESTING REQUIREMENTS

§ 135.293 *Initial and recurrent pilot testing requirements. (Proposed § 135.225.)*

Several commenters support § 135.293. One commenter objects to § 135.293(a) contending the testing of knowledge in each type of aircraft the pilot is authorized to fly will not improve safety. Operational experience shows that knowledge of each type of aircraft in which the pilot is authorized to perform a pilot crewmember function has a direct relationship to the pilot's overall competence and to safety.

One commenter suggests that the term "type" in §§ 135.293(a) (2) and (3) should be defined as it is in § 135.293(b) ("any one of a group of airplanes determined by the Administrator to have a similar means of propulsion, the same manufacturer, and no significantly different handling or flight characteristics"). Section 135.293(b) applies to flight competency checks. The definition of "type" in that paragraph relaxes the part 1 definition of "type" to contribute to the conservation of fuel. In contrast, §§ 135.293(a) (2) and (3) are written or oral test requirements and the part 1 definition of "type" is used. To clarify § 135.293(b), a definition of "type" for helicopters is added because the rule applies to both airplanes and helicopters.

One commenter on § 135.293(b) objects to leaving the extent of the competency check to the person conducting the check. This commenter contends that the rule would lead to a wide variance in the checking process, by leaving it to the whim of the local flight standards district office. The standard of performance in § 135.293(d) provides reasonable certainty of pilot competency, allows reasonable latitude in the conduct of the competency check and imposes no undue burden on either the pilot being tested or the operator. Another commenter states that the term "competency check" in § 135.293 (b) and (f) does not mean a "flight check." Section 135.293(b) clearly requires that this competency check be given in an aircraft. Section 135.293(f) allows portions of a required competency check to be given in an aircraft simulator or other appropriate training device if specifically approved.

One commenter suggests that helicopter competency checks be treated the same as competency checks in single-engine airplanes other than turbojects. The commenter argues that all light piston-engine helicopters should be in one "class" and all light turbine-engine helicopters should be in another "class," and that a competency check in "that type of aircraft, if helicopter" should not be required. The handling and flight characteristics of light helicopters are significantly different. The equipment available for them also is considerably different. A separate flight check is necessary to judge pilot competence properly. As additional helicopters become available and standardization of various models is accomplished, competency check requirements will be established similar to those for airplanes.

§ 135.295 *Initial and recurrent flight attendant crewmember testing requirements. (Proposed § 135.227.)*

Notice 77-17 proposed to redesignate current § 135.139 without change. However, that rule does not require flight attendant crewmembers to be knowledgeable and competent concerning the location and operation of other items of emergency equipment, such as a megaphone, crash ax, firstaid kit, and so forth. The equipment is on board an aircraft to enable flight attendants to respond to an emergency situation and they must be competent to use it. To provide an appropriate level of safety in revised part 135, § 135.295(e) is amended to reflect that requirement.

§ 135.297 *Pilot in command: Instrument proficiency check requirements. (Proposed § 135.229.)*

Several commenters object to § 135.297(b). They contend that there was no reason to require a demonstration of each approach to be used. Another commenter contends that a pilot who demonstrates the basic instrument approaches during an instrument proficiency check should then be allowed to use derivative approaches. Another commenter recommends that a specific combination of instrument approaches be demonstrated instead of requiring the demonstration of "any type" of instrument approach expected to be used.

These comments have merit. A pilot should not have to demonstrate all possible types of instrument approach procedures before that pilot may use them under part 135. Section 135.297(b) is revised to reflect that. A pilot who successfully demonstrates separate instrument approach procedures using ILS, VOR, and NDB facilities is considered qualified to conduct all of the published standard instrument approach procedures prescribed under part 97. A letter of competency is issued to reflect that under revised § 135.297(h). The instrument approach procedures demonstrated must include at least one straight-in approach, one circling approach in conjunction with a VOR or NDB, and one missed approach procedure. Each instrument approach procedure demonstrated must be conducted to published minimum for the procedure.

Pilots who demonstrate competency in at least the combination of instrument approach procedures described are equally competent to conduct other types of approach procedures. This does not apply, however, to the use of microwave landing systems because of the difference in glide slope gradient, instrumentation used and other differences which require a separate showing of competency.

One commenter on § 135.297(c) suggests that the second sentence be deleted and a reference to § 135.293(a)(2) be included instead. There is some similarity between the test areas listed in § 135.293(a)(2) and the test subject matter of § 135.297(c). However, the subjects of these tests are not identical and the two oral or written tests are not given for the same purpose. The test under § 135.293(a) covers subjects which are generally applicable, such as ground training requirements. The test under § 135.297(c) is an equipment test related to operational procedures in which the pilot must demonstrate competency before being used under IFR.

One commenter objects to § 135.297(c)(1) contending that the "procedures and maneuvers set forth for an ATPC (in FAR 61, appendix A)" is lengthy, many are not appropriate for 6-month instrument checks, and many could not be safely accomplished under IFR. Section 135.297(f) allows the use of a simulator or other appropriate training device for portions of the required flight check. Section 135.297(c)(1) is clarified to insure that each pilot in command is adequately tested on the procedures and maneuvers for the particular pilot certificate held and the privileges exercised under § 135.243. Also, the requirements of the instrument proficiency check for pilots in command required to hold an airline transport pilot certificate under § 135.243(a) and the requirements for pilots in command required to hold a commercial pilot certificate with an instrument rating under § 135.243(c) are stated in separate paragraphs. Another commenter suggests that the last sentence of § 135.297(c)(1) be deleted. The sentence is deleted because an instrument check is not required when operations are limited to VFR only.

Section 135.297(f) could be interpreted to allow a pilot in command to take the initial instrument proficiency check in a single-engine aircraft and then be authorized to pilot a multiengine aircraft without a check in it until the next 6-month check is due.

This paragraph is clarified to reflect that a pilot who is assigned to both single and multiengine aircraft must take the initial instrument proficiency check required by § 135.297(a) in a multiengine aircraft and succeeding checks alternately in single-engine and multiengine aircraft.

§ 135.299 *Pilot in command: line checks: routes and airports. (Proposed § 135.231.)*

Several commenters on § 135.299 argue that recurrent line checks in a part 135 operation are unnecessary and burdensome. Current § 135.122 covers specific areas not adequately covered by the testing requirements in current § 135.138. Section 135.299 insures that each pilot used in part 135 operations accomplishes line checks and that each certificate holder establishes procedures in the manual outlining company policy concerning the manner in which pilots are expected to keep current on routes and airports. The line check requirement is necessary to test the pilot's knowledge of routes and airports and to determine the manner in which the pilot applies company procedures and conducts flight operations.

Several commenters contend that line checks are not appropriate for "on-demand" operators because they do not have a "line operation." Another commenter suggests that all small "on-demand" air taxi operators in aircraft seating less than 10 passengers be exempt from § 135.299. Another commenter suggests that § 135.299 be limited to commuter air carriers as defined in part 298 of the Civil Aeronautics Board's Economic Regulations (14 CFR Part 298). The broad scope of checks and tests which must be satisfactorily accomplished during a specific period of time by pilots operating under part 135 is adopted in revised part 135 because of the many variations in air taxi operations, the qualifications of pilots, and the aircraft used. No single test or check requirement is more or less essential than any other to establish the appropriate level of safety. For these reasons, these checks and tests are considered necessary whether the operator is a single pilot owner-operator, helicopter operator, on-demand air taxi operator or commuter air carrier. They are for the express purpose of insuring that the pilots in command meet the applicable knowledge and skill requirements for use in operations under part 135.

One commenter asks how "takeoffs and landings (plural) over at least one route segment" in § 135.299(a)(2) could be accomplished and suggests that the word "segment" be deleted from § 135.299(a)(3). A line check may be as brief or as extensive as the person giving the check deems necessary to determine the pilot's competence. Consequently, more than one takeoff and landing may be needed.

Another commenter objects to § 135.299(a)(3) contending that the proposed requirement for takeoffs and landings at two or more representative airports would be costly for operators in areas of the country where no short routes exist. The commenter suggests that a requirement for takeoffs and landings at "one or more representative airports" would be equally appropriate for VFR line checks. These comments have merit and § 135.299 is revised by combining proposed paragraphs (a) and (b) and requiring takeoffs and landings at one or more representative airports for both VFR and IFR operations. However, for IFR operations, the requirement for at least one flight to be conducted over a civil airway, an approved off-airway route, or any portion of them is retained in § 135.299(a)(3).

One commenter objects to § 135.299(d) and suggests that it be deleted for the reason stated in the preamble to amendment 135-26 (36 FR 2481, Feb. 5, 1971). A number of other commenters claim § 135.299(d) is redundant because its substance is in § 91.5 and that it would require the pilot to research information that is not readily available. Amendment 135-26 was based upon conditions which existed in 1971. Conditions are sufficiently different today to justify § 135.299(c). The air taxi industry has grown, and, in many cases, has developed into specialized operations such as those of commuter air carrier. Not all air taxi operators would expect to travel to the same destinations. They also may not wish to acquire all available information concerning a flight in the same manner. Section 91.5 is sufficient for routine general aviation operations, but that section is not sufficient for the scope of operations presently conducted under part 135. Also, § 91.5 is not sufficient for the level of safety in revised part 135. Section 135.299(c) is intended to require the certificate holder to establish in the manual required by § 135.21 a procedure appropriate to that certificate holder's kind of operations. That procedure should insure that the certificate holder's pilots who have not flown over a specific route and into a specific airport within the preceding 90 days will become familiar with all available information required for the safe conduct of that particular flight. The list of specific items of information in proposed paragraph (e) is withdrawn because, in some cases, information on each item may not be available.

§ 135.301 *Crewmember: Tests and checks, grace provisions, training to accepted standards. (Proposed § 135.233.)*

Some of the comments on § 135.301 compliment the FAA on the provision which would allow additional training to be given to the pilot receiving the check.

One commenter requests an explanation of the phrase in § 135.301(a) "the calendar month before or after the calendar month in which it is required." If a test or check is required to be taken in January 1979, and it is satisfactorily completed in December 1978 or February 1979, then the test or check would be considered to have been completed in the month (January 1979) in which it was required. Of course, the date of the next required test or check would be based on the January 1979 date (not on December 1978 or February 1979).

Two commenters state that the prohibition in the last sentence of § 135.301(b) concerning the use of a person unable to demonstrate satisfactory performance on a required check is unreasonably burdensome. Another commenter suggests that the rule prohibit the use of a person who has failed a check in operations under part 135 in which the check is a requirement. If a pilot being checked under this part fails any of the required maneuvers, the person giving the check may elect to give the pilot additional training during that check. Thus, it is unlikely that a person who has received the required training under part 135 would be incapable of ultimately passing a required check under § 135.301(b). If a person is unable to pass the required check, then this is all the more reason why that person should not serve as a crewmember in operations under revised part 135 until that person has satisfactorily completed the check. The rule provides sufficient latitude in its present form.

SUBPART H—TRAINING

§ 135.321 *Applicability and terms used. (Proposed § 135.237.)*

One commenter objects to the need for establishing and maintaining an "approved training program" and suggests that the word "approved" in § 135.321(a) be changed to "acceptable." Under § 135.341, each certificate holder must have an approved training program which includes, in as broad terms as possible, those items which are essential to every training program. The rules make clear the basic requirements for initial and recurrent training for each crewmember. Revision of an approved training program may be made at the initiative of either the certificate holder or the Administrator. The rules for revision on the Administrator's initiative are comparable to those now in part 121. The basis for the requirement for an ap-

proved training program is that operations under part 135 should not be exposed to the hazards that might be created by the use of a training program over which the FAA has only limited control. Thus, there is ample justification for requiring an approved training program to enhance safety in the revision of part 135.

One commenter on the entire subpart contends that since aircraft groups I and II defined in § 135.321(b)(1) and (2) are not used elsewhere in the subpart, their application is not clear. This comment has merit and those words are deleted.

Another commenter suggests that specific training hours be specified to preclude varying interpretations of the rules for similar operations. Another commenter lauded the FAA for not establishing specific training hours. The FAA is not persuaded that specific training hours would be beneficial to either the air taxi industry or to the FAA.

One commenter suggests that § 135.321(c) be amended to provide additional categories of training such as "maneuver" or "on line" training. The present categories of training are comparable to those now in part 121 and they are adequate.

§ 135.323 *Training program: general. (Proposed § 135.239.)*

Several commenters on § 135.323(a)(1) suggest that the word "approved" be changed to "acceptable." As discussed under § 135.321, there is ample justification for requiring the program to be subject to FAA approval.

Two commenters claim that "small on-demand air taxi certificate holders" should be exempt from subpart H. Under § 135.341(a), certificate holders who are the only pilots in their operation are exempt from the requirement to establish and maintain an approved pilot training program. Also, the Administrator may authorize a deviation from this section if, because of the limited size and scope of the operation, safety allows a deviation. The deviation authority contained in paragraph (a) will be limited to certain aspects of the training program. It allows the Administrator to place the proper emphasis on each element of the training program needed for each certificate holder's operation. It also allows the Administrator to refine, in light of current technology, the kinds of training that must be included in a particular training program.

Another commenter suggests that credit be given in the approved training program for factory-approved ground schools or their equivalent. The rule allows the inclusion of this kind of valid training in the program presented to the FAA. It will be evaluated by the FAA and, if satisfactory will be approved.

Another commenter expresses concern that requiring the use of "properly qualified ground instructors" in § 135.323(a)(2) may preclude the use of other persons available to the operator. The rule does not limit instructor personnel to certificated instructors. Other properly qualified persons identified by the certificate holder and approved by the FAA may be used in the approved training program.

One commenter suggests that § 135.323(a)(4) be revised by adding the words "if applicable" where referring to the use of simulators. The rule clearly allows the use of any specific simulator available if approved by the Administrator. Another commenter opposes this paragraph but gives no rationale.

Section 135.323(c) is revised to provide that a certifying signature is not required when entries are made in a computerized recordkeeping system where a signature is not practical.

§ 135.325 *Training program and revision: initial and final approval. (Proposed § 135.241.)*

One commenter suggests limiting the applicability of § 135.325 to "Commuter Air Carriers" as defined in part 298 of the Civil Aeronautics Board's Economic Regulations (14 CFR Part 298). This commenter also suggests exempting helicopter operations from this section because of the rapidly changing training concepts in helicopter operations. The approval process under § 135.241(a) is keyed to § 135.241(c). The certificate holder must show that the training conducted after the initial approval ensures that persons who complete the training program are adequately trained to perform their assigned duties. This is the key to the concept of training to proficiency in either airplanes or helicopters. The certificate holder has an opportunity to present for approval a training program which is as effective as the certificate holder can make it using current technology. The FAA explores each possibility to translate new technology into effective regulations and to facilitate the safest and most effective training programs possible.

Several commenters complain about the lack of standardized criteria for use by FAA Flight Standards District Offices in approving training programs. The FAA appreciates this concern and intends to ensure that standardized criteria are used for the initial and final approval of training programs and of any revisions presented for approval under this section.

Some commenters claim that this subpart would cause a paperwork burden. The enhanced training requirements will increase paperwork because of expanded curriculum standards and additional recordkeeping. After the curriculum is approved, the paperwork burden is limited to amendments to training requirements and continuing recordkeeping. Although the initial paperwork may appear significant, operational experience in administering the part 121 training rules shows that the anticipated burden is not that heavy. After the program is approved, the improved proficiency of crewmembers yields a more efficient, sensitive and smooth-running operation. In short, once an operator has a training program, its benefits outweigh the modest burden of obtaining it.

§ 135.327 *Training program: Curriculum. (Proposed § 135.243.)*

Several commenters object to § 135.327. They contend that it is a burden on smaller operators and that a written curriculum for each type of aircraft is unnecessary and unwieldly. One commenter suggests that written curriculums should be required only for turbojets and large aircraft.

The enormous technological advances and abundance of supportive information now available to the industry can be used without causing an undue burden on any operator. Acceptable written curriculums can be developed for each type of aircraft because of the wealth of aircraft information now available. The majority of affected operators now have written curriculums. Probably, many can be modified to apply to other aircraft. Also, the training curriculum may be applied to more than one aircraft and one need not be written for each aircraft the operator uses. Of course, as complexity increases in each operation, a more complex curriculum becomes necessary. The specific requirements of § 135.327 are the minimum essential items the FAA needs to approve the curriculum.

§ 135.331 *Crewmember emergency training. (Proposed § 135.247.)*

One commenter on § 135.331 suggests that it provide for exclusions based upon the certificate holder's operations and equipment, for example, operations which do not include pressurized aircraft or flotation devices. The substance of this comment is accommodated because § 135.331(a) limits emergency training to that which is applicable to each crewmember and certificate holder. Thus, if a pressurized aircraft is not operated, training for rapid decompression is not required. Similarly, if flotation devices are not required in the operation, training in the use of related equipment is not required. To emphasize this, the words "if applicable" are

added at the end of § 135.331(c) (4), (6) and (7).

One commenter on § 135.331(b)(4) contends that this paragraph will be difficult to comply with but offered no explanation. Because of this comment, the review in § 135.331(b)(4) is limited to the certificate holder's previous aircraft accidents and incidents. This information should be readily accessible. Another commenter suggests that the words "and discussion" be inserted after the word "review" to insure that the items are discussed during crewmember emergency training. Discussion should be a normal part of a review. Crewmembers may request discussion at any time and the change is not necessary.

Certain commenters contend that this rule should not apply to on-demand operators of small aircraft. This rule must apply to all certificate holders to insure the adequacy of the training in these procedures and to afford the appropriate protection to passengers carried under part 135.

§ 135.333 *Training requirements: Handling and carriage of hazardous materials. (Proposed § 135.249.)*

Because the requirements of paragraph (e) are covered in § 135.323(b), paragraph (e) is withdrawn.

§ 135.335 *Approval of aircraft simulators and other training devices. (Proposed § 135.251.)*

One commenter on § 135.335(b) suggests that the term "training device" could be construed to include "blackboards, visual aids" and similar items. This would necessitate the approval of these items as part of the training program. The commenter also suggests that "training device" be defined. Training devices are approved as elements of the program. A definition would be unduly restrictive. New § 135.335(c) is added to outline the elements the FAA considers in approving a training program.

§ 135.337 *Training program: Check airmen and instructor qualifications. (Proposed § 135.253.)*

One commenter claims § 135.337 (a)(2) is unworkable because it does not specify who or what agency provides the initial training for required check airmen and instructors. The initial designation of check airmen or instructors is based on their documented qualifications and demonstrated ability. Then, considerable emphasis is placed on periodic evaluation of their performance by the FAA District Office. In addition, these personnel must participate in the proficiency check program of the operator. This must be appropriate to the person's airman certificate, ratings and duty assignments which are related to the approved check airman and instructor function involved. Instructors and check airmen (who are approved by the FAA to conduct flight crewmember qualification, proficiency and en route checks) approvals are terminated when their performance is no longer satisfactory. This maintains the integrity of the check airman and instructor program.

One commenter on § 135.337(a)(3) contends that the term "appropriate proficiency and competency checks" should be changed to read "appropriate instrument and flight checks." The term "appropriate proficiency and competency checks" is more consistent with current industry standards than the term suggested by the commenter. Also, it is consistent with the language of §§ 135.293 and 135.297.

Several commenters on § 135.337 contend that § 135.337(a)(5) exceeds the requirements of current § 121.411(a)(6) which allows a check airman to hold a class III medical certificate. The commenters assert that this precludes the use of experienced senior pilots who can no longer meet class I or II medical standards. They claim that the traveling public's safety is not dependent on the class of medical certificate held by a check airman.

The objections presented do not make a persuasive case for amending or withdrawing this rule. The commenters, in comparing proposed § 135.337 with § 121.411, may have failed to consider certain requirements of part 135 which were not proposed to be changed. Current § 135.135 requires each certificate holder who desires FAA approval of a check pilot to submit a request in writing to the appropriate FAA District Office. The Administrator may issue a letter of authority to a person as a check pilot if that person meets the requirements of §§ 61.3, 61.31, 61.139, 61.149 and 61.151 and meets and accomplishes certain other requirements essential to that person's approval. Thus, current part 135 requires a check airman to hold at least a commercial pilot certificate with appropriate category and class ratings, an instrument rating, an appropriate type rating (if required) and at least a class II medical certificate. Under § 135.337, the check airman must hold the certificate and ratings required of a pilot in command in an operation conducted under § 135.243. Consequently, the check airman must hold the class I or class II medical certificate appropriate to the certificate privileges under § 135.243.

Safety would not be compromised if pilots who are used as check airmen in an aircraft simulator only hold a class III medical certificate. Of course, the pilot must meet the other requirements of this chapter. New § 135.337(a)(7) is added to allow that. This provides greater operational flexibility for certificate holders and airmen. Section 135.337(b)(2) is clarified by inserting the words "the following as evidenced by the approval of" in place of the word "for."

§ 135.339 *Check airmen and flight instructors: initial and transition training. (Proposed § 135.255.)*

One commenter contends § 135.339 (a) should be deleted because § 135.337 does not specify who is authorized to give the initial training for the check airmen and instructors. This comment is discussed at length under § 135.337.

Commenters on § 135.339(c)(3) criticize the requirement because they interpret it to be a mandate to accomplish this training in flight. The language of § 135.339(c) is clear that demonstration of unsafe practices in flight is not required. The paragraph closely follows the language of current § 121.413. This paragraph is intended to insure that the training program includes a discussion or an appropriate demonstration of the need for timely action in response to an in-flight situation having critical accident potential. Sufficient safeguards should be employed when simulating emergency procedures.

§ 135.341 *Pilot and flight attendant crewmember training programs. (Proposed § 135.257.)*

Commenters on § 135.341 suggest that all certificate holders be required to have a training program. One commenter claims that a training program patterned on current part 121 is unduly burdensome. Another commenter suggests that the word "approved" in § 135.341(a) be changed to "acceptable".

One of the purposes of this revision of part 135 is to update and improve the training requirements. Changes include provisions for approving and revising training programs, for extending the use of aircraft simulators, and for allowing improvements in present technology to be easily applied in training programs. These changes increase the quality of crewmember training without unduly burdening any operator. The suggestion to change the word "approved" to "acceptable" is discussed at length under § 135.321(a).

One commenter contends that compliance with subpart H will unnecessarily increase the cost of conducting air taxi operations in small aircraft with little increase in the level of safety. This comment overlooks the deviation authority in § 135.341(a). That section allows waivers of certain training requirements based on the size and scope of operations when the operator shows that literal compliance with the rules is not necessary in the interest of safety. This provides adequate flexibility to significantly

reduce the cost of training for operators of small or light aircraft.

Another commenter suggests that every air taxi operator, regardless of size, be required to have an air taxi training program. This commenter contends that if an operator is not otherwise required to have an approved training program, then it should be required to contract with a company with an approved program to train that operator's personnel. The current rule does not require a training program if the certificate holder is the only pilot. No change in the current rule is justified. However, § 135.341(a) is editorially revised to clarify that language. Also the phrase "every 12 calender months" is deleted from § 135.341(b)(5) because it is not appropriate there.

§ 135.343 *Crewmember initial and recurrent training requirements. (Proposed § 135.259.)*

The concluding sentence of current § 135.137, was inadvertently omitted from this rule as proposed in Notice 77-17. To make § 135.257 and § 135.343 consistent, the sentence is restored.

§ 135.345 *Pilots: Initial, transition, and upgrade ground training. (Proposed § 135.261.)*

An Aircraft Flight Manual is not required in the certification of all aircraft. For example, one is not required for an airplane of 6,000 pounds or less maximum certificated takeoff weight type certificated under part 23. Sections 23.1581(a)(2) and 27.1581(a)(2) requires that if the required information is not furnished in an Aircraft Flight Manual, then it must be furnished in any combination of approved manual material, markings, and placards. To reflect this fact, the words, "or equivalent" are added after the words "Aircraft Flight Manual" in § 135.345(a)(2)(xi).

§ 135.347 *Pilots: Initial, transition, upgrade, and differences flight training. (Proposed § 135.263.)*

One commenter on § 135.347 contends that it prohibits a certificate holder, whose approved training program authorizes the use of an aircraft simulator, from reverting to an aircraft when the simulator is out of service. A reasonable and prudent element of an approved training program would authorize the use of an aircraft when the simulator is out of service.

One commenter suggests that the words "airplane simulator" in § 135.347(b) should be changed to the words "aircraft simulator." The FAA agrees and that is done. The phrase "or a static aircraft" in § 135.347(b) no longer serves any useful purpose and it is deleted.

§ 135.349 *Flight attendants: Initial and transition ground training. (Proposed § 135.265.)*

Section 135.349(b) is deleted because it is covered in § 135.295.

§ 135.351 *Recurrent training. (Proposed § 135.267.)*

Section 135.351(b)(3) is deleted because it is covered in § 135.295.

SUBPART I—AIRPLANE PERFORMANCE OPERATING LIMITATIONS

§ 135.361 *Applicability. (Proposed § 135.271.)*

One commenter agrees with this subpart, but goes on to state an understanding that the FAA does not intend to apply additional airplane performance standards beyond those now in the Federal Aviation Regulations. This subpart is needed to insure that these airplanes are operated within limits that meet the level of safety intended for part 135 flight operations. Their adoption does not imply that additional airplane performance standards may not be necessary in the future. These rules for airplane performance are adequate for the present generation of airplanes. However, future amendments to the current regulations may be necessary because of unforeseen circumstances.

One commenter states, without elaborating, that, "This subpart should not apply to on-demand air taxis due to the fact that there is insufficient data readily available as published by the Federal Government." Subpart I applies to the type of aircraft being operated and not the type of operation. In the interest of safety, each aircraft must meet these operating limitations, whether used in air taxi or commuter service. The requirements adopted in subpart I are in the current rules and they have not caused operators any problems.

Several commenters suggest that the FAA should make available the airport data necessary to comply with this subpart. The FAA cannot assume responsibility for the collection and publication of the information for all airports that is necessary to show compliance with this subpart. The certificate holder is responsible for obtaining the required data for each airport into which its operations are conducted. The basic data on specific airports should be requested from the airport authority which normally has that available.

Several commenters state that the "60-percent rule" should apply to all operators and an exception should allow operators with auxiliary stopping devices (such as drag chutes and propeller or thrust reversers) to use a 70-percent factor. The applicability of this subpart is consistent with current regulations governing airplane performance operating limitations. Allowing the use of a 70-percent factor for additional auxiliary stopping devices is not acceptable under this subpart. No valid data is available for these devices and extensive testing would be necessary before that data would be available. Performance data now available in the Airplane Flight Manual has proven adequate to comply with this subpart.

Four commenters suggest that subpart I apply to turbojet aircraft and large aircraft. This subpart applies to all large aircraft, including turbojet, operated under revised part 135. Section 135.155 in notice 77-17, which contained small airplane performance operating limitations, has been included in subpart I as §§ 135.397 and 135.399. Small airplane performance operating limitations do not currently apply to nontransport category turbojet airplanes and this rule was not proposed for change. However, notice 77-25 (42 FR 56702; Oct. 27, 1977) invited recommendations concerning the development of a new airworthiness certification standard for the airplanes intended for use by commuter air carriers in part 135 operations. These comments are being evaluated separately.

When published, notice 77-17 did not contain amendment 121-132 (41 FR 55475; Dec. 20, 1976) governing airplane performance. This amendment moved the definition of "effective length of runway" for takeoff from § 121.171(b) to § 121.199(b)(5), because this term is not used elsewhere in part 121. Having the definition in § 121.171 caused confusion in the past. Sections 135.361(b) and 135.389(b) are amended in a manner similar to amendment 121-132.

§ 135.363 *General. (Proposed § 135.273.)*

Section 135.363 is clarified by defining a large nontransport category airplane for the purposes of subpart I as one that was type certificated before July 1, 1942. A large airplane type certificated after that date must meet performance operating limitations for a transport category airplane to operate under part 135.

§ 135.379 *Large transport category airplanes: Turbine engine powered; takeoff limitations. (Proposed § 135.289.)*

Section 135.379(c) is clarified by inserting the words "as defined in § 25.109 of this chapter" after the word "distance." This is done because the definition of "accelerate-stop distance" has been removed from part 1 and now is defined in part 25.

§ 135.397 *Small transport category airplane performance operating limitations.* (*Proposed § 135.155.*)

Proposed § 135.155 (a) and (b) are moved from subpart C and redesignated as § 135.397 because they contain small transport category airplane performance operating limitations.

§ 135.399 *Small nontransport category airplane performance operating limitations.* (*Proposed § 135.155.*)

Proposed § 135.155(c) is moved from subpart C and redesignated as § 135.399 because it contains small nontransport category airplane performance operating limitations.

An Airplane Flight Manual is not required for airplanes of 6,000 pounds or less maximum certificated takeoff weight which are type certificated under part 23 of this chapter. Section 23.1581(a)(2) requires that if the information is not furnished in an Airplane Flight Manual, then it must be furnished in any combination of approved manual material, markings and placards. Thus, the words, "or equivalent" are added after "Airplane Flight Manual" in § 135.399. The applicability of this rule to small airplanes is unchanged from current § 135.148.

Some commenters on proposed § 135.155 believe it should apply to all multiengine turbine engine-powered airplanes. Others state that the proposal granted an unfair advantage to operators of those airplanes not affected by it. Where performance information is available in an Airplane Flight Manual, safety considerations require that the information be used with the other requirements in this subpart. The performance information required for the compliance with this section may not always be available for nontransport category airplanes.

SUBPART J—MAINTENANCE, PREVENTIVE MAINTENANCE, AND ALTERATIONS

§ 135.411 *Applicability.* (*Proposed § 135.333.*)

Several commenters contend that § 135.411(a)(1) imposes manual and recordkeeping requirements in addition to those now required in other parts of the Federal Aviation Regulations. Operators who must comply with § 135.411(a)(1) now must meet the maintenance and recordkeeping requirements of parts 91 and 43. Section 135.411(a)(1) does not add maintenance recordkeeping or manual requirements beyond those now required under parts 43, 91 and 135 for an operator using an aircraft type certificated, excluding any pilot seat, for nine or less passenger seats.

Two commenters state that a maintenance rule applied to one type of part 135 operator should be imposed on all of them. The different types and classes of aircraft now used in part 135 operations were considered in developing revised part 135. Subpart J provides an acceptable maintenance system considering those different types and classes of aircraft.

One commenter recommends that the passenger seating criteria for helicopters in § 135.411(a)(1) be increased from 9 to 19 and in § 135.411(a)(2) increased from 10 to 20. All types of aircraft, including helicopters, were considered during the development of subpart J. A helicopter is no less complex than an airplane. A helicopter is used to carry passengers in similar operating environments to an airplane. This includes approval of helicopters for use in IFR conditions. If the same maintenance standards were not imposed on helicopters and airplanes, the public interest would not be served. Passengers must have the same assurance of safety whether an air taxi operator conducts operations in airplanes or helicopters.

Some commenters suggest that § 135.411(a)(1) should apply to piston-powered aircraft and § 135.411(a)(2) should apply to turbine-powered aircraft. Basing the maintenance requirements on the type of powerplant installed is not acceptable and may compromise safety. For example, if § 135.411(a)(1) were applied only to piston-powered aircraft, an aircraft that carries 30 passengers would have lower maintenance requirements than a small turbine-powered aircraft that carries six passengers. Thus, the rule for maintenance and inspection of part 135 aircraft applies on the basis of the passenger-carrying capability rather than the type of powerplant installed.

Some commenters state that § 135.411 will burden operators in remote areas due to the shortage of personnel available to perform the required inspections. Some operators using aircraft that are type certificated for 10 or more seats, excluding any pilot seat, may experience difficulty in accomplishing required inspections. However, § 135.411(a)(2) should apply wherever the aircraft are operated to achieve the level of safety required for revised part 135. Section 135.411(a)(1), which applies to aircraft type certificated for nine or less passenger seats, excluding any pilot seat, will not burden air taxi operators in remote areas. The procedures for the performance of maintenance remains basically the same as the current rules, except for additional maintenance requirements in § 135.421 for engine, propeller, rotor and emergency equipment.

A number of commenters state that the lack of the maintenance program required by §§ 135.11 and 135.411(a)(2) has not caused many fatal accidents. A study of air taxi accidents made by the National Transportation Safety Board (NTSB-AAS 72-9) indicates that the lack of properly managed maintenance programs is a contributing factor in air taxi accidents. The Board concludes that there is a lack of clearly identifiable safety practices in the maintenance functions of commuter air carriers. The Board recommends part 135 require training for aircraft maintenance personnel and establish standard programs for using manufacturer maintenance requirements for aircraft components, powerplants and propellers. The Board's recommendation was considered in revising part 135.

Two commenters question whether a continuous maintenance program is justified in view of the cost. Subpart J is justified by the diversity of aircraft that certificate holders operate. This subpart provides the air taxi passenger with a level of airworthiness that is equivalent to a part 121 air carrier.

Some commenters want to know whether "certificated pertained to the configured capacity of an aircraft or the passenger capacity as listed on the aircraft type data sheet when an aircraft is type certificated." Under subpart J, "certificated" means the number of passengers listed on the type data sheet or as modified by a Supplemental Type Certificate (STC). To clarify that, the word "type" is added before the word "certificated" in §§ 135.411(a) (1) and (2).

§ 135.413 *Responsibility for airworthiness.* (*Proposed § 135.335.*)

Several commenters on § 135.413(a) state that there is no need to refer to having defects repaired between required maintenance under part 43 because part 135 requires a maintenance program. Although part 135 includes maintenance programs for air taxi aircraft, the performance standards for maintenance, preventive maintenance, rebuilding and alteration are prescribed in part 43. Thus, the reference is appropriate.

Section 135.413(a) applies to all part 135 certificate holders. This rule places the primary responsibility for airworthiness of its aircraft on the certificate holder. Each certificate holder must insure that all required maintenance is performed regardless of the program § 135.411 requires. The operator of an aircraft that is type certificated for nine seats or less, excluding any pilot seat, may have a properly certificated person maintain its aircraft. The person who performs this work for a certificate holder (who must comply with § 135.411(a)(1) must perform that work as the applicable Federal Aviation Regulations require. Section 135.413(b) places on the operators of aircraft type certificated for 10

seats or more, excluding any pilot seat, the responsibility to perform the maintenance on their aircraft as required by the Federal Aviation Regulations. Section 135.413(b)(2) allows these operators to have their maintenance performed by another person but it does not relieve the certificate holder of the responsibility for that work.

Several commenters state that § 135.413(b)(2) is unrealistic because it makes air taxi operators who maintain their aircraft under § 135.411(a)(2) responsible for the maintenance someone else performs on its aircraft. They also state that an FAA-certificated repair station is found by the FAA to be qualified and it would be a duplication to have the operator assume this responsibility. An FAA-certificated repair station is qualified under the requirements of part 145. However, the operator must insure that each person who performs its maintenance is competent, has adequate facilities and has an organization to perform maintenance in accordance with the certificate holder's manual. The operator can consider the fact that the FAA has found that a repair station is technically qualified to perform its maintenance. The operator still is responsible for insuring that a repair station can, and in fact does, comply with the procedures outlined in the operator's manual.

Another commenter objects to the certificate holder being responsible for work an FAA-certificated repair station performs because this requires a periodic visit to each agency with whom the operator contracts for maintenance. The certificate holder must determine the repair station's capability and then monitor its performance. In effect, a repair station under contract is an extension of the certificate holder's organization and maintenance facility. The certificate holder is expected to make the same inquiries concerning the repair station's capability and performance that it does for its own facility. Since 1956, this system has been shown to be effective by large and small operators who maintain their aircraft under part 121.

Section 135.413(b) is revised from the proposal in notice 77-17 to make it clearer. Section 135.413(b)(2) (proposed as paragraph (c)) is reworded to clarify the responsibilities of a certificate holder who maintains its aircraft.

§ 135.415 *Mechanical reliability reports. (Proposed § 135.337.)*

One commenter recommends that the reporting period should be extended to 72 hours because the certificate holder's employees work irregular hours. This comment has merit and § 135.415(d) is changed.

Several commenters indicate that no significant data is obtained by requiring mechanical reliability reports (MRR) for single-engine airplanes and helicopters. Another commenter states requiring MRR for single-engine aircraft will not provide significant data because these aircraft are not complex. An MRR indicates a safety-of-flight item regardless of the type or size of aircraft. Many single-engine aircraft are not complex but the complexity of the environment in which they operate (including instrument flight conditions) is increasing. Also, single-engine aircraft form the major part of the part 135 fleet. The additional data received on these aircraft will significantly enhance safety because that data is used to determine safety trends in aircraft and aircraft systems.

One commenter states that helicopters certificated for a passenger seating configuration of 19 seats or less should be excluded from the MRR requirements. Helicopters are a growing segment of the part 135 fleet and they operate in the same environment that airplanes do. The data received on helicopters will provide the same safety information for helicopters that the current system does for airplanes.

The phrase "because of flame out" was inadvertently omitted from the proposed rule and is added to § 135.415(a)(6).

§ 135.417 *Mechanical interruption summary report. (Proposed § 135.339.)*

One commenter indicates that a monthly reporting requirement is an undue burden on the operator of single-engine aircraft due to the lack of complexity. The lack of complexity of single-engine aircraft alone is not sufficient reason to exclude them from a mechanical interruption summary reporting requirement. However, insufficient additional safety data would be acquired to justify that report for single-engine aircraft. Adequate safety data about them will be submitted under § 135.415. Section 135.417 is changed to exclude these aircraft.

Another commenter recommends that § 135.417 be revised to include only "Commuter Air Carriers, as defined in part 298 of this title, operating airplanes that are certificated for a seating configuration, excluding any pilot seat, of 10 seats or more, or operating helicopters that are certificated for a passenger seating configuration of 20 seats or more." As discussed under § 135.411, the public interest would not be served by distinguishing helicopters from airplanes on the basis of the number of seats under this rule.

§ 135.421 *Additional maintenance requirements. (Proposed § 135.343.)*

Several commenters state that the term "manufacturer's recommended maintenance programs" could require compliance with all service letters suggesting installation of kits which may not be available. Section 135.421 requires compliance with the manufacturer's maintenance and inspection instructions in the maintenance manual that is required under the airworthiness standards that apply to the aircraft, aircraft engine, propeller, rotor or item of emergency equipment. The manual that must be made available to the owner under § 23.1529 of this chapter would satisfy this requirement. The maintenance instructions that are required by §§ 33.3 or 35.5 also would satisfy § 135.421 for the propeller or aircraft engine. Service letters or bulletins that are not required by an Airworthiness Directive are not included unless they are part of the maintenance manual or maintenance instructions required under the rules. A new § 135.421(b) is added to make this clear.

One commenter states that it has been operating engines for many years. It has a maintenance program that is reliable and that provides for engine inspection and overhaul times that are in excess of those required by the engine manufacturer. The purpose of § 135.421 is to give the certificate holder the opportunity to develop just this kind of program based upon its operating experience.

Several commenters suggest that § 135.421 apply only to nonturbine-powered aircraft. As discussed in detail under § 135.411, § 135.421 applies based on the type certificated passenger seating capacity of the aircraft, not its powerplant.

§ 135.423 *Maintenance, preventive maintenance, and alteration organization. (Proposed § 135.345.)*

Commenters claim that § 135.423 imposes an undue burden on small operators. They also state that separating the inspection function from the maintenance function is the major problem. Section 135.423 applies to certificate holders that use aircraft type certificated for 10 seats or more, excluding any pilot seat. A certificate holder who operates this size aircraft must see to it that the maintenance is performed by an adequate maintenance organization whether the work is done at the certificate holder's facilities or at another person's facility. This requirement is similar to one currently in part 121. Separation of required inspections from maintenance functions is necessary to ensure that work on required inspection items is properly performed. Considering the modern air taxi industry of today, this requirement is necessary.

This rule does not limit each person who is authorized to inspect to doing only inspections. They may perform maintenance in other areas. This section provides that the person who conducts the required inspection of an item may not be the person who performs the work on that item. Also, these items are a relatively small percentage of an operator's overall maintenance program.

One commenter recommends that all words relating to "other maintenance and preventive maintenance" in § 135.423(c) be deleted because that requires reinspection of items to be completed away from home base. The required inspection items should be properly done wherever the item is maintained.

One commenter asked for clarification of the term "adequate" in § 135.423(a). "Adequate" means that the operator has a program that complies with § 135.425. The certificate holder must ensure that maintenance, preventive maintenance and alterations are performed in accordance with its manual, that the work is done by competent personnel, that proper facilities and equipment are provided and that the aircraft is airworthy when released to service. The same commenter asked where qualified personnel could be obtained since there now is a shortage of qualified mechanics in the industry. The rule should, in fact, relieve this problem. An operator who must comply with § 135.411(a)(2) may use its employees who are not certificated mechanics, but who are qualified to be certificated as repairman under § 65.101 when recommended by the certificate holder.

One commenter recommends that each reference to a person other than a certificate holder be deleted from §§ 135.423 (a) and (b) because they have probably already been approved by the Administrator. If not, the commenter states the certificate holder should assume responsibility and sign the airworthiness release. The commenter suggests §§ 135.423 (a) and (b) be changed to state "that each certificate holder must have an adequate organization to perform the work," including "required inspection items." This change would require each operator to have a maintenance organization. An operator could not use another person with an adequate organization to perform maintenance, preventive maintenance and alteration and required inspections in accordance with the operator's manual.

The same commenter suggests that the second sentence of § 135.423(c) be deleted because the first sentence adequately covers the desired separation between inspection and maintenance functions. The first sentence requires that inspections be separated from other maintenance, preventive maintenance and alteration functions. The second sentence identifies the level in a certificate holder's organization where required inspection functions must be separate from the maintenance, preventive maintenance and alteration functions.

§ 135.425 *Maintenance, preventive maintenance, and alteration programs. (Proposed § 135.347.)*

One commenter on § 135.425 states it should only apply to helicopters that are certificated for a passenger seating configuration, excluding any pilot seat, of 19 or less. As discussed under § 135.411, the public interest would not be served by doing this. The same commenter states that operators of helicopters in remote areas cannot comply with § 135.425. A similar comment is discussed at length under § 135.411.

One commenter states that operators with small aircraft that carry nine passengers or less should be exempt from § 135.425. Section 135.411(a)(2) explicitly provides that.

One commenter states that maintenance performed under FAA-approved procedure is adequate and § 135.425 is not necessary. In September 1972, the National Transportation Safety Board released a report (NTSB-AAS 72-9) following an air taxi safety study of accidents in air taxi and commuter operations. The Board found the lack of properly managed maintenance programs was a contributing factor in air taxi accidents. The Board's recommendation was considered in the development of this rule.

§ 135.427 *Manual requirements. (Proposed § 135.349.)*

Several commenters object to § 135.427(a) requiring the operator to list in the manual "persons with whom it has arranged for the performance of its required inspections, other maintenance, preventive maintenance, or alterations, including a general description of that work." The commenter claims that this is too restrictive and elminates the ability to obtain quality work without undue delay. Section 135.427 does not prevent an operator from having maintenance performed by persons who are not listed in the manual. That would be impractical. The rule is flexible enough to allow maintenance to be performed on an "on call" basis. The operator is responsible for the airworthiness of its aircraft whoever performs the maintenance. Section 135.21(h) requires procedures for a pilot to obtain maintenance at a place where previous arrangements have not been made by the operator. This is in the current rules and has not been an undue burden. The rule is necessary to inform the certificate holder's personnel of those persons who may perform maintenance on its aircraft.

One commenter states that § 135.427 should only apply to operators that carry 20 or more passengers. As discussed under § 135.411, the public interest would not be served by doing this.

One commenter agrees with § 135.427 but expresses concern that there is no definite guidance supplied by FAA to develop a standard manual. The FAA will develop an Advisory Circular to provide operators with information to assist in developing acceptable programs and manuals.

A new § 135.427(c) is added that requires an operator to establish a system in its manual for the retention of certain maintenance records. This parallels § 121.369(c) and is referenced in § 135.439. Without § 135.427(c), a certificate holder could not use modern methods of collecting, recording or storing maintenance records. Several § 135.2 operators now use coded systems to perform, control and record their maintenance programs under § 121.369(c). Operators also use various maintenance control programs and techniques that are available in coded form. This change does not impose any additional recordkeeping requirements. A certificate holder now must comply with § 91.173(a)(1) which requires a record of the work performed. Without § 135.427(c), part 135 operators who are using coded systems under § 121.369(c) would have to revert to an uncoded recordkeeping system. This is because § 91.173 requires signatures and a written description of work accomplished on aircraft for all owners except those exempted by § 91.161(b).

§ 135.429 *Required inspection personnel. (Proposed § 135.351.)*

Several commenters oppose the separation of the required inspection items under § 135.429(c) from maintenance functions because it would impose hardships on the small operator or the small shop. This issue is discussed at length under § 135.423.

One commenter states that separating required inspections will require an operator to send an inspector to various places for tire changes or other unexpected maintenance. This may happen, but occurrences can be minimized by selective classification of required inspection items based on the operator's experience. Many maintenance tasks that are essential to a reliable and safe aircraft are not necessarily so critical that they should be required inspection items. Enough flexibility is provided under § 135.429(c) to enable an operator to manage a program that provides both safe and economic operations.

§ 135.431 *Continuing analysis and surveillance. (Proposed § 135.353.)*

Commenters on § 135.431 state that the rule should not apply to small operators. The applicability of the maintenance and inspection rules should not be based on the size of the certificate holder. They must be based on the type certificated seating capacity of the aircraft being used because that most appropriately reflects the size and complexity of the aircraft.

One commenter suggests combining §§ 135.431 (a) and (b) and deleting § 135.431(c). This would eliminate a certificate holder's privilege to petition the FAA to reconsider a notice of change of a program and should not be deleted.

§ 135.433 *Maintenance and preventive maintenance training program. (Proposed § 135.355.)*

The commenter on § 135.433 agrees with the concept of this rule but suggests that the statement "or a person performing maintenance * * * for it" in § 135.433 be deleted. The commenter states that it is impossible to insure that vendors or other organizations have adequate training programs. Adopting this suggestion would require each certificate holder to have a training program for each vendor or person who performs maintenance on its aircraft. Reviewing the qualifications and training of a person who performs maintenance for an operator is a more workable, less burdensome alternative.

§ 135.435 *Certificate requirements. (Proposed § 135.357.)*

Commenters object to § 135.435 because they assume that the words "appropriate airman certificate" in § 135.435(a) eliminate the certificate holder's prerogative to determine the qualifications of its management personnel, of persons who are directly in charge of maintenance, or of persons who perform inspection of required inspection items. This section only establishes the basic qualification that these people must hold an appropriate airman certificate. This insures that the person who performs these functions has basic knowledge of the regulations governing the performance of the maintenance, preventive maintenance or alterations.

§ 135.437 *Authority to perform and approve maintenance, preventive maintenance, and alterations. (Proposed § 135.359.)*

To allow a certificate holder to perform its own maintenance, preventive maintenance, and alterations, the words "perform or" are added to § 135.437(a) after the words "certificate holder."

§ 135.439 *Maintenance recording requirements. (Proposed § 135.361.)*

The commenters on § 135.439(a)(2)(i) object to the word "propeller." One suggests that the word "propeller" be deleted because the propeller consists of blades and hub and does not have a single time. The other commenter suggests that the word "propeller" be changed to read "propeller hub" because it is impossible to keep records on the blades. The definition of "propeller" in part 1 includes the hub and blades. Therefore, each propeller blade and hub is identified by model designation, part number, and serial number. Section 135.439(a)(2)(i) requires the total time in service for the blades, hub or other control component normally supplied by the manufacturer.

The commenters on §§ 135.439 and 135.439(a)(2)(iii) indicate that they consider the rule a duplication of recordkeeping requirements of part 91. The recordkeeping required under §§ 135.439 and 135.439(a)(2)(iii) is in place of the records required under § 91.173(a)(2)(i).

The word "rotor" is added to § 135.439(a)(2)(i) to require a record of the total time in service for a rotor. This is necessary because specific problems are being encountered with rotors and a number of airworthiness directives (AD) are being issued about rotors.

The words "date and" are added to § 135.439(a)(2)(v) to ensure that each AD is complied with by the date that it is due. The phrase "and, if the airworthiness directive involves recurring action, the time and date when the next action is required" also is added to § 135.439(a)(2)(v). A certificate holder is required to record the time and dates of recurring AD's because § 135.443 requires a certificate holder to maintain the current status of AD's. For an AD requiring recurring action, the time and date of the next required action is part of the current status. These changes clarify the rule.

The words "and repairs" are added to § 135.439(a)(2)(vi) because a repair is maintenance and repairs must be recorded to determine the airworthiness status of the aircraft.

§ 135.443 *Airworthiness release or aircraft log entry. (Proposed § 135.365.)*

Several commenters favor § 135.443 but object because making the statement outlined in § 135.443(b) each time a person performs maintenance on an aircraft is time consuming. One commenter suggests § 135.443 be amended to include the concept outlined in § 121.709(d). The procedures are included in § 135.443(c) as suggested.

One commenter suggests that the words "aircraft log entry" in § 135.443(b)(3) be changed to "aircraft maintenance records." The commenter states this requires an additional log because different times are used for the same documents in § 135.65. The aircraft log entry in § 135.443 is not an additional requirement. The log mentioned in § 135.65 may be the same log and may be part of the operator's system for maintenance recordkeeping. The log entry mentioned in § 135.443(b)(3) becomes a part of the aircraft records under § 135.439 and is not intended to duplicate other records. Section 135.439(a)(2) specifically requires the airworthiness release and the aircraft log entry to be made a part of the aircraft records.

DRAFTING INFORMATION

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ADOPTION OF THE AMENDMENTS

Accordingly, parts 121, 127, and 135 of the Federal Aviation regulations (14 CFR parts 121, 127, and 135) and special Federal Aviation regulations 23, 30, and 33 are amended as follows, effective December 1, 1978:

PART 121—CERTIFICATION AND OPERATIONS: DOMESTIC, FLAG, AND SUPPLEMENTAL AIR CARRIERS AND COMMERCIAL OPERATORS OF LARGE AIRCRAFT

1. By revising § 121.9 to read as follows:

§ 121.9 Operations of airplanes having a maximum passenger seating configuration of 30 seats or less and a maximum payload capacity of 7,500 pounds or less.

No person may conduct operations with an airplane having a maximum passenger seating configuration, excluding any pilot seat, of 30 seats or less and a maximum payload capacity of 7,500 pounds or less, unless those operations are conducted under part 135 of this chapter, except §§ 135.5, 135.17, 135.27, 135.29, 135.31, 135.35, 135.37, and 135.39, and appropriate operations specifications in place of subparts E through K of this part. However, the holder of an air carrier operating certificate issued under this part may maintain its airplanes operated under part 135 of this chapter under a continuous airworthiness maintenance program that meets subpart L of this part and operations specifications

issued to it under this part. Operations specifications issued under this section contain the operating limitations and requirements that the Administrator finds necessary.

§ 121.13 Rules applicable to helicopter operations: deviation authority. [Amended]

2. By amending § 121.13(d) by (a) deleting the word "small" between the words "with" and "helicopters"; and (b) adding the words "having a maximum passenger seating configuration, excluding any pilot seat, of 30 seats or less and a maximum payload capacity of 7,500 pounds or less" after the word "helicopters".

PART 127—CERTIFICATION AND OPERATIONS OF SCHEDULED AIR CARRIERS WITH HELICOPTERS

3. By revising § 127.5 to read as follows:

§ 127.5 Operation of airplanes having a maximum passenger seating configuration of 30 seats or less and a maximum payload capacity of 7,500 pounds or less.

No person may conduct operations with an airplane having a maximum passenger seating configuration, excluding any pilot seat, of 30 seats or less and a maximum payload capacity of 7,500 pounds or less, unless those operations are conducted under part 135 of this chapter, except §§ 135.5, 135.17, 135.27, 135.29, 135.31, 135.35, 135.37, and 135.39, and appropriate operations specifications. However, the holder of an air carrier operating certificate issued under this part may maintain its airplanes operated under part 135 of this chapter under a continuous airworthiness maintenance program that meets subpart I of this part and operations specifications issued to it under this part. Operations specifications issued under this section contain the operating limitations and requirements that the Administrator finds necessary.

4. By deleting special Federal Aviation regulation 23 in part 135.

5. By revoking special Federal Aviation regulations 30 and 33 in parts 121 and 135.

6. By revising part 135 to read as follows:

PART 135—AIR TAXI OPERATORS AND COMMERCIAL OPERATORS

Subpart A—General

Sec.
135.1 Applicability.
135.2 Air taxi operations with large aircraft.
135.3 Rules applicable to operations subject to this part.
135.5 Certificate and operations specifications required.
135.7 Applicability of rules to unauthorized operators.
135.9 Duration of certificate.
135.10 Compliance dates for certain rules.
135.11 Application and issue of certificate and operations specifications.
135.13 Eligibility for certificate and operations specifications.
135.15 Amendment of certificate.
135.17 Amendment of operations specifications.
135.19 Emergency operations.
135.21 Manual requirements.
135.23 Manual contents.
135.25 Aircraft requirements.
135.27 Business office and operations base.
135.29 Use of business names.
135.31 Advertising.
135.33 Area limitations on operations.
135.35 Termination of operations.
135.37 Management personnel required.
135.39 Management personnel qualifications.
135.41 Carriage of narcotic drugs, marihuana, and depressant or stimulant drugs or substances.
135.43 Crewmember certificate: International operations: Application and issue.

Subpart B—Flight Operations

135.61 General.
135.63 Recordkeeping requirements.
135.65 Reporting mechanical irregularities.
135.67 Reporting potentially hazardous meteorological conditions and irregularities of communications or navigation facilities.
135.69 Restriction or suspension of operations; Continuation of flight in an emergency.
135.71 Airworthiness check.
135.73 Inspections and tests.
135.75 Inspectors credentials: Admission to pilots' compartment; Forward observer's seat.
135.77 Responsibility for operational control.
135.79 Flight locating requirements.
135.81 Informing personnel of operational information and appropriate changes.
135.83 Operating information required.
135.85 Carriage of persons without compliance with the passenger-carrying provisions of this part.
135.87 Carriage of cargo including carry-on baggage.
135.89 Pilot requirements: Use of oxygen.
135.91 Oxygen for medical use by passengers.
135.93 Autopilot: Minimum altitudes for use.
135.95 Airmen: Limitations on use of services.
135.97 Aircraft and facilities for recent flight experience.
135.99 Composition of flight crew.
135.101 Second in command required in IFR conditions.
135.103 Exception to second in command requirement: IFR operations.
135.105 Exception to second in command requirement: Approval for use of autopilot system.
135.107 Flight attendant crewmember requirement.
135.109 Pilot in command or second in command: Designation required.
135.111 Second in command required in category II operations.
135.113 Passenger occupancy of pilot seat.
135.115 Manipulation of controls.
135.117 Briefing of passengers before flight.
135.119 Prohibition against carriage of weapons.
135.121 Alcoholic beverages.
135.123 Emergency and emergency evacuation duties.

Subpart C—Aircraft and Equipment

135.141 Applicability.
135.143 General requirements.
135.145 Aircraft proving tests.
135.147 Dual controls required.
135.149 Equipment requirements: General.
135.151 Cockpit voice recorders.
135.153 Ground proximity warning system.
135.155 Fire extinguishers: Passenger-carrying aircraft.
135.157 Oxygen equipment requirements.
135.159 Equipment requirements: Carrying passengers under VFR at night or under VFR over-the-top conditions.
135.161 Radio and navigational equipment: Carrying passengers under VFR at night or under VFR over-the-top.
135.163 Equipment requirements: Aircraft carrying passengers under IFR.
135.165 Radio and navigational equipment: Extended overwater or IFR operations.
135.167 Emergency equipment: Extended overwater operations.
135.169 Additional airworthiness requirements.
135.171 Shoulder harness installation at flight crewmember stations.
135.173 Airborne thunderstorm detection equipment requirements.
135.175 Airborne weather radar equipment requirements.
135.177 Emergency equipment requirements for aircraft having a passenger seating configuration of more than 19 passengers.
135.179 Inoperable instruments and equipment for multiengine aircraft.
135.181 Performance requirements: Aircraft operated over-the-top or in IFR conditions.
135.183 Performance requirements: Land aircraft operated over water.
135.185 Empty weight and center of gravity: Currency requirement.

Subpart D—VFR/IFR Operating Limitations and Weather Requirements

135.201 Applicability.
135.203 VFR: Minimum altitudes.
135.205 VFR: Visibility requirements.
135.207 VFR: Helicopter surface reference requirements.
135.209 VFR: Fuel supply.
135.211 VFR: Over-the-top carrying passengers: Operating limitations.
135.213 Weather reports and forecasts.
135.215 IFR: Operating limitations.
135.217 IFR: Takeoff limitations.
135.219 IFR: Destination airport weather minimums.
135.221 IFR: Alternate airport weather minimums.
135.223 IFR: Alternate airport requirements.
135.225 IFR: Takeoff, approach and landing minimums.
135.227 Icing conditions: Operating limitations.
135.229 Airport requirements.

Subpart A—General

§ 135.1 Applicability.

(a) Except as provided in paragraph (b) of this section, this part prescribes rules governing—

(1) Air taxi operations conducted under the exemption authority of Part 298 of this title;

(2) The transportation of mail by aircraft conducted under a postal service contract awarded under section 5402c of Title 39, United States Code;

(3) The carrying in air commerce by any person, other than as an air carrier, of persons or property for compensation or hire (commercial operations) in aircraft having a maximum passenger seating configuration, excluding any pilot seat, of 30 seats or less and a maximum payload capacity of 7,500 pounds or less; and

(4) Each person who is on board an aircraft being operated under this part.

(b) This part does not apply to—

(1) Student instruction;

(2) Nonstop sightseeing flights that begin and end at the same airport, and are conducted within a 25 statute mile radius of that airport;

(3) Ferry or training flights;

(4) Aerial work operations, including—

(i) Crop dusting, seeding, spraying, and bird chasing;

(ii) Banner towing;

(iii) Aerial photography or survey;

(iv) Fire fighting;

(v) Helicopter operations in construction or repair work (but not including transportation to and from the site of operations); and

(vi) Powerline or pipeline patrol;

(5) Sightseeing flights conducted in hot air balloons;

(6) Nonstop flights conducted within a 25 statute mile radius of the airport of takeoff carrying persons for the purpose of intentional parachute jumps;

(7) Helicopter flights conducted within a 25 statute mile radius of the airport of takeoff, if—

(i) Not more than two passengers are carried in the helicopter in addition to the required flight crew;

(ii) Each flight is made under VFR during the day;

(iii) The helicopter used is certificated in the standard category and complies with the 100-hour inspection requirements of Part 91 of this chapter;

(iv) The operator notifies the FAA Flight Standards District Office responsible for the geographic area concerned at least 72 hours before each flight and furnishes any essential information that the office requests;

(v) The number of flights does not exceed a total of six in any calendar year;

(vi) Each flight has been approved by the Administrator; and

(vii) Cargo is not carried in or on the helicopter;

(8) Operations conducted under Part 133 or 375 of this title;

(9) Emergency mail service conducted under section 405(h) of the Federal Aviation Act of 1958; or

(10) Carriage of a candidate in a Federal election, an agent of the candidate, or person traveling on behalf of the candidate, if—

(i) The principal business of the person operating the aircraft is not that of an air carrier or commercial operator; and

(ii) The payment for the carriage is required, and does not exceed the amount required to be paid, by regulations of the Federal Election Commission (11 CFR Chapter 1).

The terms "candidate" and "election" have the same meaning as that set forth in the regulations of the Federal Election Commission.

§ 135.2 Air taxi operations with large aircraft.

(a) Except as provided in paragraph (d) of this section, no person may conduct air taxi operations in large aircraft under an individual exemption and authorization issued by the Civil Aeronautics Board or under the exemption authority of Part 298 of this title, unless that person—

(1) Complies with the certification requirements for supplemental air carriers in Part 121 of this chapter, except that the person need not obtain, and that person is not eligible for, a certificate under that part; and

(2) Conducts those operations under the rules of Part 121 of this chapter that apply to supplemental air carriers.

However, the Administrator may issue operations specifications which require an operator to comply with the rules of Part 121 of this chapter that apply to domestic or flag air carriers, as appropriate, in place of the rules required by paragraph (a)(2) of this section, if the Administrator determines compliance with those rules is necessary to provide an appropriate level of safety for the operation.

(b) The holder of an operating certificate issued under this part who is required to comply with Subpart L of Part 121 of this chapter, under paragraph (a) of this section, may perform and approve maintenance, preventive maintenance, and alterations on aircraft having a maximum passenger seating configuration, excluding any pilot seat, of 30 seats or less and a maximum payload capacity of 7,500 pounds or less as provided in that subpart. The aircraft so maintained shall be identified by registration number in the operations specifications of the certificate holder using the aircraft.

(c) Operations that are subject to paragraph (a) of this section are not subject to §§ 135.21 through 135.43 of Subpart A and Subparts B through J of this part. Seaplanes used in operations that are subject to paragraph (a) of this section are not subject to § 121.291(a) of this chapter.

(d) Operations conducted with aircraft having a maximum passenger seating configuration, excluding any pilot seat, of 30 seats or less, and a maximum payload capacity of 7,500 pounds or less shall be conducted under the rules of this part. However, a certificate holder who is conducting operations on December 1, 1978, in aircraft described in this paragraph may continue to operate under paragraph (a) of this section.

(e) For the purposes of this part—

(1) "Maximum payload capacity" means:

(i) For an aircraft for which a maximum zero fuel weight is prescribed in FAA technical specifications, the maximum zero fuel weight, less empty weight, less all justifiable aircraft equipment, and less the operating load (consisting of minimum flight crew, foods and beverages and supplies and equipment related to foods and beverages, but not including disposable fuel or oil);

(ii) For all other aircraft, the maximum certificated takeoff weight of an aircraft, less the empty weight, less all justifiable aircraft equipment, and less the operating load (consisting of minimum fuel load, oil, and flight crew). The allowance for the weight of the crew, oil, and fuel is as follows:

(A) Crew—200 pounds for each crewmember required under this chapter.

(B) Oil—350 pounds.

(C) Fuel—the minimum weight of fuel required under this chapter for a flight between domestic points 174 nautical miles apart under VFR weather conditions that does not involve extended overwater operations.

(2) "Empty weight" means the weight of the airframe, engines, propellers, rotors, and fixed equipment. Empty weight excludes the weight of the crew and payload, but includes the weight of all fixed ballast, unusable fuel supply, undrainable oil, total quantity of engine coolant, and total quantity of hydraulic fluid.

(3) "Maximum zero fuel weight" means the maximum permissible weight of an aircraft with no disposable fuel or oil. The zero fuel weight figure may be found in either the aircraft type certificate data sheet or the approved Aircraft Flight Manual, or both.

(4) For the purposes of this paragraph, "justifiable aircraft equipment" means any equipment necessary for the operation of the aircraft. It does not include equipment or ballast specifically installed, permanently or otherwise, for the purpose of altering the empty weight of an aircraft to meet the maximum payload capacity specified in paragraph (d) of this section.

§ 135.3 Rules applicable to operations subject to this part.

Each person operating an aircraft in operations under this part shall—

(a) While operating inside the United States, comply with the applicable rules of this chapter; and

(b) While operating outside the United States, comply with Annex 2, Rules of the Air, to the Convention on International Civil Aviation or the regulations of any foreign country, whichever applies, and with any rules of Parts 61 and 91 of this chapter and this part that are more restrictive than that Annex or those regulations and that can be complied with without violating that Annex or those regulations. Annex 2 is incorporated by reference in § 91.1(c) of this chapter.

§ 135.5 Certificate and operations specifications required.

No person may operate an aircraft under this part without, or in violation of, an air taxi/commercial operator (ATCO) operating certificate and appropriate operations specifications issued under this part, or, for operations with large aircraft having a maximum passenger seating configuration, excluding any pilot seat, of more than 30 seats, or a maximum payload capacity of more than 7,500 pounds, without, or in violation of, appropriate operations specifications issued under Part 121 of this chapter.

§ 135.7 Applicability of rules to unauthorized operators.

The rules in this part which apply to a person certificated under § 135.5 also apply to a person who engages in any operation governed by this part without an appropriate certificate and operations specifications required by § 135.5.

§ 135.9 Duration of certificate.

(a) An ATCO operating certificate is effective until surrendered, suspended or revoked. The holder of an ATCO operating certificate that is suspended or revoked shall return it to the Administrator.

(b) Except as provided in paragraphs (c) and (d) of this section, an ATCO operating certificate in effect on December 1, 1978, expires on February 1, 1979. The certificate holder must continue to conduct operations under Part 135 and the operations specifications in effect on November 30, 1978, until the certificate expires.

(c) If the certificate holder applies before February 1, 1979, for new operations specifications under this part, the operating certificate held continues in effect and the certificate holder must continue operations under Part 135 and operations specifications in effect on November 30, 1978, until the earliest of the following—

(1) The date on which new operations specifications are issued; or

(2) The date on which the Administrator notifies the certificate holder that the application is denied; or

(3) August 1, 1979.

If new operations specifications are issued under paragraph (c)(1) of this paragraph, the ATCO operating certificate continues in effect until surrendered, suspended or revoked under paragraph (a) of this section.

(d) A certificate holder may obtain an extension of the expiration date in paragraph (c) of this section, but not beyond December 1, 1979, from the Director, Flight Standards Service, if before July 1, 1979, the certificate holder—

(1) Shows that due to the circumstances beyond its control it cannot comply by the expiration date; and

(2) Submits a schedule for compliance, acceptable to the Director, indicating that compliance will be achieved at the earliest practicable date.

(e) The holder of an ATCO operating certificate that expires, under paragraphs (b), (c), or (d) of this section, shall return it to the Administrator.

§ 135.10 Compliance dates for certain rules.

(a) A certificate holder or pilot is allowed until June 1, 1979, to comply with the following sections:

(1) A third bank and pitch indicator (artificial horizon) (§ 135.149(c)).

(2) Shoulder harness at flight crewmember stations (§ 135.171(a)).

(3) Airline transport pilot certificate (§ 135.243(a)).

(4) Instrument rating (§ 135.243(b)(iii)).

(b) A certificate holder is allowed until December 1, 1979, to comply with the following sections:

(1) Cockpit voice recorder (§ 135.151).

(2) Ground proximity warning system or other approved system (§ 135.153).

(3) Airborne thunderstorm detection equipment (§ 135.173).

(c) A certificate holder or pilot may obtain an extension of the compliance date in paragraph (a) or (b) of this section, but not beyond December 1, 1980, from the Director, Flight Standards Service, if before the compliance date in paragraph (a) or (b) of this section—

(1) The certificate holder or pilot shows that due to the circumstances beyond its control they cannot comply by that date; and

(2) The certificate holder or pilot has submitted before that date a schedule for compliance, acceptable to the Director, indicating that compliance will be achieved at the earliest practicable date.

§ 135.11 Application and issue of certificate and operations specifications.

(a) An application for an ATCO operating certificate and appropriate operations specifications is made on a form and in a manner prescribed by the Administrator and filed with the FAA Flight Standards District Office that has jurisdiction over the area in which the applicant's principal business office is located.

(b) An applicant who meets the requirements of this part is entitled to—

(1) An ATCO operating certificate containing all business names under which the certificate holder may conduct operations and the address of each business office used by the certificate holder; and

(2) Separate operations specifications, issued to the certificate holder, containing:

(i) The type and area of operations authorized.

(ii) The category and class of aircraft that may be used in those operations.

(iii) Registration numbers and types of aircraft that are subject to an airworthiness maintenance program required by § 135.411(a)(2), including time limitations or standards for determining time limitations, for overhauls, inspections, and checks for airframes, aircraft engines, propellers, rotors, appliances, and emergency equipment.

(iv) Registration numbers of aircraft that are to be inspected under an approved aircraft inspection program under § 135.419.

(v) Additional maintenance items required by the Administrator under § 135.421.

(vi) Any authorized deviation from this part.

(vii) Any other items the Administrator may require or allow to meet any particular situation.

§ 135.13 Eligibility for certificate and operations specifications.

(a) To be eligible for an ATCO operating certificate and appropriate operations specifications, a person must—

(1) Be a citizen of the United States, a partnership of which each member is a citizen of the United States, or a corporation or association created or organized under the laws of the United States or any state, territory, or possession of the United States, of which the president and two-thirds or more of the board of directors and other managing officers are citizens of the United States and in which at least 75 percent of the voting interest is owned or controlled by citizens of the United States or one of its possessions; and

(2) Show, to the satisfaction of the Administrator, that the person is able to conduct each kind of operation for which the person seeks authorization in compliance with applicable regulations; and

(3) Hold any economic authority that may be required by the Civil Aeronautics Board.

However, no person holding a commercial operator operating certificate issued under Part 121 of this chapter is eligible for an ATCO operating certificate unless the person shows to the satisfaction of the Administrator that the person's contract carriage business in large aircraft, having a maximum passenger seating configuration, excluding any pilot seat, of more than 30 seats or a maximum payload capacity of more than 7,500 pounds, will not result directly or indirectly from the person's air taxi business.

(b) The Administrator may deny any applicant a certificate under this part if the Administrator finds—

(1) That an air carrier or commercial operator operating certificate under Part 121 or an ATCO operating certificate previously issued to the applicant was revoked; or

(2) That a person who was employed in a position similar to general manager, director of operations, director of maintenance, chief pilot, or chief inspector, or who has exercised control with respect to any ATCO operating certificate holder, air carrier, or commercial operator, whose operating certificate has been revoked, will be employed in any of those positions or a similar position, or will be in control of or have a substantial ownership interest in the applicant, and that the person's employment or control contributed materially to the reasons for revoking that certificate.

§ 135.15 Amendment of certificate.

(a) The Administrator may amend an ATCO operating certificate—

(1) On the Administrator's own initiative, under section 609 of the Federal Aviation Act of 1958 (49 U.S.C. 1429) and Part 13 of this chapter; or

(2) Upon application by the holder of that certificate.

(b) The certificate holder must file an application to amend an ATCO operating certificate at least 15 days before the date proposed by the applicant for the amendment to become effective, unless a shorter filing period is approved. The application must be on a form and in a manner prescribed by the Administrator and must be submitted to the FAA Flight Standards District Office charged with the overall inspection of the certificate holder.

(c) The FAA Flight Standards District Office charged with the overall inspection of the certificate holder grants an amendment to the ATCO operating certificate if it is determined that safety in air commerce and the public interest allow that amendment.

(d) Within 30 days after receiving a refusal to amend the operating certificate, the certificate holder may petition the Director, Flight Standards Service, to reconsider the request.

§ 135.17 Amendment of operations specifications.

(a) The FAA Flight Standards District Office charged with the overall inspection of the certificate holder may amend any operations specifications issued under this part if—

(1) It determines that safety in air commerce requires that amendment; or

(2) Upon application by the holder, that District Office determines that safety in air commerce allows that amendment.

(b) The certificate holder must file an application to amend operations specifications at least 15 days before the date proposed by the applicant for the amendment to become effective, unless a shorter filing period is approved. The application must be on a form and in a manner prescribed by the Administrator and be submitted to the FAA Flight Standards District Office charged with the overall inspection of the certificate holder.

(c) Within 30 days after a notice of refusal to approve a holder's application for amendment is received, the holder may petition the Director, Flight Standards Service, to reconsider the refusal to amend.

(d) When the FAA Flight Standards District Office charged with the overall inspection of the certificate holder amends operations specifications, that District Office gives notice in writing to the holder of a proposed amendment to the operations specifications, fixing a period of not less than 7 days within which the holder may submit written information, views, and arguments concerning the proposed amendment. After consideration of all relevant matter presented, that District Office notifies the holder of any amendment adopted, or a rescission of the notice. The amendment becomes effective not less than 30 days after the holder receives notice of the adoption of the amendment, unless the holder petitions the Director, Flight Standards Service, for reconsideration of the amendment. In that case, the effective date of the amendment is stayed pending a decision by the Director. If the Director finds there is an emergency requiring immediate action as to safety in air commerce that makes the provisions of this paragraph impracticable or contrary to the public interest, the Director notifies the certificate holder that the amendment is effective on the date of receipt, without previous notice.

§ 135.19 Emergency operations.

(a) In an emergency involving the safety of persons or property, the certificate holder may deviate from the rules of this part relating to aircraft and equipment and weather minimums to the extent required to meet that emergency.

(b) In an emergency involving the safety of persons or property, the pilot in command may deviate from the rules of this part to the extent required to meet that emergency.

(c) Each person who, under the authority of this section, deviates from a rule of this part shall, within 10 days, excluding Saturdays, Sundays, and Federal holidays, after the deviation, send to the FAA Flight Standards District Office charged with the overall inspection of the certificate holder a complete report of the aircraft operation involved, including a description of the deviation and reasons for it.

§ 135.21 Manual requirements.

(a) Each certificate holder, other than one who is the only pilot used in the certificate holder's operations, shall prepare and keep current a manual setting forth the certificate holder's procedures and policies acceptable to the Administrator. This manual must be used by the certificate holder's flight, ground, and maintenance personnel in conducting its operations. However, the Administrator may authorize a deviation from this paragraph if the Administrator finds that, because of the limited size of the operation, all or part of the manual is not necessary for guidance of flight, ground, or maintenance personnel.

(b) Each certificate holder shall maintain at least one copy of the manual at its principal operations base.

(c) The manual must not be contrary to any applicable Federal regulations, foreign regulation applicable to the certificate holder's operations in foreign countries, or the certificate holder's operating certificate or operations specifications.

(d) A copy of the manual, or appropriate portions of the manual (and changes and additions) shall be made available to maintenance and ground operations personnel by the certificate holder and furnished to—

(1) Its flight crewmembers; and

(2) Representatives of the Administrator assigned to the certificate holder.

(e) Each employee of the certificate holder to whom a manual or appropriate portions of it are furnished under paragraph (d)(1) of this section shall keep it up to date with the changes and additions furnished to them.

(f) Except as provided in paragraph (g) of this section, each certificate holder shall carry appropriate parts of the manual on each aircraft when away from the principal operations base. The appropriate parts must be available for use by ground or flight personnel.

(g) If a certificate holder conducts aircraft inspections or maintenance at specified stations where it keeps the approved inspection program manual, it is not required to carry the manual aboard the aircraft en route to those stations.

§ 135.23 Manual contents.

Each manual shall have the date of the last revision on each revised page. The manual must include—

(a) The name of each management person required under § 135.37(a) who is authorized to act for the certificate holder, the person's assigned area of responsibility, and the person's duties, responsibilities, and authority;

(b) Procedures for ensuring compliance with aircraft weight and balance limitations and, for multiengine aircraft, for determining compliance with § 135.185;

(c) Copies of the certificate holder's operations specifications or appropriate extracted information, including area of operations authorized, category and class of aircraft authorized, crew complements, and types of operations authorized;

(d) Procedures for complying with accident notification requirements;

(e) Procedures for ensuring that the pilot in command knows that required airworthiness inspections have been made and that the aircraft has been approved for return to service in compliance with applicable maintenance requirements;

(f) Procedures for reporting and recording mechanical irregularities that come to the attention of the pilot in command before, during, and after completion of a flight;

(g) Procedures to be followed by the pilot in command for determining that mechanical irregularities or defects reported for previous flights have been corrected or that correction has been deferred;

(h) Procedures to be followed by the pilot in command to obtain maintenance, preventive maintenance, and servicing of the aircraft at a place where previous arrangements have not been made by the operator, when the pilot is authorized to so act for the operator;

(i) Procedures under § 135.179 for the release for, or continuation of, flight if any item of equipment required for the particular type of operation becomes inoperative or unserviceable en route;

(j) Procedures for refueling aircraft, eliminating fuel contamination, protecting from fire (including electrostatic protection), and supervising and

protecting passengers during refueling;

(k) Procedures to be followed by the pilot in command in the briefing under § 135.117;

(l) Flight locating procedures, when applicable;

(m) Procedures for ensuring compliance with emergency procedures, including a list of the functions assigned each category of required crewmembers in connection with an emergency and emergency evacuation duties under § 135.123;

(n) En route qualification procedures for pilots, when applicable;

(o) The approved aircraft inspection program, when applicable;

(p) Procedures and instructions to enable personnel to recognize hazardous materials, as defined in Title 49 CFR, and if these materials are to be carried, stored, or handled, procedures and instructions for—

(1) Accepting shipment of hazardous material required by Title 49 CFR, to assure proper packaging, marking, labeling, shipping documents, compatibility of articles, and instructions on their loading, storage, and handling;

(2) Notification and reporting hazardous material incidents as required by Title 49 CFR; and

(3) Notification of the pilot in command when there are hazardous materials aboard, as required by Title 49 CFR;

(q) Procedures for the evacuation of persons who may need the assistance of another person to move expeditiously to an exit if an emergency occurs; and

(r) Other procedures and policy instructions regarding the certificate holder's operations, that are issued by the certificate holder.

§ 135.25 Aircraft requirements.

(a) No certificate holder may operate an aircraft under this part unless that aircraft—

(1) Is registered as a civil aircraft of the United States and carries an appropriate and current airworthiness certificate issued under this chapter; and

(2) Is in an airworthy condition and meets the applicable airworthiness requirements of this chapter, including those relating to identification and equipment.

(b) Each certificate holder must have the exclusive use of at least one aircraft that meets the requirements for at least one kind of operation authorized in the certificate holder's operations specifications. In addition, for each kind of operation for which the certificate holder does not have the exclusive use of an aircraft, the certificate holder must have available for use under a written agreement (including arrangements for performing required maintenance) at least one aircraft that meets the requirements for that kind of operation. However, this paragraph does not prohibit the operator from using or authorizing the use of the aircraft for other than air taxi or commercial operations and does not require the certificate holder to have exclusive use of all aircraft that the certificate holder uses.

(c) For the purposes of paragraph (b) of this section, a person has exclusive use of an aircraft if that person has the sole possession, control, and use of it for flight, as owner, or has a written agreement (including arrangements for performing required maintenance), in effect when the aircraft is operated, giving the person that possession, control, and use for at least 6 consecutive months.

§ 135.27 Business office and operations base.

(a) Each certificate holder shall maintain a principal business office.

(b) Each certificate holder shall, before establishing or changing the location of any business office or operations base, except a temporary operations base, notify in writing the FAA Flight Standards District Office charged with the overall inspection of the certificate holder.

(c) No certificate holder who establishes or changes the location of any business office or operations base, except a temporary operations base, may operate an aircraft under this part unless the certificate holder complies with paragraph (b) of this section.

§ 135.29 Use of business names.

No certificate holder may operate an aircraft under this part under a business name that is not on the certificate holder's operating certificate.

§ 135.31 Advertising.

No certificate holder may advertise or otherwise offer to perform operations subject to this part that are not authorized by the certificate holder's operating certificate and operations specifications.

§ 135.33 Area limitations on operations.

(a) No person may operate an aircraft in a geographical area that is not specifically authorized by appropriate operations specifications issued under this part.

(b) No person may operate an aircraft in a foreign country unless that person is authorized to do so by that country.

§ 135.35 Termination of operations.

Within 30 days after a certificate holder terminates operations under this part, the operating certificate and operations specifications must be surrendered by the certificate holder to the FAA Flight Standards District Office charged with the overall inspection of the certificate holder.

§ 135.37 Management personnel required.

(a) Each certificate holder, other than one who is the only pilot used in the certificate holder's operations, must have enough qualified management personnel in the following or equivalent positions to ensure safety in its operations:

(1) Director of operations.

(2) Chief pilot.

(3) Director of maintenance.

(b) Upon application by the certificate holder, the Administrator may approve different positions or numbers of positions than those listed in paragraph (a) of this section for a particular operation if the certificate holder shows that it can perform its operations safely under the direction of fewer or different categories of management personnel.

(c) Each certificate holder shall—

(1) Set forth the duties, responsibilities, and authority of the personnel required by this section in the manual required by § 135.21;

(2) List in the manual required by § 135.21 the name of the person or persons assigned to those positions; and

(3) Within 10 working days, notify the FAA Flight Standards District Office charged with the overall inspection of the certificate holder of any change made in the assignment of persons to the listed positions.

§ 135.39 Management personnel qualifications.

(a) *Director of operations.* No person may serve as director of operations under § 135.37(a) unless that person knows the contents of the manual required by § 135.21, the operations specifications, the provisions of this part and other applicable regulations necessary for the proper performance of the person's duties and responsibilities and:

(1) The director of operations for a certificate holder conducting any operations for which the pilot in command is required to hold an airline transport pilot certificate must—

(i) Hold or have held an airline transport pilot certificate; and

(ii) Have at least 3 years of experience as pilot in command of an aircraft operated under this part, Part 121 or Part 127 of this chapter; or

(iii) Have at least 3 years of experience as director of operations with a certificate holder operating under this part, Part 121 or Part 127 of this chapter.

(2) The director of operations for a certificate holder who is not conducting any operation for which the pilot

in command is required to hold an airline transport pilot certificate must—

(i) Hold or have held a commercial pilot certificate; and

(ii) Have at least 3 years of experience as a pilot in command of an aircraft operated under this part, Part 121 or Part 127 of this chapter; or

(iii) Have at least 3 years of experience as director of operations with a certificate holder operating under this part, Part 121 or Part 127 of this chapter.

(b) *Chief pilot.* No person may serve as chief pilot under § 135.37(a) unless that person knows the contents of the manual required by § 135.21, the operations specifications, the provisions of this part and other applicable regulations necessary for the proper performance of the person's duties, and:

(1) The chief pilot of a certificate holder conducting any operation for which the pilot in command is required to hold an airline transport pilot certificate must—

(i) Hold a current airline transport pilot certificate with appropriate ratings for at least one of the types of aircraft used; and

(ii) Have at least 3 years of experience as a pilot in command of an aircraft under this part, Part 121 or Part 127 of this chapter.

(2) The chief pilot of a certificate holder who is not conducting any operation for which the pilot in command is required to hold an airline transport pilot certificate must—

(i) Hold a current commercial pilot certificate with an instrument rating; and

(ii) Have at least 3 years of experience as a pilot in command of an aircraft under this part, Part 121 or Part 127 of this chapter.

(c) *Director of maintenance.* No person may serve as a director of maintenance under § 135.37(a) unless that person knows the maintenance sections of the certificate holder's manual, the operations specifications, the provisions of this part and other applicable regulations necessary for the proper performance of the person's duties, and—

(1) Holds a mechanic certificate with both airframe and powerplant ratings; and

(2) Has at least 3 years of maintenance experience as a certificated mechanic on aircraft, including, at the time of appointment as director of maintenance, the recent experience requirements of § 65.83 of this chapter in the same category and class of aircraft as used by the certificate holder, or at least 3 years of experience with a certificated airframe repair station, including 1 year in the capacity of approving aircraft for return to service.

(d) The Director, Flight Standards Service, may authorize a deviation from this section if the Director finds that the person has had equivalent aeronautical experience.

§ 135.41 Carriage of narcotic drugs, marihuana, and depressant or stimulant drugs or substances.

If the holder of a certificate issued under this part allows any aircraft owned or leased by that holder to be engaged in any operation that the certificate holder knows to be in violation of § 91.12(a) of this chapter, that operation is a basis for suspending or revoking the certificate.

§ 135.43 Crewmember certificate: international operations: application and issue.

(a) This section provides for the issuance of a crewmember certificate to United States citizens who are employed by certificate holders as crewmembers on United States registered aircraft engaged in international air commerce. The purpose of the certificate is to facilitate the entry and clearance of those crewmembers into ICAO contracting states. They are issued under Annex 9, as amended, to the Convention on International Civil Aviation.

(b) An application for a crewmember certificate is made on FAA Form 8060-6, "Application for Crewmember Certificate," to the FAA Flight Standards District Office charged with the overall inspection of the certificate holder by whom the applicant is employed. The certificate is issued on FAA Form 8060-42, "Crewmember Certificate."

(c) The holder of a certificate issued under this section, or the certificate holder by whom the holder is employed, shall surrender the certificate for cancellation at the nearest FAA Flight Standards District Office or submit it for cancellation to the Airmen Certification Branch, AAC-260, P.O. Box 25082, Oklahoma City, Oklahoma 73125, at the termination of the holder's employment with that certificate holder.

Subpart B—Flight Operations

§ 135.61 General.

This subpart prescribes rules, in addition to those in Part 91 of this chapter, that apply to operations under this part.

§ 135.63 Recordkeeping requirements.

(a) Each certificate holder shall keep at its principal business office or at other places approved by the Administrator, and shall make available for inspection by the Administrator the following—

(1) The certificate holder's operating certificate;

(2) The certificate holder's operations specifications;

(3) A current list of the aircraft used or available for use in operations under this part and the operations for which each is equipped; and

(4) An individual record of each pilot used in operations under this part, including the following information:

(i) The full name of the pilot.

(ii) The pilot certificate (by type and number) and ratings that the pilot holds.

(iii) The pilot's aeronautical experience in sufficient detail to determine the pilot's qualifications to pilot aircraft in operations under this part.

(iv) The pilot's current duties and the date of the pilot's assignment to those duties.

(v) The effective date and class of the medical certificate that the pilot holds.

(vi) The date and result of each of the initial and recurrent competency tests and proficiency and route checks required by this part and the type of aircraft flown during that test or check.

(vii) The pilot's flight time in sufficient detail to determine compliance with the flight time limitations of this part.

(viii) The pilot's check pilot authorization, if any.

(ix) Any action taken concerning the pilot's release from employment for physical or professional disqualification.

(x) The date of the completion of the initial phase and each recurrent phase of the training required by this part.

(b) Each certificate holder shall keep each record required by paragraph (a)(3) of this section for at least 6 months, and each record required by paragraph (a)(4) of this section for at least 12 months, after it is made.

(c) For multiengine aircraft, each certificate holder is responsible for the preparation and accuracy of a load manifest in duplicate containing information concerning the loading of the aircraft. The manifest must be prepared before each takeoff and must include—

(1) The number of passengers;

(2) The total weight of the loaded aircraft;

(3) The maximum allowable takeoff weight for that flight;

(4) The center of gravity limits;

(5) The center of gravity of the loaded aircraft, except that the actual center of gravity need not be computed if the aircraft is loaded according to a loading schedule or other approved method that ensures that the center of gravity of the loaded aircraft is within approved limits. In those cases, an entry shall be made on the manifest indicating that the center of gravity is within limits according to a load-

ing schedule or other approved method;

(6) The registration number of the aircraft or flight number;

(7) The origin and destination; and

(8) Identification of crew members and their crew position assignments.

(d) The pilot in command of an aircraft for which a load manifest must be prepared shall carry a copy of the completed load manifest in the aircraft to its destination. The certificate holder shall keep copies of completed load manifests for at least 30 days at its principal operations base, or at another location used by it and approved by the Administrator.

§ 135.65 Reporting mechanical irregularities.

(a) Each certificate holder shall provide an aircraft maintenance log to be carried on board each aircraft for recording or deferring mechanical irregularities and their correction.

(b) The pilot in command shall enter or have entered in the aircraft maintenance log each mechanical irregularity that comes to the pilot's attention during flight time. Before each flight, the pilot in command shall, if the pilot does not already know, determine the status of each irregularity entered in the maintenance log at the end of the preceding flight.

(c) Each person who takes corrective action or defers action concerning a reported or observed failure or malfunction of an airframe, powerplant, propeller, rotor, or applicance, shall record the action taken in the aircraft maintenance log under the applicable maintenance requirements of this chapter.

(d) Each certificate holder shall establish a procedure for keeping copies of the aircraft maintenance log required by this section in the aircraft for access by appropriate personnel and shall include that procedure in the manual required by § 135.21.

§ 135.67 Reporting potentially hazardous meteorological conditions and irregularities of communications or flavigation facilities.

Whenever a pilot encounters a potentially hazardous meteorological condition or an irregularity in a ground communications or navigational facility in flight, the knowledge of which the pilot considers essential to the safety of other flights, the pilot shall notify an appropriate ground radio station as soon as practicable and request that the information be disseminated.

§ 135.69 Restriction or suspension of operations: continuation of flight in an emergency.

(a) During operations under this part, if a certificate holder or pilot in command knows of conditions, including airport and runway conditions, that are a hazard to safe operations, the certificate holder or pilot in command, as the case may be, shall restrict or suspend operations as necessary until those conditions are corrected.

(b) No pilot in command may allow a flight to continue toward any airport of intended landing under the conditions set forth in paragraph (a) of this section, unless, in the opinion of the pilot in command, the conditions that are a hazard to safe operations may reasonably be expected to be corrected by the estimated time of arrival or, unless there is no safer procedure. In the latter event, the continuation toward that airport is an emergency situation under § 135.19.

§ 135.71 Airworthiness check.

The pilot in command may not begin a flight unless the pilot determines that the airworthiness inspections required by § 91.169 of this chapter, or § 135.419, whichever is applicable, have been made.

§ 135.73 Inspections and tests.

Each certificate holder and each person employed by the certificate holder shall allow the Administrator, at any time or place, to make inspections or tests (including en route inspections) to determine the holder's compliance with the Federal Aviation Act of 1958, applicable regulations, and the certificate holder's operating certificate, and operations specifications.

§ 135.75 Inspectors credentials: admission to pilots' compartment: forward observer's seat.

(a) Whenever, in performing the duties of conducting an inspection, an FAA inspector presents an Aviation Safety Inspector credential, FAA Form 110A, to the pilot in command of an aircraft operated by the certificate holder, the inspector must be given free and uninterrupted access to the pilot compartment of that aircraft. However, this paragraph does not limit the emergency authority of the pilot in command to exclude any person from the pilot compartment in the interest of safety.

(b) A forward observer's seat on the flight deck, or forward passenger seat with headset or speaker must be provided for use by the Administrator while conducting en route inspections. The suitability of the location of the seat and the headset or speaker for use in conducting en route inspections is determined by the Administrator.

§ 135.77 Responsibility for operational control.

Each certificate holder is responsible for operational control and shall list, in the manual required by § 135.21, the name and title of each person authorized by it to exercise operational control.

§ 135.79 Flight locating requirements.

(a) Each certificate holder must have procedures established for locating each flight, for which an FAA flight plan is not filed, that—

(1) Provide the certificate holder with at least the information required to be included in a VFR flight plan;

(2) Provide for timely notification of an FAA facility or search and rescue facility, if an aircraft is overdue or missing; and

(3) Provide the certificate holder with the location, date, and estimated time for reestablishing radio or telephone communications, if the flight will operate in an area where communications cannot be maintained.

(b) Flight locating information shall be retained at the certificate holder's principal place of business, or at other places designated by the certificate holder in the flight locating procedures, until the completion of the flight.

(c) Each certificate holder shall furnish the representative of the Administrator assigned to it with a copy of its flight locating procedures and any changes or additions, unless those procedures are included in a manual required under this part.

§ 135.81 Informing personnel of operational information and appropriate changes.

Each certificate holder shall inform each person in its employment of the operations specifications that apply to that person's duties and responsibilities and shall make available to each pilot in the certificate holder's employ the following materials in current form:

(a) Airman's Information Manual (Alaska Supplement in Alaska and Pacific Chart Supplement in Pacific-Asia Regions) or a commercial publication that contains the same information.

(b) This part and Part 91 of this chapter.

(c) Aircraft Equipment Manuals, and Aircraft Flight Manual or equivalent.

(d) For foreign operations, the International Flight Information Manual or a commercial publication that contains the same information concerning the pertinent operational and entry requirements of the foreign country or countries involved.

§ 135.83 Operating information required.

(a) The operator of an aircraft must provide the following materials, in cur-

rent and appropriate form, accessible to the pilot at the pilot station, and the pilot shall use them:

(1) A cockpit checklist.

(2) For multiengine aircraft or for aircraft with retractable landing gear, an emergency cockpit checklist containing the procedures required by paragraph (c) of this section, as appropriate.

(3) Pertinent aeronautical charts.

(4) For IFR operations, each pertinent navigational en route, terminal area, and approach and letdown chart.

(5) For multiengine aircraft, one-engine-inoperative climb performance data and if the aircraft is approved for use in IFR or over-the-top operations, that data must be sufficient to enable the pilot to determine compliance with § 135.181(a)(2).

(b) Each cockpit checklist required by paragraph (a)(1) of this section must contain the following procedures: (1) Before starting engines; (2) Before takeoff; (3) Cruise; (4) Before landing; (5) After landing; (6) Stopping engines.

(c) Each emergency cockpit checklist required by paragraph (a)(2) of this section must contain the following procedures, as appropriate:

(1) Emergency operation of fuel, hydraulic, electrical, and mechanical systems.

(2) Emergency operation of instruments and controls.

(3) Engine inoperative procedures.

(4) Any other emergency procedures necessary for safety.

§ 135.85 Carriage of persons without compliance with the passenger-carrying provisions of this part.

The following persons may be carried aboard an aircraft without complying with the passenger-carrying requirements of this part:

(a) A crewmember or other employee of the certificate holder.

(b) A person necessary for the safe handling of animals on the aircraft.

(c) A person necessary for the safe handling of hazardous materials (as defined in Subchapter C of Title 49 CFR).

(d) A person performing duty as a security or honor guard accompanying a shipment made by or under the authority of the U.S. Government.

(e) A military courier or a military route supervisor carried by a military cargo contract air carrier or commercial operator in operations under a military cargo contract, if that carriage is specifically authorized by the appropriate military service.

(f) An authorized representative of the Administrator conducting an en route inspection.

(g) A person, authorized by the Administrator, who is performing a duty connected with a cargo operation of the certificate holder.

§ 135.87 Carriage of cargo including carry-on baggage.

No person may carry cargo, including carry-on baggage, in or on any aircraft unless—

(a) It is carried in an approved cargo rack, bin, or compartment installed in or on the aircraft;

(b) It is secured by an approved means; or

(c) It is carried in accordance with each of the following:

(1) For cargo, it is properly secured by a safety belt or other tie-down having enough strength to eliminate the possibility of shifting under all normally anticipated flight and ground conditions, or for carry-on baggage, it is restrained so as to prevent its movement during air turbulence.

(2) It is packaged or covered to avoid possible injury to occupants.

(3) It does not impose any load on seats or on the floor structure that exceeds the load limitation for those components.

(4) It is not located in a position that obstructs the access to, or use of, any required emergency or regular exit, or the use of the aisle between the crew and the passenger compartment, or located in a position that obscures any passenger's view of the "seat belt" sign, "no smoking" sign, or any required exit sign, unless an auxiliary sign or other approved means for proper notification of the passengers is provided.

(5) It is not carried directly above seated occupants.

(6) It is stowed in compliance with this section for takeoff and landing.

(7) For cargo only operations, paragraph (c)(4) of this section does not apply if the cargo is loaded so that at least one emergency or regular exit is available to provide all occupants of the aircraft a means of unobstructed exit from the aircraft if an emergency occurs.

(d) Each passenger seat under which baggage is stowed shall be fitted with a means to prevent articles of baggage stowed under it from sliding under crash impacts severe enough to induce the ultimate inertia forces specified in the emergency landing condition regulations under which the aircraft was type certificated.

(e) When cargo is carried in cargo compartments that are designed to require the physical entry of a crewmember to extinguish any fire that may occur during flight, the cargo must be loaded so as to allow a crewmember to effectively reach all parts of the compartment with the contents of a hand fire extinguisher.

§ 135.89 Pilot requirements: Use of oxygen.

(a) *Unpressurized aircraft.* Each pilot of an unpressurized aircraft shall use oxygen continuously when flying—

(1) At altitudes above 10,000 feet through 12,000 feet MSL for that part of the flight at those altitudes that is of more than 30 minutes duration; and

(2) Above 12,000 feet MSL.

(b) *Pressurized aircraft.*

(1) Whenever a pressurized aircraft is operated with the cabin pressure altitude more than 10,000 feet MSL, each pilot shall comply with paragraph (a) of this section.

(2) Whenever a pressurized aircraft is operated at altitudes above 25,000 feet through 35,000 feet MSL, unless each pilot has an approved quick-donning type oxygen mask—

(i) At least one pilot at the controls shall wear, secured and sealed, an oxygen mask that either supplies oxygen at all times or automatically supplies oxygen whenever the cabin pressure altitude exceeds 12,000 feet MSL; and

(ii) During that flight, each other pilot on flight deck duty shall have an oxygen mask, connected to an oxygen supply, located so as to allow immediate placing of the mask on the pilot's face sealed and secured for use.

(3) Whenever a pressurized aircraft is operated at altitudes above 35,000 feet MSL, at least one pilot at the controls shall wear, secured and sealed, an oxygen mask required by paragraph (2)(i) of this paragraph.

(4) If one pilot leaves a pilot duty station of an aircraft when operating at altitudes above 25,000 feet MSL, the remaining pilot at the controls shall put on and use an approved oxygen mask until the other pilot returns to the pilot duty station of the aircraft.

§ 135.91 Oxygen for medical use by passengers.

(a) Except as provided in paragraphs (d) and (e) of this section, no certificate holder may allow the carriage or operation of equipment for the storage, generation or dispensing of medical oxygen unless the unit to be carried is constructed so that all valves, fittings, and gauges are protected from damage during that carriage or operation and unless the following conditions are met—

(1) The equipment must be—

(i) Of an approved type or in conformity with the manufacturing, packaging, marking, labeling, and maintenance requirements of Title 49 CFR Parts 171, 172, and 173, except § 173.24(a)(1);

(ii) When owned by the certificate holder, maintained under the certificate holder's approved maintenance program;

(iii) Free of flammable contaminants on all exterior surfaces; and

(iv) Appropriately secured.

(2) When the oxygen is stored in the form of a liquid, the equipment must have been under the certificate holder's approved maintenance program since its purchase new or since the storage container was last purged.

(3) When the oxygen is stored in the form of a compressed gas as defined in Title 49 CFR § 173.300(a)—

(i) When owned by the certificate holder, it must be maintained under its approved maintenance program; and

(ii) The pressure in any oxygen cylinder must not exceed the rated cylinder pressure.

(4) The pilot in command must be advised when the equipment is on board, and when it is intended to be used.

(5) The equipment must be stowed, and each person using the equipment must be seated, so as not to restrict access to or use of any required emergency or regular exit, or of the aisle in the passenger compartment.

(b) No person may smoke and no certificate holder may allow any person to smoke within 10 feet of oxygen storage and dispensing equipment carried under paragraph (a) of this section.

(c) No certificate holder may allow any person other than a person trained in the use of medical oxygen equipment to connect or disconnect oxygen bottles or any other ancillary component while any passenger is aboard the aircraft.

(d) Paragraph (a)(1)(i) of this section does not apply when that equipment is furnished by a professional or medical emergency service for use on board an aircraft in a medical emergency when no other practical means of transportation (including any other properly equipped certificate holder) is reasonably available and the person carried under the medical emergency is accompanied by a person trained in the use of medical oxygen.

(e) Each certificate holder who, under the authority of paragraph (d) of this section, deviates from paragraph (a)(1)(i) of this section under a medical emergency shall, within 10 days, excluding Saturdays, Sundays, and Federal holidays, after the deviation, send to the FAA Flight Standards District Office charged with the overall inspection of the certificate holder a complete report of the operation involved, including a description of the deviation and the reasons for it.

§ 135.93 Autopilot: minimum altitudes for use.

(a) Except as provided in paragraphs (b), (c), and (d) of this section, no person may use an autopilot at an altitude above the terrain which is less than 500 feet or less than twice the maximum altitude loss specified in the approved Aircraft Flight Manual or equivalent for a malfunction of the autopilot, whichever is higher.

(b) When using an instrument approach facility other than ILS, no person may use an autopilot at an altitude above the terrain that is less than 50 feet below the approved minimum descent altitude for that procedure, or less than twice the maximum loss specified in the approved Airplane Flight Manual or equivalent for a malfunction of the autopilot under approach conditions, whichever is higher.

(c) For ILS approaches, when reported weather conditions are less than the basic weather conditions in § 91.105 of this chapter, no person may use an autopilot with an approach coupler at an altitude above the terrain that is less than 50 feet above the terrain, or the maximum altitude loss specified in the approved Airplane Flight Manual or equivalent for the malfunction of the autopilot with approach coupler, whichever is higher.

(d) Without regard to paragraphs (a), (b), or (c) of this section, the Administrator may issue operations specifications to allow the use, to touchdown, of an approved flight control guidance system with automatic capability, if—

(1) The system does not contain any altitude loss (above zero) specified in the approved Aircraft Flight Manual or equivalent for malfunction of the autopilot with approach coupler; and

(2) The Administrator finds that the use of the system to touchdown will not otherwise adversely affect the safety standards of this section.

(e) This section does not apply to operations conducted in rotorcraft.

§ 135.95 Airmen: limitations on use of services.

No certificate holder may use the services of any person as an airman unless the person performing those services—

(a) Holds an appropriate and current airman certificate; and

(b) Is qualified, under this chapter, for the operation for which the person is to be used.

§ 135.97 Aircraft and facilities for recent flight experience.

Each certificate holder shall provide aircraft and facilities to enable each of its pilots to maintain and demonstrate the pilot's ability to conduct all operations for which the pilot is authorized.

§ 135.99 Composition of flight crew.

(a) No certificate holder may operate an aircraft with less than the minimum flight crew specified in the aircraft operating limitations or the Aircraft Flight Manual for that aircraft and required by this part for the kind of operation being conducted.

(b) No certificate holder may operate an aircraft without a second in command if that aircraft has a passenger seating configuration, excluding any pilot seat, of ten seats or more.

§ 135.101 Second in command required in IFR conditions.

Except as provided in §§ 135.103 and 135.105, no person may operate an aircraft carrying passengers in IFR conditions, unless there is a second in command in the aircraft.

§ 135.103 Exception to second in command requirement: IFR operations.

The pilot in command of an aircraft carrying passengers may conduct IFR operations without a second in command under the following conditions:

(a) A takeoff may be conducted under IFR conditions if the weather reports or forecasts, or any combination of them, indicate that the weather along the planned route of flight allows flight under VFR within 15 minutes flying time, at normal cruise speed, from the takeoff airport.

(b) En route IFR may be conducted if unforecast weather conditions below the VFR minimums of this chapter are encountered on a flight that was planned to be conducted under VFR.

(c) An IFR approach may be conducted if, upon arrival at the destination airport, unforecast weather conditions do not allow an approach to be completed under VFR.

(d) When IFR operations are conducted under this section:

(1) The aircraft must be properly equipped for IFR operations under this part.

(2) The pilot must be authorized to conduct IFR operations under this part.

(3) The flight must be conducted in accordance with an ATC IFR clearance.

IFR operations without a second in command may not be conducted under this section in an aircraft requiring a second in command under § 135.99.

§ 135.105 Exception to second in command requirement: approval for use of autopilot system.

(a) Except as provided in §§ 135.99 and 135.111, unless two pilots are required by this chapter for operations under VFR, a person may operate an aircraft without a second in command if it is equipped with an operative approved autopilot system and the use of that system is authorized by appropriate operations specifications.

(b) The certificate holder may apply for an amendment of its operations

specifications to authorize the use of an autopilot system in place of a second in command.

(c) The Administrator issues an amendment to the operations specifications authorizing the use of an autopilot system, in place of a second in command, if—

(1) The autopilot is capable of operating the aircraft controls to maintain flight and maneuver it about the three axes; and

(2) The certificate holder shows, to the satisfaction of the Administrator, that operations using the autopilot system can be conducted safely and in compliance with this part.

The amendment contains any conditions or limitations on the use of the autopilot system that the Administrator determines are needed in the interest of safety.

§ 135.107 Flight attendant crewmember requirement.

No certificate holder may operate an aircraft that has a passenger seating configuration, excluding any pilot seat, of more than 19 unless there is a flight attendant crewmember on board the aircraft.

§ 135.109 Pilot in command or second in command: designation required.

(a) Each certificate holder shall designate a—

(1) Pilot in command for each flight; and

(2) Second in command for each flight requiring two pilots.

(b) The pilot in command, as designated by the certificate holder, shall remain the pilot in command at all times during that flight.

§ 135.111 Second in command required in Category II operations.

No person may operate an aircraft in a Category II operation unless there is a second in command of the aircraft.

§ 135.113 Passenger occupancy of pilot seat.

No certificate holder may operate an aircraft type certificated after October 15, 1971, that has a passenger seating configuration, excluding any pilot seat, of more than eight seats if any person other than the pilot in command, a second in command, a company check airman, or an authorized representative of the Administrator, the National Transportation Safety Board, or the United States Postal Service occupies a pilot seat.

§ 135.115 Manipulation of controls.

No pilot in command may allow any person to manipulate the flight controls of an aircraft during flight conducted under this part, nor may any person manipulate the controls during such flight unless that person is—

(a) A pilot employed by the certificate holder and qualified in the aircraft; or

(b) An authorized safety representative of the Administrator who has the permission of the pilot in command, is qualified in the aircraft, and is checking flight operations.

§ 135.117 Briefing of passengers before flight.

(a) Before each takeoff each pilot in command of an aircraft carrying passengers shall ensure that all passengers have been orally briefed on—

(1) Smoking;

(2) Use of seat belts;

(3) The placement of seat backs in an upright position before takeoff and landing;

(4) Location and means for opening the passenger entry door and emergency exits;

(5) Location of survival equipment;

(6) If the flight involves extended overwater operation, ditching procedures and the use of required flotation equipment;

(7) If the flight involves operations above 12,000 feet MSL, the normal and emergency use of oxygen; and

(8) Location and operation of fire extinguishers.

(b) Before each takeoff the pilot in command shall ensure that each person who may need the assistance of another person to move expeditiously to an exit if an emergency occurs and that person's attendant, if any, has received a briefing as to the procedures to be followed if an evacuation occurs. This paragraph does not apply to a person who has been given a briefing before a previous leg of a flight in the same aircraft.

(c) The oral briefing required by paragraph (a) of this section shall be given by the pilot in command or a member of the crew. It shall be supplemented by printed cards for the use of each passenger containing—

(1) A diagram of, and method of operating the emergency exits; and

(2) Other instructions necessary for the use of emergency equipment on board the aircraft.

Each card used under this paragraph must be carried in the aircraft in locations convenient for the use of each passenger and must contain information that is appropriate to the aircraft on which it is to be used.

§ 135.119 Prohibition against carriage of weapons.

No person may, while on board an aircraft being operated by a certificate holder, carry on or about that person a deadly or dangerous weapon, either concealed or unconcealed. This section does not apply to—

(a) Officials or employees of a municipality or a State, or of the United States, who are authorized to carry arms; or

(b) Crewmembers and other persons authorized by the certificate holder to carry arms.

§ 135.121 Alcoholic beverages.

(a) No person may drink any alcoholic beverage aboard an aircraft unless the certificate holder operating the aircraft has served that beverage.

(b) No certificate holder may serve any alcoholic beverage to any person aboard its aircraft if that person appears to be intoxicated.

(c) No certificate holder may allow any person to board any of its aircraft if that person appears to be intoxicated.

§ 135.123 Emergency and emergency evacuation duties.

(a) Each certificate holder shall assign to each required crewmember for each type of aircraft as appropriate, the necessary functions to be performed in an emergency or in a situation requiring emergency evacuation. The certificate holder shall ensure that those functions can be practicably accomplished, and will meet any reasonably anticipated emergency including incapacitation of individual crewmembers or their inability to reach the passenger cabin because of shifting cargo in combination cargo-passenger aircraft.

(b) The certificate holder shall describe in the manual required under § 135.21 the functions of each category of required crewmembers assigned under paragraph (a) of this section.

Subpart C—Aircraft and Equipment

§ 135.141 Applicability.

This subpart prescribes aircraft and equipment requirements for operations under this part. The requirements of this subpart are in addition to the aircraft and equipment requirements of Part 91 of this chapter. However, this part does not require the duplication of any equipment required by this chapter.

§ 135.143 General requirements.

(a) No person may operate an aircraft under this part unless that aircraft and its equipment meet the applicable regulations of this chapter.

(b) Except as provided in § 135.179, no person may operate an aircraft under this part unless the required instruments and equipment in it have been approved and are in an operable condition.

(c) ATC transponder equipment must meet the performance and environmental requirements of any Class of Technical Standard Order (TSO) C74b, or Class 1A or Class 1B of TSO-74c, as appropriate, except that the

Administrator may approve the use of TSO-C74 or TSO-C74a equipment if the applicant submits data showing that the equipment meets the minimum performance standards of Class 1A or Class 1B of TSO-C74c, and the environmental conditions of the TSO under which it was manufactured.

§ 135.145 Aircraft proving tests.

(a) No certificate holder may operate a turbojet airplane, or an aircraft for which two pilots are required by this chapter for operations under VFR, if it has not previously proved that aircraft or an aircraft of the same make and similar design in any operation under this part unless, in addition to the aircraft certification tests, at least 25 hours of proving tests acceptable to the Administrator have been flown by that certificate holder including—

(1) Five hours of night time, if night flights are to be authorized;

(2) Five instrument approach procedures under simulated or actual instrument weather conditions, if IFR flights are to be authorized; and

(3) Entry into a representative number of en route airports as determined by the Administrator.

(b) No certificate holder may carry passengers in an aircraft during proving tests, except those needed to make the tests and those designated by the Administrator to observe the tests. However, pilot flight training may be conducted during the proving tests.

(c) For the purposes of paragraph (a) of this section, an aircraft is not considered to be of similar design if an alteration includes—

(1) The installation of powerplants other than those of a type similar to those with which it is certificated; or

(2) Alterations to the aircraft or its components that materially affect flight characteristics.

(d) The Administrator may authorize deviations from this section if the Administrator finds that special circumstances make full compliance with this section unnecessary.

§ 135.147 Dual controls required.

No person may operate an aircraft in operations requiring two pilots unless it is equipped with functioning dual controls. However, if the aircraft type certification operating limitations do not require two pilots, a throwover control wheel may be used in place of two control wheels.

§ 135.149 Equipment requirements: general.

No person may operate an aircraft unless it is equipped with—

(a) A sensitive altimeter that is adjustable for barometric pressure;

(b) Heating or deicing equipment for each carburetor or, for a pressure carburetor, an alternate air source;

(c) For turbojet airplanes, in addition to two gyroscopic bank-and-pitch indicators (artificial horizons) for use at the pilot stations, a third indicator that—

(1) Is powered from a source independent of the aircraft's electrical generating system;

(2) Continues reliable operation for at least 30 minutes after total failure of the aircraft's electrical generating system;

(3) Operates independently of any other attitude indicating system;

(4) Is operative without selection after total failure of the aircraft's electrical generating system;

(5) Is located on the instrument panel in a position that will make it plainly visible to, and useable by, any pilot at the pilot's station; and

(6) Is appropriately lighted during all phases of operation;

(d) For aircraft having a passenger seating configuration, excluding any pilot seat, of more than 19, a public address system and a crewmember interphone system, approved under § 21.205 of this chapter, which meet §§ 121.318 and 121.319, respectively, of this chapter; and

(e) For turbine powered aircraft, any other equipment as the Administrator may require.

§ 135.151 Cockpit voice recorders.

(a) No person may operate a turbojet airplane having a passenger seating configuration, excluding any pilot seat, of 10 seats or more, unless it is equipped with an approved cockpit voice recorder that—

(1) Is installed in compliance with Part 25 of this chapter;

(2) Is installed and operated continuously from the use of the check list before the flight to completion of the final check at the end of the flight; and

(3) Has erasure features that may be used so that any time during the operation of the recorder, information recorded more than 30 minutes earlier may be erased or otherwise obliterated.

(b) In the event of an accident, or occurrence requiring immediate notification of the National Transportation Safety Board which results in termination of the flight, the certificate holder shall keep the recorded information for at least 60 days or, if requested by the Administrator or the Board, for a longer period. Information obtained from the record may be used to assist in determining the cause of accidents or occurrences in connection with investigations. The Administrator does not use the record in any civil penalty or certificate action.

§ 135.153 Ground proximity warning system.

No person may operate a turbojet airplane having a passenger seating configuration, excluding any pilot seat, of 10 seats or more, unless it is equipped with—

(a) A ground proximity warning system that meets § 37.201 of this chapter; or

(b) A system that conveys warnings of excessive closure rates with the terrain and any deviations below glide slope by visual and audible means. This system must—

(1) Be approved by the Director, Flight Standards Service; and

(2) Have a means of alerting the pilot when a malfunction occurs in the system.

(c) For the system required by this section, the Airplane Flight Manual shall contain—

(1) Appropriate procedures for—

(i) The use of the equipment;

(ii) Proper flight crew action with respect to the equipment; and

(iii) Deactivation for planned abnormal and emergency conditions; and

(2) An outline of all input sources that must be operating.

(d) No person may deactivate a system required by this section except under procedures in the Airplane Flight Manual.

(e) Whenever a system required by this section is deactivated, an entry shall be made in the airplane maintenance record that includes the date and time of deactivation.

(f) For a system required by paragraph (b) of this section, procedures acceptable to the FAA Flight Standards District Office charged with the overall inspection of the certificate holder shall be established by the certificate holder to ensure that the performance of the system can be appropriately monitored.

§ 135.155 Fire extinguishers: passenger-carrying aircraft.

No person may operate an aircraft carrying passengers unless it is equipped with hand fire extinguishers of an approved type for use in crew and passenger compartments as follows—

(a) The type and quantity of extinguishing agent must be suitable for the kinds of fires likely to occur;

(b) At least one hand fire extinguisher must be provided and conveniently located on the flight deck for use by the flight crew; and

(c) At least one hand fire extinguisher must be conveniently located in the passenger compartment of each aircraft having a passenger seating configuration, excluding any pilot seat, of at least 10 seats but less than 31 seats.

§ 135.157 Oxygen equipment requirements.

(a) *Unpressurized aircraft.* No person may operate an unpressurized aircraft at altitudes prescribed in this section unless it is equipped with enough oxygen dispensers and oxygen to supply the pilots under § 135.89(a) and to supply, when flying—

(1) At altitudes above 10,000 feet through 15,000 feet MSL, oxygen to at least 10 percent of the occupants of the aircraft, other than the pilots, for that part of the flight at those altitudes that is of more than 30 minutes duration; and

(2) Above 15,000 feet MSL, oxygen to each occupant of the aircraft other than the pilots.

(b) *Pressurized aircraft.* No person may operate a pressurized aircraft—

(1) At altitudes above 25,000 feet MSL, unless at least a 10-minute supply of supplemental oxygen is available for each occupant of the aircraft, other than the pilots, for use when a descent is necessary due to loss of cabin pressurization; and

(2) Unless it is equipped with enough oxygen dispensers and oxygen to comply with paragraph (a) of this section whenever the cabin pressure altitude exceeds 10,000 feet MSL and, if the cabin pressurization fails, to comply with § 135.89 (a) or to provide a 2-hour supply for each pilot, whichever is greater, and to supply when flying—

(i) At altitudes above 10,000 feet through 15,000 feet MSL, oxygen to at least 10 percent of the occupants of the aircraft, other than the pilots, for that part of the flight at those altitudes that is of more than 30 minutes duration; and

(ii) Above 15,000 feet MSL, oxygen to each occupant of the aircraft, other than the pilots, for one hour unless, at all times during flight above that altitude, the aircraft can safely descend to 15,000 feet MSL within four minutes, in which case only a 30-minute supply is required.

(c) The equipment required by this section must have a means—

(1) To enable the pilots to readily determine, in flight, the amount of oxygen available in each source of supply and whether the oxygen is being delivered to the dispensing units; or

(2) In the case of individual dispensing units, to enable each user to make those determinations with respect to that person's oxygen supply and delivery; and

(3) To allow the pilots to use undiluted oxygen at their discretion at altitudes above 25,000 feet MSL.

§ 135.159 Equipment requirements: carrying passengers under VFR at night or under VFR over-the-top conditions.

No person may operate an aircraft carrying passengers under VFR at night or under VFR over-the-top, unless it is equipped with—

(a) A gyroscopic rate-of-turn indicator combined with a slip-skid indicator;

(b) A gyroscopic bank-and-pitch indicator;

(c) A gyroscopic direction indicator;

(d) A generator or generators able to supply all probable combinations of continuous inflight electrical loads for required equipment and for recharging the battery; and

(e) For night flights—

(1) An anticollision light system;

(2) Instrument lights to make all instruments, switches, and gauges easily readable, the direct rays of which are shielded from the pilot's eyes; and

(3) A flashlight having at least two size "D" cells or equivalent.

(f) For the purposes of paragraph (d) of this section, a continuous inflight electrical load includes one that draws current continuously during flight, such as radio equipment, electrically driven instruments and lights, but does not include occasional intermittent loads.

§ 135.161 Radio and navigational equipment: carrying passengers under VFR at night or under VFR over-the-top.

(a) No person may operate an aircraft carrying passengers under VFR at night, or under VFR over-the-top, unless it has two-way radio communications equipment able, at least in flight, to transmit to, and receive from, ground facilities 25 miles away.

(b) No person may operate an aircraft carrying passengers under VFR over-the-top unless it has radio navigational equipment able to receive radio signals from the ground facilities to be used.

(c) No person may operate an airplane carrying passengers under VFR at night unless it has radio navigational equipment able to receive radio signals from the ground facilities to be used.

§ 135.163 Equipment requirements: aircraft carrying passengers under IFR.

No person may operate an aircraft under IFR, carrying passengers, unless it has—

(a) A vertical speed indicator;

(b) A free-air temperature indicator;

(c) A heated pitot tube for each airspeed indicator;

(d) A power failure warning device or vacuum indicator to show the power available for gyroscopic instruments from each power source;

(e) An alternate source of static pressure for the altimeter and the airspeed and vertical speed indicators;

(f) For a single-engine aircraft, a generator or generators able to supply all probable combinations of continuous inflight electrical loads for required equipment and for recharging the battery;

(g) For multiengine aircraft, at least two generators each of which is on a separate engine, of which any combination of one-half of the total number are rated sufficiently to supply the electrical loads of all required instruments and equipment necessary for safe emergency operation of the aircraft except that for multiengine helicopters, the two required generators may be mounted on the main rotor drive train; and

(h) Two independent sources of energy (with means of selecting either), of which at least one is an engine-driven pump or generator, each of which is able to drive all gyroscopic instruments and installed so that failure of one instrument or source does not interfere with the energy supply to the remaining instruments or the other energy source, unless, for single-engine aircraft, the rate-of-turn indicator has a source of energy separate from the bank and pitch and direction indicators. For the purpose of this paragraph, for multiengine aircraft, each engine-driven source of energy must be on a different engine.

(i) For the purpose of paragraph (f) of this section, a continuous inflight electrical load includes one that draws current continuously during flight, such as radio equipment, electrically driven instruments, and lights, but does not include occasional intermittent loads.

§ 135.165 Radio and navigational equipment: extended overwater or IFR operations.

(a) No person may operate a turbojet airplane having a passenger seating configuration, excluding any pilot seat, of 10 seats or more, or a multiengine airplane carrying passengers as a "Commuter Air Carrier" as defined in Part 298 of this title, under IFR or in extended overwater operations unless it has at least the following radio communication and navigational equipment appropriate to the facilities to be used which are capable of transmitting to, and receiving from, at any place on the route to be flown, at least one ground facility:

(1) Two transmitters, (2) two microphones, (3) two headsets or one headset and one speaker, (4) a marker beacon receiver, (5) two independent receivers for navigation, and (6) two independent receivers for communications.

(b) No person may operate an aircraft other than that specified in paragraph (a) of this section, under IFR or in extended overwater operations unless it has at least the following radio communication and navigational equipment appropriate to the facilities to be used and which are capable of transmitting to, and receiving from, at any place on the route, at least one ground facility:

(1) A transmitter, (2) two microphones, (3) two headsets or one headset and one speaker, (4) a marker beacon receiver, (5) two independent receivers for navigation, (6) two independent receivers for communications, and (7) for extended overwater operations only, an additional transmitter.

(c) For the purpose of paragraphs (a)(5), (a)(6), (b)(5), and (b)(6) of this section, a receiver is independent if the function of any part of it does not depend on the functioning of any part of another receiver. However, a receiver that can receive both communications and navigational signals may be used in place of a separate communications receiver and a separate navigational signal receiver.

§ 135.167 Emergency equipment: extended overwater operations.

(a) No person may operate an aircraft in extended overwater operations unless it carries, installed in conspicuously marked locations easily accessible to the occupants if a ditching occurs, the following equipment:

(1) An approved life preserver equipped with an approved survivor locator light, or an approved flotation means, for each occupant of the aircraft. The life preserver or other flotation means must be easily accessible to each seated occupant. If a flotation means other than a life preserver is used, it must be readily removable from the aircraft.

(2) Enough life rafts (with proper buoyancy) to carry all occupants of the aircraft, and at least the following equipment for each raft clearly marked for easy identification—

(i) One canopy (for sail, sunshade, or rain catcher);

(ii) One radar reflector (or similar device);

(iii) One life raft repair kit;

(iv) One bailing bucket;

(v) One signaling mirror;

(vi) One police whistle;

(vii) One raft knife;

(viii) One CO_2 bottle for emergency inflation;

(ix) One inflation pump;

(x) Two oars;

(xi) One 75-foot retaining line;

(xii) One magnetic compass;

(xiii) One dye marker;

(xiv) One flashlight having at least two size "D" cells or equivalent;

(xv) At least one approved pyrotechnic signaling device;

(xvi) A two-day supply of emergency food rations supplying at least 1,000 calories a day for each person;

(xvii) One sea water desalting kit for each two persons the raft is rated to carry, or two pints of water for each person the raft is rated to carry;

(xviii) One fishing kit; and

(xix) One book on survival appropriate for the area in which the aircraft is operated.

(b) No person may operate an aircraft in extended overwater operations unless there is attached to one of the life rafts required by paragraph (a) of this section, a survival type emergency locator transmitter that meets § 37.200 of this chapter. Batteries used in this transmitter must be replaced (or recharged, if the battery is rechargeable) when the transmitter has been in use for more than 1 cumulative hour, and also when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge), as established by the transmitter manufacturer under § 37.200(g)(2) of this chapter, has expired. The new expiration date for the replacement or recharged battery must be legibly marked on the outside of the transmitter. The battery useful life or useful life of charge requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

§ 135.169 Additional airworthiness requirements.

(a) No person may operate a large airplane unless it meets the additional airworthiness requirements of §§ 121.213 through 121.283 and 121.307 and 121.312 of this chapter.

(b) No person may operate a reciprocating engine or turbopropeller-powered small airplane that has a passenger seating configuration, excluding any pilot seat, of 10 seats or more unless it is type certificated—

(1) In the transport category;

(2) Before July 1, 1970, in the normal category and meets special conditions issued by the Administrator for airplanes intended for use in operations under this part;

(3) Before July 19, 1970, in the normal category and meets the additional airworthiness standards in Special Federal Aviation Regulation No. 23; or

(4) In the normal category and meets the additional airworthiness standards in Appendix A.

(c) No person may operate a small airplane with a passenger seating configuration, excluding any pilot seat, of 10 seats or more, with a seating configuration greater than the maximum seating configuration used in that type airplane in operations under this part before August 19, 1977. This paragraph does not apply to—

(1) An airplane that is type certificated in the transport category; or

(2) An airplane that complies with Appendix A if its passenger seating configuration, excluding any pilot seat, is not more than 19.

§ 135.171 Shoulder harness installation at flight crewmember stations.

(a) No person may operate a turbojet aircraft or an aircraft having a passenger seating configuration, excluding any pilot seat, of 10 seats or more unless it is equipped with an approved shoulder harness installed for each flight crewmember station.

(b) Each flight crewmember occupying a station equipped with a shoulder harness must fasten the shoulder harness during takeoff and landing, except that the shoulder harness may be unfastened if the crewmember cannot perform the required duties with the shoulder harness fastened.

§ 135.173 Airborne thunderstorm detection equipment requirements.

(a) No person may operate a multiengine small aircraft that has a passenger seating configuration, excluding any pilot seat, of 10 seats or more in passenger-carrying operations unless approved thunderstorm detection equipment is installed in the aircraft.

(b) No person may begin a flight under IFR or night VFR conditions when current weather reports indicate that thunderstorms or other potentially hazardous weather conditions that can be detected with airborne thunderstorm detection equipment, required by paragraph (a) of this section, may reasonably be expected along the route to be flown, unless the airborne thunderstorm detection equipment is in satisfactory operating condition.

(c) If the airborne thunderstorm detection equipment becomes inoperative en route, the aircraft must be operated under the instructions and procedures specified for that event in the manual required by § 135.21.

(d) This section does not apply to aircraft used solely within the State of Hawaii, within the State of Alaska, within that part of Canada west of longitude 130 degrees W, between latitude 70 degrees N, and latitude 53 degrees N, or during any training, test, or ferry flight.

(e) Without regard to any other provision of this part, an alternate electrical power supply is not required for airborne thunderstorm detection equipment.

§ 135.175 Airborne weather radar equipment requirements.

(a) No person may operate a large, transport category aircraft in passenger-carrying operations unless approved airborne weather radar equipment is installed in the aircraft.

(b) No person may begin a flight under IFR or night VFR conditions when current weather reports indicate that thunderstorms, or other potentially hazardous weather conditions that can be detected with airborne weather radar equipment, may reasonably be expected along the route to be flown, unless the airborne weather radar equipment required by paragraph (a) of this section is in satisfactory operating condition.

(c) If the airborne weather radar equipment becomes inoperative en route, the aircraft must be operated under the instructions and procedures specified for that event in the manual required by § 135.21.

(d) This section does not apply to aircraft used solely within the State of Hawaii, within the State of Alaska, within that part of Canada west of longitude 130 degrees W, between latitude 70 degrees N, and latitude 53 degrees N, or during any training, test, or ferry flight.

(e) Without regard to any other provision of this part, an alternate electrical power supply is not required for airborne weather radar equipment.

§ 135.177 Emergency equipment requirements for aircraft having a passenger seating configuration of more than 19 passengers.

(a) No person may operate an aircraft having a passenger seating configuration, excluding any pilot seat, of more than 19 seats unless it is equipped with the following emergency equipment:

(1) One approved first aid kit for treatment of injuries likely to occur in flight or in a minor accident, which meets the following specifications and requirements:

(i) Each first aid kit must be dust and moisture proof, and contain only materials that either meet Federal Specifications GGK-319a, as revised, or as approved by the Administrator.

(ii) Required first aid kits must be readily accessible to the cabin flight attendants.

(iii) At time of takeoff, each first aid kit must contain at least the following or other contents approved by the Administrator:

Contents:	Quantity
Adhesive bandage compressors, 1 in	16
Antiseptic swabs	20
Ammonia inhalents	10
Bandage compressors, 4 in	8
Triangular bandage compressors, 40 in	5
Burn compound, ⅛ oz or an equivalent of other burn remedy	6
Arm splint, noninflatable	1
Leg splint, noninflatable	1
Roller bandage, 4 in	4
Adhesive tape, 1-in standard roll	2
Bandage scissors	1

(2) A crash axe carried so as to be accessible to the crew but inaccessible to passengers during normal operations.

(3) Signs that are visible to all occupants to notify them when smoking is prohibited and when safety belts should be fastened. The signs must be so constructed that they can be turned on and off by a crewmember. They must be turned on for each takeoff and each landing and when otherwise considered to be necessary by the pilot in command.

(4) For airplanes, has the additional emergency equipment specified in § 121.310 of this chapter.

(b) Each item of equipment must be inspected regularly under inspection periods established in the operations specifications to ensure its condition for continued serviceability and immediate readiness to perform its intended emergency purposes.

§ 135.179 Inoperable instruments and equipment for multiengine aircraft.

(a) No person may take off a multiengine aircraft unless the following instruments and equipment are in an operable condition:

(1) Instruments and equipment that are either specifically or otherwise required by the airworthiness requirements under which the aircraft is type certificated and which are essential for safe operations under all operating conditions.

(2) Instruments and equipment required by an airworthiness directive to be in operable condition unless the airworthiness directive provides otherwise.

(b) No person may take off any multiengine aircraft with inoperable instruments or equipment installed, other than those described in paragraph (a) of this section, unless the following conditions are met:

(1) An approved Minimum Equipment List exists for the aircraft type.

(2) The aircraft has within it a letter of authorization, issued by the FAA Flight Standards District Office having certification responsibility for the certificate holder, authorizing operation of the aircraft under the Minimum Equipment List. The letter of authorization may be obtained by written request of the certificate holder. The Minimum Equipment List and the letter of authorization constitute a supplemental type certificate for the aircraft.

(3) The approved Minimum Equipment List must provide for the operation of the aircraft with the instruments and equipment in an inoperable condition.

(4) The aircraft records available to the pilot must include an entry describing the inoperable instruments and equipment.

(5) The aircraft is operated under all applicable conditions and limitations contained in the Minimum Equipment List and the letter authorizing the use of the list.

(c) Without regard to the requirements of paragraph (a)(1) of this section, an aircraft with inoperable instruments or equipment may be operated under a special flight permit under §§ 21.197 and 21.199 of this chapter.

§ 135.181 Performance requirements: aircraft operated over-the-top or in IFR conditions.

(a) Except as provided in paragraphs (b) and (c) of this section, no person may—

(1) Operate a single-engine aircraft carrying passengers over-the-top or in IFR conditions; or

(2) Operate a multiengine aircraft carrying passengers over-the-top or in IFR conditions at a weight that will not allow it to climb, with the critical engine inoperative, at least 50 feet a minute when operating at the MEAs of the route to be flown or 5,000 feet MSL, whichever is higher.

(b) Without regard to paragraph (a) of this section—

(1) If the latest weather reports or forecasts, or any combination of them, indicate that the weather along the planned route (including takeoff and landing) allows flight under VFR under the ceiling (if a ceiling exists) and that the weather is forecast to remain so until at least 1 hour after the estimated time of arrival at the destination, a person may operate an aircraft over-the-top; or

(2) If the latest weather reports or forecasts, or any combination of them, indicate that the weather along the planned route allows flight under VFR under the ceiling (if a ceiling exists) beginning at a point no more than 15 minutes flying time at normal cruise speed from the departure airport, a person may—

(i) Take off from the departure airport in IFR conditions and fly in IFR conditions to a point no more than 15 minutes flying time at normal cruise speed from that airport;

(ii) Operate an aircraft in IFR conditions if unforecast weather conditions are encountered while en route on a flight planned to be conducted under VFR; and

(iii) Make an IFR approach at the destination airport if unforecast weather conditions are encountered at the airport that do not allow an approach to be completed under VFR.

(c) Without regard to paragraph (a) of this section, a person may operate

an aircraft over-the-top under conditions allowing—

(1) For multiengine aircraft, descent or continuance of the flight under VFR if its critical engine fails; or

(2) For single-engine aircraft, descent under VFR if its engine fails.

§ 135.183 Performance requirements: land aircraft operated over water.

No person may operate a land aircraft carrying passengers over water unless—

(a) It is operated at an altitude that allows it to reach land in the case of engine failure;

(b) It is necessary for takeoff or landing;

(c) It is a multiengine aircraft operated at a weight that will allow it to climb, with the critical engine inoperative, at least 50 feet a minute, at an altitude of 1,000 feet above the surface; or

(d) It is a helicopter equipped with helicopter flotation devices.

§ 135.185 Empty weight and center of gravity: currency requirement.

(a) No person may operate a multiengine aircraft unless the current *empty weight and center of gravity* are calculated from values established by actual weighing of the aircraft within the preceding 36 calendar *months.*

(b) Paragraph (a) of this section does not apply to—

(1) Aircraft issued an original airworthiness certificate within the preceding *36 calendar months; and*

(2) Aircraft operated under a weight and balance system approved in the operations specifications of the certificate holder.

Subpart D—VFR/IFR Operating Limitations and Weather Requirements

§ 135.201 Applicability.

This subpart prescribes the operating limitations for VFR/IFR flight operations and associated weather requirements for operations under this part.

§ 135.203 VFR: minimum altitudes.

Except when necessary for takeoff and landing, no person may operate under VFR—

(a) An airplane—

(1) During the day, below 500 feet above the surface or less than 500 feet horizontally from any obstacle; or

(2) At night, at an altitude less than 1,000 feet above the highest obstacle within a horizontal distance of 5 miles from the course intended to be flown or, in designated mountainous terrain, less than 2,000 feet above the highest obstacle within a horizontal distance of 5 miles from the course intended to be flown; or

(b) A helicopter over a congested area at an altitude less than 300 feet above the surface.

§ 135.205 VFR: visibility requirements.

(a) No person may operate an airplane under VFR in uncontrolled airspace when the ceiling is less than 1,000 feet unless flight visibility is at least 2 miles.

(b) No person may operate a helicopter under VFR in uncontrolled airspace at an altitude of 1,200 feet or less above the surface or in control zones unless the visibility is at least—

(1) During the day—½ mile; or

(2) At night—1 mile.

§ 135.207 VFR: helicopter surface reference requirements.

No person may operate a helicopter under VFR unless that person has visual surface reference or, at night, visual surface light reference, sufficient to safely control the helicopter.

§ 135.209 VFR: fuel supply.

(a) No person may begin a flight operation in an airplane under VFR unless, considering wind and forecast weather conditions, it has enough fuel to fly to the first point of intended landing and, assuming normal cruising fuel consumption—

(1) During the day, to fly after that for at least 30 minutes; or

(2) At night, to fly after that for at least 45 minutes.

(b) No person may begin a flight operation in a helicopter under VFR unless, considering wind and forecast weather conditions, it has enough fuel to fly to the first point of intended landing and, assuming normal cruising fuel consumption, to fly after that for at least 20 minutes.

§ 135.211 VFR: over-the-top carrying passengers: operating limitations.

Subject to any additional limitations in § 135.181, no person may operate an aircraft under VFR over-the-top carrying passengers, unless—

(a) Weather reports or forecasts, or any combination of them, indicate that the weather at the intended point of termination of over-the-top flight—

(1) Allows descent to beneath the ceiling under VFR and is forecast to remain so until at least 1 hour after the estimated time of arrival at that point; or

(2) Allows an IFR approach and landing with flight clear of the clouds until reaching the prescribed initial approach altitude over the final approach facility, unless the approach is made with the use of radar under § 91.116(f) of this chapter; or

(b) It is operated under conditions allowing—

(1) For multiengine aircraft, descent or continuation of the flight under VFR if its critical engine fails; or

(2) For single-engine aircraft, descent under VFR if its engine fails.

§ 135.213 Weather reports and forecasts.

(a) Whenever a person operating an aircraft under this part is required to use a weather report or forecast, that person shall use that of the U.S. National Weather Service, a source approved by the U.S. National Weather Service, or a source approved by the Administrator. However, for operations under VFR, the pilot in command may, if such a report is not available, use weather information based on that pilot's own observations or on those of other persons competent to supply appropriate observations.

(b) For the purposes of paragraph (a) of this section, weather observations made and furnished to pilots to conduct IFR operations at an airport must be taken at the airport where those IFR operations are conducted, unless the Administrator issues operations specifications allowing the use of weather observations taken at a location not at the airport where the IFR operations are conducted. The Administrator issues such operations specifications when, after investigation by the U.S. National Weather Service and the FAA Flight Standards District Office charged with the overall inspection of the certificate holder, it is found that the standards of safety for that operation would allow the deviation from this paragraph for a particular operation for which an ATCO operating certificate has been issued.

§ 135.215 IFR: operating limitations.

(a) Except as provided in paragraphs (b), (c) and (d) of this section, no person may operate an aircraft under IFR outside of controlled airspace or at any airport that does not have an approved standard instrument approach procedure.

(b) The Administrator may issue operations specifications to the certificate holder to allow it to operate under IFR over routes outside controlled airspace if—

(1) The certificate holder shows the Administrator that the flight crew is able to navigate, without visual reference to the ground, over an intended track without deviating more than 5 degrees or 5 miles, whichever is less, from that track; and

(2) The Administrator determines that the proposed operations can be conducted safely.

(c) A person may operate an aircraft under IFR outside of controlled airspace if the certificate holder has been approved for the operations and that operation is necessary to—

(1) Conduct an instrument approach to an airport for which there is in use a current approved standard or special instrument approach procedure; or

(2) Climb into controlled airspace during an approved missed approach procedure; or

(3) Make an IFR departure from an airport having an approved instrument approach procedure.

(d) The Administrator may issue operations specifications to the certificate holder to allow it to depart at an airport that does not have an approved standard instrument approach procedure when the Administrator determines that it is necessary to make an IFR departure from that airport and that the proposed operations can be conducted safely. The approval to operate at that airport does not include an approval to make an IFR approach to that airport.

§ 135.217 IFR: takeoff limitations.

No person may takeoff an aircraft under IFR from an airport where weather conditions are at or above take off minimums but are below authorized IFR landing minimums unless there is an alternate airport within 1 hour's flying time (at normal cruising speed, in still air) of the airport of departure.

§ 135.219 IFR: destination airport weather minimums.

No person may take off an aircraft under IFR or begin an IFR or over-the-top operation unless the latest weather reports or forecasts, or any combination of them, indicate that weather conditions at the estimated time of arrival at the next airport of intended landing will be at or above authorized IFR landing minimums.

§ 135.221 IFR: alternate airport weather minimums.

No person may designate an alternate airport unless the weather reports or forecasts, or any combination of them, indicate that the weather conditions will be at or above authorized alternate airport landing minimums for that airport at the estimated time of arrival.

§ 135.223 IFR: alternate airport requirements.

(a) Except as provided in paragraph (b) of this section, no person may operate an aircraft in IFR conditions unless it carries enough fuel (considering weather reports or forecasts or any combination of them) to—

(1) Complete the flight to the first airport of intended landing;

(2) Fly from that airport to the alternate airport; and

(3) Fly after that for 45 minutes at normal cruising speed.

(b) Paragraph (a)(2) of this section does not apply if Part 97 of this chapter prescribes a standard instrument approach procedure for the first airport of intended landing and, for at least one hour before and after the estimated time of arrival, the appropriate weather reports or forecasts, or any combination of them, indicate that—

(1) The ceiling will be at least 1,500 feet above the lowest circling approach MDA; or

(2) If a circling instrument approach is not authorized for the airport, the ceiling will be at least 1,500 feet above the lowest published minimum or 2,000 feet above the airport elevation, whichever is higher; and

(3) Visibility for that airport is forecast to be at least three miles, or two miles more than the lowest applicable visibility minimums, whichever is the greater, for the instrument approach procedure to be used at the destination airport.

§ 135.225 IFR: takeoff, approach and landing minimums.

(a) No pilot may begin an instrument approach procedure to an airport unless—

(1) That airport has a weather reporting facility operated by the U.S. National Weather Service, a source approved by U.S. National Weather Service, or a source approved by the Administrator; and

(2) The latest weather report issued by that weather reporting facility indicates that weather conditions are at or above the authorized IFR landing minimums for that airport.

(b) No pilot may begin the final approach segment of an instrument approach procedure to an airport unless the latest weather reported by the facility described in paragraph (a)(1) of this section indicates that weather conditions are at or above the authorized IFR landing minimums for that procedure.

(c) If a pilot has begun the final approach segment of an instrument approach to an airport under paragraph (b) of this section and a later weather report indicating below minimum conditions is received after the aircraft is—

(1) On an ILS final approach and has passed the final approach fix; or

(2) On an ASR or PAR final approach and has been turned over to the final approach controller; or

(3) On a final approach using a VOR, NDB, or comparable approach procedure; and the aircraft—

(i) Has passed the appropriate facility or final approach fix; or

(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 DH, that actual weather conditions are at least equal to the minimums prescribed for the procedure.

(d) The MDA or DH and visibility landing minimums prescribed in Part 97 of this chapter or in the operator's operations specifications are increased by 100 feet and ½ mile respectively, but not to exceed the ceiling and visibility minimums for that airport when used as an alternate airport, 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.

(e) Each pilot making an IFR takeoff or approach and landing at a military or foreign airport shall comply with applicable instrument approach procedures and weather minimums prescribed by the authority having jurisdiction over that airport. In addition, no pilot may, at that airport—

(1) Take off under IFR when the visibility is less than 1 mile; or

(2) Make an instrument approach when the visibility is less than ½ mile.

(f) If takeoff minimums are specified in Part 97 of this chapter for the takeoff airport, no pilot may take off an aircraft under IFR when the weather conditions reported by the facility described in paragraph (a)(1) of this section are less than the takeoff minimums specified for the takeoff airport in Part 97 or in the certificate holder's operations specifications.

(g) Except as provided in paragraph (h) of this section, if takeoff minimums are not prescribed in Part 97 of this chapter for the takeoff airport, no pilot may take off an aircraft under IFR when the weather conditions reported by the facility described in paragraph (a)(1) of this section are less than that prescribed in Part 91 of this chapter or in the certificate holder's operations specifications.

(h) At airports where straight-in instrument approach procedures are authorized, a pilot may take off an aircraft under IFR when the weather conditions reported by the facility described in paragraph (a)(1) of this section are equal to or better than the lowest straight-in landing minimums, unless otherwise restricted, if—

(1) The wind direction and velocity at the time of takeoff are such that a straight-in instrument approach can be made to the runway served by the instrument approach;

(2) The associated ground facilities upon which the landing minimums are predicated and the related airborne equipment are in normal operation; and

(3) The certificate holder has been approved for such operations.

§ 135.227 Icing conditions: operating limitations.

(a) No pilot may take off an aircraft that has—

(1) Frost, snow, or ice adhering to any rotor blade, propeller, windshield, or powerplant installation, or to an airspeed, altimeter, rate of climb, or flight attitude instrument system;

(2) Snow or ice adhering to the wings or stabilizing or control surfaces; or

(3) Any frost adhering to the wings, or stabilizing or control surfaces, unless that frost has been polished to make it smooth.

(b) Except for an airplane that has ice protection provisions that meet § 34 of Appendix A, or those for transport category airplane type certification, no pilot may fly—

(1) Under IFR into known or forecast light or moderate icing conditions; or

(2) Under VFR into known light or moderate icing conditions; unless the aircraft has functioning deicing or anti-icing equipment protecting each rotor blade, propeller, windshield, wing, stabilizing or control surface, and each airspeed, altimeter, rate of climb, or flight attitude instrument system.

(c) Except for an airplane that has ice protection provisions that meet § 34 of Appendix A, or those for transport category airplane type certification, no pilot may fly an aircraft into known or forecast severe icing conditions.

(d) If current weather reports and briefing information relied upon by the pilot in command indicate that the forecast icing condition that would otherwise prohibit the flight will not be encountered during the flight because of changed weather conditions since the forecast, the restrictions in paragraphs (b) and (c) of this section based on forecast conditions do not apply.

§ 135.229 Airport requirements.

(a) No certificate holder may use any airport unless it is adequate for the proposed operation, considering such items as size, surface, obstructions, and lighting.

(b) No pilot of an aircraft carrying passengers at night may take off from, or land on, an airport unless—

(1) That pilot has determined the wind direction from an illuminated wind direction indicator or local ground communications or, in the case of takeoff, that pilot's personal observations; and

(2) The limits of the area to be used for landing or takeoff are clearly shown—

(i) For airplanes, by boundary or runway marker lights;

(ii) For helicopters, by boundary or runway marker lights or reflective material.

(c) For the purpose of paragraph (b) of this section, if the area to be used for takeoff or landing is marked by flare pots or lanterns, their use must be approved by the Administrator.

Subpart E—Flight Crewmember Requirements

§ 135.241 Applicability.

This subpart prescribes the flight crewmember requirements for operations under this part.

§ 135.243 Pilot in command qualifications.

(a) No certificate holder may use a person, nor may any person serve, as pilot in command in passenger-carrying operations of a turbojet airplane, of an airplane having a passenger seating configuration, excluding any pilot seat, of 10 seats or more, or a multiengine airplane being operated by the "Commuter Air Carrier" (as defined in Part 298 of this title), unless that person holds an airline transport pilot certificate with appropriate category and class ratings and, if required, an appropriate type rating for that airplane.

(b) Except as provided in paragraph (a) of this section, no certificate holder may use a person, nor may any person serve, as pilot in command of an aircraft under VFR unless that person—

(1) Holds at least a commercial pilot certificate with appropriate category and class ratings and, if required, an appropriate type rating for that aircraft; and

(2) Has had at least 500 hours of flight time as a pilot, including at least 1000 hours of cross-country flight time, at least 25 hours of which were at night; and

(3) For an airplane, holds an instrument rating or an airline transport pilot certificate with an airplane category rating; or

(4) For helicopter operations conducted VFR over-the-top, holds a helicopter instrument rating, or an airline transport pilot certificate with a category and class rating for that aircraft, not limited to VFR.

(c) Except as provided in paragraph (a) of this section, no certificate holder may use a person, nor may any person serve, as pilot in command of an aircraft under IFR unless that person—

(1) Holds at least a commercial pilot certificate with appropriate category and class ratings and, if required, an appropriate type rating for that aircraft; and

(2) Has had at least 1,200 hours of flight time as a pilot, including 500 hours of cross country flight time, 100 hours of night flight time, and 75 hours of actual or simulated instrument time at least 50 hours of which were in actual flight; and

(3) For an airplane, holds an instrument rating or an airline transport pilot certificate with an airplane category rating; or

(4) For a helicopter, holds a helicopter instrument rating, or an airline transport pilot certificate with a category and class rating for that aircraft, not limited to VFR.

§ 135.245 Second in command qualifications.

No certificate holder may use any person, nor may any person serve, as second in command of an aircraft unless that person holds at least a commercial pilot certificate with appropriate category and class ratings and an instrument rating. For flight under IFR that person must meet the recent instrument experience requirements of Part 61 of this chapter.

§ 135.247 Pilot qualifications: recent experience.

(a) No certificate holder may use any person, nor may any person serve, as pilot in command of an aircraft carrying passengers unless, within the preceding 90 days, that person has—

(1) Made three takeoffs and three landings as the sole manipulator of the flight controls in an aircraft of the same category and class and, if a type rating is required, of the same type in which that person is to serve; or

(2) For operation during the period beginning 1 hour after sunset and ending 1 hour before sunrise (as published in the Air Almanac), made three takeoffs and three landings during that period as the sole manipulator of the flight controls in an aircraft of the same category and class and, if a type rating is required, of the same type in which that person is to serve.

A person who complies with paragraph (a)(2) of this paragraph need not comply with paragraph (a)(1) of this paragraph.

(b) For the purpose of paragraph (a) of this section, if the aircraft is a tailwheel airplane, each takeoff must be made in a tailwheel airplane and each landing must be made to a full stop in a tailwheel airplane.

Subpart F—Flight Crewmember Flight and Duty Time Limitations

§ 135.261 Flight and duty time limitations.

(a) No certificate holder may assign any flight crewmember, and no flight crewmember may accept an assignment, for duty during flight time if the total flight time of that flight in addition to any other commercial

flying by that flight crewmember exceeds the following during any 24 consecutive hours:

(1) Eight hours for a flight crew consisting of one pilot.

(2) Ten hours for a flight crew consisting of two pilots required by this chapter.

(b) No certificate holder may assign a flight crewmember, and no flight crewmember may accept an assignment, for duty during flight time unless that assignment provides for at least 10 consecutive hours of rest during the 24-hour period preceding the planned completion of the assignment.

(c) A flight crewmember is not considered to be assigned for duty during flight time in excess of flight time limitations if the flights to which the flight crewmember is assigned would normally terminate within the limitations, but due to circumstances beyond the control of the certificate holder or the flight crewmember (such as adverse weather conditions) are not at the time of departure expected to reach their destination within the planned flight time.

(d) No certificate holder may assign a flight crewmember, and no flight crewmember may accept an assignment, for duty during flight time if, because of circumstances beyond the control of the certificate holder or flight crewmember, the flight crewmember has exceeded the flight time limitations in paragraph (a) of this section, unless the flight crewmember has had 16 hours of rest since the completion of the flight crewmember's last assigned flight.

(e) Time spent in transportation, not local in character, that the certificate holder requires of a flight crewmember and provides to transport the crewmember to the airport at which the flight crewmember is to serve on a flight as a flight crewmember, or from an airport at which the flight crewmember has completed an assigned flight to the flight crewmember's home station, is not considered part of a rest period.

(f) No certificate holder may assign any flight crewmember, and no flight crewmember may accept an assignment, for duty during flight time if the flight crewmember has been assigned to any duty with the certificate holder in connection with operations under this part during any required rest period.

Subpart G—Crewmember Testing Requirements

§ 135.291 Applicability.

This subpart prescribes the tests and checks required for pilot and flight attendant crewmembers and for the approval of check pilots in operations under this part.

§ 135.293 Initial and recurrent pilot testing requirements.

(a) No certificate holder may use a pilot, nor may any person serve as a pilot, unless, since the beginning of the 12th calendar month before that service, that pilot has passed a written or oral test, given by the Administrator or an authorized check pilot, on that pilot's knowledge in the following areas—

(1) The appropriate provisions of Parts 61, 91, and 135 of this chapter and the operations specifications and the manual of the certificate holder;

(2) For each type of aircraft to be flown by the pilot, the aircraft powerplant, major components and systems, major appliances, performance and operating limitations, standard and emergency operating procedures, and the contents of the approved Aircraft Flight Manual or equivalent, as applicable;

(3) For each type of aircraft to be flown by the pilot, the method of determining compliance with weight and balance limitations for takeoff, landing and en route operations;

(4) Navigation and use of air navigation aids appropriate to the operation or pilot authorization, including, when applicable, instrument approach facilities and procedures;

(5) Air traffic control procedures, including IFR procedures when applicable;

(6) Meteorology in general, including the principles of frontal systems, icing, fog, thunderstorms, and windshear, and, if appropriate for the operation of the certificate holder, high altitude weather;

(7) Procedures for avoiding operations in thunderstorms and hail, and for operating in turbulent air or in icing conditions; and

(8) New equipment, procedures, or techniques, as appropriate.

(b) No certificate holder may use a pilot, nor may any person serve as a pilot, in any aircraft unless, since the beginning of the 12th calendar month before that service, that pilot has passed a competency check given by the Administrator or an authorized check pilot in that class of aircraft, if single-engine airplane other than turbojet, or that type of aircraft, if helicopter, multiengine airplane, or turbojet airplane, to determine the pilot's competence in practical skills and techniques in that aircraft or class of aircraft. The extent of the competency check shall be determined by the Administrator or authorized check pilot conducting the competency check. The competency check may include any of the maneuvers and procedures currently required for the original issuance of the particular pilot certificate required for the operations authorized and appropriate to the category, class and type of aircraft involved. For the purposes of this paragraph, type, as to an airplane, means any one of a group of airplanes determined by the Administrator to have a similar means of propulsion, the same manufacturer, and no significantly different handling or flight characteristics. For the purposes of this paragraph, type, as to a helicopter, means a basic make and model.

(c) The instrument proficiency check required by § 135.297 may be substituted for the competency check required by this section for the type of aircraft used in the check.

(d) For the purpose of this part, competent performance of a procedure or maneuver by a person to be used as a pilot requires that the pilot be the obvious master of the aircraft, with the successful outcome of the maneuver never in doubt.

(e) The Administrator or authorized check pilot certifies the competency of each pilot who passes the knowledge or flight check in the certificate holder's pilot records.

(f) Portions of a required competency check may be given in an aircraft simulator or other appropriate training device, if approved by the Administrator.

§ 135.295 Initial and recurrent flight attendant crewmember testing requirements.

No certificate holder may use a flight attendant crewmember, nor may any person serve as a flight attendant crewmember unless, since the beginning of the 12th calendar month before that service, the certificate holder has determined by appropriate initial and recurrent testing that the person is knowledgeable and competent in the following areas as appropriate to assigned duties and responsibilities—

(a) Authority of the pilot in command;

(b) Passenger handling, including procedures to be followed in handling deranged persons or other persons whose conduct might jeopardize safety;

(c) Crewmember assignments, functions, and responsibilities during ditching and evacuation of persons who may need the assistance of another person to move expeditiously to an exit in an emergency;

(d) Briefing of passengers;

(e) Location and operation of portable fire extinguishers and other items of emergency equipment;

(f) Proper use of cabin equipment and controls;

(g) Location and operation of passenger oxygen equipment;

(h) Location and operation of all normal and emergency exits, including evacuation chutes and escape ropes; and

(i) Seating of persons who may need assistance of another person to move rapidly to an exit in an emergency as prescribed by the certificate holder's operations manual.

§ 135.297 Pilot in command: instrument proficiency check requirements.

(a) No certificate holder may use a pilot, nor may any person serve, as a pilot in command of an aircraft under IFR unless, since the beginning of the sixth calendar month before that service, that pilot has passed an instrument proficiency check and the Administrator or an authorized check pilot has so certified in a letter of competency.

(b) No pilot may use any type of instrument approach procedure under IFR unless, since the beginning of the sixth calendar month before that use, the pilot has satisfactorily demonstrated at least one instrument approach procedure using an ILS, a VOR and an NDB facility, and has been issued a letter of competency under paragraph (h) of this section. These instrument approach procedures must include at least one straight-in approach, one circling approach in conjunction with a VOR or an NDB, and one missed approach. Each approach procedure demonstrated must be conducted to the published minimum for that procedure.

(c) The instrument proficiency check required by paragraph (a) of this section consists of an oral or written equipment test and a flight check under simulated or actual IFR conditions. The equipment test includes questions on emergency procedures, engine operation, fuel and lubrication systems, power settings, stall speeds, best engine-out speed, propeller and supercharger operations, and hydraulic, mechanical, and electrical systems, as appropriate. The flight check includes navigation by instruments, recovery from simulated emergencies, and standard instrument approaches involving navigational facilities which that pilot is to be authorized to use. Each pilot taking the instrument proficiency check must show that standard of competence required by § 135.293(d).

(1) The instrument proficiency check must—

(i) For a pilot in command of an airplane under § 135.243(a), include the procedures and maneuvers for an airline transport pilot certificate in the particular type of airplane, if appropriate; and

(ii) For a pilot in command of an airplane or helicopter under § 135.243(c), include the procedures and maneuvers for a commercial pilot certificate with an instrument rating and, if required, for the appropriate type rating.

(2) The instrument proficiency check must be given by an authorized check airman or by the Administrator.

(d) If the pilot in command is assigned to pilot only one type of aircraft, that pilot must take the instrument proficiency check required by paragraph (a) of this section in that type of aircraft.

(e) If the pilot in command is assigned to pilot more than one type of aircraft, that pilot must take the instrument proficiency check required by paragraph (a) of this section in each type of aircraft to which that pilot is assigned, in rotation, but not more than one flight check during each period described in paragraph (a) of this section.

(f) If the pilot in command is assigned to pilot both single-engine and multiengine aircraft, that pilot must initially take the instrument proficiency check required by paragraph (a) of this section in a multiengine aircraft, and each succeeding check alternately in single-engine and multiengine aircraft, but not more than one flight check during each period described in paragraph (a) of this section. Portions of a required flight check may be given in an aircraft simulator or other appropriate training device, if approved by the Administrator.

(g) If the pilot in command is authorized to use an autopilot system in place of a second in command, that pilot must show, during the required instrument proficiency check, that the pilot is able (without a second in command) both with and without using the autopilot to—

(1) Conduct instrument operations competently; and

(2) Properly conduct air-ground communications and comply with complex air traffic control instructions.

(3) Each pilot taking the autopilot check must show that, while using the autopilot, the airplane can be operated as proficiently as it would be if a second in command were present to handle air-ground communications and air traffic control instructions. The autopilot check need only be demonstrated once every 12 calendar months during the instrument proficiency check required under paragraph (a) of this section.

(h) The Administrator or authorized check pilot issues a letter of competency to each pilot who passes the instrument proficiency check. The letter of competency authorizes the use of instrument approach procedures and facilities under Part 97 of this chapter and, if the pilot passes the autopilot check, authorizes the use of an autopilot system in place of a second in command.

§ 135.299 Pilot in command: line checks: routes and airports.

(a) No certificate holder may use a pilot, nor may any person serve, as a pilot in command of a flight unless, since the beginning of the 12th calendar month before that service, that pilot has passed a flight check in one of the types of aircraft which that pilot is to fly. The flight check shall—

(1) Be given by an approved check pilot or by the Administrator;

(2) Consist of at least one flight over one route segment; and

(3) Include takeoffs and landings at one or more representative airports. In addition to the requirements of this paragraph, for a pilot authorized to conduct IFR operations, at least one flight shall be flown over a civil airway, an approved off-airway route, or a portion of either of them.

(b) The pilot who conducts the check shall determine whether the pilot being checked satisfactorily performs the duties and responsibilities of a pilot in command in operations under this part, and shall so certify in the pilot training record.

(c) Each certificate holder shall establish in the manual required by § 135.21 a procedure which will ensure that each pilot who has not flown over a route and into an airport within the preceding 90 days will, before beginning the flight, become familiar with all available information required for the safe operation of that flight.

§ 135.301 Crewmember: tests and checks, grace provisions, training to accepted standards.

(a) If a crewmember who is required to take a test or a flight check under this part, completes the test or flight check in the calendar month before or after the calendar month in which it is required, that crewmember is considered to have completed the test or check in the calendar month in which it is required.

(b) If a pilot being checked under this subpart fails any of the required maneuvers, the person giving the check may give additional training to the pilot during the course of the check. In addition to repeating the maneuvers failed, the person giving the check may require the pilot being checked to repeat any other maneuvers that are necessary to determine the pilot's proficiency. If the pilot being checked is unable to demonstrate satisfactory performance to the person conducting the check, the certificate holder may not use the pilot, nor may the pilot serve, as a flight crewmember in operations under this part until the pilot has satisfactorily completed the check.

§ 135.303 Check pilot authorization: application and issue.

Each certificate holder desiring FAA approval of a check pilot shall submit a request in writing to the FAA Flight Standards District Office charged with the overall inspection of the certificate holder. The Administrator may issue a letter of authority to each check pilot if that pilot passes the appropriate oral and flight test. The letter of authority lists the tests and checks in this part that the check pilot is qualified to give, and the category, class and type aircraft, where appropriate, for which the check pilot is qualified.

Subpart H—Training

§ 135.321 Applicability and terms used.

(a) This subpart prescribes requirements for establishing and maintaining an approved training program for crewmembers, check airmen and instructors, and other operations personnel, and for the approval and use of aircraft simulators and other training devices in the conduct of that program.

(b) For the purposes of this subpart, the following terms and definitions apply:

(1) Initial training. The training required for crewmembers who have not qualified and served in the same capacity on an aircraft.

(2) Transition training. The training required for crewmembers who have qualified and served in the same capacity on another aircraft.

(3) Upgrade training. The training required for crewmembers who have qualified and served as second in command on a particular aircraft type, before they serve as pilot in command on that aircraft.

(4) Differences training. The training required for crewmembers who have qualified and served on a particular type aircraft, when the Administrator finds differences training is necessary before a crewmember serves in the same capacity on a particular variation of that aircraft.

(5) Recurrent training. The training required for crewmembers to remain adequately trained and currently proficient for each aircraft, crewmember position, and type of operation in which the crewmember serves.

(6) In flight. The maneuvers, procedures, or functions that must be conducted in the aircraft.

§ 135.323 Training program: general.

(a) Each certificate holder required to have a training program under § 135.341 shall:

(1) Establish, obtain the appropriate initial and final approval of, and provide a training program that meets this subpart and that ensures that each crewmember, flight instructor, check airman, and each person assigned duties for the carriage and handling of hazardous materials (as defined in 49 CFR 171.8) is adequately trained to perform their assigned duties.

(2) Provide adequate ground and flight training facilities and properly qualified ground instructors for the training required by this subpart.

(3) Provide and keep current for each aircraft type used and, if applicable, the particular variations within the aircraft type, appropriate training material, examinations, forms, instructions, and procedures for use in conducting the training and checks required by this subpart.

(4) Provide enough flight instructors, check airmen, and simulator instructors to conduct required flight training and flight checks, and simulator training courses allowed under this subpart.

(b) Whenever a crewmember who is required to take recurrent training under this subpart completes the training in the calendar month before, or the calendar month after, the month in which that training is required, the crewmember is considered to have completed it in the calendar month in which it was required.

(c) Each instructor, supervisor, or check airman who is responsible for a particular ground training subject, segment of flight training, course of training, flight check, or competence check under this part shall certify as to the proficiency and knowledge of the crewmember, flight instructor, or check airman concerned upon completion of that training or check. That certification shall be made a part of the crewmember's record. When the certification required by this paragraph is made by an entry in a computerized recordkeeping system, the certifying instructor, supervisor, or check airman, must be identified with that entry. However, the signature of the certifying instructor, supervisor, or check airman, is not required for computerized entries.

(d) Training subjects that apply to more than one aircraft or crewmember position and that have been satisfactorily completed during previous training while employed by the certificate holder for another aircraft or another crewmember position, need not be repeated during subsequent training other than recurrent training.

(e) Aircraft simulators and other training devices may be used in the certificate holder's training program if approved by the Administrator.

§ 135.325 Training program and revision: initial and final approval.

(a) To obtain initial and final approval of a training program, or a revision to an approved training program, each certificate holder must submit to the Administrator—

(1) An outline of the proposed or revised curriculum, that provides enough information for a preliminary evaluation of the proposed training program or revision; and

(2) Additional relevant information that may be requested by the Administrator.

(b) If the proposed training program or revision complies with this subpart, the Administrator grants initial approval in writing after which the certificate holder may conduct the training under that program. The Administrator then evaluates the effectiveness of the training program and advises the certificate holder of deficiencies, if any, that must be corrected.

(c) The Administrator grants final approval of the proposed training program or revision if the certificate holder shows that the training conducted under the initial approval in paragraph (b) of this section ensures that each person who successfully completes the training is adequately trained to perform that person's assigned duties.

(d) Whenever the Administrator finds that revisions are necessary for the continued adequacy of a training program that has been granted final approval, the certificate holder shall, after notification by the Administrator, make any changes in the program that are found necessary by the Administrator. Within 30 days after the certificate holder receives the notice, it may file a petition to reconsider the notice with the Administrator. The filing of a petition to reconsider stays the notice pending a decision by the Administrator. However, if the Administrator finds that there is an emergency that requires immediate action in the interest of safety, the Administrator may, upon a statement of the reasons, require a change effective without stay.

§ 135.327 Training program: curriculum.

(a) Each certificate holder must prepare and keep current a written training program curriculum for each type of aircraft for each crewmember required for that type aircraft. The curriculum must include ground and flight training required by this subpart.

(b) Each training program curriculum must include the following:

(1) A list of principal ground training subjects, including emergency training subjects, that are provided.

(2) A list of all the training devices, mockups, systems trainers, procedures trainers, or other training aids that the certificate holder will use.

(3) Detailed descriptions or pictorial displays of the approved normal, ab-

normal, and emergency maneuvers, procedures and functions that will be performed during each flight training phase or flight check, indicating those maneuvers, procedures and functions that are to be performed during the inflight portions of flight training and flight checks.

§ 135.329 Crewmember training requirements.

(a) Each certificate holder must include in its training program the following initial and transition ground training as appropriate to the particular assignment of the crewmember:

(1) Basic indoctrination ground training for newly hired crewmembers including instruction in at least the—

(i) Duties and responsibilities of crewmembers as applicable;

(ii) Appropriate provisions of this chapter;

(iii) Contents of the certificate holder's operating certificate and operations specifications (not required for flight attendants); and

(iv) Appropriate portions of the certificate holder's operating manual.

(2) The initial and transition ground training in §§ 135.345 and 135.349, as applicable.

(3) Emergency training in § 135.331.

(b) Each training program must provide the initial and transition flight training in § 135.347, as applicable.

(c) Each training program must provide recurrent ground and flight training in § 135.351.

(d) Upgrade training in §§ 135.345 and 135.347 for a particular type aircraft may be included in the training program for crewmembers who have qualified and served as second in command on that aircraft.

(e) In addition to initial, transition, upgrade and recurrent training, each training program must provide ground and flight training, instruction, and practice necessary to ensure that each crewmember—

(1) Remains adequately trained and currently proficient for each aircraft, crewmember position, and type of operation in which the crewmember serves; and

(2) Qualifies in new equipment, facilities, procedures, and techniques, including modifications to aircraft.

§ 135.331 Crewmember emergency training.

(a) Each training program must provide emergency training under this section for each aircraft type, model, and configuration, each crewmember, and each kind of operation conducted, as appropriate for each crewmember and the certificate holder.

(b) Emergency training must provide the following:

(1) Instruction in emergency assignments and procedures, including coordination among crewmembers.

(2) Individual instruction in the location, function, and operation of emergency equipment including—

(i) Equipment used in ditching and evacuation;

(ii) First aid equipment and its proper use; and

(iii) Portable fire extinguishers, with emphasis on the type of extinguisher to be used on different classes of fires.

(3) Instruction in the handling of emergency situations including—

(i) Rapid decompression;

(ii) Fire in flight or on the surface and smoke control procedures with emphasis on electrical equipment and related circuit breakers found in cabin areas;

(iii) Ditching and evacuation;

(iv) Illness, injury, or other abnormal situations involving passengers or crewmembers; and

(v) Hijacking and other unusual situations.

(4) Review of the certificate holder's previous aircraft accidents and incidents involving actual emergency situations.

(c) Each crewmember must perform at least the following emergency drills, using the proper emergency equipment and procedures, unless the Administrator finds that, for a particular drill, the crewmember can be adequately trained by demonstration:

(1) Ditching, if applicable.

(2) Emergency evacuation.

(3) Fire extinguishing and smoke control.

(4) Operation and use of emergency exits, including deployment and use of evacuation chutes, if applicable.

(5) Use of crew and passenger oxygen.

(6) Removal of life rafts from the aircraft, inflation of the life rafts, use of life lines, and boarding of passengers and crew, if applicable.

(7) Donning and inflation of life vests and the use of other individual flotation devices, if applicable.

(d) Crewmembers who serve in operations above 25,000 feet must receive instruction in the following:

(1) Respiration.

(2) Hypoxia.

(3) Duration of consciousness without supplemental oxygen at altitude.

(4) Gas expansion.

(5) Gas bubble formation.

(6) Physical phenomena and incidents of decompression.

§ 135.333 Training requirements: handling and carriage of hazardous materials.

(a) Except as provided in paragraph (d) of this section, no certificate holder may use any person to perform, and no person may perform, any assigned duties and responsibilities for the handling or carriage of hazardous materials (as defined in 49 CFR 171.8), unless within the preceding 12 calendar months that person has satisfactorily completed initial or recurrent training in an appropriate training program established by the certificate holder, which includes instruction regarding—

(1) The proper shipper certification, packaging, marking, labeling, and documentation for hazardous materials; and

(2) The compatibility, loading, storage, and handling characteristics of hazardous materials.

(b) Each certificate holder shall maintain a record of the satisfactory completion of the initial and recurrent training given to crewmembers and ground personnel who perform assigned duties and responsibilities for the handling and carriage of hazardous materials.

(c) Each certificate holder that elects not to accept hazardous materials shall ensure that each crewmember is adequately trained to recognize those items classified as hazardous materials.

(d) If a certificate holder operates into or out of airports at which trained employees or contract personnel are not available, it may use persons not meeting the requirements of paragraphs (a) and (b) of this section to load, offload, or otherwise handle hazardous materials if these persons are supervised by a crewmember who is qualified under paragraphs (a) and (b) of this section.

§ 135.335 Approval of aircraft simulators and other training devices.

(a) Training courses using aircraft simulators and other training devices may be included in the certificate holder's training program if approved by the Administrator.

(b) Each aircraft simulator and other training device that is used in a training course or in checks required under this subpart must meet the following requirements:

(1) It must be specifically approved for—

(i) The certificate holder;

(ii) The type aircraft and, if applicable, the particular variation within type for which the training or check is being conducted; and

(iii) The particular maneuver, procedure, or crewmember function involved.

(2) It must maintain the performance, functional, and other characteristics that are required for approval.

(3) It must be modified to conform with any modification to the aircraft being simulated that changes the performance, functional, or other characteristics required for approval.

(c) In granting initial and final approval of training programs or revisions to them, the Administrator considers the training devices, methods and procedures listed in the certificate holder's curriculum under § 135.327.

§ 135.337 Training program: check airmen and instructor qualifications.

(a) No certificate holder may use a person, nor may any person serve, as a flight instructor or check airman in a training program established under this subpart unless, for the particular aircraft type involved, that person—

(1) Holds the airman certificate and ratings that must be held to serve as a pilot in command in operations under this part;

(2) Has satisfactorily completed the appropriate training phases for the aircraft, including recurrent training, required to serve as a pilot in command in operations under this part;

(3) Has satisfactorily completed the appropriate proficiency or competency checks required to serve as a pilot in command in operations under this part;

(4) Has satisfactorily completed the applicable training requirements of § 135.339;

(5) Holds a Class I or Class II medical certificate required to serve as a pilot in command in operations under this part;

(6) In the case of a check airman, has been approved by the Administrator for the airman duties involved; and

(7) In the case of a check airman used in an aircraft simulator only, holds a Class III medical certificate.

(b) No certificate holder may use a person, nor may any person serve, as a simulator instructor for a course of training given in an aircraft simulator under this subpart unless that person—

(1) Holds at least a commercial pilot certificate; and

(2) Has satisfactorily completed the following as evidenced by the approval of a check airman—

(i) Appropriate initial pilot and flight instructor ground training under this subpart; and

(ii) A simulator flight training course in the type simulator in which that person instructs under this subpart.

§ 135.339 Check airmen and flight instructors: initial and transition training.

(a) The initial and transition ground training for pilot check airmen must include the following:

(1) Pilot check airman duties, functions, and responsibilities.

(2) The applicable provisions of this chapter and certificate holder's policies and procedures.

(3) The appropriate methods, procedures, and techniques for conducting the required checks.

(4) Proper evaluation of pilot performance including the detection of—

(i) Improper and insufficient training; and

(ii) Personal characteristics that could adversely affect safety.

(5) The appropriate corrective action for unsatisfactory checks.

(6) The approved methods, procedures, and limitations for performing the required normal, abnormal, and emergency procedures in the aircraft.

(b) The initial and transition ground training for pilot flight instructors, except for the holder of a valid flight instructor certificate, must include the following:

(1) The fundamental principles of the teaching-learning process.

(2) Teaching methods and procedures.

(3) The instructor-student relationship.

(c) The initial and transition flight training for pilot check airmen and pilot flight instructors must include the following:

(1) Enough inflight training and practice in conducting flight checks from the left and right pilot seats in the required normal, abnormal, and emergency maneuvers to ensure that person's competence to conduct the pilot flight checks and flight training under this subpart.

(2) The appropriate safety measures to be taken from either pilot seat for emergency situations that are likely to develop in training.

(3) The potential results of improper or untimely safety measures during training.

The requirements of paragraphs (2) and (3) of this paragraph may be accomplished in flight or in an approved simulator.

§ 135.341 Pilot and flight attendant crewmember training programs.

(a) Each certificate holder, other than one who is the only pilot used in the certificate holder's operation, shall establish and maintain an approved pilot training program, and each certificate holder who uses a flight attendant crewmember shall establish and maintain an approved flight attendant training program, that is appropriate to the operations to which each pilot and flight attendant is to be assigned, and will ensure that they are adequately trained to meet the applicable knowledge and practical testing requirements of §§ 135.293 through 135.301. However, the Administrator may authorize a deviation from this section if the Administrator finds that, because of the limited size and scope of the operation, safety will allow a deviation from these requirements.

(b) Each certificate holder required to have a training program by paragraph (a) of this section shall include in that program ground and flight training curriculums for—(1) Initial training; (2) Transition training; (3) Upgrade training; (4) Differences training; and (5) Recurrent training.

(c) Each certificate holder required to have a training program by paragraph (a) of this section shall provide current and appropriate study materials for use by each required pilot and flight attendant.

(d) The certificate holder shall furnish copies of the pilot and flight attendant crewmember training program, and all changes and additions, to the assigned representative of the Administrator. If the certificate holder uses training facilities of other persons, a copy of those training programs or appropriate portions used for those facilities shall also be furnished. Curricula that follow FAA published curricula may be cited by reference in the copy of the training program furnished to the representative of the Administrator and need not be furnished with the program.

§ 135.343 Crewmember initial and recurrent training requirements.

No certificate holder may use a person, nor may any person serve, as a crewmember in operations under this part unless that crewmember has completed the appropriate initial or recurrent training phase of the training program appropriate to the type of operation in which the crewmember is to serve since the beginning of the 12th calendar month before that service. This section does not apply to a certificate holder who is the only pilot used in the certificate holder's operation.

§ 135.345 Pilots: initial, transition, and upgrade ground training.

Initial, transition, and upgrade ground training for pilots must include instruction in at least the following, as applicable to their duties:

(a) General subjects—

(1) The certificate holder's flight locating procedures;

(2) Principles and methods for determining weight and balance, and runway limitations for takeoff and landing;

(3) Enough meteorology to ensure a practical knowledge of weather phenomena, including the principles of frontal systems, icing, fog, thunderstorms, windshear and, if appropriate, high altitude weather situations;

(4) Air traffic control systems, procedures, and phraseology;

(5) Navigation and the use of navigational aids, including instrument approach procedures;

(6) Normal and emergency communication procedures;

(7) Visual cues before and during descent below DH or MDA; and

(8) Other instructions necessary to ensure the pilot's competence.

(b) For each aircraft type—

(1) A general description;

(2) Performance characteristics;

(3) Engines and propellers;

(4) Major components;

(5) Major aircraft systems (i.e., flight controls, electrical, and hydraulic), other systems, as appropriate, principles of normal, abnormal, and emergency operations, appropriate procedures and limitations;

(6) Procedures for avoiding severe weather situations and for operating in or near thunderstorms (including best penetrating altitudes), turbulent air (including clear air turbulence and low altitude windshear), icing, hail, and other potentially hazardous meteorological conditions;

(7) Operating limitations;

(8) Fuel consumption and cruise control;

(9) Flight planning;

(10) Each normal and emergency procedure; and

(11) The approved Aircraft Flight Manual, or equivalent.

§ 135.347 Pilots: initial, transition, upgrade, and differences flight training.

(a) Initial, transition, upgrade, and differences training for pilots must include flight and practice in each of the maneuvers and procedures in the approved training program curriculum.

(b) The maneuvers and procedures required by paragraph (a) of this section must be performed in flight, except to the extent that certain maneuvers and procedures may be performed in an aircraft simulator, or an appropriate training device, as allowed by this subpart.

(c) If the certificate holder's approved training program includes a course of training using an aircraft simulator or other training device, each pilot must successfully complete—

(1) Training and practice in the simulator or training device in at least the maneuvers and procedures in this subpart that are capable of being performed in the aircraft simulator or training device; and

(2) A flight check in the aircraft or a check in the simulator or training device to the level of proficiency of a pilot in command or second in command, as applicable, in at least the maneuvers and procedures that are capable of being performed in an aircraft simulator or training device.

§ 135.349 Flight attendants: initial and transition ground training.

Initial and transition ground training for flight attendants must include instruction in at least the following—

(a) General subjects—

(1) The authority of the pilot in command; and

(2) Passenger handling, including procedures to be followed in handling deranged persons or other persons whose conduct might jeopardize safety.

(b) For each aircraft type—

(1) A general description of the aircraft emphasizing physical characteristics that may have a bearing on ditching, evacuation, and inflight emergency procedures and on other related duties;

(2) The use of both the public address system and the means of communicating with other flight crewmembers, including emergency means in the case of attempted hijacking or other unusual situations; and

(3) Proper use of electrical galley equipment and the controls for cabin heat and ventilation.

§ 135.351 Recurrent training.

(a) Each certificate holder must ensure that each crewmember receives recurrent training and is adequately trained and currently proficient for the type aircraft and crewmember position involved.

(b) Recurrent ground training for crewmembers must include at least the following:

(1) A quiz or other review to determine the crewmember's knowledge of the aircraft and crewmember position involved.

(2) Instruction as necessary in the subjects required for initial ground training by this subpart, as appropriate, including emergency training.

(c) Recurrent flight training for pilots must include, at least, flight training in the maneuvers or procedures in this subpart, except that satisfactory completion of the check required by § 135.293 within the preceding 12 calendar months may be substituted for recurrent flight training.

Subpart I—Airplane Performance Operating Limitations

§ 135.361 Applicability.

(a) This subpart prescribes airplane performance operating limitations applicable to the operation of the categories of airplanes listed in § 135.363 when operated under this part.

(b) For the purpose of this subpart, "effective length of the runway," for landing means the distance from the point at which the obstruction clearance plane associated with the approach end of the runway intersects the centerline of the runway to the far end of the runway.

(c) For the purpose of this subpart, "obstruction clearance plane" means a plane sloping upward from the runway at a slope of 1:20 to the horizontal, and tangent to or clearing all obstructions within a specified area surrounding the runway as shown in a profile view of that area. In the plan view, the centerline of the specified area coincides with the centerline of the runway, beginning at the point where the obstruction clearance plane intersects the centerline of the runway and proceeding to a point at least 1,500 feet from the beginning point. After that the centerline coincides with the takeoff path over the ground for the runway (in the case of takeoffs) or with the instrument approach counterpart (for landings), or, where the applicable one of these paths has not been established, it proceeds consistent with turns of at least 4,000-foot radius until a point is reached beyond which the obstruction clearance plane clears all obstructions. This area extends laterally 200 feet on each side of the centerline at the point where the obstruction clearance plane intersects the runway and continues at this width to the end of the runway; then it increases uniformly to 500 feet on each side of the centerline at a point 1,500 feet from the intersection of the obstruction clearance plane with the runway; after that it extends laterally 500 feet on each side of the centerline.

§ 135.363 General.

(a) Each certificate holder operating a reciprocating engine powered large transport category airplane shall comply with §§ 135.365 through 135.377.

(b) Each certificate holder operating a turbine engine powered large transport category airplane shall comply with §§ 135.379 through 135.387, except that when it operates a turbopropeller-powered large transport category airplane certificated after August 29, 1959, but previously type certificated with the same number of reciprocating engines, it may comply with §§ 135.365 through 135.377.

(c) Each certificate holder operating a large nontransport category airplane shall comply with §§ 135.389 through 135.395 and any determination of compliance must be based only on approved performance data. For the purpose of this subpart, a large nontransport category airplane is an airplane that was type certificated before July 1, 1942.

(d) Each certificate holder operating a small transport category airplane shall comply with § 135.397.

(e) Each certificate holder operating a small nontransport category airplane shall comply with § 135.399.

(f) The performance data in the Airplane Flight Manual applies in determining compliance with §§ 135.365 through 135.387. Where conditions are different from those on which the performance data is based, compliance is determined by interpolation or by computing the effects of change in the specific variables, if the results of the interpolation or computations are substantially as accurate as the results of direct tests.

(g) No person may take off a reciprocating engine powered large transport category airplane at a weight that is more than the allowable weight for the runway being used (determined under the runway takeoff limitations of the transport category operating rules of this subpart) after taking into account the temperature operating correction factors in § 4a.749a-'T' or § 4b.117 of the Civil Air Regulations in effect on January 31, 1965, and in the applicable Airplane Flight Manual.

(h) The Administrator may authorize in the operations specifications deviations from this subpart if special circumstances make a literal observance of a requirement unnecessary for safety.

(i) The 10-mile width specified in §§ 135.369 through 135.373 may be reduced to 5 miles, for not more than 20 miles, when operating under VFR or where navigation facilities furnish reliable and accurate identification of high ground and obstructions located outside of 5 miles, but within 10 miles, on each side of the intended track.

§ 135.365 Large transport category airplanes: reciprocating engine powered: weight limitations.

(a) No person may take off a reciprocating engine powered large transport category airplane from an airport located at an elevation outside of the range for which maximum takeoff weights have been determined for that airplane.

(b) No person may take off a reciprocating engine powered large transport category airplane for an airport of intended destination that is located at an elevation outside of the range for which maximum landing weights have been determined for that airplane.

(c) No person may specify, or have specified, an alternate airport that is located at an elevation outside of the range for which maximum landing weights have been determined for the reciprocating engine powered large transport category airplane concerned.

(d) No person may take off a reciprocating engine powered large transport category airplane at a weight more than the maximum authorized takeoff weight for the elevation of the airport.

(e) No person may take off a reciprocating engine powered large transport category airplane if its weight on arrival at the airport of destination will be more than the maximum authorized landing weight for the elevation of that airport, allowing for normal consumption of fuel and oil en route.

§ 135.367 Large transport category airplanes: reciprocating engine powered: takeoff limitations.

(a) No person operating a reciprocating engine powered large transport category airplane may take off that airplane unless it is possible—

(1) To stop the airplane safely on the runway, as shown by the accelerate-stop distance data, at any time during takeoff until reaching critical-engine failure speed;

(2) If the critical engine fails at any time after the airplane reaches critical-engine failure speed V_1, to continue the takeoff and reach a height of 50 feet, as indicated by the takeoff path data, before passing over the end of the runway; and

(3) To clear all obstacles either by at least 50 feet vertically (as shown by the takeoff path data) or 200 feet horizontally within the airport boundaries and 300 feet horizontally beyond the boundaries, without banking before reaching a height of 50 feet (as shown by the takeoff path data) and after that without banking more than 15 degrees.

(b) In applying this section, corrections must be made for any runway gradient. To allow for wind effect, takeoff data based on still air may be corrected by taking into account not more than 50 percent of any reported headwind component and not less than 150 percent of any reported tailwind component.

§ 135.369 Large transport category airplanes: reciprocating engine powered: en route limitations: all engines operating.

(a) No person operating a reciprocating engine powered large transport category airplane may take off that airplane at a weight, allowing for normal consumption of fuel and oil, that does not allow a rate of climb (in feet per minute), with all engines operating, of at least 6.90 Vs_0 (that is, the number of feet per minute obtained by multiplying the number of knots by 6.90) at an altitude of a least 1,000 feet above the highest ground or obstruction within ten miles of each side of the intended track.

(b) This section does not apply to large transport category airplanes certificated under Part 4a of the Civil Air Regulations.

§ 135.371 Large transport category airplanes: reciprocating engine powered: en route limitations: one engine inoperative.

(a) Except as provided in paragraph (b) of this section, no person operating a reciprocating engine powered large transport category airplane may take off that airplane at a weight, allowing for normal consumption of fuel and oil, that does not allow a rate of climb (in feet per minute), with one engine inoperative, of at least $(0.079-0.106/N)\ Vs_0^2$ (where N is the number of engines installed and Vs_0 is expressed in knots) at an altitude of least 1,000 feet above the highest ground or obstruction within 10 miles of each side of the intended track. However, for the purposes of this paragraph the rate of climb for transport category airplanes certificated under Part 4a of the Civil Air Regulations is $0.026\ Vs_0^2$.

(b) In place of the requirements of paragraph (a) of this section, a person may, under an approved procedure, operate a reciprocating engine powered large transport category airplane at an all-engines-operating altitude that allows the airplane to continue, after an engine failure, to an alternate airport where a landing can be made under § 135.377, allowing for normal consumption of fuel and oil. After the assumed failure, the flight path must clear the ground and any obstruction within five miles on each side of the intended track by at least 2,000 feet.

(c) If an approved procedure under paragraph (b) of this section is used, the certificate holder shall comply with the following:

(1) The rate of climb (as prescribed in the Airplane Flight Manual for the appropriate weight and altitude) used in calculating the airplane's flight path shall be diminished by an amount in feet per minute, equal to $(0.079-0.106/N)\ Vs_0^2$ (when N is the number of engines installed and Vs_0 is expressed in knots) for airplanes certificated under Part 25 of this chapter and by $0.026\ Vs_0^2$ for airplanes certificated under Part 4a of the Civil Air Regulations.

(2) The all-engines-operating altitude shall be sufficient so that in the event the critical engine becomes inoperative at any point along the route, the flight will be able to proceed to a predetermined alternate airport by use of this procedure. In determining the takeoff weight, the airplane is assumed to pass over the critical obstruction following engine failure at a point no closer to the critical obstruction than the nearest approved radio navigational fix, unless the Administrator approves a procedure established on a different basis upon finding that adequate operational safeguards exist.

(3) The airplane must meet the provisions of paragraph (a) of this section at 1,000 feet above the airport used as an alternate in this procedure.

(4) The procedure must include an approved method of accounting for winds and temperatures that would otherwise adversely affect the flight path.

(5) In complying with this procedure, fuel jettisoning is allowed if the certificate holder shows that it has an adequate training program, that proper instructions are given to the flight crew, and all other precautions are taken to ensure a safe procedure.

(6) The certificate holder and the pilot in command shall jointly elect an alternate airport for which the appropriate weather reports or forecasts, or any combination of them, indicate that weather conditions will be at or above the alternate weather minimum specified in the certificate holder's operations specifications for that airport when the flight arrives.

§ 135.373 Part 25 transport category airplanes with four or more engines: reciprocating engine powered: en route limitations: two engines inoperative.

(a) No person may operate an airplane certificated under Part 25 and having four or more engines unless—

(1) There is no place along the intended track that is more than 90 minutes (with all engines operating at cruising power) from an airport that meets § 135.377; or

(2) It is operated at a weight allowing the airplane, with the two critical engines inoperative, to climb at 0.013 Vs_0^2 feet per minute (that is, the number of feet per minute obtained by multiplying the number of knots squared by 0.013) at an altitude of 1,000 feet above the highest ground or obstruction within 10 miles on each side of the intended track, or at an altitude of 5,000 feet, whichever is higher.

(b) For the purposes of paragraph (a)(2) of this section, it is assumed that—

(1) The two engines fail at the point that is most critical with respect to the takeoff weight;

(2) Consumption of fuel and oil is normal with all engines operating up to the point where the two engines fail with two engines operating beyond that point;

(3) Where the engines are assumed to fail at an altitude above the prescribed minimum altitude, compliance with the prescribed rate of climb at the prescribed minimum altitude need not be shown during the descent from the cruising altitude to the prescribed minimum altitude, if those requirements can be met once the prescribed minimum altitude is reached, and assuming descent to be along a net flight path and the rate of descent to be 0.013 Vs_0^2 greater than the rate in the approved performance data; and

(4) If fuel jettisoning is provided, the airplane's weight at the point where the two engines fail is considered to be not less than that which would include enough fuel to proceed to an airport meeting § 135.377 and to arrive at an altitude of at least 1,000 feet directly over that airport.

§ 135.375 Large transport category airplanes: reciprocating engine powered: landing limitations: destination airports.

(a) Except as provided in paragraph (b) of this section, no person operating a reciprocating engine powered large transport category airplane may take off that airplane, unless its weight on arrival, allowing for normal consumption of fuel and oil in flight, would allow a full stop landing at the intended destination within 60 percent of the effective length of each runway described below from a point 50 feet directly above the intersection of the obstruction clearance plane and the runway. For the purposes of determining the allowable landing weight at the destination airport the following is assumed:

(1) The airplane is landed on the most favorable runway and in the most favorable direction in still air.

(2) The airplane is landed on the most suitable runway considering the probable wind velocity and direction (forecast for the expected time of arrival), the ground handling characteristics of the type of airplane, and other conditions such as landing aids and terrain, and allowing for the effect of the landing path and roll of not more than 50 percent of the headwind component or not less than 150 percent of the tailwind component.

(b) An airplane that would be prohibited from being taken off because it could not meet paragraph (a)(2) of this section may be taken off if an alternate airport is selected that meets all of this section except that the airplane can accomplish a full stop landing within 70 percent of the effective length of the runway.

§ 135.377 Large transport category airplanes: reciprocating engine powered: landing limitations: alternate airports.

No person may list an airport as an alternate airport in a flight plan unless the airplane (at the weight anticipated at the time of arrival at the airport), based on the assumptions in § 135.375(a) (1) and (2), can be brought to a full stop landing within 70 percent of the effective length of the runway.

§ 135.379 Large transport category airplanes: turbine engine powered: takeoff limitations.

(a) No person operating a turbine engine powered large transport category airplane may take off that airplane at a weight greater than that listed in the Airplane Flight Manual for the elevation of the airport and for the ambient temperature existing at takeoff.

(b) No person operating a turbine engine powered large transport category airplane certificated after August 26, 1957, but before August 30, 1959 (SR422, 422A), may take off that airplane at a weight greater than that listed in the Airplane Flight Manual for the minumum distance required for takeoff. In the case of an airplane certificated after September 30, 1958 (SR422A, 422B), the takeoff distance may include a clearway distance but the clearway distance included may not be greater than one-half of the takeoff run.

(c) No person operating a turbine engine powered large transport category airplane certificated after August 29, 1959 (SR422B), may take off that airplane at a weight greater than that listed in the Airplane Flight Manual at which compliance with the following may be shown:

(1) The accelerate-stop distance, as defined in § 25.109 of this chapter, must not exceed the length of the runway plus the length of any stopway.

(2) The takeoff distance must not exceed the length of the runway plus the length of any clearway except that the length of any clearway included must not be greater than one-half the length of the runway.

(3) The takeoff run must not be greater than the length of the runway.

(d) No person operating a turbine engine powered large transport category airplane may take off that airplane at a weight greater than that listed in the Airplane Flight Manual—

(1) For an airplane certificated after August 26, 1957, but before October 1, 1958 (SR422), that allows a takeoff path that clears all obstacles either by at least (35+0.01 D) feet vertically (D is the distance along the intended flight path from the end of the runway in feet), or by at least 200 feet horizontally within the airport boundaries and by at least 300 feet horizontally after passing the boundaries; or

(2) For an airplane certificated after September 30, 1958 (SR422A, 422B), that allows a net takeoff flight path that clears all obstacles either by a height of at least 35 feet vertically, or by at least 200 feet horizontally within the airport boundaries and by at least 300 feet horizontally after passing the boundaries.

(e) In determining maximum weights, minimum distances and flight paths under paragraphs (a) through (d) of this section, correction must be made for the runway to be used, the elevation of the airport, the effective runway gradient, and the ambient temperature and wind component at the time of takeoff.

(f) For the purposes of this section, it is assumed that the airplane is not banked before reaching a height of 50 feet, as shown by the takeoff path or net takeoff flight path data (as appropriate) in the Airplane Flight Manual, and after that the maximum bank is not more than 15 degrees.

(g) For the purposes of this section, the terms, "takeoff distance," "takeoff run," "net takeoff flight path," have the same meanings as set forth in the rules under which the airplane was certificated.

§ 135.381 Large transport category airplanes: turbine engine powered: en route limitations: one engine inoperative.

(a) No person operating a turbine engine powered large transport category airplane may take off that airplane at a weight, allowing for normal consumption of fuel and oil, that is greater than that which (under the approved, one engine inoperative, en route net flight path data in the Airplane Flight Manual for that airplane) will allow compliance with subparagraph (1) or (2) of this paragraph, based on the ambient temperatures expected en route.

(1) There is a positive slope at an altitude of at least 1,000 feet above all terrain and obstructions within five statute miles on each side of the intended track, and, in addition, if that airplane was certificated after August 29, 1958 (SR422B), there is a positive slope at 1,500 feet above the airport where the airplane is assumed to land after an engine fails.

(2) The net flight path allows the airplane to continue flight from the cruising altitude to an airport where a landing can be made under § 135.387 clearing all terrain and obstructions within five statute miles of the intended track by at least 2,000 feet vertically and with a positive slope at 1,000 feet above the airport where the airplane lands after an engine fails, or, if that airplane was certificated after September 30, 1958 (SR422A, 422B), with a positive slope at 1,500 feet above the airport where the airplane lands after an engine fails.

(b) For the purpose of paragraph (a)(2) of this section, it is assumed that—

(1) The engine fails at the most critical point en route;

(2) The airplane passes over the critical obstruction, after engine failure at a point that is no closer to the obstruction than the approved radio navigation fix, unless the Administrator authorizes a different procedure based on adequate operational safeguards;

(3) An approved method is used to allow for adverse winds;

(4) Fuel jettisoning will be allowed if the certificate holder shows that the crew is properly instructed, that the training program is adequate, and that all other precautions are taken to ensure a safe procedure;

(5) The alternate airport is selected and meets the prescribed weather minimums; and

(6) The consumption of fuel and oil after engine failure is the same as the consumption that is allowed for in the approved net flight path data in the Airplane Flight Manual.

§ 135.383 Large transport category airplanes: turbine engine powered: en route limitations: two engines inoperative.

(a) Airplanes certificated after August 26, 1957, but before October 1, 1958 (SR422). No person may operate a turbine engine powered large transport category airplane along an intended route unless that person complies with either of the following:

(1) There is no place along the intended track that is more than 90 minutes (with all engines operating at cruising power) from an airport that meets § 135.387.

(2) Its weight, according to the two-engine-inoperative, en route, net flight path data in the Airplane Flight Manual, allows the airplane to fly from the point where the two engines are assumed to fail simultaneously to an airport that meets § 135.387, with a net flight path (considering the ambient temperature anticipated along the track) having a positive slope at an altitude of at least 1,000 feet above all terrain and obstructions within five statute miles on each side of the intended track, or at an altitude of 5,000 feet, whichever is higher.

For the purposes of paragraph (2) of this paragraph, it is assumed that the two engines fail at the most critical point en route, that if fuel jettisoning is provided, the airplane's weight at the point where the engines fail includes enough fuel to continue to the airport and to arrive at an altitude of at least 1,000 feet directly over the airport, and that the fuel and oil consumption after engine failure is the same as the consumption allowed for in the net flight path data in the Airplane Flight Manual.

(b) Airplanes certificated after September 30, 1958, but before August 30, 1959 (SR422A). No person may operate a turbine engine powered large transport category airplane along an intended route unless that person complies with either of the following:

(1) There is no place along the intended track that is more than 90 minutes (with all engines operating at cruising power) from an airport that meets § 135.387.

(2) Its weight, according to the two-engine-inoperative, en route, net flight path data in the Airplane Flight Manual allows the airplane to fly from the point where the two engines are assumed to fail simultaneously to an airport that meets § 135.387 with a net flight path (considering the ambient temperatures anticipated along the track) having a positive slope at an altitude of at least 1,000 feet above all terrain and obstructions within five statute miles on each side of the intended track, or at an altitude of 2,000 feet, whichever is higher.

For the purpose of paragraph (2) of this paragraph, it is assumed that the two engines fail at the most critical point en route, that the airplane's weight at the point where the engines fail includes enough fuel to continue to the airport, to arrive at an altitude of at least 1,500 feet directly over the airport, and after that to fly for 15 minutes at cruise power or thrust, or both, and that the consumption of fuel and oil after engine failure is the same as the consumption allowed for in the net flight path data in the Airplane Flight Manual.

(c) Aircraft certificated after August 29, 1959 (SR422B). No person may operate a turbine engine powered large transport category airplane along an intended route unless that person complies with either of the following:

(1) There is no place along the intended track that is more than 90 minutes (with all engines operating at cruising power) from an airport that meets § 135.387.

(2) Its weight, according to the two-engine-inoperative, en route, net flight path data in the Airplane Flight Manual, allows the airplane to fly from the point where the two engines are assumed to fail simultaneously to an airport that meets § 135.387, with the net flight path (considering the ambient temperatures anticipated along the track) clearing vertically by at least 2,000 feet all terrain and obstructions within five statute miles on each side of the intended track. For the purposes of this paragraph, it is assumed that—

(i) The two engines fail at the most critical point en route;

(ii) The net flight path has a positive slope at 1,500 feet above the airport where the landing is assumed to be made after the engines fail;

(iii) Fuel jettisoning will be approved if the certificate holder shows that the crew is properly instructed, that the training program is adequate, and that

all other precautions are taken to ensure a safe procedure;

(iv) The airplane's weight at the point where the two engines are assumed to fail provides enough fuel to continue to the airport, to arrive at an altitude of at least 1,500 feet directly over the airport, and after that to fly for 15 minutes at cruise power or thrust, or both; and

(v) The consumption of fuel and oil after the engines fail is the same as the consumption that is allowed for in the net flight path data in the Airplane Flight Manual.

§ 135.385 Large transport category airplanes: turbine engine powered: landing limitations: destination airports.

(a) No person operating a turbine engine powered large transport category airplane may take off that airplane at a weight that (allowing for normal consumption of fuel and oil in flight to the destination or alternate airport) the weight of the airplane on arrival would exceed the landing weight in the Airplane Flight Manual for the elevation of the destination or alternate airport and the ambient temperature anticipated at the time of landing.

(b) Except as provided in paragraph (c), (d), or (e) of this section, no person operating a turbine engine powered large transport category airplane may take off that airplane unless its weight on arrival, allowing for normal consumption of fuel and oil in flight (in accordance with the landing distance in the Airplane Flight Manual for the elevation of the destination airport and the wind conditions anticipated there at the time of landing), would allow a full stop landing at the intended destination airport within 60 percent of the effective length of each runway described below from a point 50 feet above the intersection of the obstruction clearance plane and the runway. For the purpose of determining the allowable landing weight at the destination airport the following is assumed:

(1) The airplane is landed on the most favorable runway and in the most favorable direction, in still air.

(2) The airplane is landed on the most suitable runway considering the probable wind velocity and direction and the ground handling characteristics of the airplane, and considering other conditions such as landing aids and terrain.

(c) A turbopropeller powered airplane that would be prohibited from being taken off because it could not meet paragraph (b)(2) of this section, may be taken off if an alternate airport is selected that meets all of this section except that the airplane can accomplish a full stop landing within 70 percent of the effective length of the runway.

(d) Unless, based on a showing of actual operating landing techniques on wet runways, a shorter landing distance (but never less than that required by paragraph (b) of this section) has been approved for a specific type and model airplane and included in the Airplane Flight Manual, no person may take off a turbojet airplane when the appropriate weather reports or forecasts, or any combination of them, indicate that the runways at the destination airport may be wet or slippery at the estimated time of arrival unless the effective runway length at the destination airport is at least 115 percent of the runway length required under paragraph (b) of this section.

(e) A turbojet airplane that would be prohibited from being taken off because it could not meet paragraph (b)(2) of this section may be taken off if an alternate airport is selected that meets all of paragraph (b) of this section.

§ 135.387 Large transport category airplanes: turbine engine powered: landing limitations: alternate airports.

No person may select an airport as an alternate airport for a turbine engine powered large transport category airplane unless (based on the assumptions in § 135.385(b)) that airplane, at the weight anticipated at the time of arrival, can be brought to a full stop landing within 70 percent of the effective length of the runway for turbopropeller-powered airplanes and 60 percent of the effective length of the runway for turbojet airplanes, from a point 50 feet above the intersection of the obstruction clearance plane and the runway.

§ 135.389 Large nontransport category airplanes: takeoff limitations.

(a) No person operating a large nontransport category airplane may take off that airplane at a weight greater than the weight that would allow the airplane to be brought to a safe stop within the effective length of the runway, from any point during the takeoff before reaching 105 percent of minimum control speed (the minimum speed at which an airplane can be safely controlled in flight after an engine becomes inoperative) or 115 percent of the power off stalling speed in the takeoff configuration, whichever is greater.

(b) For the purposes of this section—

(1) It may be assumed that takeoff power is used on all engines during the acceleration;

(2) Not more than 50 percent of the reported headwind component, or not less than 150 percent of the reported tailwind component, may be taken into account;

(3) The average runway gradient (the difference between the elevations of the endpoints of the runway divided by the total length) must be considered if it is more than one-half of one percent;

(4) It is assumed that the airplane is operating in standard atmosphere; and

(5) For takeoff, "effective length of the runway" means the distance from the end of the runway at which the takeoff is started to a point at which the obstruction clearance plane associated with the other end of the runway intersects the runway centerline.

§ 135.391 Large nontransport category airplanes: en route limitations: one engine inoperative.

(a) Except as provided in paragraph (b) of this section, no person operating a large nontransport category airplane may take off that airplane at a weight that does not allow a rate of climb of at least 50 feet a minute, with the critical engine inoperative, at an altitude of at least 1,000 feet above the highest obstruction within five miles on each side of the intended track, or 5,000 feet, whichever is higher.

(b) Without regard to paragraph (a) of this section, if the Administrator finds that safe operations are not impaired, a person may operate the airplane at an altitude that allows the airplane, in case of engine failure, to clear all obstructions within five miles on each side of the intended track by 1,000 feet. If this procedure is used, the rate of descent for the appropriate weight and altitude is assumed to be 50 feet a minute greater than the rate in the approved performance data. Before approving such a procedure, the Administrator considers the following for the route, route segement, or area concerned:

(1) The reliability of wind and weather forecasting.

(2) The location and kinds of navigation aids.

(3) The prevailing weather conditions, particularly the frequency and amount of turbulence normally encountered.

(4) Terrain features.

(5) Air traffic problems.

(6) Any other operational factors that affect the operations.

(c) For the purposes of this section, it is assumed that—

(1) The critical engine is inoperative;

(2) The propeller of the inoperative engine is in the minimum drag position;

(3) The wing flaps and landing gear are in the most favorable position;

(4) The operating engines are operating at the maximum continuous power available;

(5) The airplane is operating in standard atmosphere; and

(6) The weight of the airplane is progressively reduced by the anticipated consumption of fuel and oil.

§ 135.393 Large nontransport category airplanes: landing limitations: destination airports.

(a) No person operating a large nontransport category airplane may take off that airplane at a weight that—

(1) Allowing for anticipated consumption of fuel and oil, is greater than the weight that would allow a full stop landing within 60 percent of the effective length of the most suitable runway at the destination airport; and

(2) Is greater than the weight allowable if the landing is to be made on the runway—

(i) With the greatest effective length in still air; and

(ii) Required by the probable wind, taking into account not more than 50 percent of the headwind component or not less than 150 percent of the tailwind component.

(b) For the purpose of this section, it is assumed that—

(1) The airplane passes directly over the intersection of the obstruction clearance plane and the runway at a height of 50 feet in a steady gliding approach at a true indicated airspeed of at least 1.3 V_{so};

(2) The landing does not require exceptional pilot skill; and

(3) The airplane is operating in standard atmosphere.

§ 135.395 Large nontransport category airplanes: landing limitations: alternate airports.

No person may select an airport as an alternate airport for a large nontransport category airplane unless that airplane (at the weight anticipated at the time of arrival), based on the assumptions in § 135.393(b), can be brought to a full stop landing within 70 percent of the effective length of the runway.

§ 135.397 Small transport category airplane performance operating limitations.

(a) No person may operate a reciprocating engine powered small transport category airplane unless that person complies with the weight limitations in § 135.365, the takeoff limitations in § 135.367 (except paragraph (a)(3)), and the landing limitations in §§ 135.375 and 135.377.

(b) No person may operate a turbine engine powered small transport category airplane unless that person complies with the takeoff limitations in § 135.379 (except paragraphs (d) and (f)) and the landing limitations in §§ 135.385 and 135.387.

§ 135.399 Small nontransport category airplane performance operating limitations.

No person may operate a reciprocating engine or turbopropeller-powered small airplane that is certificated under § 135.169(b) (2), (3), or (4), unless that person complies with the takeoff weight limitations in the approved Airplane Flight Manual or equivalent for operations under this part, and, if the airplane is certificated under § 135.169(b)(4), with the landing weight limitations in the approved Airplane Flight Manual or equivalent for operations under this part.

Subpart J—Maintenance, Preventive Maintenance, and Alterations

§ 135.411 Applicability.

(a) This subpart prescribes rules in addition to those in other parts of this chapter for the maintenance, preventive maintenance, and alterations for each certificate holder as follows:

(1) Aircraft that are type certificated for a passenger seating configuration, excluding any pilot seat, of nine seats or less, shall be maintained under Parts 91 and 43 of this chapter and §§ 135.415, 135.417, and 135.421. An approved aircraft inspection program may be used under § 135.419.

(2) Aircraft that are type certificated for a passenger seating configuration, excluding any pilot seat, of ten seats or more, shall be maintained under a maintenance program in §§ 135.415, 135.417, and 135.423 through 135.443.

(b) A certificate holder who is not otherwise required, may elect to maintain its aircraft under paragraph (a)(2) of this section.

§ 135.413 Responsibility for airworthiness.

(a) Each certificate holder is primarily responsible for the airworthiness of its aircraft, including airframes, aircraft engines, propellers, rotors, appliances, and parts, and shall have its aircraft maintained under this chapter, and shall have defects repaired between required maintenance under Part 43 of this chapter.

(b) Each certificate holder who maintains its aircraft under § 135.411(a)(2) shall—

(1) Perform the maintenance, preventive maintenance, and alteration of its aircraft, including airframe, aircraft engines, propellers, rotors, appliances, emergency equipment and parts, under its manual and this chapter; or

(2) Make arrangments with another person for the performance of maintenance, preventive maintenance, or alteration. However, the certificate holder shall ensure that any maintenance, preventive maintenance, or alteration that is performed by another person is performed under the certificate holder's manual and this chapter.

§ 135.415 Mechanical reliability reports.

(a) Each certificate holder shall report the occurrence or detection of each failure, malfunction, or defect in an aircraft concerning—

(1) Fires during flight and whether the related fire-warning system functioned properly;

(2) Fires during flight not protected by related fire-warning system;

(3) False fire-warning during flight;

(4) An exhaust system that causes damage during flight to the engine, adjacent structure, equipment, or components;

(5) An aircraft component that causes accumulation or circulation of smoke, vapor, or toxic or noxious fumes in the crew compartment or passenger cabin during flight;

(6) Engine shutdown during flight because of flameout;

(7) Engine shutdown during flight when external damage to the engine or aircraft structure occurs;

(8) Engine shutdown during flight due to foreign object ingestion or icing;

(9) Shutdown of more than one engine during flight;

(10) A propeller feathering system or ability of the system to control overspeed during flight;

(11) A fuel or fuel-dumping system that affects fuel flow or causes hazardous leakage during flight;

(12) An unwanted landing gear extension or retraction or opening or closing of landing gear doors during flight;

(13) Brake system components that result in loss of brake actuating force when the aircraft is in motion on the ground;

(14) Aircraft structure that requires major repair;

(15) Cracks, permanent deformation, or corrosion of aircraft structures, if more than the maximum acceptable to the manufacturer or the FAA; and

(16) Aircraft components or systems that result in taking emergency actions during flight (except action to shut-down an engine).

(b) For the purpose of this section, "during flight" means the period from the moment the aircraft leaves the surface of the earth on takeoff until it touches down on landing.

(c) In addition to the reports required by paragraph (a) of this section, each certificate holder shall report any other failure, malfunction, or defect in an aircraft that occurs or is detected at any time if, in its opinion, the failure, malfunction, or defect has endangered or may endanger the safe operation of the aircraft.

(d) Each certificate holder shall send each report required by this section, in

writing, covering each 24-hour period beginning at 0900 hours local time of each day and ending at 0900 hours local time on the next day to the FAA Flight Standards District Office charged with the overall inspection of the certificate holder. Each report of occurrences during a 24-hour period must be mailed or delivered to that office within the next 72 hours. However, a report that is due on Saturday or Sunday may be mailed or delivered on the following Monday and one that is due on a holiday may be mailed or delivered on the next work day. For aircraft operated in areas where mail is not collected, reports may be mailed or delivered within 72 hours after the aircraft returns to a point where the mail is collected.

(e) The certificate holder shall transmit the reports required by this section on a form and in a manner prescribed by the Administrator, and shall include as much of the following as is available:

(1) The type and identification number of the aircraft.

(2) The name of the operator.

(3) The date.

(4) The nature of the failure, malfunction, or defect.

(5) Identification of the part and system involved, including available information pertaining to type designation of the major component and time since last overhaul, if known.

(6) Apparent cause of the failure, malfunction or defect (e.g., wear, crack, design deficiency, or personnel error).

(7) Other pertinent information necessary for more complete identification, determination of seriousness, or corrective action.

(f) A certificate holder that is also the holder of a type certificate (including a supplemental type certificate), a Parts Manufacturer Approval, or a Technical Standard Order Authorization, or that is the licensee of a type certificate need not report a failure, malfunction, or defect under this section if the failure, malfunction, or defect has been reported by it under § 21.3 or § 37.17 of this chapter or under the accident reporting provisions of Part 830 of the regulations of the National Transportation Safety Board.

(g) No person may withhold a report required by this section even though all information required by this section is not available.

(h) When the certificate holder gets additional information, including information from the manufacturer or other agency, concerning a report required by this section, it shall expeditiously submit it as a supplement to the first report and reference the date and place of submission of the first report.

§ 135.417 Mechanical interruption summary report.

Each certificate holder shall mail or deliver, before the end of the 10th day of the following month, a summary report of the following occurrences in multiengine aircraft for the preceding month to the FAA Flight Standards District Office charged with the overall inspection of the certificate holder:

(a) Each interruption to a flight, unscheduled change of aircraft en route, or unscheduled stop or diversion from a route, caused by known or suspected mechanical difficulties or malfunctions that are not required to be reported under § 135.415.

(b) The number of propeller featherings in flight, listed by type of propeller and engine and aircraft on which it was installed. Propeller featherings for training, demonstration, or flight check purposes need not be reported.

§ 135.419 Approved aircraft inspection program.

(a) Whenever the Administrator finds that the aircraft inspections required or allowed under Part 91 of this chapter are not adequate to meet this part, or upon application by a certificate holder, the Administrator may amend the certificate holder's operations specifications under § 135.17, to require or allow an approved aircraft inspection program for any make and model aircraft of which the certificate holder has the exclusive use of at least one aircraft (as defined in § 135.25(b)).

(b) A certificate holder who applies for an amendment of its operations specifications to allow an approved aircraft inspection program must submit that program with its application for approval by the Administrator.

(c) Each certificate holder who is required by its operations specifications to have an approved aircraft inspection program shall submit a program for approval by the Administrator within 30 days of the amendment of its operations specifications or within any other period that the Administrator may prescribe in the operations specifications.

(d) The aircraft inspection program submitted for approval by the Administrator must contain the following:

(1) Instructions and procedures for the conduct of aircraft inspections (which must include necessary tests and checks), setting forth in detail the parts and areas of the airframe, engines, propellers, rotors, and appliances, including emergency equipment, that must be inspected.

(2) A schedule for the performance of the aircraft inspections under paragraph (1) of this paragraph expressed in terms of the time in service, calendar time, number of system operations, or any combination of these.

(3) Instructions and procedures for recording discrepancies found during inspections and correction or deferral of discrepancies including form and disposition of records.

(e) After approval, the certificate holder shall include the approved aircraft inspection program in the manual required by § 135.21.

(f) Whenever the Administrator finds that revisions to an approved aircraft inspection program are necessary for the continued adequacy of the program, the certificate holder shall, after notification by the Administrator, make any changes in the program found by the Administrator to be necessary. The certificate holder may petition the Administrator to reconsider the notice to make any changes in a program. The petition must be filed with the representatives of the Administrator assigned to it within 30 days after the certificate holder receives the notice. Except in the case of an emergency requiring immediate action in the interest of safety, the filing of the petition stays the notice pending a decision by the Administrator.

(g) Each certificate holder who has an approved aircraft inspection program shall have each aircraft that is subject to the program inspected in accordance with the program.

(h) The registration number of each aircraft that is subject to an approved aircraft inspection program must be included in the operations specifications of the certificate holder.

§ 135.421 Additional maintenance requirements.

(a) Each certificate holder who operates an aircraft type certificated for a passenger seating configuration, excluding any pilot seat, of nine seats or less, must comply with the manufacturer's recommended maintenance programs, or a program approved by the Administrator, for each aircraft engine, propeller, rotor, and each item of emergency equipment required by this chapter.

(b) For the purpose of this section, a manufacturer's maintenance program is one which is contained in the maintenance manual or maintenance instructions set forth by the manufacturer as required by this chapter for the aircraft, aircraft engine, propeller, rotor or item of emergency equipment.

§ 135.423 Maintenance, preventive maintenance, and alteration organization.

(a) Each certificate holder that performs any of its maintenance (other than required inspections), preventive maintenance, or alterations, and each person with whom it arranges for the performance of that work, must have an organization adequate to perform the work.

(b) Each certificate holder that performs any inspections required by its manual under § 135.427(b) (2) or (3), (in this subpart referred to as "required inspections"), and each person with whom it arranges for the performance of that work, must have an organization adequate to perform that work.

(c) Each person performing required inspections in addition to other maintenance, preventive maintenance, or alterations, shall organize the performance of those functions so as to separate the required inspection functions from the other maintenance, preventive maintenance, and alteration functions. The separation shall be below the level of administrative control at which overall responsibility for the required inspection functions and other maintenance, preventive maintenance, and alteration functions is exercised.

§ 135.425 Maintenance, preventive maintenance, and alteration programs.

Each certificate holder shall have an inspection program and a program covering other maintenance, preventive maintenance, and alterations, that ensures that—

(a) Maintenance, preventive maintenance, and alterations performed by it, or by other persons, are performed under the certificate holder's manual;

(b) Competent personnel and adequate facilities and equipment are provided for the proper performance of maintenance, preventive maintenance, and alterations; and

(c) Each aircraft released to service is airworthy and has been properly maintained for operation under this part.

§ 135.427 Manual requirements.

(a) Each certificate holder shall put in its manual the chart or description of the certificate holder's organization required by § 135.423 and a list of persons with whom it has arranged for the performance of any of its required inspections, other maintenance, preventive maintenance, or alterations, including a general description of that work.

(b) Each certificate holder shall put in its manual the programs required by § 135.425 that must be followed in performing maintenance, preventive maintenance, and alterations of that certificate holder's aircraft, including airframes, aircraft engines, propellers, rotors, appliances, emergency equipment, and parts, and must include at least the following:

(1) The method of performing routine and nonroutine maintenance (other than required inspections), preventive maintenance, and alterations.

(2) A designation of the items of maintenance and alteration that must be inspected (required inspections) including at least those that could result in a failure, malfunction, or defect endangering the safe operation of the aircraft, if not performed properly or if improper parts or materials are used.

(3) The method of performing required inspections and a designation by occupational title of personnel authorized to perform each required inspection.

(4) Procedures for the reinspection of work performed under previous required inspection findings ("buy-back procedures").

(5) Procedures, standards, and limits necessary for required inspections and acceptance or rejection of the items required to be inspected and for periodic inspection and calibration of precision tools, measuring devices, and test equipment.

(6) Procedures to ensure that all required inspections are performed.

(7) Instructions to prevent any person who performs any item of work from performing any required inspection of that work.

(8) Instructions and procedures to prevent any decision of an inspector regarding any required inspection from being countermanded by persons other than supervisory personnel of the inspection unit, or a person at the level of administrative control that has overall responsibility for the management of both the required inspection functions and the other maintenance, preventive maintenance, and alterations functions.

(9) Procedures to ensure that required inspections, other maintenance, preventive maintenance, and alterations that are not completed as a result of work interruptions are properly completed before the aircraft is released to service.

(c) Each certificate holder shall put in its manual a suitable system (which may include a coded system) that provides for the retention of the following information—

(1) A description (or reference to data acceptable to the Administrator) of the work performed;

(2) The name of the person performing the work if the work is performed by a person outside the organization of the certificate holder; and

(3) The name or other positive identification of the individual approving the work.

§ 135.429 Required inspection personnel.

(a) No person may use any person to perform required inspections unless the person performing the inspection is appropriately certificated, properly trained, qualified, and authorized to do so.

(b) No person may allow any person to perform a required inspection unless, at the time, the person performing that inspection is under the supervision and control of an inspection unit.

(c) No person may perform a required inspection if that person performed the item of work required to be inspected.

(d) Each certificate holder shall maintain, or shall determine that each person with whom it arranges to perform its required inspections maintains, a current listing of persons who have been trained, qualified, and authorized to conduct required inspections. The persons must be identified by name, occupational title and the inspections that they are authorized to perform. The certificate holder (or person with whom it arranges to perform its required inspections) shall give written information to each person so authorized, describing the extent of that person's responsibilities, authorities, and inspectional limitations. The list shall be made available for inspection by the Administrator upon request.

§ 135.431 Continuing analysis and surveillance.

(a) Each certificate holder shall establish and maintain a system for the continuing analysis and surveillance of the performance and effectiveness of its inspection program and the program covering other maintenance, preventive maintenance, and alterations and for the correction of any deficiency in those programs, regardless of whether those programs are carried out by the certificate holder or by another person.

(b) Whenever the Administrator finds that either or both of the programs described in paragraph (a) of this section does not contain adequate procedures and standards to meet this part, the certificate holder shall, after notification by the Administrator, make changes in those programs requested by the Administrator.

(c) A certificate holder may petition the Administrator to reconsider the notice to make a change in a program. The petition must be filed with the FAA Flight Standards District Office charged with the overall inspection of the certificate holder within 30 days after the certificate holder receives the notice. Except in the case of an emergency requiring immediate action in the interest of safety, the filing of the petition stays the notice pending a decision by the Administrator.

§ 135.433 Maintenance and preventive maintenance training program.

Each certificate holder or a person performing maintenance or preventive maintenance functions for it shall have a training program to ensure that each person (including inspection

personnel) who determines the adequacy of work done is fully informed about procedures and techniques and new equipment in use and is competent to perform that person's duties.

§ 135.435 Certificate requirements.

(a) Except for maintenance, preventive maintenance, alterations, and required inspections performed by repair stations certificated under the provisions of Subpart C of Part 145 of this chapter, each person who is directly in charge of maintenance, preventive maintenance, or alterations, and each person performing required inspections must hold an appropriate airman certificate.

(b) For the purpose of this section, a person "directly in charge" is each person assigned to a position in which that person is responsible for the work of a shop or station that performs maintenance, preventive maintenance, alterations, or other functions affecting airworthiness. A person who is "directly in charge" need not physically observe and direct each worker constantly but must be available for consultation and decision on matters requiring instruction or decision from higher authority than that of the person performing the work.

§ 135.437 Authority to perform and approve maintenance, preventive maintenance, and alterations.

(a) A certificate holder may perform, or make arrangements with other persons to perform, maintenance, preventive maintenance, and alterations as provided in its maintenance manual. In addition, a certificate holder may perform these functions for another certificate holder as provided in the maintenance manual of the other certificate holder.

(b) A certificate holder may approve any airframe, aircraft engine, propeller, rotor, or appliance for return to service after maintenance, preventive maintenance, or alterations that are performed under paragraph (a) of this section. However, in the case of a major repair or alteration, the work must have been done in accordance with technical data approved by the Administrator.

§ 135.439 Maintenance recording requirements.

(a) Each certificate holder shall keep (using the system specified in the manual required in § 135.427(1) the following records for the periods specified in paragraph (b) of this section:

(1) All the records necessary to show that all requirements for the issuance of an airworthiness release under § 135.443 have been met.

(2) Records containing the following information:

(i) The total time in service of the airframe, engine, propeller, and rotor.

(ii) The current status of life-limited parts of each airframe, engine, propeller, rotor, and appliance.

(iii) The time since last overhaul of each item installed on the aircraft which are required to be overhauled on a specified time basis.

(iv) The identification of the current inspection status of the aircraft, including the time since the last inspections required by the inspection program under which the aircraft and its appliances are maintained.

(v) The current status of applicable airworthiness directives, including the date and methods of compliance, and, if the airworthiness directive involves recurring action, the time and date when the next action is required.

(vi) A list of current major alterations and repairs to each airframe, engine, propeller, rotor, and appliance.

(b) Each certificate holder shall retain the records required to be kept by this section for the following periods:

(1) Except for the records of the last complete overhaul of each airframe, engine, propeller, rotor, and appliance the records specified in paragraph (a)(1) of this section shall be retained until the work is repeated or superseded by other work or for one year after the work is performed.

(2) The records of the last complete overhaul of each airframe, engine, propeller, rotor, and appliance shall be retained until the work is superseded by work of equivalent scope and detail.

(3) The records specified in paragraph (a)(2) of this section shall be retained and transferred with the aircraft at the time the aircraft is sold.

(c) The certificate holder shall make all maintenance records required to be kept by this section available for inspection by the Administrator or any representative of the National Transportation Safety Board.

§ 135.441 Transfer of maintenance records.

Each certificate holder who sells a United States registered aircraft shall transfer to the purchaser, at the time of the sale, the following records of that aircraft, in plain language form or in coded form which provides for the preservation and retrieval of information in a manner acceptable to the Administrator:

(a) The records specified in § 135.439(a)(2).

(b) The records specified in § 135.439(a)(1) which are not included in the records covered by paragraph (a) of this section, except that the purchaser may allow the seller to keep physical custody of such records. However, custody of records by the seller does not relieve the purchaser of its responsibility under § 135.439(c) to make the records available for inspection by the Administrator or any representative of the National Transportation Safety Board.

§ 135.443 Airworthiness release or aircraft maintenance log entry.

(a) No certificate holder may operate an aircraft after maintenance, preventive maintenance, or alterations are performed on the aircraft unless the certificate holder prepares, or causes the person with whom the certificate holder arranges for the performance of the maintenance, preventive maintenance, or alterations, to prepare—

(1) An airworthiness release; or

(2) An appropriate entry in the aircraft maintenance log.

(b) The airworthiness release or log entry required by paragraph (a) of this section must—

(1) Be prepared in accordance with the procedure in the certificate holder's manual;

(2) Include a certification that—

(i) The work was performed in accordance with the requirements of the certificate holder's manual;

(ii) All items required to be inspected were inspected by an authorized person who determined that the work was satisfactorily completed;

(iii) No known condition exists that would make the aircraft unairworthy;

(iv) So far as the work performed is concerned, the aircraft is in condition for safe operation; and

(3) Be signed by an authorized certificated mechanic or repairman, except that a certificated repairman may sign the release or entry only for the work for which that person is employed and for which that person is certificated.

(c) Instead of restating each of the conditions of the certification required by paragraph (b) of this section, the certificate holder may state in its manual that the signature of an authorized certificated mechanic or repairman constitutes that certification.

APPENDIX A

ADDITIONAL AIRWORTHINESS STANDARDS FOR 10 OR MORE PASSENGER AIRPLANES

Applicability

1. *Applicability.* This appendix prescribes the additional airworthiness standards required by § 135.169.

2. *References.* Unless otherwise provided, references in this appendix to specific sections of Part 23 of the Federal Aviation Regulations (FAR Part 23) are to those sections of Part 23 in effect on March 30, 1967.

Flight Requirements

3. *General.* Compliance must be shown with the applicable requirements of Subpart B of FAR Part 23, as supplemented or modified in §§ 4 through 10.

Performance

4. *General.* (a) Unless otherwise prescribed in this appendix, compliance with each applicable performance requirement in §§ 4 through 7 must be shown for ambient atmospheric conditions and still air.

(b) The performance must correspond to the propulsive thrust available under the particular ambient atmospheric conditions and the particular flight condition. The available propulsive thrust must correspond to engine power or thrust, not exceeding the approved power or thrust less—

(1) Installation losses; and

(2) The power or equivalent thrust absorbed by the accessories and services appropriate to the particular ambient atmospheric conditions and the particular flight condition.

(c) Unless otherwise prescribed in this appendix, the applicant must select the takeoff, en route, and landing configurations for the airplane.

(3) The airplane configuration may vary with weight, altitude, and temperature, to the extent they are compatible with the operating procedures required by paragraph (e) of this section.

(e) Unless otherwise prescribed in this appendix, in determining the critical engine inoperative takeoff performance, the accelerate-stop distance, takeoff distance, changes in the airplane's configuration, speed, power, and thrust must be made under procedures established by the applicant for operation in service.

(f) Procedures for the execution of balked landings must be established by the applicant and included in the Airplane Flight Manual.

(g) The procedures established under paragraphs (e) and (f) of this section must—

(1) Be able to be consistently executed in service by a crew of average skill;

(2) Use methods or devices that are safe and reliable; and

(3) Include allowance for any time delays, in the execution of the procedures, that may reasonably be expected in service.

5. *Takeoff*—(a) *General.* Takeoff speeds, the accelerate-stop distance, the takeoff distance, and the one-engine-inoperative takeoff flight path data (described in paragraphs (b), (c), (d), and (f) of this section), must be determined for—

(1) Each weight, altitude, and ambient temperature within the operational limits selected by the applicant;

(2) The selected configuration for takeoff;

(3) The center of gravity in the most unfavorable position;

(4) The operating engine within approved operating limitations; and

(5) Takeoff data based on smooth, dry, hard-surface runway.

(b) *Takeoff speeds.* (1) The decision speed V_1 is the calibrated airspeed on the ground at which, as a result of engine failure or other reasons, the pilot is assumed to have made a decision to continue or discontinue the takeoff. The speed V_1 must be selected by the applicant but may not be less than—

(i) $1.10 V_{MC}$;

(ii) $1.10 V_{MC}$;

(iii) A speed that allows acceleration to V_1 and stop under paragraph (c) of this section; or

(iv) A speed at which the airplane can be rotated for takeoff and shown to be adequate to safely continue the takeoff, using normal piloting skill, when the critical engine is suddenly made inoperative.

(2) The initial climb out speed V_2, in terms of calibrated airspeed, must be selected by the applicant so as to allow the gradient of climb required in § 6(b)(2), but it must not be less than V_1 or less than $1.2 V_{S1}$.

(3) Other essential take off speeds necessary for safe operation of the airplane.

(c) *Accelerate-stop distance.* (1) The accelerate-stop distance is the sum of the distances necessary to—

(i) Accelerate the airplane from a standing start to V_1; and

(ii) Come to a full stop from the point at which V_1 is reached assuming that in the case of engine failure, failure of the critical engine is recognized by the pilot at the speed V_1.

(2) Means other than wheel brakes may be used to determine the accelerate-stop distance if that means is available with the critical engine inoperative and—

(i) Is safe and reliable;

(ii) Is used so that consistent results can be expected under normal operating conditions; and

(iii) Is such that exceptional skill is not required to control the airplane.

(d) *All engines operating takeoff distance.* The all engine operating takeoff distance is the horizontal distance required to takeoff and climb to a height of 50 feet above the takeoff surface under the procedures in FAR 23.51(a).

(e) *One-engine-inoperative takeoff.* Determine the weight for each altitude and temperature within the operational limits established for the airplane, at which the airplane has the capability, after failure of the critical engine at V_1 determined under paragraph (b) of this section, to take off and climb at not less than V_2, to a height 1,000 feet above the takeoff surface and attain the speed and configuration at which compliance is shown with the en route one-engine-inoperative gradient of climb specified in § 6(c).

(f) *One-engine-inoperative takeoff flight path data.* The one-engine-inoperative takeoff flight path data consist of takeoff flight paths extending from a standing start to a point in the takeoff at which the airplane reaches a height 1,000 feet above the takeoff surface under paragraph (e) of this section.

6. *Climb*—(a) *Landing climb: All-engines-operating.* The maximum weight must be determined with the airplane in the landing configuration, for each altitude, and ambient temperature within the operational limits established for the airplane, with the most unfavorable center of gravity, and out-of-ground effect in free air, at which the steady gradient of climb will not be less than 3.3 percent, with:

(1) The engines at the power that is available 8 seconds after initiation of movement of the power or thrust controls from the minimum flight idle to the takeoff position.

(2) A climb speed not greater than the approach speed established under § 7 and not less than the greater of $1.05 V_{MC}$ or $1.10 V_{S1}$.

(b) *Takeoff climb: one-engine-inoperative.* The maximum weight at which the airplane meets the minimum climb performance specified in subparagraphs (1) and (2) of this paragraph must be determined for each altitude and ambient temperature within the operational limits established for the airplane, out of ground effect in free air, with the airplane in the takeoff configuration, with the most unfavorable center of gravity, the critical engine inoperative, the remaining engines at the maximum takeoff power or thrust, and the propeller of the inoperative engine windmilling with the propeller controls in the normal position except that, if an approved automatic feathering system is installed, the propellers may be in the feathered position:

(1) *Takeoff: landing gear extended.* The minimum steady gradient of climb must be measurably positive at the speed V_2.

(2) *Takeoff: landing gear retracted.* The minimum steady gradient of climb may not be less than 2 percent at speed V_2. For airplanes with fixed landing gear this requirement must be met with the landing gear extended.

(c) *En route climb: one-engine-inoperative.* The maximum weight must be determined for each altitude and ambient temperature within the operational limits established for the airplane, at which the steady gradient of climb is not less 1.2 percent at an altitude 1,000 feet above the takeoff surface, with the airplane in the en route configuration, the critical engine inoperative, the remaining engine at the maximum continuous power or thrust, and the most unfavorable center of gravity.

7. *Landing.* (a) The landing field length described in paragraph (b) of this section must be determined for standard atmosphere at each weight and altitude within the operational limits established by the applicant.

(b) The landing field length is equal to the landing distance determined under FAR 23.75(a) divided by a factor of 0.6 for the destination airport and 0.7 for the alternate airport. Instead of the gliding approach specified in FAR 23.75(a)(1), the landing may be preceded by a steady approach down to the 50-foot height at a gradient of descent not greater than 5.2 percent (3°) at a calibrated airspeed not less than $1.3 V_{S1}$.

Trim

8. *Trim*—(a) *Lateral and directional trim.* The airplane must maintain lateral and directional trim in level flight at a speed of V_H or V_{MO}/M_{MO}, whichever is lower, with landing gear and wing flaps retracted.

(b) *Longitudinal trim.* The airplane must maintain longitudinal trim during the following conditions, except that it need not maintain trim at a speed greater than V_{MO}/M_{MO}:

(1) In the approach conditons specified in FAR 23.161(c) (3) through (5), except that instead of the speeds specified in those paragraphs, trim must be maintained with a stick force of not more than 10 pounds down to a speed used in showing compliance with § 7 or $1.4 V_{S1}$, whichever is lower.

(2) In level flight at any speed from V_H or V_{MO}/M_{MO}, whichever is lower, to either V_2 or $1.4 V_{S1}$, with the landing gear and wing flaps retracted.

Stability

9. *Static longitudinal stability.* (a) In showing compliance with FAR 23.175(b) and with paragraph (b) of this section, the airspeed must return to within ±7½ percent of the trim speed.

(b) *Cruise stability.* The stick force curve must have a stable slope for a speed range of ±50 knots from the trim speed except that the speeds need not exceed V_{FC}/M_{FC} or be less than $1.4 V_{S1}$. This speed range will be considered to begin at the outer extremes of the friction band and the stick force may not exceed 50 pounds with—

(1) Landing gear retracted;
(2) Wing flaps retracted;
(3) The maximum cruising power as selected by the applicant as an operating limitation for turbine engines or 75 percent of maximum continuous power for reciprocating engines except that the power need not exceed that required at V_{MO}/M_{MO};
(4) Maximum takeoff weight; and
(5) The airplane trimmed for level flight with the power specified in subparagraph (3) of this paragraph.

V_{FC}/M_{FC} may not be less than a speed midway between V_{MO}/M_{MO} and V_{DF}/M_{DF}, except that, for altitudes where Mach number is the limiting factor, M_{FC} need not exceed the Mach number at which effective speed warning occurs.

(c) *Climb stability (turbopropeller powered airplanes only).* In showing compliance with FAR 23.175(a), an applicant must, instead of the power specified in FAR 23.175(a)(4), use the maximum power or thrust selected by the applicant as an operating limitation for use during climb at the best rate of climb speed, except that the speed need not be less than $1.4V_{S1}$.

Stalls

10. *Stall warning.* If artificial stall warning is required to comply with FAR 23.207, the warning device must give clearly distinguishable indications under expected conditions of flight. The use of a visual warning device that requires the attention of the crew within the cockpit is not acceptable by itself.

Control systems

11. *Electric trim tabs.* The airplane must meet FAR 23.677 and in addition it must be shown that the airplane is safely controllable and that a pilot can perform all the maneuvers and operations necessary to effect a safe landing following any probable electric trim tab runaway which might be reasonably expected in service allowing for appropriate time delay after pilot recognition of the runaway. This demonstration must be conducted at the critical airplane weights and center of gravity positions.

Instruments: Installation

12. *Arrangement and visibility.* Each instrument must meet FAR 23.1321 and in addition:
(a) Each flight, navigation, and powerplant instrument for use by any pilot must be plainly visible to the pilot from the pilot's station with the minimum practicable deviation from the pilot's normal position and line of vision when the pilot is looking forward along the flight path.
(b) The flight instruments required by FAR 23.1303 and by the applicable operating rules must be grouped on the instrument panel and centered as nearly as practicable about the vertical plane of each pilot's forward vision. In addition—
(1) The instrument that most effectively indicates the attitude must be in the panel in the top center position;
(2) The instrument that most effectively indicates the airspeed must be on the panel directly to the left of the instrument in the top center position;
(3) The instrument that most effectively indicates altitude must be adjacent to and directly to the right of the instrument in the top center position; and
(4) The instrument that most effectively indicates direction of flight must be adjacent to and directly below the instrument in the top center position.

13. *Airspeed indicating system.* Each airspeed indicating system must meet FAR 23.1323 and in addition:
(a) Airspeed indicating instruments must be of an approved type and must be calibrated to indicate true airspeed at sea level in the standard atmosphere with a minimum practicable instrument calibration error when the corresponding pitot and static pressures are supplied to the instruments.
(b) The airspeed indicating system must be calibrated to determine the system error, i.e., the relation between IAS and CAS, in flight and during the accelerate-takeoff ground run. The ground run calibration must be obtained between 0.8 of the minimum value of V_1 and 1.2 times the maximum value of V_1, considering the approved ranges of altitude and weight. The ground run calibration is determined assuming an engine failure at the minimum value of V_1.
(c) The airspeed error of the installation excluding the instrument calibration error, must not exceed 3 percent or 5 knots whichever is greater, throughout the speed range from V_{MO} to $1.3V_{S1}$ with flaps retracted and from $1.3V_{SO}$ to V_{FE} with flaps in the landing position.
(d) Information showing the relationship between IAS and CAS must be shown in the Airplane Flight manual.

14. *Static air vent system.* The static air vent system must meet FAR 23.1325. The altimeter system calibration must be determined and shown in the Airplane Flight Manual.

Operating Limitations and Information

15. *Maximum operating limit speed V_{MO}/M_{MO}.* Instead of establishing operating limitations based on V_{NE} and V_{NO}, the applicant must establish a maximum operating limit speed V_{MO}/M_{MO} as follows:
(a) The maximum operating limit speed must not exceed the design cruising speed V_C and must be sufficiently below V_D/M_D or V_{DF}/M_{DF} to make it highly improbable that the latter speeds will be inadvertently exceeded in flight.
(b) The speed V_{MO} must not exceed $0.8V_D/M_D$ or $0.8V_{DF}/M_{DF}$ unless flight demonstrations involving upsets as specified by the Administrator indicates a lower speed margin will not result in speeds exceeding V_D/M_D or V_{DF}. Atmospheric variations, horizontal gusts, system and equipment errors, and airframe production variations are taken into account.

16. *Minimum flight crew.* In addition to meeting FAR 23.1523, the applicant must establish the minimum number and type of qualified flight crew personnel sufficient for safe operation of the airplane considering—
(a) Each kind of operation for which the applicant desires approval;
(b) The workload on each crewmember considering the following:
(1) Flight path control.
(2) Collision avoidance.
(3) Navigation.
(4) Communications.
(5) Operation and monitoring of all essential aircraft systems.
(6) Command decisions; and
(c) The accessibility and ease of operation of necessary controls by the appropriate crewmember during all normal and emergency operations when at the crewmember flight station.

17. *Airspeed indicator.* The airspeed indicator must meet FAR 23.1545 except that, the airspeed notations and markings in terms of V_{NO} and V_{NE} must be replaced by the V_{MO}/M_{MO} notations. The airspeed indicator markings must be easily read and understood by the pilot. A placard adjacent to the airspeed indicator is an acceptable means of showing compliance with FAR 23.1545(c).

Airplane Flight Manual

18. *General.* The Airplane Flight Manual must be prepared under FARs 23.1583 and 23.1587, and in addition the operating limitations and performance information in §§ 19 and 20 must be included.

19. *Operating limitations.* The Airplane Flight Manual must include the following limitations—
(a) *Airspeed limitations.* (1) The maximum operating limit speed V_{MO}/M_{MO} and a statement that this speed limit may not be deliberately exceeded in any regime of flight (climb, cruise, or descent) unless a higher speed is authorized for flight test or pilot training;
(2) If an airspeed limitation is based upon compressibility effects, a statement to this effect and informaton as to any symptoms, the probable behavior of the airplane, and the recommended recovery procedures; and
(3) The airspeed limits, shown in terms of V_{MO}/M_{MO} instead of V_{NO} and V_{NE}.
(b) *Takeoff weight limitations.* The maximum takeoff weight for each airport elevation, ambient temperature, and available takeoff runway length within the range selected by the applicant may not exceed the weight at which—
(1) The all-engine-operating takeoff distance determined under § 5(b) or the accelerate-stop distance determined under § 5(c), whichever is greater, is equal to the available runway length;
(2) The airplane complies with the one-engine-inoperative takeoff requirements specified in § 5(e); and
(3) The airplane complies with the one-engine-inoperative takeoff and en route climb requirements specified in §§ 6 (b) and (c).
(c) *Landing weight limitations.* The maximum landing weight for each airport elevation (standard temperature) and available landing runway length, within the range selected by the applicant. This weight may not exceed the weight at which the landing field length determined under § 7(b) is equal to the available runway length. In showing compliance with this operating limitation, it is acceptable to assume that the landing weight at the destination will be equal to the takeoff weight reduced by the normal consumption of fuel and oil en route.

20. *Performance information.* The Airplane Flight Manual must contain the performance information determined under the performance requirements of this appendix. The information must include the following:
(a) Sufficient information so that the takeoff weight limits specified in § 19(b) can be determined for all temperatures and altitudes within the operation limitations selected by the applicant.
(b) The conditions under which the performance information was obtained, including the airspeed at the 50-foot height used to determine landing distances.
(c) The performance information (determined by extrapolation and computed for the range of weights between the maximum landing and takeoff weights) for—

(1) Climb in the landing configuration; and

(2) Landing distance.

(d) Procedure established under § 4 related to the limitations and information required by this section in the form of guidance material including any relevant limitations or information.

(e) An explanation of significant or unusual flight or ground handling characteristics of the airplane.

(f) Airspeeds, as indicated airspeeds, corresponding to those determined for takeoff under § 5(b).

21. *Maximum operating altitudes.* The maximum operating altitude to which operation is allowed, as limited by flight, structural, powerplant, functional, or equipment characteristics, must be specified in the Airplane Flight Manual..

22. *Stowage provision for airplane flight manual.* Provision must be made for stowing the Airplane Flight Manual in a suitable fixed container which is readily accessible to the pilot.

23. *Operating procedures.* Procedures for restarting turbine engines in flight (including the effects of altitude) must be set forth in the Airplane Flight Manual.

Airframe Requirements

Flight Loads

24. *Engine Torque.* (a) Each turbopropeller engine mount and its supporting structure must be designed for the torque effects of:

(1) The conditions in FAR 23.361(a).

(2) The limit engine torque corresponding to takeoff power and propeller speed multiplied by a factor accounting for propeller control system malfunction, including quick feathering action, simultaneously with 1*g* level flight loads. In the absence of a rational analysis, a factor of 1.6 must be used.

(b) The limit torque is obtained by multiplying the mean torque by a factor of 1.25.

25. *Turbine engine gyroscopic loads.* Each turbopropeller engine mount and its supporting structure must be designed for the gyroscopic loads that result, with the engines at maximum continuous r.p.m., under either—

(a) The conditions in FARs 23.351 and 23.423; or

(b) All possible combinations of the following:

(1) A yaw velocity of 2.5 radians per second.

(2) A pitch velocity of 1.0 radians per second.

(3) A normal load factor of 2.5.

(4) Maximum continuous thrust.

26. *Unsymmetrical loads due to engine failure.* (a) Turbopropeller powered airplanes must be designed for the unsymmetrical loads resulting from the failure of the critical engine including the following conditions in combination with a single malfunction of the propeller drag limiting system, considering the probable pilot corrective action on the flight controls:

(1) At speeds between V_{mo} and V_D, the loads resulting from power failure because of fuel flow interruption are considered to be limit loads.

(2) At speeds between V_{mo} and V_c, the loads resulting from the disconnection of the engine compressor from the turbine or from loss of the turbine blades are considered to be ultimate loads.

(3) The time history of the thrust decay and drag buildup occurring as a result of the prescribed engine failures must be substantiated by test or other data applicable to the particular engine-propeller combination.

(4) The timing and magnitude of the probable pilot corrective action must be conservatively estimated, considering the characteristics of the particular engine-propeller-airplane combination.

(b) Pilot corrective action may be assumed to be initiated at the time maximum yawing velocity is reached, but not earlier than 2 seconds after the engine failure. The magnitude of the corrective action may be based on the control forces in FAR 23.397 except that lower forces may be assumed where it is shown by analysis or test that these forces can control the yaw and roll resulting from the prescribed engine failure conditions.

Ground Loads

27. *Dual wheel landing gear units.* Each dual wheel landing gear unit and its supporting structure must be shown to comply with the following:

(a) *Pivoting.* The airplane must be assumed to pivot about one side of the main gear with the brakes on that side locked. The limit vertical load factor must be 1.0 and the coefficient of friction 0.8. This condition need apply only to the main gear and its supporting structure.

(b) *Unequal tire inflation.* A 60-40 percent distribution of the loads established under FAR 23.471 through FAR 23.483 must be applied to the dual wheels.

(c) *Flat tire.* (1) Sixty percent of the loads in FAR 23.471 through FAR 23.483 must be applied to either wheel in a unit.

(2) Sixty percent of the limit drag and side loads and 100 percent of the limit vertical load established under FARs 23.493 and 23.485 must be applied to either wheel in a unit except that the vertical load need not exceed the maximum vertical load in paragraph (c)(1) of this section.

Fatigue Evaluation

28. *Fatigue evaluation of wing and associated structure.* Unless it is shown that the structure, operating stress levels, materials and expected use are comparable from a fatigue standpoint to a similar design which has had substantial satisfactory service experience, the strength, detail design, and the fabrication of those parts of the wing, wing carrythrough, and attaching structure whose failure would be catastrophic must be evaluated under either—

(a) A fatigue strength investigation in which the structure is shown by analysis, tests, or both to be able to withstand the repeated loads of variable magnitude expected in service; or

(b) A fail-safe strength investigation in which it is shown by analysis, tests, or both that catastrophic failure of the structure is not probable after fatigue, or obvious partial failure, of a principal structural element, and that the remaining structure is able to withstand a static ultimate load factor of 75 percent of the critical limit load factor at V_c. These loads must be multiplied by a factor of 1.15 unless the dynamic effects of failure under static load are otherwise considered.

Design and Construction

29. *Flutter.* For multiengine turbopropeller powered airplanes, a dynamic evaluation must be made and must include—

(a) The significant elastic, inertia, and aerodynamic forces associated with the rotations and displacements of the plane of the propeller; and

(b) Engine-propeller-nacelle stiffness and damping variations appropriate to the particular configuration.

Landing Gear

30. *Flap operated landing gear warning device.* Airplanes having retractable landing gear and wing flaps must be equipped with a warning device that functions continuously when the wing flaps are extended to a flap position that activates the warning device to give adequate warning before landing, using normal landing procedures, if the landing gear is not fully extended and locked. There may not be a manual shut off for this warning device. The flap position sensing unit may be installed at any suitable location. The system for this device may use any part of the system (including the aural warning device) provided for other landing gear warning devices.

Personnel and Cargo Accommodations

31. *Cargo and baggage compartments.* Cargo and baggage compartments must be designed to meet FAR 23.787 (a) and (b), and in addition means must be provided to protect passengers from injury by the contents of any cargo or baggage compartment when the ultimate forward inertia force is 9*g*.

32. *Doors and exits.* The airplane must meet FAR 23.783 and FAR 23.807 (a)(3), (b), and (c), and in addition:

(a) There must be a means to lock and safeguard each external door and exit against opening in flight either inadvertently by persons, or as a result of mechanical failure. Each external door must be operable from both the inside and the outside.

(b) There must be means for direct visual inspection of the locking mechanism by crewmembers to determine whether external doors and exits, for which the initial opening movement is outward, are fully locked. In addition, there must be a visual means to signal to crewmembers when normally used external doors are closed and fully locked.

(c) The passenger entrance door must qualify as a floor level emergency exit. Each additional required emergency exit except floor level exits must be located over the wing or must be provided with acceptable means to assist the occupants in descending to the ground. In addition to the passenger entrance door:

(1) For a total seating capacity of 15 or less, an emergency exit as defined in FAR 23.807(b) is required on each side of the cabin.

(2) For a total seating capacity of 16 through 23, three emergency exits as defined in FAR 23.807(b) are required with one on the same side as the door and two on the side opposite the door.

(d) An evacuation demonstration must be conducted utilizing the maximum number of occupants for which certification is desired. It must be conducted under simulated night conditions utilizing only the emergency exits on the most critical side of the aircraft. The participants must be representative of average airline passengers with no

previous practice or rehearsal for the demonstration. Evacuation must be completed within 90 seconds.

(e) Each emergency exit must be marked with the word "Exit" by a sign which has white letters 1 inch high on a red background 2 inches high, be self-illuminated or independently internally electrically illuminated, and have a minimum luminescence (brightness) of at least 160 microlamberts. The colors may be reversed if the passenger compartment illumination is essentially the same.

(f) Access to window type emergency exits must not be obstructed by seats or seat backs.

(g) The width of the main passenger aisle at any point between seats must equal or exceed the values in the following table:

Total seating capacity	Minimum main passenger aisle width	
	Less than 25 inches from floor	25 inches and more from floor
10 through 23	9 inches	15 inches.

Miscellaneous

33. *Lightning strike protection.* Parts that are electrically insulated from the basic airframe must be connected to it through lightning arrestors unless a lightning strike on the insulated part—

(a) Is improbable because of shielding by other parts; or

(b) Is not hazardous.

34. *Ice protection.* If certification with ice protection provisions is desired, compliance with the following must be shown:

(a) The recommended procedures for the use of the ice protection equipment must be set forth in the Airplane Flight Manual.

(b) An analysis must be performed to establish, on the basis of the airplane's operational needs, the adequacy of the ice protection system for the various components of the airplane. In addition, tests of the ice protection system must be conducted to demonstrate that the airplane is capable of operating safely in continuous maximum and intermittent maximum icing conditions as described in Appendix C of Part 25 of this chapter.

(c) Compliance with all or portions of this section may be accomplished by reference, where applicable because of similarity of the designs, to analysis and tests performed by the applicant for a type certificated model.

35. *Maintenance information.* The applicant must make available to the owner at the time of delivery of the airplane the information the applicant considers essential for the proper maintenance of the airplane. That information must include the following:

(a) Description of systems, including electrical, hydraulic, and fuel controls.

(b) Lubrication instructions setting forth the frequency and the lubricants and fluids which are to be used in the various systems.

(c) Pressures and electrical loads applicable to the various systems.

(d) Tolerances and adjustments necessary for proper functioning.

(e) Methods of leveling, raising, and towing.

(f) Methods of balancing control surfaces.

(g) Identification of primary and secondary structures.

(h) Frequency and extent of inspections necessary to the proper operation of the airplane.

(i) Special repair methods applicable to the airplane.

(j) Special inspection techniques, such as X-ray, ultrasonic, and magnetic particle inspection.

(k) List of special tools.

Propulsion

General

36. *Vibration characteristics.* For turbopropeller powered airplanes, the engine installation must not result in vibration characteristics of the engine exceeding those established during the type certification of the engine.

37. *In flight restarting of engine.* If the engine on turbopropeller powered airplanes cannot be restarted at the maximum cruise altitude, a determination must be made of the altitude below which restarts can be consistently accomplished. Restart information must be provided in the Airplane Flight Manual.

38. *Engines.* (a) *For turbopropeller powered airplanes.* The engine installation must comply with the following:

(1) *Engine isolation.* The powerplants must be arranged and isolated from each other to allow operation, in at least one configuration, so that the failure or malfunction of any engine, or of any system that can affect the engine, will not—

(i) Prevent the continued safe operation of the remaining engines; or

(ii) Require immediate action by any crewmember for continued safe operation.

(2) *Control of engine rotation.* There must be a means to individually stop and restart the rotation of any engine in flight except that engine rotation need not be stopped if continued rotation could not jeopardize the safety of the airplane. Each component of the stopping and restarting system on the engine side of the firewall, and that might be exposed to fire, must be at least fire resistant. If hydraulic propeller feathering systems are used for this purpose, the feathering lines must be at least fire resistant under the operating conditions that may be expected to exist during feathering.

(3) *Engine speed and gas temperature control devices.* The powerplant systems associated with engine control devices, systems, and instrumentation must provide reasonable assurance that those engine operating limitations that adversely affect turbine rotor structural integrity will not be exceeded in service.

(b) *For reciprocating engine powered airplanes.* To provide engine isolation, the powerplants must be arranged and isolated from each other to allow operation, in at least one configuration, so that the failure or malfunction of any engine, or of any system that can affect that engine, will not—

(1) Prevent the continued safe operation of the remaining engines; or

(2) Require immediate action by any crewmember for continued safe operation.

39. *Turbopropeller reversing systems.* (a) Turbopropeller reversing systems intended for ground operation must be designed so that no single failure or malfunction of the system will result in unwanted reverse thrust under any expected operating condition. Failure of structural elements need not be considered if the probability of this kind of failure is extremely remote.

(b) Turbopropeller reversing systems intended for in flight use must be designed so that no unsafe condition will result during normal operation of the system, or from any failure (or reasonably likely combination of failures) of the reversing system, under any anticipated condition of operation of the airplane. Failure of structural elements need not be considered if the probability of this kind of failure is extremely remote.

(c) Compliance with this section may be shown by failure analysis, testing, or both for propeller systems that allow propeller blades to move from the flight low-pitch position to a position that is substantially less than that at the normal flight low-pitch stop position. The analysis may include or be supported by the analysis made to show compliance with the type certification of the propeller and associated installation components. Credit will be given for pertinent analysis and testing completed by the engine and propeller manufacturers.

40. *Turbopropeller drag-limiting systems.* Turbopropeller drag-limiting systems must be designed so that no single failure or malfunction of any of the systems during normal or emergency operation results in propeller drag in excess of that for which the airplane was designed. Failure of structural elements of the drag-limiting systems need not be considered if the probability of this kind of failure is extremely remote.

41. *Turbine engine powerplant operating characteristics.* For turbopropeller powered airplanes, the turbine engine powerplant operating characteristics must be investigated in flight to determine that no adverse characteristics (such as stall, surge, or flameout) are present to a hazardous degree, during normal and emergency operation within the range of operating limitations of the airplane and of the engine.

42. *Fuel flow.* (a) For turbopropeller powered airplanes—

(1) The fuel system must provide for continuous supply of fuel to the engines for normal operation without interruption due to depletion of fuel in any tank other than the main tank; and

(2) The fuel flow rate for turbopropeller engine fuel pump systems must not be less than 125 percent of the fuel flow required to develop the standard sea level atmospheric conditions takeoff power selected and included as an operating limitation in the Airplane Flight Manual.

(b) For reciprocating engine powered airplanes, it is acceptable for the fuel flow rate for each pump system (main and reserve supply) to be 125 percent of the takeoff fuel consumption of the engine.

Fuel System Components

43. *Fuel pumps.* For turbopropeller powered airplanes, a reliable and independent power source must be provided for each pump used with turbine engines which do not have provisions for mechanically driving the main pumps. It must be demonstrated that the pump installations provide a reliability and durability equivalent to that in FAR 23.991(a).

44. *Fuel strainer or filter.* For turbopropeller powered airplanes, the following apply:

(a) There must be a fuel strainer or filter between the tank outlet and the fuel metering device of the engine. In addition, the fuel strainer or filter must be—

(1) Between the tank outlet and the engine-driven positive displacement pump inlet, if there is an engine-driven positive displacement pump;

(2) Accessible for drainage and cleaning and, for the strainer screen, easily removable; and

(3) Mounted so that its weight is not supported by the connecting lines or by the inlet or outlet connections of the strainer or filter itself.

(b) Unless there are means in the fuel system to prevent the accumulation of ice on the filter, there must be means to auto-

matically maintain the fuel-flow if ice-clogging of the filter occurs; and

(c) The fuel strainer or filter must be of adequate capacity (for operating limitations established to ensure proper service) and of appropriate mesh to insure proper engine operation, with the fuel contaminated to a degree (for particle size and density) that can be reasonably expected in service. The degree of fuel filtering may not be less than that established for the engine type certification.

45. *Lightning strike protection.* Protection must be provided against the ignition of flammable vapors in the fuel vent system due to lightning strikes.

Cooling

46. *Cooling test procedures for turbopropeller powered airplanes.* (a) Turbopropeller powered airplanes must be shown to comply with FAR 23.1041 during takeoff, climb, en route, and landing stages of flight that correspond to the applicable performance requirements. The cooling tests must be conducted with the airplane in the configuration, and operating under the conditions that are critical relative to cooling during each stage of flight. For the cooling tests a temperature is "stabilized" when its rate of change is less than 2° F. per minute.

(b) Temperatures must be stabilized under the conditions from which entry is made into each stage of flight being investigated unless the entry condition is not one during which component and engine fluid temperatures would stabilize, in which case, operation through the full entry condition must be conducted before entry into the stage of flight being investigated to allow temperatures to reach their natural levels at the time of entry. The takeoff cooling test must be preceded by a period during which the powerplant component and engine fluid temperatures are stabilized with the engines at ground idle.

(c) Cooling tests for each stage of flight must be continued until—

(1) The component and engine fluid temperatures stabilize;

(2) The stage of flight is completed; or

(3) An operating limitation is reached.

Induction System

47. *Air induction.* For turbopropeller powered airplanes—

(a) There must be means to prevent hazardous quantities of fuel leakage or overflow from drains, vents, or other components of flammable fluid systems from entering the engine intake systems; and

(b) The air inlet ducts must be located or protected so as to minimize the ingestion of foreign matter during takeoff, landing, and taxiing.

48. *Induction system icing protection.* For turbopropeller powered airplanes, each turbine engine must be able to operate throughout its flight power range without adverse effect on engine operation or serious loss of power or thrust, under the icing conditions specified in Appendix C of Part 25 of this chapter. In addition, there must be means to indicate to appropriate flight crewmembers the functioning of the powerplant ice protection system.

49. *Turbine engine bleed air systems.* Turbine engine bleed air systems of turbopropeller powered airplanes must be investigated to determine—

(a) That no hazard to the airplane will result if a duct rupture occurs. This condition must consider that a failure of the duct can occur anywhere between the engine port and the airplane bleed service; and

(b) That, if the bleed air system is used for direct cabin pressurization, it is not possible for hazardous contamination of the cabin air system to occur in event of lubrication system failure.

Exhaust System

50. *Exhaust system drains.* Turbopropeller engine exhaust systems having low spots or pockets must incorporate drains at those locations. These drains must discharge clear of the airplane in normal and ground attitudes to prevent the accumulation of fuel after the failure of an attempted engine start.

Powerplant Controls and Accessories

51. *Engine controls.* If throttles or power levers for turbopropeller powered airplanes are such that any position of these controls will reduce the fuel flow to the engine(s) below that necessary for satisfactory and safe idle operation of the engine while the airplane is in flight, a means must be provided to prevent inadvertent movement of the control into this position. The means provided must incorporate a positive lock or stop at this idle position and must require a separate and distinct operation by the crew to displace the control from the normal engine operating range.

52. *Reverse thrust controls.* For turbopropeller powered airplanes, the propeller reverse thrust controls must have a means to prevent their inadvertent operation. The means must have a positive lock or stop at the idle position and must require a separate and distinct operation by the crew to displace the control from the flight regime.

53. *Engine ignition systems.* Each turbopropeller airplane ignition system must be considered an essential electrical load.

54. *Powerplant accessories.* The powerplant accessories must meet FAR 23.1163, and if the continued rotation of any accessory remotely driven by the engine is hazardous when malfunctioning occurs, there must be means to prevent rotation without interfering with the continued operation of the engine.

Powerplant Fire Protection

55. *Fire detector system.* For turbopropeller powered airplanes, the following apply:

(a) There must be a means that ensures prompt detection of fire in the engine compartment. An overtemperature switch in each engine cooling air exit is an acceptable method of meeting this requirement.

(b) Each fire detector must be constructed and installed to withstand the vibration, inertia, and other loads to which it may be subjected in operation.

(c) No fire detector may be affected by any oil, water, other fluids, or fumes that might be present.

(d) There must be means to allow the flight crew to check, in flight, the functioning of each fire detector electric circuit.

(e) Wiring and other components of each fire detector system in a fire zone must be at least fire resistant.

56. *Fire protection, cowling and nacelle skin.* For reciprocating engine powered airplanes, the engine cowling must be designed and constructed so that no fire originating in the engine compartment can enter either through openings or by burn through, any other region where it would create additional hazards.

57. *Flammable fluid fire protection.* If flammable fluids or vapors might be liberated by the leakage of fluid systems in areas other than engine compartments, there must be means to—

(a) Prevent the ignition of those fluids or vapors by any other equipment; or

(b) Control any fire resulting from that ignition.

Equipment

58. *Powerplant instruments.* (a) The following are required for turbopropeller airplanes:

(1) The instruments required by FAR 23.1305(a) (1) through (4), (b) (2) and (4).

(2) A gas temperature indicator for each engine.

(3) Free air temperature indicator.

(4) A fuel flowmeter indicator for each engine.

(5) Oil pressure warning means for each engine.

(6) A torque indicator or adequate means for indicating power output for each engine.

(7) Fire warning indicator for each engine.

(8) A means to indicate when the propeller blade angle is below the low-pitch position corresponding to idle operation in flight.

(9) A means to indicate the functioning of the ice protection system for each engine.

(b) For turbopropeller powered airplanes, the turbopropeller blade position indicator must begin indicating when the blade has moved below the flight low-pitch position.

(c) The following instruments are required for reciprocating engine powered airplanes:

(1) The instruments required by FAR 23.1305.

(2) A cylinder head temperature indicator for each engine.

(3) A manifold pressure indicator for each engine.

Systems and Equipments

General

59. *Function and installation.* The systems and equipment of the airplane must meet FAR 23.1301, and the following:

(a) Each item of additional installed equipment must—

(1) Be of a kind and design appropriate to its intended function;

(2) Be labeled as to its identification, function, or operating limitations, or any applicable combination of these factors, unless misuse or inadvertent actuation cannot create a hazard;

(3) Be installed according to limitations specified for that equipment; and

(4) Function properly when installed.

(b) Systems and installations must be designed to safeguard against hazards to the aircraft in the event of their malfunction or failure.

(c) Where an installation, the functioning of which is necessary in showing compliance with the applicable requirements, requires a power supply, that installation must be considered an essential load on the power supply, and the power sources and the distribution system must be capable of supplying the following power loads in probable operation combinations and for probable durations:

(1) All essential loads after failure of any prime mover, power converter, or energy storage device.

(2) All essential loads after failure of any one engine on two-engine airplanes.

(3) In determining the probable operating combinations and durations of essential loads for the power failure conditions described in subparagraphs (1) and (2) of this paragraph, it is permissible to assume that the power loads are reduced in accordance with a monitoring procedure which is consistent with safety in the types of operations authorized.

60. *Ventilation.* The ventilation system of the airplane must meet FAR 23.831, and in addition, for pressurized aircraft, the ventilating air in flight crew and passenger compartments must be free of harmful or haz-

ardous concentrations of gases and vapors in normal operation and in the event of reasonably probable failures or malfunctioning of the ventilating, heating, pressurization, or other systems, and equipment. If accumulation of hazardous quantities of smoke in the cockpit area is reasonably probable, smoke evacuation must be readily accomplished.

Electrical Systems and Equipment

61. *General.* The electrical systems and equipment of the airplane must meet FAR 23.1351, and the following:

(a) *Electrical system capacity.* The required generating capacity, and number and kinds of power sources must—

(1) Be determined by an electrical load analysis; and

(2) Meet FAR 23.1301.

(b) *Generating system.* The generating system includes electrical power sources, main power busses, transmission cables, and associated control, regulation and protective devices. It must be designed so that—

(1) The system voltage and frequency (as applicable) at the terminals of all essential load equipment can be maintained within the limits for which the equipment is designed, during any probable operating conditions;

(2) System transients due to switching, fault clearing, or other causes do not make essential loads inoperative, and do not cause a smoke or fire hazard;

(3) There are means, accessible in flight to appropriate crewmembers, for the individual and collective disconnection of the electrical power sources from the system; and

(4) There are means to indicate to appropriate crewmembers the generating system quantities essential for the safe operation of the system, including the voltage and current supplied by each generator.

62. *Electrical equipment and installation.* Electrical equipment, controls, and wiring must be installed so that operation of any one unit or system of units will not adversely affect the simultaneous operation of any other electrical unit or system essential to the safe operation.

63. *Distribution system.* (a) For the purpose of complying with this section, the distribution system includes the distribution busses, their associated feeders, and each control and protective device.

(b) Each system must be designed so that essential load circuits can be supplied in the event of reasonably probable faults or open circuits, including faults in heavy current carrying cables.

(c) If two independent sources of electrical power for particular equipment or systems are required under this appendix, their electrical energy supply must be ensured by means such as duplicate electrical equipment, throwover switching, or multichannel or loop circuits separately routed.

64. *Circuit protective devices.* The circuit protective devices for the electrical circuits of the airplane must meet FAR 23.1357, and in addition circuits for loads which are essential to safe operation must have individual and exclusive circuit protection.

REFERENCE TABLE

New section No.	Old section No.
Subpart A—General	
135.1	135.1
135.2	135.2
135.3	135.3
	135.5 [Deleted]
135.5	135.9
135.7	New
135.9	135.11
135.10	*New*
135.11	135.13
135.13	135.15
135.15	135.17
135.17	135.19
135.19	135.7
135.21	135.27
135.23	New
135.25	135.31
135.27	135.41
135.29	135.47
135.31	135.45
135.33	135.69
135.35	135.51
135.37	New
135.39	New
135.41	135.12
135.43	New
Subpart B—Flight Operations	
135.61	135.61
135.63	135.43
135.65	135.119
135.67	New
135.69	New
135.71	135.67
135.73	135.49
135.75	New
135.77	New
135.79	135.29
135.81	135.39
135.83	135.71
135.85	135.63
135.87	135.117
135.89	135.83
135.91	135.114
135.93	135.79
135.95	135.33
135.97	135.37
135.99	135.52
135.101	135.73
135.103	135.75
135.105	135.77
135.107	135.54
135.109	135.35
135.111	135.72
135.113	135.53
135.115	New
135.117	135.81
135.119	135.84
135.121	135.115
	135.89 [Deleted]
135.123	New
Subpart C—Aircraft and Equipment	
135.141	135.141
135.143	135.143
135.145	135.32
135.147	135.149
135.149	135.151
135.151	*New*
135.153	New
135.155	135.161
135.157	135.165
135.159	135.153
135.161	135.157
135.163	135.155
135.165	135.159
135.167	135.163
135.169	135.144
135.171	New
135.173	New
135.175	New
135.177	New
135.179	New
135.181	135.145
135.183	135.147
135.185	135.167
Subpart D—VFR/IFR Operating Limitations and Weather Requirements	
135.201	New
135.203	135.91
135.205	135.93
135.207	135.95
135.209	135.97
135.211	135.99
135.213	135.65
135.215	135.101
135.217	135.103
135.219	135.105
135.221	135.109
135.223	135.107
135.225	135.111
135.227	135.85
135.229	135.87
Subpart E—Flight Crewmember Requirements	
135.241	New
135.243	135.121/123
135.245	135.127
135.247	New
Subpart F—Flight Crewmember Flight and Duty Time Limitations	
135.261	135.136
Subpart G—Crewmember Testing Requirements	
135.291	New
135.293	135.138
135.295	135.139
135.297	135.131
135.299	135.122
135.301	135.133
135.303	135.135
Subpart H—Training	
135.321	New
135.323	New
135.325	New
135.327	New
135.329	New
135.331	New
135.333	135.140
135.335	New
135.337	*New*
135.339	New
135.341	135.55
135.343	135.137
135.345	New
135.347	New
135.349	New
135.351	New
Subpart I—Airplane Performance Operating Limitations	
135.361	*New*
135.363	New
135.365	New
135.367	New
135.369	New
135.371	New
135.373	*New*
135.375	New
135.377	*New*
135.379	New
135.381	New
135.383	New
135.385	New
135.387	New
135.389	*New*
135.391	New
135.393	New
135.395	New
135.397	135.148
135.399	135.148
Subpart J—Maintenance, Preventive Maintenance, and Alterations	
135.411	New
135.413	New
135.415	135.57
135.417	135.59
135.419	135.60
135.421	*New*
135.423	New
135.425	*New*
135.427	New
135.429	New
135.431	New
135.433	New
135.435	New
135.437	New
135.439	New
135.441	New
135.443	New

(Secs. 313(a), 314(a), 601 through 610, and 1102 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1355(a), 1421 through 1430, and 1502); Sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c)).)

Issued in Washington, D.C., on

LANGHORNE BOND,
Administrator.

[FR Doc. 78-27489 Filed 9-26-78; 3:10 pm]

[1505-01-M]

Title 14—Aeronautics and Space

CHAPTER I—FEDERAL AVIATION ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

[Docket No. 16097; Amdt. Nos. 121-147, 127-35, and Rev. of Part 135]

REGULATORY REVIEW PROGRAM; AIR TAXI OPERATORS AND COMMERCIAL OPERATORS

Correction

In FR Doc. 78-27489 appearing at page 46742 in the issue for Tuesday, October 10, 1978, make the following corrections:

(1) On page 46744, in the third column, in the paragraph under the heading "FLIGHT AND DUTY TIME REGULATIONS (PROPOSED SUBPART F)", in the 10th line, the notice number "87-3" should read "78-3".

(2) On page 46752, in the middle column, in the second full paragraph, the 18th line should read: "dence of operator cost impacts, the".

(3) On page 46776, in the middle column, in the first full paragraph, in the 7th line, after the word "certificated", insert the word "ground".

(4) On page 46800, in the middle column, in § 135.243(b)(2), in the third line, "1000 hours" should read "100 hours".

(5) On page 46814, in the first column, in § 135.439(a), in the third line, "135.427(1)" should read "§ 135.427(f)".

(6) On page 46820, in the third column, above the signature, the incomplete sentence should read: "Issued in Washington, D.C., on September 26, 1978.".

NOTE.—On October 19, 1978 (43 FR 48653), the Office of the Federal Register published a correction which purported to correct a proposed amendment to 14 CFR Parts 1, 21, 23, and 135. The headings to this correction were completely in error. Therefore, the correction at 43 FR 48653 should be disregarded. Item 6 above contains the information which was intended for publication on October 19, 1978.