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of
CIVIL AIR REGULATION PART 40

SCHEDULED INTERSTATE AIR CARRIER CERTIFICATION AND OPERATION RULES

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The date and Amendment Number which appear in the upper, inner corner of each page indicate the effective date on which the page was last revised and the Amendment Number effecting the change. If there is a date of April 1, 1954, and no Amendment Number, this is the date on which all Regulations were renumbered.

The inclusion, in parentheses at the end of a paragraph or section, of an Amendment Number and date indicate the last effective date and Amendment Number changing that section or paragraph of the Regulation since the effective date but prior to the date shown in the upper, inner corner.

The section or paragraph number in the upper, outer corner of each page shows the first full paragraph or section of the Regulation which starts on that page.

Material which has been deleted is shown thus:
~~This material is obsolete.~~

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This material is new.

The inclusion in the left-hand margin of the letter "M" indicates that the FAA has issued Civil Aeronautics Manual Material on the section or paragraph so noted.

The Change Number, such as 40-37, which appears in the lower, left-hand corner indicates the Rules Service Co. Change Sheet which issued the Change.

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LATEST CHANGE RECORD			
Latest Change	Date of Issuance	Date of Incorporation	Incorporator's Initial's
40-51	November 16, 1964		

64-75 (See Reverse Side for Filing Instructions)

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CIVIL AIR REGULATIONS — CHANGE SHEET NO. 40-51

1. This Change Sheet No. 40-51 to the Civil Air Regulations Service is issued in order to provide UP-TO-DATE pages incorporating recent changes to CAR 40. The changes which have been made and which are incorporated in these revised pages cover the following item:

   (a) The FAA has postponed (Amendment No. 40-49) the effective date of Amendment No. 40-44 from November 2, 1964, to January 4, 1965, concerning approved survivor locator lights.

2. The Notes and Filing Instructions listed below should be read completely BEFORE removing any old pages from or inserting any new pages in CAR 40.

NOTES AND FILING INSTRUCTIONS

The pages included with this Change should be incorporated in, and the old pages removed from, CAR 40. The changes to be made are as follows:

REMOVE PAGES	INCORPORATE PAGES
B-103, B-104	B-103, B-104
42C, 42D	42C, 42D
Cover Page 40-50	Cover Page 40-51

Sincerely yours,

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CIVIL AIR REGULATIONS PART 40

SCHEDULED INTERSTATE AIR CARRIER CERTIFICATION AND OPERATION RULES

REVISION

Effective: October 1, 1953
Adopted: April 13, 1953

18 F.R. 2267

Presently effective Parts 40 and 61 of the Civil Air Regulations prescribe the standards for scheduled interstate air carrier certification and operation respectively. Subsequent to the promulgation of present Parts 40 and 61, the scheduled air carrier industry has undergone rapid growth and development. This growth and development necessitated the devisement of new procedures and techniques many of which are not compatible with the standards presently applicable to these operations. It has also become apparent that these regulations are in need of clarification and simplification in order to facilitate their administration by the air carriers to whom they apply and by the Administrator of Civil Aeronautics. In view of the foregoing, it became evident that the standards for certification and operation of scheduled air carriers should be revised.

The first proposed revision contemplated the consolidation of Parts 40, 41 and 61 into a single Part 40. A draft of this proposal was published in the Federal Register as a notice of proposed rule making (15 F.R. 6700) and circulated as Draft Release No. 50-8, dated October 2, 1950. In response to that notice, the Civil Aeronautics Administration (CAA) and the Air Transport Association (ATA) opposed the combining of domestic and international operating rules in a single part with the reasoning that to do so would substantially increase their administrative complexity. The Board recognized this comment to be of sufficient validity and importance as to dictate against an attempt at that time to consolidate the rules pertaining to domestic and international operations and decided, therefore, that the proposed Part 40 should be further amended so as to incorporate only the rules applicable to domestic scheduled air carrier certification and operation.

Numerous conferences and discussions were held with interested persons as a consequence of which a new proposal to combine present Parts 40 and 61 into a single Part 40 was drafted and published in the Federal Register as a notice of proposed rule making (16 F.R. 8923) and circulated as Draft Release No. 51-6 dated August 27, 1951. In response to this notice, extensive comments were received from the various representative groups in the scheduled air carrier industry. These comments were consolidated and on May 8, 1952, conferences were commenced with these groups to discuss in detail the comment received. These conferences disclosed, among other matters, that certain issues were present concerning which interested persons desired an opportunity to present oral argument before the Board.

On July 30, 1952, the Board published in the Federal Register as a notice of proposed rule making (17 F.R. 6971) a revised draft of the proposed Part 40. This notice not only reflected changes made as a result of the comment received on Draft Release No. 51-6 and the conferences held subsequent thereto, but also invited additional comment with respect to those matter pertaining to the proposed part concerning which opportunity for oral argument was desired.

As a result of comment received in response to the July 30, 1952, notice, a notice of proposed rule making and oral argument was published in the Federal Register (17 F. R. 11124) and circulated as Draft Release No. 52-33 setting down for oral argument before the Board certain, but not all, of the requested issues. On January 8, 1953, the Board heard oral argument on the designated issues and gave permission to interested persons to submit additional written comment on those issues concerning which oral argument was requested, but which were not set down to be heard by the Board.

The revision of Part 40 brought to issue certain matters which are either highly controversial in nature or which involve further detailed study of their various technical aspects or both. As these issues arose, it was decided to

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separate certain of them from the revision of Part 40 to preclude further unwarranted delay in the promulgation of the proposed revision. These controversial items are being processed as separate rule-making proceedings.

Among the items designated for separate rule-making proceedings were four issues pertaining to flight time and duty time limitations. By notice of proposed rule making and oral argument (17 F.R. 11883) circulated as Draft Release No. 52-34 the Board set down these issues for oral argument on February 26, 1953. Upon request of the ATA and the Air Line Pilots Association (ALPA) this oral argument was postponed indefinitely by notice published in the Federal Register (18 F.R. 1120) and circulated as Draft Release No. 53-3.

With regard to the other controversial items being considered separately, the issues pertaining to emergency and survival equipment and propeller reverse pitch indicating lights were published in the Federal Register as notices of proposed rule making (17 F.R. 8022 and 17 F.R. 9827) and circulated as Draft Releases Nos. 52-26 and 52-28, respectively. Consideration by the Board of rules pertaining to these two items is contemplated within the immediate future. Another item being considered separately concerns the mandatory application of certain transport category requirements to airplanes operated under the revised part. This item is presently under study and provisions pertaining thereto have been removed from revised Part 40.

Considerable comment has been received concerning the reference in § 40.181 (a) concerning the designation of a second alternate when the weather conditions forecast for the destination and first alterante are "marginal". This comment indicated that the word "marginal" is not sufficient definitive and that the language contained in this section does not establish an unambiguous standard for air carrier operations. The Board recognizes that this comment may have merit but is of the opinion that some provision should be contained in Part 40 in recognition of marginal weather conditions. It is intended, therefore, that additional consideration be given this matter and an appropriate alternative proposal be circulated in the near future.

This revision of Part 40 contains numerous changes from the presently effective provisions. Many of these changes are comparatively minor in nature, however, several of the changes involve the establishment of a substantially different basis of certification and operation. A change in the procedure for the issuance of operations specifications is included in revised Part 40. The new rule separates the operations specifications from the air carrier operating certificate and establishes separate procedures for the issuance and amendment of each. In addition, provisions are included which govern the content of the operations specifications.

Another matter of particular significance concerns the presently effective requirement that aircraft used in scheduled air transportation after a certain date shall comply with the transport category requirements of the appropriate certification rules and shall meet the transport category performance requirements of the appropriate operating part. Because this requirement was intended to remove from scheduled air transportation several aircraft not capable of complying with the transport category requirements, such aircraft types as the Lockheed 18 and the Douglas DC-3 would not be permitted to operate in scheduled passenger service after the specified dates unless recertificated in the transport category. The Board has found it necessary on four previous occasions to alter the effective date of this requirement in order to permit the continued use of these aircraft types.

The safety record of both the Lockeed 18 and the Douglas DC-3 aircraft clearly indicates that these aircraft may be continued in scheduled passenger service without detrimental effect upon safety in air transportation. Revised Part 40, therefore, provides that aircraft types which have been certificated under a previous set of airworthiness rules should be permitted to continue their useful economic life unless the operational record of such aircraft indicates a necessity for application of more restrictive airworthiness regulations. The rule requiring that only transport category aircraft be used after December 31, 1953, therefore, is deleted from this regulation.

This revision of Part 40 also provides operating limitations for aircraft not certificated in the transport category. These provisions are based upon the non-transport category performance limitations which presently appear in Part 42 of the Civil Air Regulations with certain changes to render them more nearly an approximate

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equivalent of the many requirements and rules from various sources presently applicable to such aircraft types as the Lockheed 18 and the Douglas DC-3.

The aircraft equipment requirements contained herein differ in some respects from those contained in existing scheduled air carrier regulations. In the sense that certain of these aircraft requirements are not applicable to all operations in existing Civil Air Regulations, they may be regarded as technically retroactive. However, it is not believed that these requirements will actually cause undue hardship because in almost every instance the scheduled passenger-carrying fleet is presently so equipped.

Revised Part 40 contains numerous changes in the training program for crew members. Training standards are provided for both initial and recurrent training. These standards now include training provisions for other members of the crew as well as for the pilot crew members. In the belief that the instrument check, so called, is in fact a misnomer and during recent years has become more nearly a "proficiency" check, the regulation labels it accordingly. The regulation requires two such checks annually, but relates these checks more nearly to the pilots' over-all proficiency and removes much of the instrument check portion which was not related to direct and intimate knowledge and skill concerning the operation of aircraft controls. Provision is made for the accomplishment of procedures such as radio range orientation, manual loop navigation, and rudimentary tracking and beam bracketing in approved flight simulators. The regulations provide that the proficiency check give more precise treatment to aspects such as engine-out operation in multi-engine aircraft. Provisions for a line check are included as a means of requiring the carrier to ascertain that the training provided the pilot is reflected in typical route operations. In order to insure that some control is maintained over pilot proficiency in all aircraft types an additional requirement has been added making it necessary that either a proficiency check or a line check be had in each type of aircraft within the preceding 12 months before a pilot is to serve as pilot in command.

In addition, new standards are included which increase the emphasis upon airport qualification and to some degree deemphasize the route qualification factors. This trend is motivated by the development of aircraft and navigational aids for en route navigation, the increased complexity of procedure for operations in terminal areas, and the improvement in instrument approach facilities whereby all-weather operation more closely approaches reality.

The Board has attempted, through the technique of redispatch in flight, to alleviate certain excessive fuel requirements which were encountered in air carrier operations as a result of the present Civil Air Regulations. In addition, the air carriers are relieved of the necessity for making provision for an alternate airport whenever the weather forecasts assure that no difficulty may be anticipated in approaching and landing at the destination under visual flight rules irrespective of the fact that flight en route may be accomplished in accordance with the instrument flight rules. The Board is of the opinion that adequate safeguards are provided to permit operations without the additional fuel normally required when an alternate airport is specified. The regulation provides, therefore, that under conditions in which available forecasts assure no undue delay in transition from IFR en route to VFR approach and landing at the destination an alternate airport need not be specified.

Another change from existing rules concerns the execution of an instrument approach at an airport to which the ceiling and visibility are reported to be below the minimum specified for that airport. The present rules prohibit a pilot from executing an instrument approach in such a situation. Revised Part 40 provides an exception to this prohibition in those instances when the landing is being made at an airport at which ILS and GCA are available and used for the approach and in those instances when the approach has progressed into its final phase at the time the below minimum report is received, and the pilot has determined that conditions at least equal to the prescribed minimums actually exist.

In addition to editorial and clarifying corrections, this revision of Part 40 contains numerous changes which have been made as a result of comment received in response to notice of proposed rule making and the Board's conclusions

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concerning matters presented during oral argument. In addition the sections have been renumbered and rearranged subsequent to the July 30, 1952 notice. Since the sections discussed herein are numbered in accordance with the revised numbering, the number of the section as it appeared in the July 30, 1952 notice is indicated in brackets as a reference aid.

A new subparagraph (a) (3) is added to § 40,320 providing a weekly flight time limitation of 30 hours. Although this flight time limitation is in presently effective Part 61, it was not included in the July 30, 1952 notice because of controversy concerning the number of hours which this limitation should provide. This issue is now being considered in separate rule making proceedings. In order that this part not be unduly delayed in promulgation, it was considered desirable to continue in effect the limitation as contained in Part 61 and make such later changes thereto as may be necessary upon completion of the separate rule-making proceedings.

Section 40.358 has been changed by adding a requirement that the pilot in command shall insure that appropriate aeronautical charts containing adequate information concerning navigational aids and instrument approach procedures are aboard the airplane for each flight. This requirement is presently in effect in § 61.309 of Part 61 and had been inadvertently omitted from revised Part 40 on the assumption that this requirement was to be included in Part 43 of the regulations. Since no such requirement has been introduced into Part 43, it was considered desirable that the presently effective requirement be continued by including it in revised Part 40.

On January 8, 1953, the Board heard oral argument on certain matters at issue pertaining to revised Part 40. After careful consideration of the comments and arguments presented, the Board reached the following conclusions with respect to the provisions set down for oral argument.

With respect to the proposal that there be added to the non-transport category take-off performance limitations contained in § 40.91 [40.63] a requirement to take account of temperature, the Board concluded that, while temperature does have a marked effect on aircraft performance, the impact upon operating weights of such aircraft as the DC-3 would be correspondingly marked were temperature accountability to be required. The excellent safety record of such aircraft as the DC-3 and Lockheed 18 appears to dictate against such a requirement at this time.

With respect to the proposal to decrease the requirement for gradient accountability contained in § 40.91 [40.63], the Board concluded that although its proposal does constitute an increase in gradient accountability when compared with previous requirements applicable to non-transport category aircraft, this requirement will not create an undue burden in view of the fact that these rules also permit account to be taken of favorable wind components during the take-off. The inclusion of non-transport category performance limitations in Part 40 intended to insure operating weights approximately equivalent to those resulting from previous rules and the Board concludes that this rule is consistent with such an objective.

With respect to the proposal to decrease the landing distance requirements of § 40.93 [40.65], the Board concluded that the proposed requirement will effect operating weights of non-transport category airplanes adversely only in exceptional circumstances. The proposed landing distance requirements appear to be justified from the fact that overshooting accidents constitute a disproportionate percentage of all air carrier accidents. The Board also concluded that undue burden would not result from the application of this rule.

With respect to the proposal to amend § 40.232 (c) [40.92 (c)] to require additional navigational receiving equipment during the period of transition from low frequency to very high frequency navigation systems, the Board concluded that no showing had been made that the rule proposed by the Board did not in fact require the same duality of airborne equipment as contemplated under existing regulations. The Board was concerned, however, with the charge made during oral argument that there exists a requirement in certain high density terminal areas for airborne equipment in addition to that specified in § 40.232 [40.92]. This view, however, was not at issue during the oral argument and the Board intends, therefore, that a separate rule-making action be initiated in the near future to determine whether Part 40 should be further amended to require radio equipment in addition to that specified when necessary for air traffic control in particular terminal areas.

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CIVIL AIR REGULATIONS PART 40

With respect to the proposal to amend § 40.280 (b) [40.120 (b)] to require that check airmen be "actively engaged in the same occupation as the airmen being checked" the Board concluded that no justification was presented for so restrictive a limitation upon managerial discretion. The Board was concerned, however, with an expressed view that "a holder of an airline transport pilot license who is trained and qualified on the equipment meets the requirements of the last sentence of § 40.280 (b) [40.120 (b)]". Since this construction is not consistent with the Board's intent in proposing the requirement, an amendment of this section has been made to clarify the Board's intent that check airmen shall possess the certificates and ratings required to be held by the airmen being checked.

With respect to the proposal that § 40.289 (b) [40.126 (b)] be amended to include a maximum interval for checking the competence of each crew member, the Board has concluded that an interval of twelve months should be established in order to insure against excessive intervals between such checks.

With respect to the proposals to amend § 40.302 [40.132] concerning proficiency and line checks, the Board is of the opinion that a misunderstanding as to the Board's intent may have been responsible in large measure for the expressed apprehension concerning this requirement. It is not intended that more than two proficiency checks a year be required. It is intended, however, that at least one of the two required proficiency checks shall be accomplished in the larger aircraft type in which a pilot is to serve as pilot in command. This section has been amended to simplify and clarify this requirement. The Board has also concluded that retention of the remainder of the section in substantially the form proposed by the Board will not create an undue burden upon air carriers.

With respect to the proposal to amend § 40.303 (c) [40.135 (c)], the Board has concluded that this requirement should be simplified so as to require only a landing and a take-off at each airport into which the pilot is scheduled to fly. The requirement to "fly through the approach procedure for which the lowest minimums are authorized" has been deleted. The Board is of the opinion that this amendment will simplify the administration of the rule without jeopardizing the objective sought.

With respect to the proposal to amend § 40.303 [40.135] to permit route familiarization by means of two one-way flights over the routes and to eliminate the requirement for night familiarization, the Board has concluded that such an amendment would simplify route qualification procedures without seriously compromising the resulting degree of pilot familiarization.

With respect to the proposal to amend § 40.304 [40.136] to enable a pilot to be scheduled into an airport at which he has not landed during the preceding twelve months, by reason of flying over such airport during that period, the Board has concluded that flight over an airport in operations commonly conducted today do not provide a pilot with sufficient opportunity to remain familiar with the airport and its facilities and physical environs. The Board recognized on the other hand that some relaxation can be made in this requirement by permitting such a pilot to serve as pilot-in-command and land at such airports if the reported weather conditions are at least three miles visibility and the ceiling at or above the lowest initial approach altitude for that airport.

With respect to the proposal to amend § 40.307 [40.138] to require the recent experience requirements for flight engineer to be made applicable each six months instead of each twelve months as prescribed, the Board concluded that such an amendment is desirable and would serve to insure that flight engineers possess adequate recent experience for the proper execution of their duties and that such an amendment will not constitute an undue burden upon the air carriers.

With respect to the proposal to amend § 40.351 [40.151] to require that the aircraft dispatcher and pilot in command be jointly responsible for delay of a flight, the Board concluded that this amendment was desirable in that it stated more clearly the Board's intent with respect to the relationships of the pilots and dispatchers. The Board did not agree, however, with the proposal that a new paragraph (e) be added to define certain functions of the dispatcher not related to safety because it considered such matters irrelevant to Part 40.

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CIVIL AIR REGULATIONS PART 40

With respect to the proposal to amend § 40.391 [40.82] by deleting the words "en route", the Board concluded that such an amendment would appear to authorize operation of an airplane with required equipment unserviceable for an indefinite period of time. It is acknowledged, however, that certain operations may exist wherein the strict observance of this requirement would constitute an undue burden upon an air carrier. The Board has provided for such an eventuality by permitting the Administrator to exempt a carrier from strict compliance with the prohibition against re-scheduling a flight with required equipment inoperative in any particular circumstance in which the Administrator finds that undue hardship will result and that strict compliance with the requirement is not necessary in the interest of safety.

With respect to the proposal to amend § 40.408 [40.193] to substitute a 500-foot minimum altitude for the prescribed 1,000 feet under VFR conditions, the Board concluded that the higher minimum altitude is the more desirable as the general requirement. The Board concluded, moreover, that proper administration of this rule, will enable the carrier under conditions acceptable to the Administrator to avoid undue hardship without compromising safety.

With respect to the proposal to amend § 40.408 [40.193] to permit over-the-top operations below the minimum en route IFR altitude under conditions less restrictive than those currently contained in § 61.261, the Board concluded that adequate consideration of the matters pertinent thereto had been made when promulgating Civil Air Regulation Amendment 61-8, effective September 10, 1952, and that this amendment constitutes a reasonable and desirable limitation upon such operations.

With respect to the proposal to amend § 40.507 [40.207] to require the time since last overhaul of airframe and engines to be included in the aircraft maintenance log, the Board concluded that this information was desirable for the proper assessment by the flight crew of certain irregularities experienced in flight and that the provisions of information from which time since last overhaul may be readily determined by the flight crew should be required.

The following provisions of revised Part 40 are discussed for the purpose of making clear the intent of the rule. The definition of "runway" in § 40.5 [40.2] is not intended to alter materially the existing use of airport areas other than paved areas for the purpose of "overrun".

Section 40.32 [40.22] does not contemplate the re-approval of all off-airway routes presently contained in air carrier operations specifications. These specifications continue in effect in accordance with § 40.18 (a) [40.12 (a)] as though they had been issued under the provisions of revised Part 40. The Administrator does have authority, however, under § 40.21 [40.15] to amend any operations specifications, "if he finds that safety in air transportation so requires or permits."

Although some of the words and phrases of §§ 40.70 [40.53] through 40.78 [40.61] have been rearranged or reworded, there is no intention to change the meaning of, or the interpretation presently being adhered to, regarding the existing transport category performance limitations.

Although certain editorial changes have been made in §§ 40.202 [40.80] through 40.205 [40.86], the intent of these sections is the same as the comparable provisions of present Part 61 regarding oxygen and protective breathing equipment.

The incorporation of the special airworthiness requirements, in §§ 40.110 [40.300] through 40.143 [40.333] and 40.150 [40.340] through 40.153 [40.343] is made without alteration of the intent of these provisions from presently effective regulations.

AMENDMENT POSTPONING EFFECTIVE DATE OF REVISED PART 40

Effective: September 25, 1953
Adopted: September 25, 1953

Amendment 40-1
18 F.R. 6257

On April 13, 1953, the Civil Aeronautics Board rescinded Part 61 and adopted a revision of Part 40 of the Civil Air Regulations effective October 1, 1953. The

revision of Part 40 consolidates the general substance of Part 40 and Part 61 of the Civil Air Regulations. At the time of adoption of revised Part 40 it was considered that the October 1, 1953, effective date would provide sufficient time to enable implementation of revised Part 40. It has become apparent, however, that unforeseen delays in publication of manual material and issuance of operation specifications make it extremely doubtful that such materials will be in the hands of the air carriers sufficiently in advance of the October 1, 1953, effective date to enable orderly implementation of revised Part 40 on October 1, 1953. In view of the foregoing, the Board is postponing the effective date of revised Part 40 to January 1, 1954, and will continue presently effective Parts 40 and 61 in effect until January 1, 1954.

Since the time remaining prior to October 1, 1953, is insufficient to permit normal rule making procedure and delay beyond that date would operate contrary to the purpose of the amendment, the Board finds that notice and public procedure hereon are impracticable; and since this regulation imposes no burden on any person, the amendment may be made effective without prior notice.

AMENDMENT POSTPONING EFFECTIVE DATE OF REVISED PART 40

Effective: December 23, 1953
Adopted: December 23, 1953

Amendment 40-2
18 F.R. 8865

On April 13, 1953, the Board adopted a revision to Part 40 which contains major changes to the certification and operating rules applicable to domestic scheduled interstate air carriers. Revised Part 40 was made effective October 1, 1953. Present Parts 40 and 61 were accordingly rescinded effective that date. Because of unforeseen delays in the completion of Civil Aeronautics Manual material and issuance of operations specifications, it became impossible for air carriers to complete the necessary activities required for compliance with revised Part 40 by October 1, 1953. Consultation with the Civil Aeronautics Administration and the air carriers during September of this year indicated that this activity was expected to be completed in a relatively short time after October 1, and that, if the effective date of revised Part 40 were extended for a period of three months, an orderly transition of air carrier operations under the revised Part 40 would be permitted. Accordingly, on September 25, 1953, the Board extended the effective date of Part 40 to January 1, 1954.

It has now become apparent that expectations with respect to the completion of manual material and the issuance of air carrier operations specifications have not materialized. The Board is advised that the last of the Civil Aeronautics Manual material has been submitted to the Federal Register for publication, and that suitable arrangements have been made to insure that this material will be in the possession of the air carriers and agents of the Civil Aeronautics Administration without delay. Recent consultation with the air carriers indicates that completion of air carrier manuals and other instructional material and the completion of air carrier training programs can be assured during March 1954 if the Civil Aeronautics Manuals are in the possession of the air carriers early in January as contemplated.

Although the Board regrets the additional delays which have been encountered in this activity, it is clear that the magnitude of the task has rendered many of the delays unavoidable. Furthermore, it is apparent that a complete indoctrination of all personnel involved with respect to the changes imposed under revised Part 40 and adequate training with respect to associated procedures are essential in order that the safety of air carrier operations will not be jeopardized as a consequence of the transition. In view of the foregoing, the Board is postponing the effective date of revised Part 40 until April 1, 1954.

Since the time remaining prior to January 1, 1954, is insufficient to permit normal rule making procedure and delay beyond that date would operate contrary to the purpose of the amendment, the Board finds that notice and public procedure hereon are impracticable; and since this regulation imposes no burden on any person, the amendment may be made effective without prior notice.

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CIVIL AIR REGULATIONS PART 40
MISCELLANEOUS AMENDMENTS

Effective: April 1, 1954
Adopted: March 11, 1954

Amendment 40-3
19 F.R. 1455

Revised Part 40 was adopted by the Civil Aeronautics Board April 13, 1953, and is to become effective April 1, 1954. Since the adoption of this part, the Civil Aeronautics Administration has been engaged in the preparation of Civil Aeronautics Manual material and other administrative documents, the purpose of which is to establish policy and interpretation, and to promulgate those supplemental regulations, authority for which has been delegated to the Administrator. The air carriers, on the other hand, have been engaged in the preparation of company manuals and other personnel training media in order to insure that the necessary administrative changes will have been accomplished in sufficient time and that the personnel to be affected by the provisions of this part will have been fully familiarized with respect to their details. In the course of these activities, detailed reexamination of the provisions of revised Part 40 was inevitable. Certain errors of a typographical or clerical nature were discovered. Certain ambiguities heretofore unnoticed were recognized. Some unintended restrictions were discovered to result from inadvertent construction of certain regulations. In still other instances relief has been requested from certain provisions which, although intended by the Board to become applicable, had not previously been recognized as creating undue hardship upon the persons affected.

One of the proposed changes which concerned the flight checking of flight engineers was published as a notice of proposed rule making in the FEDERAL REGISTER (18 F.R. 5436) on September 9, 1953. The remaining proposed changes were consolidated into a notice of proposed rule making and published on November 19, 1953, in the FEDERAL REGISTER (18 F.R. 7324). As a result of the comment received it has not been deemed necessary to implement all the proposed changes, but only those set forth herein. The following discussion, however, concerns only the more important matters involved.

The Board's attention has been called to the fact that 40.34 has been construed by some persons so as to impose an absolute condition upon air carrier communications. The provision for "reliable and rapid communications" required by this section was intended to be subject to a determination by the Administrator that reliability and rapidity are reasonably assured in the light of the current state of the aeronautical and communications arts. Since some difficulty has been experienced in the interpretation of this requirement, the words "under normal operating conditions" are being added to protect against unreasonable restrictiveness in its enforcement.

The Board contemplated that some time would be required after the effective date of revised Part 40 for compliance with certain requirements necessitating modification of aircraft. Inasmuch as the effective date of revised Part 40 has been extended from October 1, 1953, to April 1, 1954, an extension of the compliance date of certain sections appears desirable. Moreover, the Board has been advised that requirements for certain new equipment and instruments imposed by revised Part 40 may in certain instances require extensive fleet modifications. In some instances the instruments and equipment involved will require several months for procurement. Since it is considered desirable that air carriers be permitted to schedule necessary modifications consistent with normal maintenance schedules, additional time should be provided to permit compliance with such requirements. Also, the requirement for duplicate sources of power and power distribution systems in Part 40 is new. This requirement parallels current requirements of the airworthiness parts of the Civil Air Regulations relating to transport category airplanes. The Board's attention has been drawn to the fact, however, that certain existing aircraft types do not now meet these provisions and in order to insure compliance must be subject to considerable engineering study and probable subsequent modification. Requirements for duplicate sources of energy for certain flight instruments, on the other hand, have been contained in the operating parts of the Civil Air Regulations for a considerable period of time. It would appear, therefore, that additional time should be allowed for compliance with the provisions applicable to required instruments and equipment other than flight instruments. In view of the foregoing, this amendment extends the date for compliance with 40.172 (k) and 40.173 (d) until January 1, 1955, with 40.173 (b)(3) until November 1, 1954, with 40.175 (c) until July 1, 1955, for other than flight instruments, and with 40.175 (d) until December 1, 1954.

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CIVIL AIR REGULATIONS PART 40

The nontransport category performance operating limitations of revised Part 40 contain no landing distance requirement specifically applicable to alternate airports. The Board has been advised that the absence of a landing distance requirement directed specifically to alternate airports has given rise to a question as to whether the landing distance at alternate airports was intended to be the same as that for airports of intended destination. The Board did not intend that the requirement concerning runway margins in the nontransport category performance limitation be any more stringent than that contained in the transport category performance limitations. This intent is clarified by inserting a new 40.94 prescribing the same landing distance limitations at alternate airports for the nontransport category operating limitations as are presently prescribed for transport category airplanes.

The Board's attention has been drawn to the fact that 40.176 implies major differences in cockpit procedures between certain aircraft of the same type operated by the same air carrier. It appears that a greater contribution to safety is made when cockpit check procedures are standardized to the extent practicable and that the language of this section appears to render such standardization more difficult. Therefore, the portion of the requirement tending to discourage standardization is deleted.

The Board's attention has been directed to the fact that the language of 40.281 and 40.232 literally requires a duplication of equipment not intended by the Board. The various requirements of this section were intended to define functions to be served by the radio equipment carried aboard aircraft and duplication of equipment for each function was intended to be required only where a reference to duplication was explicitly made. For instance, a single piece of radio equipment may be used to fulfill several functions. Sections 40.231 and 40.232 are being amended, therefore, to clarify and emphasize the functional nature of the requirements and to avoid unintended duplications.

The Board's attention has been called to the fact that certain existing labor contracts would be voided by the fact that the equivalent duty provision contained in current Part 61 does not exist in revised Part 40. Since it does not appear that safety will be compromised by continuing the flexibility currently provided in Part 61, and since such flexibility appears to be desirable under existing contractual arrangements between air carriers and certain mechanical employee groups, 40.243 and 40.340 (b) (3) are being amended to include equivalent duty provisions similar to those currently in Part 61.

Since it is intended that an aircraft the maximum certificated weight of which is exactly 12,500 pounds be regarded as a "small aircraft," 40.261 (c) is amended to bring this section in accord with the definition of large aircraft elsewhere in the Civil Air Regulations.

Section 40.280 (b) states that there shall be provided for flight checking a sufficient number of check airmen holding the same airman certificates and ratings as are required for the airman being checked. Section 40.307 states that under certain conditions the air carrier or an authorized representative of the Administrator shall check a flight engineer prior to assignment to duty. This latter section creates some doubt as to whether the check includes a flight check, thus requiring, under 40.280 (b), an airman holding a flight engineer certificate to conduct the check. Section 40.280 (b) also is not clear as to whether it concerns any flight check or just those required by revised Part 40. To clarify the intent of these provisions, 40.280 (b) is being amended to indicate that check airmen are required only for those flight checks that are required, and 40.307 is being amended so that when the checking of a flight engineer is necessary, it shall include a flight check or, where the flight engineer has been previously qualified on the type airplane, a check in a synthetic trainer. These provisions are not intended to prevent an air carrier from checking its flight engineers additionally in any manner desired, but is only intended to provide a minimum requirement for checks. This does not affect the responsibility or the authority of the pilot in command.

The Board has been advised that 40.303 (c) is susceptible of an interpretation which would require the pilot making an entry into an airport for the purpose of airport qualification to manipulate the controls of the aircraft during the takeoff and landing. Such manipulation of controls is not essential to the purpose of this regulation and may in fact under certain circumstances result in the preoccupation of the pilot to the extent that visual survey of the airport and its environs

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may not be as complete as is desired. Section 40.303 (c) is being amended to clarify this intent.

Paragraph (d) of 40.303 was not intended to be applied to routes on which facilities are adequate for instrument flight and on which instrument operation has been authorized in the operations specifications. This paragraph is being amended to clarify this intent.

In order for a pilot to maintain route and airport qualifications for particular trips as pilot in command, 40.304(a) requires that during the preceding 12 months, he (1) make at least one trip as pilot or other member of the crew between terminals into which he is scheduled to fly, (2) make one actual or one simulated entry utilizing a synthetic trainer into each regular, provisional, or refueling airport into which he is scheduled to fly, and (3), if applicable, comply with the provisions of 40.303 (d). The Board has received comment contending that the requirement for an actual entry or a simulated entry into each airport constitutes an undue administrative burden. It has been argued that the questionable contribution to safety which this requirement makes can scarcely justify the Administrative burden it creates. In reexamining this requirement it appears that the clerical problem created is indeed a considerable one in that the compilation of a great number of additional records would be necessary and a continuous review of these records required in order to insure continued compliance. Therefore, the requirement in 40.304 (a) for an actual entry or a simulated entry into each airport every 12 months is deleted.

The preamble of revised Part 40 makes clear that the Board intended in this part "to continue in effect the (weekly) limitation as contained in Part 61." Section 40.320 (a)(3), however, renders the thirty-hour limitation application on a "calendar week" basis rather than a "seven consecutive days" basis. Until such time as it is possible for the Board to complete certain separate rule-making procedures in the matter of flight time limitations, the provisions contained in current Part 61 should be retained. Section 40.320 (a)(3) is being amended, therefore, to bring the weekly flight time limitations into accord with the current requirements of Part 61.

Section 40.388 (a) provides that an alternate airport need not be selected if the ceiling at the take-off airport is at least 300 feet and the visibility at least one mile, even though these minimums are less than the landing minimum for the airport. Since it is customary to provide minimums on a sliding scale, additional minimums are hereby established; namely, the additional minimums of 400 feet and three-quarters mile, and 500 feet and one-half mile. In view of comment received, however, the question of permitting the elimination of an alternate airport under these conditions will be reviewed.

The Board's attention has been called to the fact that 40.509 (c) is susceptible of an interpretation requiring Mechanical Interpretation Summary Reports to include reports of propeller featherings which are accomplished for training, experimentation, or demonstration purposes. The Board intended that this requirement be applicable only to propeller featherings required as a result of an actual or suspected engine malfunction. Section 40.509 (c) is being amended to make this intent apparent.

There are several proposed changes which were published in the notice of proposed rule making, on which no action is being taken as a result of comment received. Section 40.175 (f) requires a door that leads to an emergency exit to remain open during take-off and landing to prevent the door from jamming closed in the event of an accident. Since the opening of a door blocks one section of seats in certain airplane types, it was proposed that the door be permitted to be closed but remain unlocked. It appears from comment received, however, that the door may become jammed even though unlocked. In view of this, the proposed change has not been made.

Section 40.178 (b) requires that certain markings be made on the exterior of the fuselage of an airplane which would assist in evacuation and rescue of passengers from the outside in the event of an accident. As originally adopted, this provision was to become effective on December 31, 1953, three months after the intended effective date of the part. When revised Part 40 was first extended for three months, it was proposed to extend the effective date of this provision to March 1, 1954. Comment received in response to this indicated that these provisions could be complied with by this date. In view of the extension of the effective date of this part

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to April 1, 1954, the proposed amendment is no longer necessary.

Section 40.364 requires an instrument approach to be made in accordance with the operations specification of the air carrier. In view of certain practices of air traffic control to clear aircraft for "contact" approaches under conditions of low ceiling and visibility, it was believed that there might be some doubt as to whether this practice would continue to apply to scheduled air transportation. As a result of comment received, however, it was not felt necessary to amend 40.364, since the Board does not intend that this section affect the current practice of air traffic control in authorizing such clearances. This matter, however, will be pursued further in conjunction with certain contemplated amendments to Part 60.

AIR-SPEED INDICATORS AND ASSOCIATED OPERATIONS REQUIREMENTS

Effective: October 1, 1954
Adopted: March 23, 1954

Amendment 40-4

Revised Part 40 of the Civil Air Regulations contains no requirements specifying the dimensional units to be used in air carrier operations. It has been recommended, however, by the Air Coordinating Committee, the Department of Defense, the Air Transport Association of America, and the Air Line Pilots Association, that the regulations should require the use of nautical miles instead of statute miles, and the use of air-speed expressed in knots instead of miles per hour. A notice of proposed rule making was published on December 2, 1953, in the FEDERAL REGISTER (18 F.R. 7659), in which it was proposed that the operations requirements pertaining to air carriers be amended to require that air-speed limitations and related information be in knots and nautical miles. It was further proposed that after January 1, 1956, all air-speed indicators in aircraft operated under this part should be calibrated in knots. While comment received indicated diverse views, the organizations most concerned with this part favored the proposed changes; namely, the Air Transport Association of America and the Air Line Pilots Association.

This amendment, accordingly, requires that air-speed limitations and related information contained in the Airplane Flight Manual and pertinent placards be in the same units as used on the air-speed indicator, that all such indicators be calibrated in the same units when more than one air-speed indicator is required, and, for air-speed indicators calibrated in statute miles per hour, that a readily usable means shall be provided for the flight crew to convert statute miles per hour to knots. Since it will require a certain amount of time to comply with these requirements they will become effective on October 1, 1954. This amendment also contemplates that in the future all air-speed indicators in aircraft operated under this part will be calibrated in knots and that all air-speed limitations and related information contained in the Airplane Flight Manual and pertinent placards will be expressed in knots. Since it will take about two years for airplanes to be equipped with these indicators, these latter provisions will become effective April 1, 1956.

EXTENSION OF EFFECTIVE DATE OF REQUIREMENT FOR CHOP MARKS ON AIRPLANE EXTERIORS

Effective: April 1, 1954
Adopted: March 31, 1954

Amendment 40-5

Revised Part 40 was adopted by the Civil Aeronautics Board April 13, 1953, and is to become effective April 1, 1954. Section 40.178 (b) of this part requires that the exterior area of the fuselage of an airplane be marked to indicate the location of mechanism of access and areas suitable for cutting to facilitate the escape and rescue of occupants in the event of an accident. Marks indicating areas suitable for cutting are commonly known as "chop marks".

In Civil Air Regulations Draft Release No. 53-26, dated November 17, 1953, it was proposed that 40.178 (b) be amended by extending the effective date for its compliance therewith until March 1, 1954. The comment received in response to this draft release indicated general concurrence with this proposal. Since the effective date of revised Part 40 was subsequently extended to April 1, 1954, it became

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unnecessary to include this amendment in Civil Air Regulations Amendment 40-3, adopted on March 11, 1954.

During the period allotted for comment on Draft Release 53-26, however, a proposal was received for the elimination of this requirement on the grounds that airplane fuselages, particularly those of modern pressurized airplanes, are so strongly resistant to chopping or cutting by means of such devices as axes, as to render questionable the justification for this requirement. It was agreed to consider this proposal further in order to determine whether any additional modifications should be made to this section in the future. The Board is advised that certain air carriers misunderstood the result of this exchange of views, and believed that the requirement was to be postponed indefinitely. Accordingly, they made no effort to apply the markings required by this regulation. The Board is of the opinion that this assumption was unwarranted, since the Board cannot, consistent with proper rule-making procedures, commit itself in advance to any course of action, and moreover in this instance there was no more than an agreement to reconsider.

The Board intends that any "chop marks" appearing on airplane exteriors should be applied on the basis of a sound engineering analysis of the airplane structure involved, and that such marks reflect a valid determination that the areas so marked be truly suitable for cutting. In view of the lack of time available prior to the effective date of revised Part 40 it appears that air carriers who have not yet made such an engineering analysis will be unable to apply "chop marks" at the proper places on their airplanes. "Chop marks" applied on the basis of other than a proper analysis may mislead rescue crews to attempt to enter a cabin at a strong structural member. The Board considers that such "chop marks" would create a more hazardous condition than the complete absence of "chop marks". It appears advisable, therefore, to extend the effective date of that portion of 40.178 (b) which relates to areas suitable for cutting, to allow all carriers to apply "chop marks" on the basis of a proper study. The portion of 40.178 (b), however, on marking which indicates the location of mechanisms of access will become effective on April 1, 1954, in accordance with the current requirement.

EN ROUTE LIMITATIONS

Effective: May 18, 1954
Adopted: April 13, 1954 Amendment 40-6

Currently effective 40.75 pertaining to en route limitations with two engines inoperative, permits the assumption that the second engine will become inoperative 90 minutes after the point of departure. This could lead to an unsafe operation in long overwater flights. The present requirements are not clear also with respect to the rate of climb required when the failure of the engine occurs at an altitude which is above the minimum prescribed altitude. This amendment clarifies these provisions by prescribing that both engines must be considered to fail simultaneously at the point along the route which has the most critical effect on the take-off weight. It also prescribes that if the altitude at which engine failure occurs is above the minimum prescribed altitude, a descent may be assumed to an altitude at which the rate of climb is zero, provided that the latter is sufficiently above the minimum prescribed altitude to assure compliance, during the subsequent portion of the flight, with the prescribed minimum altitude.

AUTHORITY OF ADMINISTRATOR TO WAIVE CERTAIN PROVING TEST REQUIREMENTS FOR AIR CARRIERS

Effective: June 1, 1954 Amendment 40-7
Adopted: June 1, 1954 19 F.R.

Section 40.63(b) of revised Part 40 states that an air carrier using a type of airplane not previously used by it but previously proved in other operations shall test the airplane for at least 50 hours of which 25 hours shall be over authorized routes. The purpose of this requirement is to insure that an air carrier using a type of airplane not previously used by it or a type which has been greatly modified

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would acquire experience in the handling of the airplane prior to its use in passenger operation. It is also intended that by requiring a certain number of hours of proving tests to be conducted over authorized routes, personnel along the routes would become accustomed to the handling and servicing of the airplane on the ground.

Prior to using new type airplanes in scheduled passenger operation, air carriers generally conduct a fairly extensive training and familiarization program in the airplane. While the program may accomplish the purpose of familiarizing all personnel involved in the operation and handling of the new airplane, it may not comply with the proving test requirements set forth above. For example, while a new type airplane may have been proved for more than 50 hours and all personnel involved in its operation received adequate training in its handling, these proving tests may not have been conducted over authorized routes. In the past there have been several instances in which an air carrier has conducted rather extensive proving tests prior to using a new type airplane in scheduled passenger operation but under a specific waiver of the Board has not conducted 25 hours of these tests over authorized routes. In such cases it was not felt that the specific hourly requirements of 40.63 (b) needed to be enforced since the purpose of the requirements would have been fulfilled. Since proving tests of airplanes not previously used are conducted under the surveillance of the Civil Aeronautics Administration, it is felt that the Administrator should be permitted to waive the provisions of 40.63(b) in those cases where the purposes of these provisions have been accomplished by the training and indoctrination program conducted by the air carrier.

ANTI-COLLISION LIGHTS FOR LARGE AIRPLANES OPERATING AT NIGHT

Effective: August 15, 1954
Adopted: July 9, 1954

Amendment 40-8
19 F.R. 4347

Currently effective 40.200 of Part 40 of the Civil Air Regulations requires, among other things, that all airplanes used in scheduled interstate air transportation be equipped with flashing position lights when operating at night. Recent experience has indicated that there is need for greater conspicuity than can be obtained with the existing system of flashing position lights, because of the increased speed of airplanes and the increase in the number of airplanes that operate at night. Experiments in recent years revealed that high intensity rotating lights, commonly referred to as anti-collision lights, increase conspicuity to the point where safety in air navigation can be materially improved if aircraft are equipped with such lights. In order to enable the air carriers to evaluate this and other systems of aircraft exterior lighting, the Board promulgated several Special Civil Air Regulations, the most recent of which, SR-392, is currently in effect.

After the service testing of anti-collision lights by certain air carrier operators, it appeared early in 1952 that the anti-collision lights which were then available were satisfactory to these operators as evidenced by their plans for installation on a fleet-wide basis. The Board then established a broad standard for these lights in Part 4b of the Civil Air Regulations for the purpose of assuring a reasonable degree of standardization of anti-collision lights.

Since the need for increased conspicuity of aircraft operating at night has not diminished but has been magnified by recent experience of near accidents at night, and since there are satisfactory anti-collision lights available which tend to alleviate the danger of collision, the Board considers it necessary in the interest of safety that the installation of anti-collision lights on all large aircraft be made mandatory. This amendment, therefore, requires that all large air carrier airplanes used in scheduled interstate air transportation be equipped with operable anti-collision lights. Although it was proposed that this requirement become effective on September 30, 1954, the Board has been informed that in some cases it would require as long as eighteen months to effect a fleet-wide installation. Therefore, to permit an orderly installation of these lights, the effective date of this requirement has been established as June 1, 1956. Similar amendments are being made to Parts 41, 42, and 43 for all aircraft having a maximum certificated weight of more than 12,500 pounds, and additional study is being given to the possibility of requiring generally similar types of lights for small airplanes.

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Considerable concern was expressed by the air carriers with respect to the possibility that a flight may not be permitted to continue beyond a stop en route with an inoperative anti-collision light. It is expected that the air carriers will perform a high level of maintenance on the light so that failures in flight will be relatively infrequent. In view of the fact that each affected airplane will be equipped with flashing position lights and in view of the relatively few failures anticipated, it is considered that a reasonable level of safety will result if the provisions presently applicable to other required equipment becoming unserviceable is equally applicable to the anti-collision light. Accordingly, under the provisions of 40.51, an air carrier may establish a procedure for continuation of flight beyond a stop en route if the anti-collision light becomes inoperative. In unusual circumstances, the Administrator may authorize, under 40.391, continuation of flight beyond a scheduled terminal.

It is understood that, notwithstanding the promulgation of this amendment, the air carriers have indicated their desire to continue, in conjunction with other interested parties, research and development on the overall problem of aircraft exterior lighting. In this respect, it is expected that the industry will take full advantage of Special Civil Air Regulation SR-392 which authorizes limited experimentation with exterior lighting on air carrier airplanes.

PROPELLER REVERSE PITCH INDICATORS

Effective: October 1, 1954
Adopted: August 27, 1954

Amendment 40-9
19 F.R. 5595

The currently effective provisions of Part 40 of the Civil Air Regulations contain no requirements for a propeller reverse pitch indicator to indicate to the pilot when a propeller is in reverse pitch. The need for such an indicator has been under consideration for some time and this amendment requires that all aircraft operated under the provisions of this part be equipped with such an indicator after September 1, 1955.

On September 1, 1953, the Board published a notice of proposed rule making in the FEDERAL REGISTER, which was also circulated as Civil Air Regulations Draft Release 53-17, in which it was proposed to amend Parts 40, 41, and 42 of the Civil Air Regulations to require the installation, on airplanes equipped with reversing propellers, of means to indicate to the pilots when the propeller is in reverse pitch. It was intended that such means be permitted to indicate to the pilots when the propeller blade angle is below the normal low pitch position. It was also proposed that the source of indication be actuated by propeller blade angle or be directly responsive to propeller blade angle.

As a result of the comments received, the Board has determined that certain modifications should be accomplished to the proposed rule. Interested persons have recommended that the reverse pitch indicators should not be permitted to give any indication except when the propeller blade angle is below the low pitch stop, in order that no confusion arise as to the action to be taken by the flight crew when such an indication occurs. This recommendation is consistent with the objective sought and the Board is of the opinion that such a change is desirable. This amendment, therefore, makes it clear that no indication may be given at or above the normal low pitch stop position.

In Draft Release 53-17, the Board also proposed that propeller reverse pitch indicators be required to be actuated during the entire period the propeller is in reverse pitch; i.e., below zero degree geometric pitch, and that actuation be permitted at the operator's option in the portion of the reversing cycle between the low pitch stop and zero degree geometric pitch. It appears that there is considerable difference of opinion among interested parties as to the point or range in the reversing cycle where actuation of the reverse pitch indicator would be most advantageous from an operational point of view. In considering the case of unwanted reversal in flight, it appears that actuation early in the cycle might be more desirable. However, from the viewpoint of normal reversing operations during the landing ground run, it appears that actuation late in the cycle might be more desirable. It is believed that from an overall operational point of view, the point of actuation of the reverse pitch indicator in the reversing cycle is not critical. It has also become apparent that the requirement proposed in the Draft Release for early indication may

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be too restrictive, since it might require other functions of the propeller hub assembly to be unduly compromised. Therefore, this amendment permits actuation of the indicator at any point in the reversing cycle between the low pitch stop position and full reverse pitch.

The Board envisages that considerable operational benefit will result from the incorporation of propeller reverse pitch indicators. Accordingly, it is expected that air carriers will include in the appropriate manuals and other documents used for crew training and indoctrination, suitable information concerning the use of such indicators.

A recommendation has been received for further amendment of this proposal to ensure that certain alternative techniques for indicating reverse thrust may be employed. The Board is of the opinion that the language set forth in this amendment adequately defines the objectives sought, and does not unduly limit the type of indicating means that may be used.
[Added 40.172(l)]

QUALIFICATION OF FLIGHT CREW MEMBERS

Effective: September 21, 1954 — Amendment 40-10
Adopted: September 21, 1954 — 19 F.R. 6160

At the present time 40.261(d) of Part 40 of the Civil Air Regulations requires that where a flight engineer is required a flight crew member in addition to the flight engineer shall be sufficiently qualified that, in the event of illness or other incapacity of the flight engineer, emergency coverage can be provided for the flight engineer's duties. The subsection specifically states that a pilot need not hold a flight engineer certificate so to function at such time.

In connection with the proceedings resulting from a petition of the Air Transport Association for the amendment of certain provisions of Part 40 with respect to the necessity for and training of flight engineers, it came to the Board's attention that some individuals interpreted the last sentence of 40.261(d) as allowing a pilot to serve in the capacity of flight engineer only at a time when the aircraft is in an emergency situation. The intent of the sentence was to make clear that a pilot as such will be considered sufficiently qualified without holding a flight engineer certificate to provide emergency coverage at a time when, due to illness or other incapacity, the flight engineer cannot carry out his duties. In order that there may be no misunderstanding on this point the Board is promulgating this amendment. [Revised 40.261(d)]

EXTENSION OF EFFECTIVE DATE OF REQUIREMENT FOR CHOP MARKS ON AIRPLANE EXTERIORS

Effective: September 29, 1954 — Amendment 40-11
Adopted: September 29, 1954 — 19 F.R. 6323

The Air Transport Association has requested that the effective date of the chop mark requirement be delayed pending further investigation and determination as to the effectiveness of this requirement.

Section 40.178(b) of Part 40, which was made effective April 1, 1954, required that the exterior area of the fuselage of the airplane be marked to indicate the location of mechanisms of access and areas suitable for cutting to facilitate the escape and rescue of occupants in the event of an accident. Marks indicating areas suitable for cutting are commonly known as "chop marks".

By Amendment 40-5, effective April 1, 1954, the date for compliance with that part of this regulation applicable to chop marks was extended until October 1, 1954. The extension was made to provide the carriers with additional time to make certain that the chop marks appearing on airplane exteriors would be applied on the basis of a sound engineering analysis of the airplane structure involved, since chop marks at points not readily penetrable would serve to mislead rescue crews.

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The Board's attention has been drawn to the fact that recent analyses both from an engineering and a practical standpoint of current types of air carrier airplanes indicate that the difficulties encountered in the actual breakthrough and the time involved, would render escape or rescue virtually impossible. The Board has also been advised that it would be impossible to reach areas where penetration could be made from the outside without the use of ladders, stands, or similar means, when the fuselage is in a normal upright position, and that, in most instances, it would be difficult to remove passengers from the interior of the airplane after access had been obtained.

In view of the difficulties encountered in properly locating the chop marks, there appears to be a need for further study and determination of the chop mark requirement. It appears that this determination can reasonably be expected to be made by April 1, 1955, and the effective date is being extended accordingly.
[Revised 40.178(b)]

EXTENSION OF EFFECTIVE DATE OF REQUIREMENT FOR CARRIAGE OF CRASH AX(ES) ABOARD SCHEDULED AIR CARRIER AIRPLANES

Effective: December 29, 1954
Adopted: December 29, 1954

Amendment 40-12
20 F.R. 17

Section 40.173(d) of Part 40 of the Civil Air Regulations requires that "On and after January 1, 1955, all airplanes shall be equipped with at least one crash ax, and if accomodations are provided for more than 30 persons including the crew, airplanes shall be equipped with at least two crash axes. This equipment shall be stowed in readily accessible locations."

The Air Transport Association has recently requested that further study be made prior to the implementation of this requirement. Questions have been raised as to the effectiveness of a crash ax for cutting through the fuselage of an airplane and, particularly, to the advisability from a safety standpoint of stowing a crash ax in the passenger compartment of the airplane.

The Bureau of Safety Regulation has been conducting an investigation into the question of the need of a crash ax as an article of emergency equipment for all air carrier operations. Data received from the air forces concerning tests which were conducted by them indicated that the crash kit, which included a crash ax, was inadequate for the purpose for which it was intended. More recently the NACA has conducted a series of tests in order to determine the effectiveness of the crash ax in cutting an opening in an airplane fuselage through which passengers could be evacuated in an emergency. On the basis of these tests it appeared doubtful whether the average passenger could chop an adequate opening through the fuselage by means of an ax. Furthermore, it was concluded that the opening would have to be sufficient in size to permit the passenger to step through to the ground because of the sharp jagged edges resulting from the use of an ax. In fact, the military has required that the ax be supplemented by additional equipment such as a saw or a six pound sledge hammer in order to cope with the jagged edges.

In view of the foregoing information, the justification for an ax for the use of passengers would appear to be somewhat uncertain. This is particularly true of the provision for a second ax on larger airplanes. Therefore the Board feels that additional investigation of the problem is in order prior to making final disposition of the crash ax requirement. Inasmuch as this requirement is closely allied with the requirement for chop marks on the fuselage, the crash ax requirement will be extended to concide with the April 1, 1955, effective date for "chop marks."
[Revised 40.173(d)]

EXTENSION OF EFFECTIVE DATE OF REQUIREMENT FOR CARRIAGE OF A SECOND CRASH AX AND FOR CHOP MARKS ON AIRPLANE EXTERIORS

Effective: April 1, 1955
Adopted: March 17, 1955

Amendment 40-13
20 F.R. 1720

Section 40.173(d) of Part 40 of the Civil Air Regulations requires that "On and

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after April 1, 1955, all airplanes shall be equipped with at least one crash ax, and if accomodations are provided for more than 30 persons, including the crew, airplanes shall be equipped with at least two crash axes. This equipment shall be stowed in readily accessible locations."

Section 40.178(b) requires that "The exterior areas of the fuselage of an airplane shall be marked to indicate the location of mechanisms of access and those areas suitable for cutting to facilitate the escape and rescue of occupants in the event of an accident: PROVIDED, That marking of areas suitable for cutting need not be applied prior to April 1, 1955." Marks indicating areas suitable for cutting are commonly known as chop marks.

Questions have been raised as to the effectiveness of a crash ax for cutting through the fuselage of an airplane and as to the need of a second crash ax on large airplanes. In addition, the Board has been requested to delete the requirements for chop marks on the exterior of airplanes. Having completed a further investigation of the problem, the Board is concurrently issuing a notice of proposed rule-making containing proposals for the final disposition of these matters.

In order to afford interested parties an opportunity to comment on the Board's proposal, and to thereafter allow a sufficient period of time for the implementation of the final regulations, the effective date of the requirement for the carriage of a second crash ax and for the marking of areas suitable for cutting is being extended to September 1, 1955.

Since this amendment is minor in nature and imposes no additional burden on any person, notice and public procedure hereon are unnecessary and the amendment may be made effective without prior notice.
[Revised 40.173(d), 40.178(b)]

EN ROUTE PERFORMANCE OPERATING LIMITATIONS

Effective: May 9, 1955 — Amendment 40-14
Adopted: May 9, 1955 — 20 F.R. 3294

Currently effective 40.74, pertaining to the transport category one-engine-inoperative en route performance operating limitations, provides that the airplane weight at take-off shall be such that, in the event of an engine failure at any point along the route, the airplane can meet a prescribed rate of climb at an altitude at least 1,000 feet above the elevation of the highest ground or obstruction within 10 miles on either side of the intended track. This amendment provides an alternative to this performance operating limitation under which, upon approval by the Administrator of Civil Aeronautics, a so-called "drift-down" procedure may be used. For some time a similar alternative has been permitted for the operation of nontransport category airplanes with no adverse effect on safety. The Board, therefore, considers that a properly planned and executed drift-down procedure would not jeopardize the safety of operation of transport category airplanes.

The Board is of the view that experience during recent years demonstrates that the jettisoning of fuel may be accomplished safely when adequate indoctrination of flight crew and other necessary precautions are provided. Accordingly, there is included a provision whereby fuel jettisoning may be used in showing compliance with this requirement if proper safeguards are taken.

Although consideration has been given to the inclusion of certain operational variables such as the incidence of downdrafts, turbulence, and icing conditions in the approval of drift-down procedures, the Board is of the view that these conditions are not sufficiently definitive and do not establish a clear criterion against which a particular drift-down procedure may be examined. They are, therefore, not included in this regulation. On the other hand, temperature and wind are measurable quantities which can be forecast with reasonable accuracy. Accordingly, the Board is of the view that account should be taken of temperature and wind. However, in order to avoid placing an undue burden upon the air carrier in accounting for these conditions, this regulation permits the use of "declared" values or such approved assumptions with respect to their probable magnitude.

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Inasmuch as this regulation prescribes an operational procedure to be used in lieu of compliance with specific performance limitations, the Board has decided that the lateral and vertical clearances should be more nearly related to operating limitations generally in effect. Since minimum flight altitudes are normally predicated on a 5-mile lateral clearance, this value is also used in drift-down procedures. However, since a vertical clearance of 2,000 feet is normally required in mountainous terrain and since terrain elevations which are critical from the standpoint of the performance operating limitations are found only in mountainous areas, the Board believes it logical to apply a 2,000-foot terrain clearance provision in this requirement.

In order that a flight with one engine inoperative not be complicated unduly by navigational problems, the Board believes that the drift-down procedure normally should be related clearly to an approved radio navigational fix. The procedure will be so established that on either side of the governing fix a definite course will be prescribed to an alternate airport. In order to insure that these airports will, in fact, be usable under such circumstances, the Board is applying the same requirements for initial dispatch as are required currently with respect to any other alternate airport.

Although this amendment does not limit the application of a drift-down procedure to airplanes possessing reciprocating engines, the Board intends to continue its consideration of the special problems which may be raised by the introduction of turbine engines and, specifically, will consider whether any different conclusions need be reached with respect to the application of "drift-down" to turbine-powered airplanes.[1]
[Revised 40.74(a); Added 40,74(b), (c)]

EN ROUTE NAVIGATIONAL FACILITIES

Effective: June 29, 1955 — Amendment 40-15
Adopted: June 29, 1955 — 20 F.R. 4713

Currently effective § 40.36 of Part 40 of the Civil Air Regulations requires that nonvisual ground aids to air navigation be available along each route, but provides "That no nonvisual ground aids to navigation are required for day VFR operations where the characteristics of the terrain are such that navigation can be conducted by pilotage." This amendment permits VFR operations also at night, but only over lighted airways or on routes where in the opinion of the Administrator, lighted landmarks permit navigation to be safely conducted by pilotage.

Prior to the effective date of revised Part 40, night VFR operations were authorized on certain routes not served by nonvisual aids when such routes were equipped with airway beacons and obstruction lights deemed by the Administrator to be adequate for safe air carrier operations at night. At the time Part 40 was revised it was considered that authorization for night VFR was inconsistent with the airborne equipment requirements of § 40.231(b) and it was therefore deleted.

The Board has since been advised by the Civil Aeronautics Administration that as a result of this deletion it will be necessary to cancel a large number of night VFR operations previously authorized under the provisions of old Parts 40 and 61 because the routes are not equipped with nonvisual ground aids. Thus it appears that the deletion of the authorization for night VFR operations is unduly restrictive with regard to previously authorized routes. Furthermore, the Board has received requests from industry that Part 40 be amended to permit again night VFR operations on certain routes, where lighted airway beacons or lighted landmarks permit navigation to be conducted by pilotage. The CAA also has recommended such an amendment. For the foregoing reasons, the Civil Aeronautics Board issued a notice of proposed rule making which was published in the FEDERAL REGISTER (20 F.R. 1057) and circulated to industry as Civil Air Regulations Draft Release No. 55-4, dated February 9, 1955, which proposed to amend revised Part 40 to authorize such operations.

Comment has been received which recommends against the proposal in favor of the establishment of controlled IFR routes between all airline terminals. The Board

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[1] Adams, Vice Chairman, dissenting

agrees that it would be ideal to establish controlled IFR routes between all airline terminals. However, from a practical standpoint it must be recognized that this is not possible for the CAA to do for every route segment. Furthermore, if this policy were adhered to strictly, it would prohibit many night VFR operations which heretofore have been approved and conducted safely for a number of years. The Board does not believe that such an effect is warranted. Furthermore, the Board anticipates that when checking route segments for approval for night VFR operations, the CAA will give consideration to the characteristics of the adjacent terrain and also to the availability of radio navigational facilities adjacent to the route and that safety will be adequately assured.

The Board believes that justification exists for amending Part 40 of the Civil Air Regulations to permit again VFR operations at night in accordance with the provisions and subject to the conditions, prescribed by this amendment; and the Board finds that safety will not be jeopardized thereby.
[Revised § 40.36]

MISCELLANEOUS AMENDMENTS

Effective: August 25, 1955
Adopted: July 20, 1955

Amendment 40-16
20 F.R. 5311

The presently effective provisions of Part 4b of the Civil Air Regulations require that each transport category airplane be furnished with an Airplane Flight Manual. In addition, the presently effective provisions of Part 40 require the maintenance of an operator's manual for the use of flight personnel. In many instances the information contained in the Airplane Flight Manual has also been contained in the operator's manual. The Board is of the opinion, therefore, that the regulations should be changed so that air carriers need carry only the operator's manual in their airplanes. This amendment adds a new § 40.53 which in effect permits an air carrier to carry on its airplanes only the operator's manual if such manual also contains information required for the Airplane Flight Manual. Concurrently with this Amendment, Part 4b is being amended so that each airplane need not be furnished with an Airplane Flight Manual if not required by the operating parts of the Civil Air Regulations.

The current provisions of § 40.115(b) and (c) require, on all passenger airplanes with engines of over 600 horsepower, the installation of smoke detectors in "B" and "C" compartments. As a result of studies and discussions conducted during the 1954 Annual Airworthiness Review, certain changes to these provisions were indicated. This amendment reflects in part these changes by amending § 40.115(b) and (c) so as to permit the installation of heat-type fire detectors in lieu of smoke detectors in cargo compartments "B" and "C". It should be noted that Special Civil Air Regulation SR-401 permitted noncompliance with the smoke detector provisions in Part 4b and in the operating parts of the Civil Air Regulations until April 1, 1956. Concurrently with this amendment, SR-401 is being amended so that the installation of either smoke or fire detectors will not be mandatory until April 1, 1957.
[Revised 40.115(b), (c); Added 40.53]

APPLICABILITY OF CONTROL OF ENGINE ROTATION AND INSTRUMENTATION REQUIREMENTS TO TURBINE-POWERED AIRPLANES

Effective: July 25, 1955
Adopted: July 25, 1955

Amendment 40-17
20 F.R. 5389

The current engine rotation requirements and the engine instrument requirements prescribed in Part 40 of the Civil Air Regulations are not entirely appropriate for turbine-powered airplanes for the reason that these requirements have been developed on the basis of experience with reciprocating engine airplanes, which until the present time have been the only airplanes operated under Part 40. Since it is evident that airplanes with turbine engines would be introduced into air transportation in the immediate future, a notice of proposed rule making was published in the FEDERAL REGISTER (20 F.R. 4593) and circulated to the industry in Civil Air Regulations Draft Release No. 55-16 on June 23, 1955, which proposed to revise the engine rotation and engine instrumentation requirements of Part 40 so as to render them appropriate to turbine-powered airplanes. Comment received in response to Draft Release No. 55-16

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expressed objection to the authority proposed to be given the Administrator in establishing engine rotation and instrument requirements for turbine-powered airplanes. Such a policy, howver, has been used in the airworthiness certification of these airplanes and the Board believes it is desirable to continue this policy with respect to the operating rules discussed herein until detailed requirements based upon operational experience can be prescribed.

Currently effective § 40.150 of Part 40 requires that all airplanes be provided with means for individually stopping and restarting the rotation of any engine in flight. However, on the basis of current information, it does not appear that the extremely slow rotation of feathered propellers of some turbo-propeller airplanes will jeopardize safety. On the contrary, to stop the propeller completely will, in some instances, either involve additional hazards or require unduly burdensome modifications. Similarly, the rotation of a turbine engine, following engine failure, may not be as hazardous as would be stopping the engine completely in flight. This amendment therefore, requires means for completely stopping rotation on turbine engine installations only if the Administrator finds that rotation could jeopardize the safety of flight.

Currently effective § 40.172 of Part 40 requires the installation of specified engine instruments. Although the required instruments can be installed on reciprocating engine airplanes, it is clear that some are not appropriate for turbine-powered airplanes. Furthermore, it is recognized that turbine engines may require instrumentation different from that for which provision is currently made in § 40.172. In view of the limited experience in air carrier operations with such engines, the Board believes it is desirable that a determination as to what different instrumentation may be required should, for the present, be made by the Administrator on a basis of equivalent safety. Accordingly, this amendment gives the Administrator such authority with respect to turbine engine instrumentation.
[Revised 40.150, 40.172]

CRASH AX AND CHOP MARK REQUIREMENTS

Effective: September 1, 1955 — Amendment 40-18
Adopted: August 30, 1955 — 20 F.R. 6515

Section 40.173(d) of Part 40 of the Civil Air Regulations requires that "All airplanes shall be equipped with at least one crash ax, and if accomodations are provided for more than 30 persons including the crew airplanes shall be equipped with at least two crash axes. This equipment shall be stowed in readily accessible locations: PROVIDED, That the carriage of a second crash ax shall not be mandatory prior to September 1, 1955."

Section 40.178(b) requires that "The exterior areas of the fuselage of an airplane shall be marked to indicate the location of mechanisms of access and those areas suitable for cutting to facilitate the escape and rescue of occupants in the event of an accident: PROVIDED, That marking of areas suitable for cutting need not be applied prior to September 1, 1955." Marks indicating areas suitable for cutting are commonly known as "chop marks."

During 1954 the Board received proposals from certain air carriers for the elimination of the requirement for a second aircraft ax and the requirement for the marking of areas suitable for cutting. With respect to the aircraft ax requirement, the charge was made that the necessity for the second ax as a matter of Federal regulation has never been justified. With respect to the requirement for chop marks, it was argued that airplane fuselages, particularly those of modern pressurized airplanes, are so strongly resistant to chopping or cutting by means of hand tools as to render questionable the justification for this requirement. The Board's attention was also drawn to the fact that Part 4b of the Civil Air Regulations contains a requirement for external means of access on all emergency exits, and that the existence of chop marks may induce rescue personnel to engage in fruitless chopping or cutting when expeditious means of access are readily available. As a consequence of the foregoing and in response to a formal request of the Air Transport Association, the Board extended the effective dates of the requirements for the second ax and for chop marks until September 1, 1955, the current effective date, in order to permit reinvestigation of these provisions.

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The Board examined in detail the safety record of civil operations and found that some use of an aircraft ax has been made as a result of which safety was clearly benefited. However, no record exists of the use of an aircraft ax in any air carrier accident, nor does any record exist in which two aircraft axes have been used during actual operations. In fact, no record has been found of any situation involving a combination of circumstances in which the carriage of two aircraft axes would have been beneficial. On the basis of this study, therefore, it appeared that the probability that a need for two aircraft axes will arise in air carrier operations is so extremely remote as to render questionable the justification for such a requirement in the Civil Air Regulations.

A review was also accomplished in order to determine whether the presence of chop marks had in any way contributed to the safety of aircraft operations. Our investigation of civil and military records reveals no indication that the presence of chop marks has in any way served to facilitate the rescue of personnel, notwithstanding the extensive use of chop marks for the past 15 years. Various experiments have been conducted showing that chopping or cutting of aircraft fuselages is at best very difficult and time consuming. It became clear that where external means for opening emergency exits are available, these should be used in lieu of attempts at forcible entry. Even where external means for opening emergency exits are not available, it appeared that attempts at forcible entry through such exits would be more fruitful than chopping through other areas of the fuselage. Accordingly, it was concluded that all emergency exits should be clearly identifiable as such from the outside and, where appropriate, suitable markings should be applied to indicate the method of operation of mechanisms of access. In the case of emergency exits which are not operable from the outside, it appeared that, because of differences in design between aircraft, instructions should be added indicating the most suitable procedure for forcible entry through such exits.

In view of the foregoing, a notice of proposed rule making was circulated as Civil Air Regulations Draft Release No. 55-8 (20 F.R. 1742) proposing the amendment of the pertinent sections of Part 40. This notice proposed the deletion of the requirement for the second aircraft ax. It also proposed the deletion of the requirements for chop marks and in lieu thereof proposed to require the addition of external markings on emergency exits to facilitate access into the aircraft. In the case of emergency exits which are operable from the outside, these markings were to be in the form of instructions concerning the operation of mechanisms of access. In the case of emergency exits which are not operable from the outside, the markings were to be in the form of instructions to facilitate forcible entry.

Comments received in response to this draft release indicated some opposition to the deletion of the requirements for the second ax and the chop marks; however, no justification was presented in support of these requirements. Accordingly, the Board concludes that these requirements should be deleted.

Opposition was also expressed concerning the requirement to include instructions for forcible entry at emergency exits which are not operable from the outside. The Air Transport Association, the Flight Safety Foundation, and the National Fire Protection Association concurred in the view that it is impossible, at this time, to envisage instructions concerning forcible entry which would be useful in facilitating rescue efforts. It was argued that the limitations of language are such that it would be difficult to avoid instructions, the length and complexity of which would defeat the objective sought, unless a system of universal symbols, not currently in existence, is developed. It was suggested, furthermore, that an educational program designed to acquaint rescue personnel with the peculiarity of design of various emergency exits would be far more profitable than the requirements proposed in Draft Release 55-8. The Board is of the view that these comments have merit. We are not satisfied, however, that our investigation of the feasibility of marking aircraft to facilitate forcible entry should be abandoned although it appears advisable to determine whether symbolic instructions are necessary to achieve this end. Meanwhile, the Board is of the view that programs looking toward the further indoctrination of aircraft rescue personnel should be prosecuted as vigorously as practicable.

The Board concludes that the substance of the amendments proposed in Draft Release 55-8 should be adopted at this time except with respect to the requirement for instructions for forcible entry. We are amending Part 40, therefore, to require that all emergency exits shall be clearly identifiable as such from the outside. Emer-

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gency exits which are operable from the outside should also be marked to indicate the method of opening. These latter markings may be used, where appropriate, to identify the emergency exits themselves. The Board anticipates that emergency exits which are not operable from the outside may be identified by such means as the words Emergency Exit or conventional corner markings.
[Revised 40.173(d), 40.178(b)]

PROPELLER REVERSE PITCH INDICATORS

Effective: September 1, 1955 — Amendment 40-19
Adopted: August 31, 1955 — 20. F.R. 6545

Currently effective effective § 40.172(l) of Part 40 of the Civil Air Regulations requires that, effective September 1, 1955, a means shall be provided for each reversible propeller on airplanes equipped with reversible propellers which will indicate to the pilots when the propeller is in reverse pitch.

A notice of proposed rule making was published in the FEDERAL REGISTER (20 F.R. 4973) and circulated to the industry as Civil Air Regulations Draft Release No. 55-17 dated July 1, 1955, which proposed to extend the compliance date of § 40.172(l) from September 1, 1955, to April 1, 1956. This notice was based upon consideration of information received that certain air carriers would be unable to accomplish the installation of propeller reverse pitch indicators by September 1, 1955, due to delays in the delivery of necessary parts from manufacturers.

As a result of comment received on Draft Release No. 55-17 and based on investigation by the Board and the Civil Aeronautics Administration, the Board has determined that the large majority of air carrier aircraft to which this requirement is applicable have been equipped with indicators. However, although the air carriers concerned have been diligent in their efforts to achieve compliance in all aircraft affected, some have been unable to do so, because of unanticipated difficulties in the procurement of necessary parts. The Board has also determined that in the case of at least one propeller system the necessary parts will not be available in sufficient time to permit modification by April 1, 1956, the date proposed in Draft Release No. 55-17, but that all required modifications may reasonably be expected to be accomplished by July 1, 1956. The Board, therefore, concludes that the current compliance date of September 1, 1955, is not realistic and should be extended to July 1, 1956. It is expected, however, that conscientious efforts will be continued by the parties concerned to accomplish the required change as soon as possible, prior to the mandatory compliance date, on consideration of the safety factors involved.
[Revised 40.172(l)]

EMERGENCY AND EVACUATION EQUIPMENT AND PROCEDURES

Effective: November 28, 1955 — Amendment 40-20
Adopted: November 28, 1955 — 20 F.R. 8848

Currently effective provisions of Part 40 of the Civil Air Regulations contain certain requirements for emergency and evacuation equipment and procedures. This amendment requires air carriers operating pursuant to Part 40 to make certain additional provisions with respect to emergency and evacuation equipment and procedures.

The necessity for these additional provisions was indicated following the Board's investigation of several air carrier accidents and they have been under consideration for some time. These matters were the substance of a notice of proposed rule making which was published in the Federal Register (17 F.R. 8022) and circulated as Civil Air Regulations Draft Release No. 52-26 dated August 29, 1952. As a result of comment received, it appeared desirable to arrange a meeting with representatives of industry to discuss particular issues. Such a meeting was held in Washington, D.C., on November 25, 1952, at which the general intent of each proposal was thoroughly discussed and specific changes in the wording of the rules were proposed.

As a result of comment received in response to Draft Release No. 52-26 and the discussions at the subsequent industry meeting, the proposals were revised and a new notice of proposed rule making was published in the Federal Register (18 F.R.

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4744) and circulated as Civil Air Regulations Draft Release No. 53-15 dated August 10, 1953. Since a substantial lapse of time occurred following the issuance of Draft Release No. 53-15, and because of the changes made as a result of comment received on the revised proposals, the Board decided to publish the proposed rules again prior to taking any final action. Accordingly, the proposed rules were published in the Federal Register (20 F.R. 1016) and circulated as Civil Air Regulations Draft Release No. 55-5 dated February 10, 1955. The comment received in response thereto has been considered by the Board in the drafting of this amendment. The following are summaries of the regulatory changes made by this amendment:

1. Means of emergency evacuation. There are no requirements in Part 40 of the Civil Air Regulations for evacuation equipment to assist passengers in evacuating an airplane on the ground. Experience has shown, however, that in certain instances it is essential that some means be provided in addition to those required by the applicable airworthiness requirements. Accordingly, this amendment requires that at all emergency exits which are more than 6 feet from the ground means be provided to assist the occupants in descending from the airplane. At floor level exits approved as emergency exits, such means for emergency evacuation shall be a chute or an equivalent device which will be suitable for the rapid evacuation of passengers. The Board intends that this means shall be in a position for ready use during flight time (as defined by the Civil Air Regulations, "Flight Time" includes that time during which the airplane is taxiing) and so located that it will not create a hazard by obstructing any emergency exit. As an example, certain of the air carriers have already installed chutes immediately above exit doors or on brackets attached to the fuselage immediately adjacent to the doors. An approved chute so located is in a position for "ready use" within the meaning of the new section.

2. Interior emergency exit markings. At the present time §40.178(a) of Part 40 requires that emergency exits for airplanes carrying passengers be clearly marked as such with luminous paint in letters not less than 3/4 inches high, such marking to be located either on or immediately adjacent to pertinent exits and readily visible to passengers. Location and method of operation of the handles are required to be marked with luminous paint. The Board does not consider that these requirements are adequate to ensure that in case of a crash landing or ditching at night the passengers and crew would be able to identify and operate emergency exits. This amendment, therefore, provides that for all air carrier passenger airplanes lights be installed so as to illuminate all emergency exits in such a manner as to attract the attention of the occupants of the airplane at night. It is further required that these lights be equipped with an integral energy supply system. Since Draft Release No. 55-5 was circulated, the Board has determined that a light designed only for manual operation, if designed to withstand the impact forces of a crash landing and continue operation, will serve as a suitable alternative to an automatic light to provide emergency lighting at those times when it is most likely to be needed. Accordingly, this amendment requires that these lights either (1) be designed to function automatically in the event of a crash landing and to continue to function thereafter and also be operable manually, or (2) be designed only for manual operation and also to continue to function after a crash landing. When such lights require manual operation to function, they must be turned on prior to each night take-off and landing. With respect to the automatic light, any approved system whether it is designed to operate as a result of inertia forces or upon failure of the main electrical system, will be satisfactory as long as it meets the two requirements; mainly, it will function automatically in the event of a crash landing and continue to function thereafter, and it is also operable manually.

The requirements for emergency exit markings in the airplane interior are deleted from §40.178 and incorporated with modifications in §40.173(f). This latter section includes revised language which takes account of the new emergency exit lighting requirements.

3. Equipment for extended overwater operations. This amendment modifies and expands the current provisions to require scheduled air carriers in extended overwater operations to have on their airplanes suitable equipment in the form of life vests, life rafts, signaling devices, and survival kits. This equipment is required to be installed in conspicuously marked approved locations where it will be easily accessible in the event of ditching.

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An intensive investigation of ditching operations, including tests of life-raft capacity, has recently been conducted by the Civil Aeronautics Administration and the United States Navy in cooperation with other government agencies and interested aeronautical organizations. The Board has been advised that analysis of the results of these tests has not yet been accomplished. Consequently, as indicated in Draft Release No. 55-5, pending development of satisfactory criteria of life-raft capacity, the Board is not taking any action at this time to require that such life rafts possess sufficient maximum capacity to accommodate all occupants in the event of a loss of one life raft of the largest capacity on board. In view of the foregoing, this amendment does not charge the requirement that airplanes on extended overwater flights carry life rafts sufficient in number and of such rated capacity as to accommodate all occupants of the airplane.

The Board is also concerned by the lack of any current requirement that life jackets and life rafts be equipped with a means of illumination which would materially assist in the rescue of persons from the water at night. Although such a light is not yet available, the Board has recently been informed that progress is being made toward the development of a serviceable, reliable, lightweight, inexpensive light of indefinate shelf life, adaptable to such use. Therefore, the Board will consider further whether a means of illuminating life jackets and life rafts should be required when it has determined that developments are sufficiently mature to warrant such action.

4. Assignment of emergency evacuation functions for each crew member. This amendment requires each air carrier to assign emergency functions for each crew member to perform in the event of circumstances requiring emergency evacuation. The objective of this requirement is to assure that each crew member will know, and be able to perform, those basic functions which are necessary in order to accomplish an emergency evacuation. The "emergency" for which this rule requires each crew member to be prepared is that of evacuating the airplane. Although innumerable types of emergencies may arise in flight which may necessitate an emergency evacuation of an airplane, the Board is of the opinion that the procedures to be followed in evacuating an airplane remain limited in number. Therefore, it is considered reasonable, and it is the intent of this rule, to require that each crew member be prepared to perform emergency evacuation functions when necessitated by various general situations; for example, ditching, fire in flight, and landing gear collapse. This rule will not, of course, limit the authority of the pilot in command over crew members with respect to the assignment of duties under the particular conditions of an emergency.

The Board has always based its rules on the premise that wherever possible the air carrier should be responsible for assigning crew duties. It has been brought to the attention of the Board, however, that in certain instances crew duties are not sufficiently delineated and crew training programs are not sufficiently complete to provide proper coordination of the crew in the event of a crash landing or ditching. The Board considers that it is necessary to ensure that assigned crew duties are realistic, and do not, for example, require an individual to be assigned certain tasks which are not probable of accomplishment under the conditions anticipated. Therefore, these functions are required to be listed in the air carrier manual and all crew members must be made thoroughly familiar with them during both initial and recurrent training. In addition, the air carrier must show that the functions so assigned are practicable of accomplishment.

5. Briefing of passengers. This amendment requires each air carrier engaged in extended overwater operations to establish a procedure for orally briefing passengers in order to ensure that they will be familiar with the location and method of operation of life vests and emergency exits, and the location of life rafts. Such briefing must include a demonstration of donning life jackets.

The Board considers that it is in the public interest to attain the increased safety sought by these rules at the earliest opportunity. At the same time it recognizes that certain of the requirements involving physical changes to airplane structures and the procurement of additional equipment would be unduly burdensome unless an appropriate period of time for planning, procurement, and installation is allowed. Accordingly, a majority of these rules need not be complied with for approximately 18 months. However, the rules involving procedures only must be complied with in approximately 6 months.

Interested persons have been afforded an opportunity to participate in the making of this amendment, and due consideration has been given to all relevant matter pre-

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sented. Since this amendment contains rules which need not be complied with for at least 6 months, it may be made effective immediately.
[Amended §§40.173(e), (f); 40.178, and 40.206; Added §§40.267 and 40.370]

REVISION OF PART

Effective: December 31, 1955 — 20 F.R. 10131

Because of the great number of amendments to Part 40, it has been decided to issue a revision of this part incorporating all amendments thereto in effect on December 31, 1955. Attention is also called to the following changes which have been made:

(1) Minor editorial changes have been made in a few of the definitions in §40.5. These changes are for the purpose of obtaining uniformity in language or clarification of intent.

(2) Minor editorial changes have been made in §§40.18, 40.33, 40.35, 40.61(a)(2), 40.63(a), 40.117, 40.171(g), 40.175(b), 40.176, 40.284(a), 40.304(b), 40.340 (a) and (b), 40.363(e), 40.406(c), and 40.508(b).

(3) Obsolete compliance dates have been deleted from §§40.90, 40.172(k), 40.173 (b)(3), and 40.175(d).

(4) An obsolete footnote in §40.110 has been deleted.

(5) A proviso containing an obsolete compliance date in §40.175(c) has been deleted.

(6) All footnotes have been changed to notes and follow the sections to which they apply.

Since the changes effected by this revision are minor in nature and impose no additional burden on any person, notice and public procedure hereon are unnecessary and the revised part may be made effective on less than 30 days' notice.
[Revised §§40.5, 40.18(a), 40.33, 40.35, 40.52(a)(2), 40.61(a)(2), 40.90, 40.93(b)(2), 40.117, 40.137, 40.139, 40.171(g)(h), 40.172(k), 40.173(b)(3), 40.175(b), (c), (d), 40.231(b), 40.281(h), 40.284(a), 40.289(a), 40.304(b), 40.340(a), (b), 40.355, 40.356(c)(3), 40.358(a), 40.363(c), 40.406(c), 40.408, 40.508(b); Added §40.18(b)]

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Part 40 Reprinted by G. P. O. as of December 31, 1955

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WEATHER REPORTING FACILITIES AND REQUIREMENTS COVERING LANDING LIMITATIONS OUTSIDE CONTINENTAL UNITED STATES

Effective: June 22, 1956 — Amendment 1
Adopted: May 18, 1956 — 21 F.R. 3405

Part 40 of the Civil Air Regulations contains the certification and operation rules for scheduled air carriers conducting interstate operations. Part 41, on the other hand, contains the regulations applicable to scheduled air carriers operating outside the continental limits of the United States. However, § 40.1 of Part 40 permits the Administrator to authorize air carriers whose operations are essentially domestic in character to operate on routes extending beyond the continental limits of the United States in accordance with the provisions of Part 40 in lieu of the provisions of Part 41 in order to permit continuity of operating procedures throughout the air carriers' systems.

Currently effective § 40.35 of Part 40 requires air carriers to show that sufficient weather reporting services are available en route to insure necessary weather reports and forecasts prepared and released by the United States Weather Bureau or

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by a source approved by the Weather Bureau. However, reports prepared by the United States Weather Bureau or by a source approved by the Weather Bureau are not normally available for areas under the jurisdiction of other nations.

Currently effective § 40.406 of Part 40 prescribes the take-off and landing weather minimum requirements for IFR flight. These requirements include provisions allowing pilots to "take-a-look" to determine whether conditions at the airport are at or above prescribed weather minimums and, if so, to continue to approach and land. Authority to "take-a-look" is limited to airports served by ILS and GCA in operative condition or to airports at which certain instrument approach procedures are commenced when weather conditions above prescribed minimums exist but which a later report indicates are below minimum requirements. Part 41, on the other hand, prohibits air carriers from "Taking-a-look" only at airports at which United States Weather Bureau reports indicate below minimum conditions exist. At airports outside the United States which do not possess a United States Weather Bureau reporting service, a pilot may in his discretion "take-a-look". If he finds that weather conditions at the airport are at or above prescribed weather minimums, he may complete the approach and land.

The inapplicability of § 40.35 to air carrier operations outside the United States and the inconsistency between Parts 40 and 41 with respect to "take-a-look" restrictions appear to have been an oversight. In order to correct this situation, § 40.35 is being amended to provide for the use of weather reports prepared by sources other than those approved by the United States Weather Bureau on routes extending beyond the continental limits of the United States on which operations are conducted pursuant to § 40.1. These "other" sources shall be approved by the Administrator. In addition, § 40.406 is being amended to prohibit pilots from "taking-a-look" only when the latest United States Weather Bureau report or a report from a source approved by the Weather Bureau indicates the ceiling or visibility to be less than the prescribed minimum. This will enable pilots flying on routes outside the continental United States pursuant to § 40.1 to exercise the same "take-a-look" privileges as are available to pilots flying in accordance with Part 41.
[Revised 40.35, 40.406]

TRAINING PROGRAMS AND PROFICIENCY CHECKS -
USE OF AIRCRAFT SIMULATORS

Effective: March 15, 1957 — Amendment 40-2
Adopted: February 9, 1957 — 22 F.R. 885

Part 40 of the Civil Air Regulations currently requires certain pilot proficiency checks to be accomplished twice a year by each pilot serving as pilot in command in air carrier service. The objective of these checks is to insure that the pilot maintains a high standard of proficiency in the piloting and navigation of the airplane types to be flown by him. The proficiency checks must be given by an authorized representative of the Administrator of Civil Aeronautics or a check pilot of the carrier concerned. In addition to the normal airplane maneuvers, these checks include certain critical maneuvers which are encountered from time to time in air carrier service such as take-offs and landings with inoperative engines, missed approaches, instrument letdowns, and various emergency procedures.

The Administrator, with the approval of the Board, has for several years approved many maneuvers required in the proficiency checks to be accomplished in synthetic trainers which accurately simulate the flight characteristics and the performance of the aircraft, to which a pilot is assigned, through all ranges of normal and emergency operations. This approval has been based in part upon an air carrier's use of the synthetic trainer in its pilot training program, and the pilot's satisfactory demonstration in actual flight of ability to perform at least 4 basic maneuvers, as follows: Flight at minimum speeds, approach to lowest approved minimums, landing under circling approach conditions, and simulated engine failure(s) during take-off.

The Board foresees, however, that the increasing complexity of aircraft, with concomitant need for devices to simulate the flight characteristics of large modern transport aircraft, will be further accentuated as turbo-prop and turbo-jet aircraft are procured. As a result, more intensive training of pilots and crews will be necessary to insure that they are proficient in the operation of these larger and faster aircraft with their corresponding new operating problems, and this

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training can be accomplished only at considerably increased costs. In anticipation of this problem, certain carriers are preparing to acquire simulators before the aircraft are put into service. This action is predicated on the assumption that essential training can be conducted in part in aircraft simulators more effectively, safely, and economically than in an aircraft, and with considerable saving in time.

The fundamental characteristics of the aircraft simulators in use and under consideration should be made clear in order that interested persons will clearly understand the nature of the device the Board is discussing in this amendment. The Board has in mind that the aircraft simulator shall be a full scale mock-up of the cockpit interior of a particular type aircraft with normal crew stations, plus accommodations for necessary additional persons such as check airmen, instructors, or observers. It shall also include suitable course and altitude recorders. It shall be capable of accurately reproducing the engine and flight performance, control loading, instrument indication, and control movements of the specific model aircraft during the execution of all normal and anticipated emergency maneuvers. Of great importance is the requirement that the device shall be designed to permit presentation of malfunction of aircraft, aircraft engines, propellers, appliances, systems, and other components, and appropriate procedures to cope with such emergencies. Capabilities, as outlined above, will permit intensive training and checking in normal and abnormal flight conditions, various flight procedures, navigational problems, and essential crew coordination.

Accordingly, the Board published on June 13, 1956 (21 F. R. 4294) a notice of proposed rule making as Civil Air Regulations Draft Release No. 56–16 "Training Programs and Proficiency Checks (Use of Aircraft Simulators)" in which certain proposals were made with respect to the use of aircraft simulators. The Board indicated that it was of the opinion that the advantages of the trainers were so apparent that their controlled introduction into air carrier training procedures on a wider basis was in the public interest and should be encouraged. In summary, the Board found that aircraft simulators have been proven as a valuable aid in improving the effectiveness of pilot training for instrument and equipment proficiency. The promise of further improvement in training is, in fact, so great that it appears desirable to reduce the number of in-flight proficiency checks that pilots are required to take. Simulators are particularly suited to instruction in and practice of numerous emergency procedures which cannot satisfactorily be accomplished in flight, and permit special emphasis on the coordination of crew duties; they offer a laboratory for experimentation in techniques and procedures which might be time-consuming or hazardous in flight; they will permit training to be conducted with more safety as a result of the reduction of frequency of aircraft operations under simulated emergency conditions; their use will result in the reduction of traffic congestion and noise in large terminal areas; and they will reduce substantially the total cost of pilot training programs.

The Board also indicated that, in determining the most appropriate method to realize the full possibilities of aircraft simulators, it could not lose cognizance of its responsibility to assure the highest degree of safety in air transportation even whilr taking this opportunity to encourage sound technical and economic development of air carrier operations. It is the Board's opinion, therefore, that the broadened use of aircraft simulators in air carrier training programs should be permitted in accordance with these basic principles:

A. The use of simulators shall be permissive with the air carriers.

B. The air carrier shall be required to show that the aircraft simulator meets prescribed standards and shall establish within its training pri gram an approved course of training in such an aircraft simulator. It is anticipated that the training shall consist of at least several hours covering all items currently contained in the flight proficiency checks.

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C. When a pilot in command satisfactorily completes each 12 months an approved course of training in an aircraft simulator which the air carrier shows meets the prescribed standards, each such pilot need accomplish only one proficiency check in flight each 12 months.

D. The Board shall review the experience gained under these regulations to determine the effectiveness of the procedures permitted thereby.

In response to Draft Release No. 56–16, the Board received from interested persons comment favorable to the Board's basic objective of permitting broadened use of aircraft simulators by air carriers. There was, however, some diversity of opinion with respect to the specific proposals to amend the operating parts. In the Board's proposal the major change from current practice was to substitute an approved simulator course for one of the two proficiency checks required to be accomplished in flight annually. Certain air carrier spokesmen indicated that they considered this an improper mixing of the training and checking functions, and stated that the regulation should simply permit the accomplishment of one of the required checks in a simulator. Furthermore, these persons also considered that it was not necessary for the Administrator to approve a particular portion of an air carrier's training program (i.e., simulator curriculum). On the other hand, pilot spokesmen expressed concern that successful utilization of aircraft simulators would be realized only through very close supervision by the Administrator, with review by the pilots, of procedures and qualifications of instructors and check personnel.

In Draft Release No. 56–16, the Board also asked for separate comment with respect to the desirability of including in the Civil Air Regulations certain specific standards for aircraft simulator equipment (Draft Release No. 56–16, Appendix A) which would be used as a basis for approval by the Administrator.

The Board has carefully studied the various views presented and is of the opinion that, at least in the initial stages of expanded simulator use by air carriers, the Administrator should approve the aircraft simulator training program of each air carrier. This procedure will be consistent with the present policy whereby the Administrator makes rules, compliance with which is mandatory, for the conduct of the proficiency checks required by the Civil Air Regulations. The Board will, however, review the experience gained under this regulation and propose any changes which, in the light of such experience, may be in the public interest.

The Board is also of the opinion, in view of the comment received, and other information, that the detailed description of the systems or conditions being simulated, and the degree of simulation, should not be prescribed in the Civil Air Regulations but should be controlled by the Administrator through the medium of the appropriate Civil Aeronautics Manual. The Board considers, however, that the broad, basic standards which describe the characteristics and function of an acceptable aircraft simulator should be included in the regulations. [Added 40.302(b)(3)]

POSITION AND ANTI-COLLISION LIGHT REQUIREMENTS

Effective: April 1, 1957

Amendment 40-3
22 F.R. 1276

The continuing increase in air traffic density and the advent of aircraft capable of appreciably higher speeds than heretofore attained demand further improvement in the exterior lighting of aircraft. Recent studies with respect to exterior aircraft lighting indicate a need for the establishment of new specifications in the certification parts of the Civil Air Regulations for anti-collision lights.

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Since the anti-collision light is a flashing light and in addition has the added advantage of more concentrated intensities which offer conspicuity at a greater distance, the Board believes that flashing position lights will no longer contribute noticeably to the conspicuity of aircraft. It is believed, however, that with the use of the anti-collision lights now required on all air carrier aircraft it becomes important for the position lights to retain their direction and attitude indicating features and this can best be accomplished by maintaining the position lights steady rather than flashing.

Interested persons have been afforded an opportunity to participate in the making of this amendment (21 F.R. 3388), and due consideration has been given to all relevant matter presented.

[Revised 40.200(a), 40.200(b).]

EXTENSION OF COMPLIANCE DATE FOR INSTALLATION OF EMERGENCY EXIT LIGHTING AND MEANS FOR EMERGENCY EVACUATION

Effective: May 31, 1957 — Amendment 40-4
Adopted: May 31, 1957 — 22 F.R. 3917

Provisions of Part 40 of the Civil Air Regulations, adopted November 28, 1955 (20 F.R. 8848) require that after May 31, 1957, for night operations, aircraft emergency exit markings shall be illuminated by a special source of light, independent of the main aircraft lighting system. This regulation also requires that after May 31, 1957, certain means for emergency evacuation shall be installed on all passenger-carrying airplanes, as for example ropes and chutes.

By letter dated March 29, 1957, the Air Transport Association of America (ATA) requested, on behalf of certain member air carriers, an extension from May 31, 1957, to July 31, 1958, of the compliance date for installation of emergency exit lights in a large number of presently operated air carrier aircraft. In support of their request the ATA described in considerable detail the problems with which the air carriers had been confronted in the design, procurement, installation, and approval of emergency exit lighting systems appropriate for many types of aircraft. Also by letter dated May 3, 1957, ATA requested, on behalf of several air carriers, an extension of the May 31, 1957, compliance date for installation of the means for emergency evacuation in certain air carrier airplanes. Extensions were requested for various periods, the maximum of which was for a period of 14 months.

The Board is greatly disturbed that progress with the installation of this emergency equipment has not met with its expectations as expressed in the amendments to Part 40 requiring such equipment and the Board does not consider the substantiating data submitted by the ATA to be sufficient to warrant extension for the period of time requested by the carriers. The Board recognizes, however, that difficulties may have been encountered by the air carriers in accomplishing an orderly procurement and installation program without serious disruption of scheduled service and that a brief period of relief may be granted without affecting adversely safety in air carrier operations.

In view of the foregoing, the Board is extending the date for compliance with the emergency exit lighting and evacuation requirements of Part 40 for a period of 90 days. The Board hereby invites each air carrier which believes that it cannot comply with such requirements within 90 days to submit to the Bureau of Safety in writing not later than July 1, 1957, a request for further extension, together with complete substantiating data as to why it cannot comply and believes it should be granted such extension. Each such request for further relief will be evaluated and the Board, prior to August 31, 1957, will take such action as it deems justified.

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CIVIL AIR REGULATIONS PART 40

Since this amendment grants relief by temporarily extending the date for compliance with a requirement of the Civil Air Regulations, and delay in extending such relief would impose an undue hardship, the Board for good cause finds that notice and public procedure hereon would be contrary to the public interest and may be omitted and that this amendment may be made effective immediately.

[Revised 40.173(e) and (f)(2)]

ADMISSION TO FLIGHT DECK

Effective: August 15, 1957 — Amendment 40-5
Adopted: July 11, 1957 — 22 F.R. 5571

Section 40.356 of Part 40 of the Civil Air Regulations specifies the persons who may be admitted to the flight deck of an air carrier airplane. Although it was the intention of the Board to limit admission to such flight deck to the persons specified in this section, it has come to the attention of the Board that there is ambiguity as to whether other persons not expressly authorized to be admitted to the flight deck are prohibited from admission thereto. This amendment eliminates this ambiguity.

A growing need for in-flight observation of equipment and procedures has been verified by the Board in the granting of many recent waivers, and the experience gained in operations subject to such waivers has been excellent. Accordingly, § 40.356 is being amended to include in the list of persons authorized to be admitted to the flight deck, without having a seat available in the passenger compartment, certain operations personnel of the air carrier and technical representatives of the manufacturer of the airplane or components thereof. It is contemplated that authorization for such operations personnel and technical representatives will be granted by the air carrier only when the presence of such persons in the pilot compartment is required in the furtherance of their functions of observing and monitoring the in-flight operations of the air carrier or its equipment. It should be clearly understood that it is not intended by this amendment to compromise in any way the authority of the pilot in command to refuse such persons admission to the flight deck.

This amendment was published in the Federal Register (21 F.R. 6573) as a notice of proposed rule making and circulated to the industry as Civil Air Regulations Draft Release No. 56-24, date August 22, 1956. Certain comments received in response to Draft Release No. 56-24 recommended that the provisions governing admission to the flight deck be amended to give the pilot in command complete discretion with respect to admitting persons to the flight deck. The Board has given careful consideration to this recommendation, but is of the opinion that it would not be in the interest of safety to grant to the pilot in command any greater discretion than that provided for in this amendment.

In order to achieve uniformity in the Civil Air Regulations, similar amendments are being made to the corresponding sections in Parts 41 and 42 of the Civil Air Regulations which pertain to admission to the flight deck.

[Revised § 40.356]

FLIGHT RECORDERS

Effective: September 9, 1957 — Amendment 40-6
Adopted: August 5, 1957 — 22 F.R. 6378

On two occasions within the past several years, the Board has amended the Civil Air Regulations to require the use of a recording device on aircraft used in air transportation. In the first instance the Board found it necessary to rescind the rule because of the difficulty operators were having in providing proper maintenance due to procurement and transportation difficulties brought on by World War II. In the second instance

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the Board found that, contrary to earlier indications, there was no device readily available of proven reliability and fully adequate for the purpose intended. The Board gave notice, however, that a requirement for a recording device would be reconsidered at such time as a suitable instrument became available.

On November 10, 1955, the Board, having received information that a suitable instrument was available, circulated Civil Air Regulations Draft Release No. 55-26 which proposed in the alternative that flight recorders be required equipment on all large 4-engine and 2-engine airplanes originally type certificated under Part 4a or Part 4b of the Civil Air Regulations or that they be installed only on large transport category airplanes designed to operate above 25,000 feet altitude.

Although much comment, both written and oral, was received by the Board on this draft release, there was no significant opinion expressed by those in favor of requiring a flight recorder on the desirability of one or the other of the alternative proposals. It was clear that interested persons either favored the general use of flight recorders or they didn't favor use of them at all.

Those favoring use of the recorders were of the opinion that recorders might have been of some value in approximately 25 percent of the accidents studied by the Board's Analysis Division; that they would do much to eliminate the conjecture, supposition, and personal opinion from analysis of both accidents and daily routine operations; that there is a recorder in being which is rugged, dependable, and will operate months on end without need for calibration; that the record can be quickly removed and read at any time without processing; and that, aside from its value in accident investigation, its use may result in improved operational procedures and airworthiness standards.

On the other hand, those opposing use of flight recorders were of the opinion that the advantage to be derived from their use in accident investigation was highly exaggerated and that at best they would be of some assistance in only a very small percentage of accidents. This, they argued, was not sufficient justification to require use of these recorders on all large transport category airplanes when it is considered that, for the scheduled airlines alone, in a five-year period it is estimated that it would cost about 9 million dollars to purchase, maintain, and stock necessary spare parts for the recorder. Furthermore, it was argued that the reliability of the one recorder in being is subject to considerable question, the inference being that since there had been two previous abortive attempts to require use of these recorders because of their unreliability it would not be justified to require their use now until more positive evidence appeared as to their reliability.

The Board, having considered the comment received in response to the proposals contained in Civil Air Regulations Draft Release No. 55-26 and other information submitted during the oral argument held April 17, 1957, concludes that a flight recorder of sufficient reliability to fulfill the objectives for such a device is in being and should be used in all large airplanes certificated for use in air transportation above 25,000 feet altitude.

The Board agrees that the costs involved in comparison to the value of the recorder for the purposes intended do not justify a requirement for the installation of flight recorders on the entire transport fleet. The cost of the equipment and its installation and maintenance appears to be prohibitive when related to the total cost of some of the smaller airplanes of the current air carrier fleet. This consideration is magnified by the relatively low income generating capacity of many current airplane types. Furthermore, flight recorders in these airplane types would be furnishing information concerning design and operations for which there already exists a very substantial body of operational experience. Accordingly, no airplane certificated for flight below 25,000 feet altitude will be required to install and use flight recorders.

The Board is of the opinion, however, that in the case of large airplanes certificated for use in air transportation above 25,000 feet altitude, a flight recorder should be required for accident investigation purposes and for use in analyzing various incidents, such as extreme vertical accelerations due to turbulence, which occur from time to time in flight but which do not result in accidents, in order to take appropriate precautionary or remedial action. Such airplanes will be operating under conditions with respect to which little operational experience directly applicable to civil transportation exists and the recorded intelligence involving these higher altitudes, pressure differentials, and speeds will help materially in making a more accurate determination of the cause of accidents of such aircraft. Furthermore, in assessing the economic impact this requirement might have on the air carriers affected, it is clear that it will be substantially less than for currently operated airplanes because of the higher initial cost of the airplanes for which flight recorders will be required and their greater seating capacity.

[Added § 40.208]

INTERIOR EMERGENCY EXIT MARKING LIGHTS

Effective: August 9, 1957 — Amendment 40-7
Adopted: August 9, 1957 — 22 F.R. 6568

Currently effective § 40.173 (f) (2) of Part 40 of the Civil Air Regulations requires that, on all airplanes used for scheduled interstate air transportation at night, a source or sources of light with an emergency energy supply independent of the main lighting system be installed to illuminate all emergency exit markings. This particular requirement was adopted by the Board in November of 1955 in an amendment concerning emergency and evacuation equipment and procedures. The Board adopted this rule to increase safety in the evacuation of airplanes. It was the Board's intention that through this amendment all passenger-carrying airplanes would be equipped with lights installed so as to illuminate all emergency exits in such a manner as to attract the attention of the occupants at night and thus expedite evacuation. The Board intended that this requirement should apply specifically to passenger-carrying airplanes as is borne out by the history of the amendment and the preamble thereto. However, this provision is so worded as to be applicable to all airplanes whether engaged in passenger or cargo operations under Part 40.

The Board has been requested to clarify its intent with respect to this provision insofar as its applicability to airplanes used in night cargo operations is concerned. A careful review of the development of the emergency and evacuation equipment and procedure amendment reveals very clearly that the concern of all interested parties was directed almost exclusively to passenger-carrying airplanes. This is particularly apparent with respect to the emergency exit marking lighting requirements, the object of which is to insure, in the case of a crash landing or of a ditching at night, that the passengers and crew may be able to identify and operate emergency exits thus expediting evacuation of the airplane. In airplanes used solely for the carrying of cargo, the problem of locating and operating emergency exits during a ditching or crash landing at night is not comparable to that encountered in passenger operations. Properly qualified crews are so familiar with every feature of the airplane, and the emergency exits which they would normally use are so close at hand, that special lighting for these exits is unnecessary. Furthermore, airline crews typically carry flashlights. All existing large airplane types used in this type of operation have an exit or loading door located immediately aft of the flight deck and the cockpit windows in most cases provide an additional means of crew evacuation. Furthermore, a survey of accidents involving night cargo operations indicates that there have been no difficulties in crew evacuation that would indicate a need for emergency illumination facilities for the emergency exits.

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In view of the foregoing, § 40.173 (f) (2) is being amended to reflect the intent of the Board that the emergency lighting requirements apply only to passenger-carrying airplanes.

Since this amendment is minor in nature and imposes no additional burden on any person, notice and public procedure hereon are unnecessary, and it may be made effective without prior notice.

[Revised § 40.173 (f) (2)]

ELIMINATION OF THE REQUIREMENT IN RECURRING PROFICIENCY CHECK FOR ACTUAL OR SIMULATED MAXIMUM CERTIFICATED WEIGHT FOR TAKE-OFF WITH ONE ENGINE INOPERATIVE

Effective: November 21, 1957
Adopted: October 17, 1957

Amendment 40-8
22 F.R. 8304

By virtue of presently effective Civil Air Regulations, a pilot who is to serve as a pilot in command must pass, periodically, a proficiency check in airplanes that he flies. This check flight includes a demonstration of the ability to complete a take-off at maximum take-off weight with the critical engine inoperative, a requirement which the Board has found to be no longer practical for the periodic checks.

In the large modern transport airplane a great difference exists between maximum certificated take-off weight and maximum certificated landing weight. If such an airplane is flown at maximum weight for a check flight, it must be loaded with large quantities of fuel or ballast. Then, if the flight is to be terminated within a reasonable time, fuel, ballast, or both must be dumped so as to reduce the weight to that permitted for landing.

To avoid the obvious disadvantages of the above, the Board by regulation has permitted maximum take-off weight to be simulated. This has been done by reducing take-off power, or by limiting take-off distance to the minimum required for the weight at which the airplane is being operated. Neither procedure has been fully satisfactory. Time-consuming calculations and special runway markings are required, and even with these devices the maximum take-off weight condition to be simulated cannot be fully represented. Furthermore, use of reduced power settings for take-offs has been opposed by engine manufacturers who contend that the practice is injurious to the powerplants, and by supervisory training personnel who state that the practice encourages nonstandard and improper use of the powerplant controls and induces an additional hazard to flight. It appears, therefore, that the requirement for an actual or simulated take-off at maximum certificated weight with one engine inoperative should not be continued as a regulatory requirement in the periodic proficiency check. It should be understood, however, that this amendment will not affect the present requirements in initial pilot flight training for simulation of engine failure at actual or simulated maximum weights in take-off, landing, and approach configurations.

[Revised § 40.302 (b) (2) (i)]

HIGH-ALTITUDE OPERATIONS

Effective: January 24, 1958
Adopted: December 20, 1957

Amendment 40-9
22 F.R. 10728

Part 40 of the Civil Air Regulations presently permits scheduled air carriers to operate off-airways under both IFR and VFR within the continental limits of the United States at altitudes above 12,500 feet east of longitude 100° W. and 14,500 feet west of longitude 100° W. Approval by the Administrator of such high-altitude routes is not required.

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In recent years, however, there has been a marked increase in air carrier and other flight operations conducted above 12,500 feet, and it has become apparent that positive traffic separation at these altitudes is increasingly important. Accordingly, a notice of proposed rule making was published in the Federal Register (22 F.R. 3418) and circulated to the industry as Civil Air Regulations Draft Release No. 57-8 to afford interested parties opportunity to comment on a proposed rule which would prohibit high-altitude operations by air carriers operating under Part 40 of the Civil Air Regulations in uncontrolled airspace within the continental limits of the United States in weather conditions less than those prescribed for VFR flight.

The comments received by the Board in response to the notice of proposed rule making were generally favorable. However, there was comment to the effect that the proposed rule is unnecessary inasmuch as the airlines have voluntarily imposed certain restrictions on their high-altitude operations. In view of the importance of traffic separation at these high altitudes, the Board deems it necessary in the interest of safety to provide for such separation through regulation.

This regulation is limited in its application to air carrier operations conducted under Part 40 of the Civil Air Regulations. However, this does not mean that air carriers subject to this part are necessarily to be governed by a different standard for these operations than are air carriers operating under Parts 41 and 42 of the Civil Air Regulations. Attention is directed to the fact that air carriers operating within the continental limits of the United States under Parts 41 and 42 who desire to conduct flights over off-airways routes must secure the approval of the Administrator of Civil Aeronautics for such routes. The Board has been advised by the Administrator that he intends to exercise this authority consistent with the restrictions imposed on Part 40 operators by this regulation. [Revised 40.30, 40.31, 40.32]

LANDING FLARE REQUIREMENTS

Effective: February 13, 1958 — Amendment 40-10
Adopted: January 9, 1958 — 23 F.R. 292

Part 40 of the Civil Air Regulations currently requires that civil aircraft carrying passengers for hire at night shall be equipped with specified types and numbers of landing flares.

The value of landing flares as required equipment was discussed at the Board's 1955 Annual Airworthiness Review. Recommendations were made at that time to amend the regulations to require the carriage of flares only in large aircraft in extended overwater operations. As a result of this discussion and further study by the Board, Civil Air Regulations Draft Release No. 56-31, "Landing Flare Requirements of Parts 40, 41, 42, and 43 of the Civil Air Regulations," was circulated to the public (21 F.R. 10255). This notice, which proposed the deletion of the flare requirement, was issued for the purpose of obtaining the views of all interested persons to assist the Board in making a complete re-evaluation of existing flare requirements.

Comment received from interested persons concerning the proposals to delete all flare requirements (as contained in Draft Release 56-31) was varied. The consensus was that landing flare requirements for all non-commercial operations and for operations which employ small aircraft for the carriage of passengers for compensation or hire should be deleted. In this connection, it should be noted that Civil Air Regulations Draft Release No. 55-24, "Air Taxi Certification and Operation Rules" (small aircraft of 12,500 pounds or less maximum certificated take-off weight), did not propose flares as required equipment and no adverse comment was received on this proposal. With respect to air carrier operations, the Air Line Pilots Association, on behalf of the

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pilots, recommended the retention and improvement of flares. This position was also advanced by a manufacturer of flare equipment. The Aircraft Industries Association, on behalf of the aircraft manufacturers, and the Air Transport Association, on behalf of the scheduled air carriers, recommended deletion of the flare requirements. The Civil Aeronautics Administration did not object to the deletion of flare requirements for overland operations but did recommend their retention for overwater operations.

In support of the recommendations to retain flares, the following opinions were expressed. One was that flares insure the highest possible level of safety during emergency landings at night (including emergency landings made necessary by severe vibration or buffeting, failure of aircraft components, uncontrollable fires, or the evaluation of sea conditions preparatory to ditching). It was also the view of some persons that flares might become necessary to assist in night emergency landings resulting from possible fuel exhaustion, the cause of which could be mechanical difficulties, traffic delays, communications and navigational equipment and facilities failures, and unexpected adverse weather conditions. It was also recommended that flares should be improved to provide better ground illumination and longer burning capacity to make them more effective for use in the emergency situations described above. Other comment in support of retention of flares stressed the view that safety of air carrier operations would be jeopardized if flares are not carried in overwater operations.

The Board has carefully studied this entire matter and finds that available records concerning the use of landing flares in scheduled air carrier operations show only five instances from January 1938 to the present time in which flares have been used for emergency purposes. Four of these instances involved twin-engine aircraft and one involved a four-engine aircraft. From 1947 to the present time, no multiengine air carrier aircraft has been involved in the dropping of landing flares for emergency purposes. There is no available evidence or data showing the effective use of landing flares in the operation of small passenger-carrying airplanes. Furthermore, the records reveal that in 55 reported instances landing flares were discharged inadvertently while the airplane was on the ground or in the air with resultant damage in many cases to the aircraft, other aircraft, ramps, and hangers. There have been instances where flares contributed to the intensity of a fire following a crash. It is also significant that the military services discontinued the carriage of flares in their passenger transport operations several years ago for reasons involving cost, maintenance, the hazard of carrying flares and their questionable value under emergency conditions. Furthermore, the flare requirements, which have been in effect for many years, were promulgated at a time when most airplanes had a single engine with only a short operating range, when most airports or landing areas were unlighted, and the general reliability of aircraft was considerably less than that of aircraft which are presently utilized. In recent years, improved airplane performance, reliability, and operating range, more efficient airplane landing lights, a considerable increase in the number of lighted landing areas, and the development of more accurate and dependable communications and navigational aids have clearly minimized the need for landing flare installations in aircraft operations. The Board finds, however, that these developments which have greatly improved operations in the United States do not apply to the same degree in extended overwater operations.

The Board has carefully considered all of the comment received and other relevant information and has concluded that flares for passenger-carrying aircraft should not be required as mandatory safety equipment for operations conducted within the United States. It does find, however, that there is a continued need for their use in extended overwater operations. [Revised § 40.200 (d)]

CIVIL AIR REGULATIONS PART 40

AMENDMENTS RESULTING FROM THE 1957 ANNUAL AIRWORTHINESS REVIEW

Effective: May 17, 1958
Adopted: April 15, 1958

Amendment 40-11
23 F.R. 2594

The Board has been advised that the descent flight provision of the two-engine-inoperative en route requirement of Part 40 is in need of clarification. The language of this provision does not make clear the generally understood intent that the descent may be based on a net flight path. Section 40.75(b)(2) is therefore being amended to clarify the intent.

During this year's annual airworthiness meeting, the subjects of interior markings and emergency lighting for exits were discussed. As a result, changes are being made to the certification requirements to eliminate the need for the marking and lighting of crew compartment exits. Since it is considered that the operating parts should be consistent with the certification requirements, a similar amendment is being made to Part 40.

[Revised §§ 40.75(b)(2), 40.173(f)(1), 40.173(f)(2).]

SUPPLEMENTAL OXYGEN REQUIREMENTS FOR SUSTENANCE AND FIRST-AID

Effective: September 1, 1958
Adopted: August 27, 1958

Amendment 40-12
23 F.R. 6744

Part 40 contains among other things oxygen requirements for aircraft operating under this part. Civil Air Regulations Draft Release No. 58-7, which was published March 27, 1958, proposed changes to the requirements for supplemental oxygen and associated equipment both in the airworthiness requirements and operating rules. The changes simultaneously made in Part 4b requirements will be applicable only to applications for certification filed after their effective date, but the changes in the operating rules made herein will apply to all operations thereby governed on the effective date hereof, or as otherwise provided in the text of the regulation.

The particular characteristics of turbine-powered airplanes which dictate a need for somewhat different requirements relative to the use of supplemental oxygen than those applicable to piston-engine airplanes are the higher operating altitudes at the time of a possible decompression combined with excessive fuel consumption by these turbine-powered airplanes at low altitudes which may require continued cruise at an altitude demanding sustaining oxygen to enable the airplane to reach a suitable landing field.

The base cruising altitude at which oxygen must be provided is being raised from 8,000 to 10,000 feet. It has been generally agreed that this requirement, while reducing the quantity of oxygen required, will provide an acceptable level of safety.

A provision relating to crew oxygen masks is being added. The time required for the crew to institute the use of their oxygen masks when operating at these altitudes is so short that any location of crew masks that could involve any avoidable loss of time in donning them would not be in the interest of safety. To minimize the danger inherent in this situation, one pilot will be required to wear and to use his mask at all times when operations above 25,000 feet are conducted. The other members of the flight crew will be required to have the masks on their person at all times and in such a position as to

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be immediately placed on their faces for use. Since the object is to avoid any possible hazard to the passengers following decompression, it is considered necessary that the pilot wearing the mask be drawing oxygen from the system under normal conditions. Since all flight crew members would probably have specified duties following cabin depressurization, it is considered appropriate that masks should be immediately available for each flight crew member on flight deck duty.

On those flights wherein operations are conducted above 25,000 feet, the need for rapid action on the part of all occupants precludes waiting until an emergency occurs to instruct the passengers in the use of the oxygen equipment. A provision, therefore, is being included to require briefing of the passengers prior to such operations. This briefing should insure that the passengers know how to use the equipment provided. To the degree practicable, language problems should be avoided or overcome.

For all airplanes operating above 25,000 feet oxygen and dispensing equipment must be provided for all passenger cabin occupants as well as the crew. Although a rapid descent of the airplane generally will be possible, it is felt that a 10-minute supply of oxygen would be the minimum amount that could be provided which would insure an adequate quantity for descent from higher altitudes in the event that circumstances prevent realization of the demonstrated descent rate. For purposes of computing a quantity of oxygen for descent, a uniform descent for the 10-minute period would be assumed.

For a particular operation to comply with the rules in this part the amount of sustaining and first-aid oxygen required shall be determined on the basis of cabin pressure altitudes and flight duration consistent with the operating procedures established for each such operation and route. The requirements for airplanes with pressurized cabins shall be determined on the basis of cabin pressure altitude and upon the assumption that a cabin pressurization failure will occur at that altitude or point of flight which is most critical from the standpoint of oxygen need, and that after such failure any descent to a flight altitude that will permit successful termination of the flight will not exceed the operating limitations of the airplane. Following such a failure, the cabin pressure altitude shall be considered to be the same as the flight altitude unless it can be shown that no probable failure of the cabin or pressurization equipment will result in a cabin pressure altitude equal to the flight altitude, under which circumstances the maximum cabin pressure altitude attained may be used as a basis for certification and/or determination of oxygen supply.
[Revised 40.202, 40.203; Added 40.202-T, 40.203-T, 40.204(b)]

PILOT ROUTE AND AIRPORT QUALIFICATION REQUIREMENTS

Effective: September 24, 1958 — Amendment 40-13
Adopted: September 16, 1958 — 23 F.R. 7339

Section 40.303 of Part 40 of the Civil Air Regulations requires, in part, that each pilot in command in qualifying over a route shall make an entry into each regular, provisional, and refueling airport into which he is scheduled to fly. Section 40.304 governs the maintenance and reestablishment of route qualifications and requires compliance under certain circumstances with the provisions of §40.303 by the pilot in command.

On January 20, 1955, the Bureau of Safety circulated Civil Air Regulations Draft Release No. 55-3 (20 F.R. 550) which dealt with the overall problem of pilot airport and route qualification. Attention was drawn to the development of motion picture panoramic views of airports and their environs which showed excellent promise of providing an effective means for attaining pilot airport qualification in lieu of actual entry. An objective in this proposal was to amend the regulations in a manner that would encourage

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further research and development of the visual training aids programs by various commercial sources and at the same time provide more acceptable airport qualification rules for use in the meantime. Furthermore, it seemed appropriate to permit methods of airport qualification other than physical entry, provided that such alternative methods had the approval of the Administrator.

Following circulation of Draft Release 55-3 for comment, the Board promulgated a series of Special Civil Air Regulations (SR-413, SR-414, SR-418, and SR-418A) to permit the controlled introduction of new techniques in airport and route qualification. These techniques included the use of pictorial means within the training program which would enable pilots to qualify at specified airports by using color motion pictures or slides showing clear daylight views of the complete physical layouts of the airports, surrounding terrain, obstructions, approaches to all runways, restricted areas, and conspicuous reference points that are of value to pilots. Under these special regulations air carriers were also authorized to conduct operations at an airport in close proximity to an airport into which pilots were qualified when the Administrator found that such pilots were adequately qualified at the new airport. In making such findings, the Administrator took into consideration such things as the familiarity of the pilots with the layout, surrounding terrain, location of obstacles, and instrument approach and traffic control procedures at the new airport. In addition, under SR-418 and SR-418A, a pilot was expressly permitted to accomplish initial qualification into an airport without being accompanied by a pilot qualified at that airport if such initial entry were made under VFR weather conditions at the particular airport involved.

One of the principal purposes of these special regulations has been to provide sufficient opportunity for evaluation of pictorial means of airport and route qualification by industry and Government alike in order to guide the Board in its final action in amending the Civil Air Regulations. Experience gained under these special regulations up to the time of the adoption of SR-418A indicated that the various procedures provided there for airport and route qualification, including pictorial means, had been successful. Therefore, the Board stated in the preamble to SR-418A that prior to the termination of that regulation, a proposal to incorporate its substance into Part 40 would be circulated for comment. Accordingly, the Board circulated Draft Release 58-13 to obtain comments as to the continued effectiveness and extent of use of the privileges of SR-418A and any other recommendations with respect to incorporation of the provisions of that regulation in Part 40 of the Civil Air Regulations.

It was proposed to incorporate the provisions of SR-418A into Part 40 with a slight revision of the requirement concerning route qualification on those routes on which navigation must be accomplished by pilotage and on which the flight is to be conducted at or below the level of adjacent terrain. These changes were made in the interest of clarity.

In view of the wide acceptance of this means of qualification and in the absence of any contrary view, the Board believes it desirable to include the substance of the special regulations in Part 40 of the Civil Air Regulations as proposed.
[Revised 40.303, 40.304(a)]

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CIVIL AIR REGULATIONS PART 40
REQUIRED RECORDS

Effective: November 5, 1958
Adopted: October 1, 1958

Amendment 40-14
23 F.R. 7722

A notice of proposed rule making was published in the Federal Register March 13, 1958, (23 F.R. 1737) and circulated to the industry as Economic Regulations Draft Release No. 92 dated March 7, 1958, which proposed to bring up to date the record requirements of Part 40 of the Civil Air Regulations and make them consistent with corresponding record retention provisions in Part 249 of the Economic Regulations.

Accordingly, concurrently with the amendment of Part 249, the record provisions of Part 40 are being amended. Since the record retention requirements in Part 40 will be consistent with corresponding requirements in Part 249 and §§ 40.501 through 40.511 each contain language requiring compliance therewith, there is no longer any necessity for § 40.500 and it is being deleted.

The retention period for manifests required by § 40.505 is being increased from "60 days" to "3 months" to accord with the retention requirement for manifests prescribed in Part 249.

Although it was proposed to change the retention period for maintenance releases required by § 40.511 from "60 days" to "3 months," it has been determined that the present period of retention will be adequate. However, the words "2 months" are being substituted for "60 days" to bring the language into accord with that used in Part 249.

Finally, a new § 40.512 is being added to require records of radio contacts by or with pilots en route to be maintained. Consistent with the retention period prescribed in in Part 249 for such records, § 40.512 provides that they shall be retained for a period of 30 days.

The foregoing record requirements are considered necessary to enable the Board and the Administrator to discharge fully their respective accident investigation and safety regulatory responsibilities.

[Revised 40.505, 40.511; Added 40.512; Deleted 40.500]

USE OF AVERAGE, ASSUMED, AND ESTIMATED WEIGHTS

Effective: December 30, 1958
Adopted: December 30, 1958

Amendment 40-15
24 F.R. 50

Air carriers have for many years utilized approved weight and balance control procedures involving average, assumed, and estimated weights in determining compliance with the various weight limitations of this part. Such procedures have been formally endorsed by the Civil Aeronautics Administration and the Board since December 8, 1947, the date of issuance of Safety Regulation Release No. 270. Subsequently, these procedures and the methods by which they may be carried out have been continued in Civil Aeronautics Manual 40. These procedures and the recommended methods of implementation described in Civil Aeronautics Manual 40 are a practical approach to compliance with the regulations pertaining to operating limitations without adversely affecting the safety of air carrier operations. This approach recognizes that it is not possible to require literal compliance with the weight and balance requirements of Part 40 of the Civil Air Regulations through a determination of actual weights in every instance, considering the extent of present-day air carrier operations, without drastically curtailing such operations.

To obviate the actual weighing of the airplane and its contents prior to each flight, certain approved methods and procedures have become an essential part of day-to-day air

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carrier operations and insure reasonable compliance with the appropriate operating limitations. For a fleet or group of airplanes of the same model and configuration, an average operating fleet weight is utilized when the operating weights and positions of the center of gravity are within the limitations established by the Administrator in Civil Aeronautics Manual 40. For example, an operator of a fleet of more than 9 airplanes of the same model and configuration must weigh periodically at least 6 of these airplanes, plus at least 10 percent of the number over 9. Furthermore, to insure that a safe average weight will be maintained, certain safeguards are incorporated in the approved weight procedures. If the basic operating weight of any airplane weighed or the calculated basic operating weight of any one of the remaining airplanes in the fleet varies by an amount more than plus or minus one-half of one percent of the maximum landing weight from the established basic operating fleet weight, that airplane will be eliminated from the group and operated on its actual or calculated weight. Carriers also may elect to use either the actual passenger weight or the average passenger weight to compute passenger loads over any route except in unusual cases as, for example, a passenger load consisting of an athletic team. The average weights which may be used are set forth in Civil Aeronautics Manual 40. In determining compliance with certain operating limitations such as landing distance limitations, the carrier may assume that the take-off weight of the airplane is reduced by the weight of the fuel and oil expected to be consumed in flight to the field of intended destination and the weight of such fluids may be established on the basis of actual weight, a standard volume comparison, or a volume comparison utilizing appropriate temperature correction factors to actually determine the weight by computation of the quantity of fluid on board.

There are many other instances in which average, assumed, or estimated weights are used in the conduct of air carrier operations.

It has recently been brought to the Board's attention that the absence of explicit authority in Part 40 for the use of average, assumed, or estimated weights in accordance with procedures approved by the Administrator has given rise to concern that an air carrier might be considered in technical violation of the Civil Air Regulations if the weight of a particular airplane actually exceeded any of the various weight limitations of this part, even though the calculations had been made in accordance with approved procedures.

In order to remove any doubt as to the legality of using such approved procedures and to bring the regulations into accord with a well-established and safe administrative practice, Part 40 is being amended to provide specific authority for the use of an approved weight and balance control system in which average, assumed, or estimated weights may be utilized if such system gives assurance of results substantially equalling direct weighing.

Since this amendment merely confirms an established administrative practice essential to the maintenance of safe, optimum air carrier operations and imposes no additional burden on any person, the Board finds that notice and public procedure hereon are unnecessary and that good cause exists for making this amendment effective without prior notice.

[Revised 40.601

ABSENCE OF FLIGHT CREW MEMBERS FROM THEIR DUTY STATIONS

Effective:	April 22, 1959	Amendment 40-16
Adopted:	April 17, 1959	24 F.R. 3153

Section 40.354 of the Civil Air Regulations requires all flight crew members to remain at their respective stations with seat belts fastened during take-off or landing, and while en route except when the absence of one such flight crew member is necessary in connection with his "regular duties." As used in this regulation the term "regular duties" was intended to mean those duties involving the operation of the airplane. It

was not intended to encompass activities related to furthering public relations or other activities not related to operational safety of the airplane. The absence of a flight crew member from his duty station for the performance of such activities reduces unnecessarily the degree of vigilance, attention to duty, and availability for emergency action required for the operation of modern aircraft under conditions of high density traffic.

Accordingly, § 40.354 is being amended to clarify its intention and application. Similar amendments are being made simultaneously to Parts 41, 42, 46, and 60 of the Civil Air Regulations to provide identical rules for the types of operations covered by those parts.

Inasmuch as this amendment is clarification of the present requirements and imposes no additional burden on any person, compliance with the notice, procedures and effective date provisions of section 4 of the Administrative Procedure Act is unnecessary and not required.

[Revised 40.354]

EXTENSION OF COMPLIANCE DATE FOR OXYGEN SYSTEM REQUIREMENTS FOR TURBINE-POWERED AIRPLANES

Effective: July 29, 1959
Adopted: July 29, 1959

Amendment 40-17
24 F.R. 6240

Currently effective §§40.202–T(a), 40.203–T(a), and 40.204(b) provide that on and after July 31, 1959, turbine-powered airplanes shall comply with requirements therein with respect to supplemental oxygen for sustenance supplemental oxygen for emergency descent and first aid, and oxygen equipment standards.

These regulations, which were adopted on August 27, 1958, were not made mandatory until July 31, 1959, in recognition of the fact that currently operating turbine-powered airplanes were not type certificated in accordance with these provisions and operators would need reasonable time to arrange for appropriate design changes and procurement and installation of the required equipment.

The Administrator has been advised that, despite diligent efforts by air carriers operators and the manufacturer involved, compliance by July 31, 1959, is not possible, due primarily to the time required for system evaluation and late delivery of necessary parts. It now appears that an additional four months will be required to show full compliance with the requirements.

The selection of the July 31, 1959, date for compliance was predicated on the belief that this afforded sufficient time to make the necessary changes. It is recognized, however, that difficulties have been encountered by the air carriers in accomplishing an orderly procurement and installation program without serious disruption of scheduled service and that a period of relief may be granted without affecting safety adversely in air carrier operations by extending the compliance date to November 30, 1959. As before the currently effective oxygen system requirements will apply, with the additional requirement that, when operating at flight altitudes above 25,000 feet, all flight crew members on flight deck duty shall be provided with oxygen masks, connected to appropriate supply terminals, which shall be immediately available for use.

Since this amendment grants relief by extending the date for complaince with a requirement of the Civil Air Regulations, and delay in extending such relief would impose

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an undue hardship, the Administrator for good cause finds that notice and public procedure hereon would be contrary to the public interest and may be omitted and that this amendment may be made effective immediately.
[Revised 40.202–T(a); 40.203–T(a); 40.204(b)]

DELETION OF CERTAIN DEFINITIONS

Effective: August 13, 1959 — Amendment 40-18
Adopted: August 7, 1959 — 24 F.R. 6580

Part 40 of the Civil Air Regulations contains definitions of four terms which are also defined in Part 60, and which pertain primarily to the air traffic rules. The Part 40 definitions of these terms are written differently from those in Part 60, even though the terms are intended to have the same meaning in both parts.

Inasmuch as §40.2 states that the provisions of Part 60 shall be applicable to all air carrier operations conducted under the provisions of Part 40, unless otherwise specified, the repetition of the definitions in Part 40 is unnecessarily duplicative. To avoid this, and the obvious disadvantage of revising Part 40 each time that the definitions in Part 60 may be modified, those terms which have the same meaning in both parts but which pertain primarily to Part 60 and are defined therein should not be defined in Part 40 also. This amendment therefore eliminates the four definitions in Part 40.

Since this amendment is technical in nature, makes no substantive change, and imposes no additional burden on any person, notice and public procedure hereon are unnecessary, and it may be made effective without prior notice.
[Deleted: Air Traffic Clearance, Air Traffic Control, Control Area, Control Zone]

FREQUENCY OF PILOT PROFICIENCY CHECKS

Effective: October 29, 1959 — Amendment 40-19
Adopted: September 24, 1959 — 24 F.R. 7865

Part 40 of the Civil Air Regulations presently requires each pilot in command to successfully pass pilot proficiency checks at least twice in each 12-month period. Section 40.302(b) requires such checks to be given at intervals of not less than 4 months nor more than 8 months. Section 40.305 specifies similar requirements for pilots other than pilots in command.

Parts 40, 41, 42, and 46 specify the time interval between pilot proficiency checks differently which has resulted in varying interpretations as to requirements and administrative practices. Since no difference is intended between air carrier operations in this respect, all of the air carrier parts are being amended to make the frequency requirement of pilot proficiency checks the same.

Since this regulatory action imposes no additional burden upon any person, notice and public procedure hereon are unnecessary.
[Revised §40.302(b) (1) (3), §40.305,]

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CIVIL AIR REGULATIONS PART 40

RETENTION OF FLIGHT RECORDER TAPES AND CLARIFICATION OF PERIOD THE FLIGHT RECORDER SHALL BE IN OPERATION

Effective: November 6, 1959 — Amendment 40-20
Adopted: September 30, 1959 — 24 F.R. 8089

Section 40.208 of the Civil Air Regulations requires the installation of flight recorders on all airplanes of more than 12,500 pounds maximum certificated takeoff weight which are certificated for operations above 25,000 feet altitude. The regulations further require that the flight recorders shall be operating continuously during flight time.

In promulgating this regulation, the period of time for retention of the recorder tapes was not included in the rule as it was assumed that air carriers would retain these records for a sufficient length of time for the investigation of accidents and incidents which may have occurred during the time of flight. The tapes also can furnish information to the operator concerning performance and operation of these airplane types for which there does not exist a substantial amount of operational experience.

In view of the importance of the information obtained from flight recorders, and since there may be some question as to the length of time that such tape recordings should be maintained by the air carriers, the Federal Aviation Agency believes that a clarification of the rule is needed.

As stated above, §40.208 requires that the flight recorders "shall be operating continously during flight time." It was the intent of this regulation to require the operation of the recorder only during flight and not during taxi operation to and from the runway. Therefore, in order to clarify this point, the word "time" is being deleted from this phrase since flight time has been defined as block-to-block time. In deleting the word "time" it is intended that the flight recorder must be in full operating condition at the instant the aircraft starts its takeoff roll and be in continuous operation during the flight and until the aircraft has completed its landing at an airport.

Accordingly, §40.208 is being amended to clarify these matters. Similar amendments are being made concurrently to Parts 41 and 42 of the Civil Air Regulations to provide identical rules for the types of air carrier operations covered by those parts.

Inasmuch as this amendment is a clarification of the present requirements and imposes no, or very little additional burden on any person, compliance with the notice and public procedure provisions of section 4 of the Administrative Procedure Act is unnecessary.

[Revised §40.208]

APPROVAL OF AIR CARRIER TRAINING PROGRAMS; QUALIFICATION OF PILOTS OTHER THAN PILOTS IN COMMAND; PROFICIENCY CHECKS FOR PILOTS OTHER THAN PILOTS IN COMMAND

Effective: January 1, 1961 — Amendment 40-21
Adopted: December 1, 1959 — 24 F.R. 9765

The Federal Aviation Agency published as a notice of rule making (24 F.R. 5246) and circulated as Civil Air Regulations Draft Release No. 59-3, dated June 25, 1959, a proposal to amend Part 40 of the Civil Air Regulations to require:

(1) FAA approval of air carrier training programs;

(2) appropriate aircraft ratings for pilots serving as other than pilots in command; and

(3) more specific initial training and recurrent proficiency checks for pilots serving as other than pilots in command.

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Interested persons have been afforded an opportunity to participate in the making of this amendment and due consideration has been given to all relevant matter presented. Because of the importance of this amendment, each portion thereof has been evaluated in the light of such comments.

1. *FAA approval of air carrier training programs.* The air carriers commenting on this portion of the proposal expressed strong opposition to it. Briefly, the air carriers contend that the present regulatory scheme for the establishment of methods and procedures for crew member training programs has been adequate and that no justification has been shown for requiring FAA approval of such programs. The FAA is unable to agree with these contentions.

It must be emphasized that the training program is one of the most important factors in the safety of air carrier operations. The quality and scope of such programs are the key to insuring that all crew members are competent to perform their duties with the high degree of skill expected and required in air carrier operations. Under the provisions of the present regulation, the air carriers are given discretion in establishing "adequate" or "appropriate" training, or "training as necessary." As a result some air carriers have prepared and are administering excellent training programs. However, others have not achieved the minimum safety objective sought by the training requirements of §§ 40.280 through 40.289. While the methods and procedures employed by the various air carriers in their training programs may differ to fit the particular operation of each air carrier, each training program must provide a uniform and minimum standard of flight and ground training necessary for safety in air transportation. Experience in the administration of the present regulations shows that this standard can only be achieved by FAA approval of each training program.

Accordingly, because of the vital importance which the air carrier training program has to safety in air carrier operations, each air carrier subject to this part will be required to obtain approval of its training program by a representative of the Administrator.

This final regulation will not alter the responsibility which each air carrier has at present for the preparation and administration of its training program. However, each air carrier will be required to submit its training program, and subsequent changes thereto, to the FAA for prior approval.

2. *Initial training qualifications of pilots other than pilots in command.* The complexity of modern aircraft and the operational demands of today's navigation, communication, and air traffic control systems require a high level of skill and competance for air carrier copilots. Many of the functions which are required of the copilot, particularly with respect to emergency procedures, must be performed properly or the safety of the flight may be seriously affected. In addition, in the event that the pilot in command becomes incapacitated during flight, the copilot must possess adequate knowledge and skill to fly the aircraft safely to a destination.

In order to properly determine the ability of the copilot to operate a particular type of aircraft, it was proposed in Draft Release 59-3 to provide for the issuance of appropriate aircraft type ratings for all pilots serving as other than pilots in command. However, upon reevaluation of the original proposal in the light of comments received, it appears that the objective of the original proposal can be achieved without requiring pilots serving other than as pilots in command to obtain an appropriate aircraft type rating, provided adequate flight training for those pilots who serve as second in command is provided in the initial and recurrent training requirements of this part and is part of the training program approved by the Administrator.

Accordingly, the original proposal has been modified in this regulation by omitting the aircraft type rating requirement. In lieu of a type rating, this regulation prescribes in § 40.282 (c) certain minimum maneuvers and procedures in which it is considered necessary that pilots serving as second in command be proficient, and requires that they receive instruction and practice in such maneuvers and procedures during initial flight training.

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The term "second in command" is used in this regulation in order to identify more precisely those pilots who perform the traditional functions of a copilot, as distinguished from the pilot in command and other pilots. In this respect, this regulation amends current § 40.261 (c) to make it clear that where the air carrier is authorized to operate under instrument conditions or operates aircraft of more than 12,500 pounds maximum certificated weight, the minimum pilot crew shall consist of a pilot in command and a pilot designated as second in command. An appropriate definition of "second in command" is added by this regulation. In keeping with these changes, an appropriate amendment is also being made to § 40.301.

It is considered that pilots qualifying to serve on airplanes other than as pilot in command or as second in command should, in the interest of safety, be required to receive the flight training specified in § 40.282 (a) and demonstrate their ability to take off and land each type of airplane in which they are to serve, in addition to accomplishing the other training requirements provided in §§ 40.280 and 40.281. Accordingly, such a requirement is prescribed in this regulation.

3. *Proficiency checks for pilots other than pilots in command.* In order to make certain that all pilots serving as second in command are initially proficient and continue to maintain their proficiency to pilot and navigate, and to perform their duties on, aircraft to which they are assigned for duty, it was proposed in Draft Release 59-3 to require proficiency checks to be given such pilots prior to their initial assignment to duty and twice each 12 months thereafter by a check pilot or a representative of the Administrator.

As indicated in the draft release, the present method of having the second in command checked by the pilot in command during daily operations is not an adequate method by which the continued proficiency of the second in command can be determined. Although the air carriers were opposed to this requirement, the Agency remains firm in its belief that in order to make certain that all pilots serving as second in command are initially proficient and continue to maintain such proficiency, they must be given a proficiency check by a designated check pilot or a representative of the Administrator. However, upon reconsideration of the original proposal in the light of comments received, the Administrator has concluded that an adequate level of safety will be maintained if such proficiency checks are given only once each 12 months to pilots serving as second in command. Accordingly, such requirements are reflected in this amendment.

In Draft Release 59-3, it was proposed to include in the proficiency check at least the takeoffs and landings and other flight maneuvers generally covered in § 40.282 (a). However, the original proposal is being modified by this amendment to provide that the proficiency check for a pilot serving as second in command shall include an oral or written equipment examination, and at least the procedures and flight maneuvers specified in the new § 40.282 (c).

Comment received indicated that interested persons opposing Draft Release 59-3 believed the proposal would require copilots to acquire and demonstrate the same level of proficiency as is presently required of pilots in command. The Administrator wishes to make it clear that identical proficiency standards will not be required for such pilots. Under the provisions of Part 40, a pilot assigned to perform copilot duties as second in command is required to hold a commercial pilot certificate and instrument rating, whereas a pilot in command is required to hold the higher rating of an airline transport pilot certificate with appropriate aircraft type ratings. In view of the difference in the certification requirements, pilots serving as second in command will not be held to the high degree of skill required of a pilot in command. However, they will be required to demonstrate that they possess the knowledge and skill to perform their duties as a copilot safely and efficiently, and to navigate and pilot the airplane to which they are assigned safely to a destination in the event the pilot in command becomes incapacitated during flight.

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This final regulation is so drafted as to permit the air carriers to use the flight crew method of training and checking pilots. Air carriers utilizing this method have found that it has economic advantages over the method of training and checking crew members individually and is an effective method of standardizing training. Although initial flight training and some proficiency check maneuvers will make it necessary in the interest of safety for the check pilot to occupy one of the pilot positions, it appears that many maneuvers can be conducted safely using the flight crew concept of training and checking pilots.

This regulation is being made effective January 1, 1961. This effective date will allow air carriers subject to Part 40 sufficient time in which to obtain FAA approval of their training programs and to accomplish the initial demonstration check of pilots other than pilot in command required by this amendment. However, each air carrier will be required to submit its training program to the FAA for approval not later than May 1, 1960.

Although compliance with the requirements prescribed in this regulation may result in some additional costs to the air carriers, it appears that such costs are outweighed by the considerations of safety involved.

[Revised §§ 40.261 (c), 40.282 (a), 40.289 (b) (c), 40.300 (b), 40.301, 40.305; Added §§ 40.5, 40.282 (c), and 40.290]

MAXIMUM AGE LIMITATIONS FOR PILOTS

Effective: March 15, 1960 — Amendment 40-22
Adopted: December 1, 1959 — 24 F.R. 9767

Notice was given in Draft Release 59-6 (24 F.R. 5247) that a proposal was under consideration to amend Parts 40, 41 and 42 of the Civil Air Regulations to provide, in part, maximum age limits for utilizations of pilots in air carrier operations by an air carrier.

It was pointed out in the draft release that the number of active air carrier pilots age 60 or over has been increasing significantly in recent years, that pilots in this age group are being employed in the carriage of a substantial number of passengers, both in piston and jet powered aircraft, and that this number will increase substantially within the next few years. Absent some limitation in the regulations, this condition could continue until a number of active pilots have, within the next 5 years, reached ages 65 to 70, and together with the then larger group over age 60 become increasingly responsible for a growing percentage of air carrier operations.

The draft release points out the reasons indicating that a hazard to safety is presented by utilization of pilots of these ages in air carrier operations. These include the fact that there is a progressive deterioration of certain important psysiological and psychological functions with age, that significant medical defects attributable to this degenerative process occur at an increasing rate as age increases, and that sudden incapacity due to such medical defects becomes significantly more frequent in any group reaching age 60.

Such incapacity, due primarily to heart attacks and strokes, cannot be predicted accurately as to any specific individual on the basis of presently available scientific tests and criteria. On the contrary, the evidences of the aging process are so varied in different individuals that it is not possible to determine accurately with respect to any individual whether the presence or absence of any specific defect in itself either led to or precluded a sudden incapacitating attack. Any attempt to be selective in predicting which individuals are likely to suffer an incapacitating attack would be futile under the circumstances and would not be medically sound. Such a procedure, in light of the knowledge that a substantial percentage of any group of persons will suffer from such attacks after reaching age 60, would therefore be ineffective in eliminating the hazard to safety involved.

This conclusion is emphasized by the fact that, in the case of one large group under medical supervision over an extended period, some 85% of the persons who had a heart attack for the first time had the attack within six months to a year after a thorough medi-

cal examination had found the individual in a condition normal to his age and without any evidence to suggest the imminence of such an attack. In addition, the general good health of an individual, or the appearance of good health, are not determinative as to whether he will suffer a heart attack from the conditions that are normal as a result of age.

Other factors, even less susceptible to precise measurement as to their effect but which must be considered in connection with safety in flight, result simply from aging alone and are, with some variations, applicable to all individuals. These relate to loss of ability to perform highly skilled tasks rapidly, to resist fatigue, to maintain physical stamina, to perform effectively in a complex and stressful environment, to apply experience, judgment and reasoning rapidly in new, changing and emergency situations, and to learn new techniques, skills and procedures. The progressive loss of these abilities generally starts well prior to age 60; and, even though they may be significant in themselves prior to age 60, they assume greater significance at the older ages when coupled with the medical defects leading to increased risk of sudden incapacitation.

The older pilots as a group fly the largest, highest-performance aircraft, carrying the greatest number of passengers over the longest non-stop distances, operating into and out of the most congested airports near the largest cities, and traveling in flight in and through traffic lanes with the highest density of air traffic. A great many of these flights involve the newest, largest, fastest and most highly powered jet aircraft. The possible hazards inherent in the older pilot's medical condition are entirely too serious to determine the question of safety by an attempt to balance the increased chances of an incapacitating attack against the possibility that the pilot might not be engaged in the carriage of a large number of passengers at the time of such an attack.

In exploring all the ramifications of the problems involved, the nature of air traffic and air carrier operations in the future has been considered. Present indications are that the very large increases that have taken place in recent years are small in relation to the increases yet to occur. Projection of the number of pilots who will be in the 60 to 70 year age group, in an era of extreme density and frequency of jet and piston air carrier operations involving many millions of passenger miles, indicates a probability of sudden incapacitation of some of these pilots in the course of flight. While medical science may at some future time develop accurate, validly selective tests which would safely allow selected pilots to fly in air carrier operations after age 60, safety cannot be compromised in the meantime for lack of such tests. This is particularly so in light of the statutory directives contained in section 601 (b) of the Federal Aviation Act of 1958 that, "In prescribing standards, rules, and regulations * * * the Administrator shall give full consideration to the duty resting upon air carriers to perform their services with the highest possible degree of safety in the public interest * * *". and that, "The Administrator shall exercise and perform his powers and duties under this Act in such a manner as will best tend to reduce or eliminate the possibility of, or recurrence of, accidents in air transportation * * *"

To the extent that a progressive loss of certain abilities generally starts well prior to age 60, further consideration is required of those aspects of safety in flight concerned with factors other than incapacitation. Especially with the development and increasing use of larger and higher performance aircraft and more complicated traffic conditions, growing importance attaches to the ability of pilots to learn new techniques, skills, and procedures, and to unlearn and discard previously learned and well established patterns of behavior.

For this reason, the draft proposal included a provision to establish age 55 as the age prior to which an individual must obtain a type-rating for turbo-jet powered aircraft in order to act as pilot-in-command for such aircraft in air carrier service. Age 55 was selected on the basis that it marks the point at which the detrimental effects of age on physiological and psychological functions have become significant.

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All interested persons have been given an opportunity to comment and all comments received have been given careful consideration. Many strong arguments were made, both in favor of and against the draft proposal. Some of the comments in favor of the proposal recommended more stringent action than that now being taken in this amendment, and referred to opinions and conclusions more far-reaching than those expressed above. Some of these were received from active airline pilots, although a majority of those identifying themselves as airline pilots from whom comments were received were adverse to the proposal.

The Air Transport Association, representing the major air carriers, was in favor of the proposal as to age 60. The Air Line Pilots Association, from which most complete and voluminous comments were received, was opposed to all proposals, but offered no practicable substitute to achieve the safety aims of this amendment. The position taken was that qualification of a pilot should be determined on an individual selection basis without any limitation as to chronological age. This is rejected as an inadequate safety standard in light of the present inability of medical science to provide a reliable and valid basis for selection.

Some requests for a public hearing were received. In the rule-making process, a public hearing has basically the same purpose as written comments, namely, to inform the Agency of the facts and opinions of the public concerning the proposed rule. It serves a useful purpose, however, when it provides something more than usually is obtained from written comments. Normally, this would involve situations where facts and views cannot be expressed adequately by written comments, where written comments cannot properly be evaluated without further development in a public hearing, or where written comments which have been received raise new issues which require further public consideration and this can be accomplished most satisfactorily and expeditiously in a hearing.

Comments were received covering all the issues involved in the proposed rule. They have been most carefully evaluated with respect to their bearing on some of the requests that were received for a public hearing. In respect to the provision to establish age 55 as the age prior to which an individual must obtain a type-rating for turbojet powered aircraft, it is possible that a hearing may produce further information or data not already encompassed in the scope of the comments received. The comments and other data available appear to be sufficiently precise and determinative in connection with the provisions applicable to utilization of a pilot after attainment of age 60. In this connection, the requests for a public hearing did not indicate any area that the comments have not covered adequately nor was any showing made that they could not be evaluated properly without a public hearing. They did not point out any issue that was not previously considered. On this point a public hearing is likely to repeat opinions and evidence already submitted in the form of written comments. With respect to this provision of the proposed rule, therefore, it does not appear that a public hearing would serve a useful purpose; and it is not deemed necessary in the public interest.

After considering all of the comments received, I find that a public hearing is necessary and appropriate with respect to the proposal concerning eligibility to obtain a type-rating for turbojet powered aircraft after the attainment of age 55 and a notice for such a hearing on January 7, 1960, is being issued. I find further that establishment of a maximum age of 60 for pilots utilized by air carriers in air carrier operations is necessary for safety in air commerce and is in the public interest.

[Added 40.260 (b)]

EXTENSION OF COMPLIANCE DATE FOR OXYGEN SYSTEM REQUIREMENTS FOR TURBINE-POWERED AIRPLANES

Effective: November 30, 1959 — Amendment 40-23
Adopted: November 30, 1959 — 24 F.R. 9839

Currently effective § 40.203–T (a) provides that on and after November 30, 1959, turbine-powered airplanes with pressurized cabins shall comply with the provisions of

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§ 40.203–T. Section 40.203–T (c) requires that when operating at flight altitudes above 25,000 feet, one pilot at the controls of the airplane shall wear an oxygen mask at all times and all other flight crew members on flight deck duty shall be provided with oxygen masks, connected to appropriate supply terminals, which shall be worn in a manner that will permit immediate placing of the masks on their faces for use, properly secured and sealed.

The Administrator has received information to the effect that this requirement is not necessary to achieve the highest degree of safety in air transportation and it is claimed that compliance with this regulation may detract from the required crew coordination and adversely affect safety. The FAA intends to make further studies of this matter during the next 60 days. Under these circumstances, the effective date of this requirement will be delayed until February 1, 1960, to obtain additional information. If a change in this requirement is indicated, it will be accomplished prior to that date. If no change is required, the original rule will then become effective.

Since this amendment grants relief by extending the date for compliance with a requirement of the Civil Air Regulations, the Administrator finds that notice and public procedure hereon are not necessary, and that this amendment will be made effective immediately.

[Revised § 40.203–T (c)]

DRINKING AND SERVING OF ALCOHOLIC BEVERAGES

Effective: March 10, 1960 — Amendment 40-24
Adopted: January 6, 1960 — 25 F.R. 168

A notice of proposed rule making was published in the FEDERAL REGISTER July 3, 1959 (24 F.R. 5424) and circulated to the industry as Draft Release 59-7 dated July 3, 1959, which proposed to amend Part 40 by adding a new § 40.371 to prohibit (1) the drinking of any alcoholic beverage aboard an air carrier aircraft unless the beverage has been served by the air carrier operating the aircraft, and (2) the serving by the air carrier of such beverage to any person who is or who appears to be intoxicated.

A large number of comments were received from individuals, air carriers and other industry representatives. These comments ranged from opposition to hearty endorsement of the proposal, including suggestions that it did not go far enough and that all drinking and serving of alcoholic beverages aboard air carrier aircraft should be prohibited. Many of the comments were motivated by moral, religious, or social considerations, as well as safety.

The Federal Aviation Agency, when it proposed the rule, did so only after careful investigation and study. The Agency's responsibility is only for the air safety considerations and not for the social or moral aspects. The study and investigations which preceded the notice of proposed rule making were largely conducted by the Civil Aeronautics Administration, one of the predecessor agencies of the Federal Aviation Agency. The result indicated that there was no factual information, nor any specific occurrences sufficient to establish a safety hazard arising from the serving of alcoholic beverages by the air carrier to passengers aboard air carrier aircraft. The instances which were revealed tended to show that the occasional difficulties experienced had been caused either by passengers who had consumed a considerable quantity of alcoholic beverages prior to boarding the plane, or by those who drank from their own bottles during the course of the flight. This conclusion has been emphasized and verified by many of the comments received from the air carriers affected.

In addition to being confined to the safety aspects of this problem, the proposal was designed to regulate only so far as was necessary to meet safety requirements. It proposed to interfere as little as possible with the personal freedom of passengers and at the same time to prevent abuses that could possibly create a hazardous situation. It was for this reason that the proposed rule did not prohibit the consumption of alcoholic

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beverages, but sought to subject it to reasonable control. It is a generally accepted fact that flat prohibition has not proven successful in preventing consumption of alcoholic beverages. In this type of situation, it might even work adversely, since passengers who wish to drink might either do so to excess in advance of the flight, knowing that they could not obtain a drink aboard an aircraft, or would be encouraged to engage in surreptitious drinking from their own supply after boarding.

Some of the carriers and individuals who commented apparently misconstrued the intent of the proposed regulation insofar as they interpreted it as prohibiting passengers from bringing their own liquor aboard an aircraft. This was not our intention. The restriction proposed is against the consumption of alcoholic beverages unless they are served to the passengers by the air carriers. So construed, this would permit persons to bring liquor aboard and have it served to them by the air carrier, if the air carrier wishes to provide such service. Some of the comments received from individuals made the point that they were accustomed to having a drink before a meal, or that they required or desired some liquor for medicinal reasons or to contribute to their peace of mind while flying. The rule as proposed and adopted herein would permit a carrier to develop its own policies in this regard so that it might accommodate the varying needs of its passengers, and at the same time prevent any safety hazard.

There was also some misapprehension as to the extent of the carrier's and its personnel's responsibility for enforcing this regulation. Some apparently thought that the crew members would be required to restrain physically a passenger who wished to consume drinks that were not served to him by the carrier, and they forsaw difficulties with discharging such a responsibility. This regulation would impose no such responsibility on the flight crew members. This regulation, like all other regulations adopted by the Agency, would be enforced through the various enforcement processes of the Agency. It is expected of the carriers that they would advise their passengers of the restriction in such a regulation and make suitable reports to the Agency of any known violations. The only time it would be expected that a crew member would be required to take direct action would be when such action is required for the safety of the flight. This is no greater burden than that now on the crew members to do whatever is necessary for the safety of the aircraft and the persons aboard it.

Several comments were made pointing out that the proposed rule prohibited an air carrier from serving an alcoholic beverage to any person if such person "is or appears" to be intoxicated. It was pointed out that a person might not appear to be intoxicated when, in fact, he or she was, and those commenting did not feel that is was proper to impose responsibility for this type of judgment. With this the Agency agrees and the words "is or" will be stricken from the proposed regulation, so that the carrier and its personnel may rely on the appearance of the passenger in determining whether or not to serve him or her alcoholic beverages. Two of the carriers proposed that action on the proposed regulation be delayed to permit the air carrier industry to develop a code which would control the amount and time of serving alcoholic beverages aboard aircraft. The Agency is strongly in favor of any such voluntary agreements that can be reached among the carriers. To the extent that they are in effect and complied with, they would clearly contribute to decreasing any safety hazard arising from the consumption of alcoholic beverages aboard air carrier aircraft. On the other hand, a code of this kind could not reach the principal problem involved – that of uncontrolled consumption by a passenger of his own liquor supply. Therefore, the adoption of a code, while extremely helpful, would not meet the entire problem. The adoption of this regulation will not in any way inhibit the industry from adopting their own code, and in fact such a move would be viewed with favor by this Agency.

[Added 40.371]

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REQUIREMENTS FOR USE OF OXYGEN MASKS BY FLIGHT CREW MEMBERS OF TURBINE-POWERED AIRPLANES

Effective: February 1, 1960
Adopted: January 28, 1960

Amendment 40-25
25 F.R. 797

Currently effective § 40.203–T(c) provides that on and after February 1, 1960, when operating at flight altitudes above 25,000 feet, one pilot at the controls of the airplane shall wear and use an oxygen mask at all times and all other flight crew members on flight deck duty shall be provided with oxygen masks, connected to appropriate supply terminals, which shall be worn in a manner that will permit immediate placing of the masks on their faces for use, properly secured and sealed.

The date for compliance with this regulation was to have been November 30, 1959, but was deferred for 60 days in order to make further studies of this matter upon representation that this requirement is not necessary to achieve the highest degree of safety in air transportation and that compliance with this regulation may detract from the required crew coordination and adversely affect safety. These studies have been made during the intervening period.

No evidence has been presented during this time which validates the contention that the regulation is not necessary to achieve the highest practicable degree of safety; neither has the claim been substantiated that the regulation would adversely affect safety. It is concluded, therefore, that the original basis for the regulation remains valid and that it should remain in effect.

During the course of the study it was noted that the various types of masks intended to be used in compliance with this regulation differ in the facility with which they can be donned. For example, some masks can be placed on the face with one hand so that they are properly secured and sealed. This is accomplished by having retaining means already in place on the head. This feature permits the mask to be placed on the face with minimum delay and without disturbing headphones, glasses, or hats. Thus, the crew member can proceed with emergency procedures quickly and without distraction. Therefore, it is believed that if all crew members are provided with masks having these characteristics, safety would not be adversely affected by permitting the aircraft to be operated at flight altitudes up to 30,000 feet without requiring one pilot at the controls to wear and use an oxygen mask. Therefore, the regulation is being relaxed to the extent that a pilot need not wear a mask at or below 30,000 feet if all flight crew members are equipped with masks having these characteristics. In order for any air carrier to take advantage of this relaxation, it will be necessary for existing masks to be reevaluated by a satisfactory demonstration of these characteristics to a representative of the Administrator.

It should be emphasized, however, that the Federal Aviation Agency will continue to study the need for and use of oxygen masks by flight crew members. If shown necessary by service experience, additional rule making action will be undertaken.

Since this amendment grants relief by extending the altitude above which masks shall be worn in compliance with a requirement of the Civil Air Regulations, the Administrator finds that notice and public procedure hereon are not necessary, and that this amendment may be made effective immediately.

[Revised § 40.203–T (c)]

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FREQUENCY OF PILOT LINE CHECKS

Effective: June 1, 1960 — Amendment 40-26
Adopted: April 27, 1960 — 25 F.R. 3850

Section 40.302 (a) of the Civil Air Regulations presently requires in part that a pilot shall satisfactorily accomplish a line check prior to serving as pilot in command and at least once each 12 months thereafter. This has normally been termed within the industry as the annual or yearly line check for the pilot in command.

By letter dated February 9, 1960, the Air Transport Association of America, on behalf of its member air carriers, recommended that the time interval between line checks be specified in the same manner as Civil Air Regulations Amendments 40-19 and 41-26, which clarified the time intervals between proficiency checks. The ATA advises that such a clarification will simplify recordkeeping and administration of the line check in the same way that the proficiency check requirements have been simplified.

The FAA has considered the foregoing recommendation and believes that the requirements with respect to the frequency of pilot line checks should be amended to provide the clarification requested and to make such requirements consistent with the frequency requirements for pilot proficiency checks.

Since this regulatory action imposes no additional burden upon any person, notice and public procedure hereon are unnecessary, and it may be made effective on less than 30 days notice.
[Revised § 40.302 (a)]

INSTALLATION OF FLIGHT RECORDERS ON TURBINE-POWERED AIRPLANES

Effective: August 18, 1960 — Amendment 40-27
Adopted: July 12, 1960 — 25 F.R. 6826

The Federal Aviation Agency published a notice of proposed rule making in the Federal Register (25 F.R. 2734) stating that it had under consideration certain amendments to Parts 40, 41, and 42 of the Civil Air Regulations to require the installation and use of flight recorders on all large (more than 12,500 pounds maximum certificated takeoff weight) turbine-powered airplanes after September 1, 1960. The proposal was circulated to the aviation industry as Draft Release 60-6, dated March 28, 1960, and comments were requested on or before May 3, 1960.

The Air Transport Association, on behalf of the scheduled air carriers, raised specific objections to the proposed effective date of September 1, 1960. The airlines stated that the date prescribed could only be met by removing airplanes from service to complete the required installations. This, they affirmed, would impose unreasonable interruptions of schedules and add undue burdens of additional expense. Further, it was stated that some air carriers may desire to equip their airplanes with a more sophisticated type of recorder capable of recording additional parameters of information which would be of value to their operations and maintenance, as well as for incident and accident investigation purposes. The currently required parameters are time, heading, airspeed, altitude and vertical acceleration.

The FAA recognizes that flight recorders capable of recording additional operations and maintenance parameters would make available information which would be most useful for incident and accident investigation and for accident prevention purposes. Furthermore, it appears that such recorded information would be used by the air carriers in developing more efficient maintenance and operations procedures and in developing new methods of establishing maintenance schedules for engine, accessory, and component overhauls.

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Comments received from certain of the manufacturers of flight recorders indicated that the September 1, 1960, date would not provide them with a sufficient period of time to manufacture and deliver equipment ordered for installation on those turbine-powered airplanes now in operation which previously have not been required to be so equipped. In addition, certain manufacturers stated that more recently developed recorders capable of recording additional parameters can be supplied by late 1960, and early 1961, and confirmed that some air carriers had indicated a very definite interest in these newer types of recorders.

After consideration of all the comments received and upon further investigation thereof, the Agency has concluded that a longer period of time should be authorized for compliance with this regulation as it applies to turbine-propeller powered airplanes. Turbojet airplanes, since they are certificated for operation above 25,000 feet, are currently required to be equipped with flight recorders. The FAA recognizes that difficulties may be encountered by the air carriers in accomplishing an orderly procurement and installation program and that a brief period of relief may be granted with respect to turbine-propeller powered airplanes without adversely affecting safety in air carrier operations. Accordingly, a compliance date of November 1, 1960, has been adopted in this final rule. Also, provision has been made in the regulation for the Director, Bureau of Flight Standards, to further extend the November 1, 1960, date for any air carrier who, prior to September 1, 1960, submits to the FAA, in writing, a request for such an extension, together with substantiating data, which shows to the satisfaction of the Director:

1. That the air carrier will be unable to comply with the November 1, 1960, date due to flight recorder procurement or installation problems and;
2. The action the air carrier has undertaken to insure that a progressive installation of the required flight recorder equipment will be completed at the earliest practicable date following November 1, 1960. In no event will the November 1, 1960, date be extended beyond May 1, 1961. This relaxation of the original proposal will provide the air carriers further opportunities to investigate the various types of recorders available and to proceed with the orderly procurement and installation of the required equipment at the earliest practicable time following the effective date of this rule.

It will be noted that neither the November 1, 1960, compliance date nor the provision for extension thereof applies to the large turbojet-powered airplanes or large nonturbine-powered airplanes certificated for operations above 25,000 feet altitude, since they are required by currently effective regulations to be equipped with flight recorders.

Certain air carriers requested that the Fairchild F-27 airplanes be specifically exempted from the requirements of this rule in view of the geographic areas in which they are operated or in consideration of the varied local service or low altitude types of operations in which they are engaged. The FAA, in its notice of proposed rule making, explained that it was proposing this regulation specifically to encompass all of the newer types of high-speed turbine-powered airplanes, whether certificated to operate above or below 25,000 feet, since they are frequently subjected to similar atmospheric forces. The F-27 is a modern turbine-powered transport type airplane and is capable of operating at high speeds. For these reasons, the Agency is convinced that all large turbine-powered airplanes should be equipped with flight recorders. Accordingly, the rules adopted herein make no exception for the F-27 airplane.

This amendment also clarifies the Agency's intent to require continuous operation of the flight recorder from the instant the aircraft starts its takeoff roll until it has completed its landing roll at an airport. Operation of the recorder is not required during taxi operations to or from the runway.
[Revised 40.208]

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CIVIL AIR REGULATIONS PART 40

OXYGEN MASK REQUIREMENTS AND ALTITUDE TRAINING FOR FLIGHT CREWMEMBERS ASSIGNED TO DUTY ON TURBINE-POWERED AIRPLANES OPERATED ABOVE 25,000 FEET

Effective: March 3, 1961
Adopted: January 19, 1961

26 F.R. 1055
Amendment No. 40-28

The currently effective provisions of § 40.203-T(c) of Part 40 of the Civil Air Regulations require one pilot at the controls of a turbine-powered airplane to wear and use an oxygen mask when operating above 25,000 feet, and the remaining flight crewmembers to wear their masks in a position permitting immediate placing of the masks on their faces for use, properly secured and sealed. A proviso to the currently effective rule relieves the one pilot at the controls of the necessity of using a mask at or below 30,000 feet if all flight crewmembers are equipped with a "quick-donning" type of oxygen mask which is demonstrated to be satisfactory to a representative of the Administrator.

Civil Air Regulation Draft Release No. 60-15, dated August 24, 1960 (25 F.R. 8381), proposed certain amendments to the requirements for the use of oxygen masks by flight crewmembers and certain altitude training requirements for flight crewmembers assigned to duty on turbine-powered airplanes operated above 25,000 feet.

In Draft Release 60-15, it was proposed to retain that part of the currently effective rule requiring one pilot to wear and use an oxygen mask when operating above 25,000 feet and all other flight crewmembers to wear their masks in a position for ready use. However, it was proposed to amend the proviso to the current rule and increase the altitude above which one pilot must wear and use an oxygen mask from 30,000 feet to 35,000 feet, provided all flight crewmembers are equipped with a "quick-donning" type of oxygen mask and are wearing the same in a ready position for use. It was proposed to classify an oxygen mask as a "quick-donning" type only if the mask is demonstrated to be one capable of being immediately placed on the face from the position being worn, and is shown to meet the following criteria: (1) That the mask can be placed on the face for use, properly secured and sealed, with either hand; (2) that the action of donning the mask can be accomplished without disturbing glasses, headphones, or other equipment worn; and (3) that the action of donning the mask can be accomplished without distracting or delaying the flight crewmember from proceeding with his assigned emergency procedures.

Industry comments unanimously supported the proposal to raise the present limitation of 30,000 feet to 35,000 feet as the altitude above which one pilot at the controls must wear and use an oxygen mask at all times. It was recommended, however, that the altitudes be specified in terms of "flight levels," to accord with the terminology used in the air traffic rules of Part 60 for high altitude flights. This recommendation has been incorporated into the final rule.

The industry groups expressed opposition to the proposal to continue the requirement that above an altitude of 25,000 feet flight crewmembers on flight deck duty must wear an oxygen mask at all times.

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Comment was also critical of the other criteria proposed with respect to the donning of oxygen masks, particularly that set forth in the proviso of the proposed rule for the "quick-donning" type of mask.

In lieu of the donning criteria proposed, certain industry comment recommended, for several reasons, that the rule require only that oxygen masks be located in a ready position for placement on the face in a fully operative condition within a specific time limit, such as 5 seconds. Such a period of time is well within the period beyond which the lack of oxygen becomes a critical safety factor.

In light of the comments received, we have re-evaluated the requirement that oxygen masks must be worn, as well as the criteria proposed for classifying a mask as a "quick-donning" type. At the time the wearing of oxygen masks was originally prescribed, the use of turbine-powered airplanes in civil air transportation had just begun. Thus, the lack of previous operating experience with such airplanes and the type of oxygen masks then available justified a most conservative approach to the requirements for oxygen masks. Since that time we have accumulated many thousands of hours of experience in the operation of turbine-powered airplanes having pressurized cabins and the occurrence of sudden decompressions has been infrequent. Furthermore, certain oxygen masks and their harnesses have so advanced in design that they can meet the standards prescribed for the "quick-donning" concept. Upon consideration of these factors, we believe it is no longer necessary to require the oxygen mask to be worn on the person of flight crewmembers. However, above flight level 250 we consider it necessary to require that the oxygen masks, when not being used, be kept at all times in a condition for ready use, and so located as to be within the immediate reach at all times of the flight crewmembers while at their duty stations.

This final rule requires that, when operating above flight level 250, each flight crewmember be provided with an oxygen mask so designed that it is capable of being rapidly placed on the face from its ready position, properly secured, sealed, and supplying oxygen upon demand. The mask must also be so designed that upon completion of the donning action it does not prevent the flight crewmember from being able immediately to communicate with other crewmembers over the airplane intercommunication system. If flight crewmembers are provided with oxygen masks which meet these standards, the regulation requires one pilot at the controls of the airplane to wear and use an oxygen mask at all times while operating above flight level 250. However, as stated in the proviso to the rule, if each flight crewmember on flight deck duty is provided with a quick-donning type of oxygen mask, the one pilot at the controls of the airplane need not wear and use an oxygen mask while at or below flight level 350.

Upon consideration of comments received, the criteria proposed for the quick-donning type of oxygen mask have been changed to specify a donning time of 5 seconds. The proposal to require a demonstration that the mask is capable of being donned without disturbing headphones has been deleted. However, the Agency considers it necessary to require, as criteria for the quick-donning type of oxygen mask, a demonstration:

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(1) That the mask is capable of being placed on the face from its ready position, properly secured, sealed, and supplying oxygen upon demand, with one hand and within 5 seconds;

(2) that the donning of the mask can be accomplished without disturbing eye glasses and without delaying the flight crewmember from proceeding with his assigned emergency duties; and

(3) that upon completion of the donning action, the oxygen mask does not prevent the flight crewmember from being able immediately to communicate with other crewmembers over the airplane intercommunication system.

The Agency has concluded that if all flight crewmembers are provided with an oxygen mask which qualifies as a quick-donning type of mask, they will be sufficiently equipped for protection against the dangers of hypoxia to justify not requiring one pilot at the controls to wear and use an oxygen mask while operating at or below flight level 350. Above that flight level, however, the time element becomes more critical and in the interest of safety we consider it necessary to require one pilot at the controls to wear and use an oxygen mask at all times.

The Agency believes that the initial and recurrent instructional training given flight crewmembers should include actual training and practice in the donning of the oxygen mask. If masks of the quick-donning type are provided by the air carrier, it should require each flight crewmember to demonstrate his ability to properly don the mask from its ready position, with one hand and within 5 seconds, and proceed with his emergency duties without delay. Such training and practice are equally as important to personal safety as the quick-donning characteristics of the mask which have been demonstrated by the air carrier.

Presently, the maximum certificated ceiling for transport category airplanes used in air carrier operations is 42,000 feet. If higher ceilings are authorized in the future for airplanes used in air carrier operations, the Agency will undertake to evaluate the present rules in light of such operations, and, if necessary, prescribe additional oxygen equipment and operational procedures to insure the protection of all occupants of the airplane.

With regard to the proposal for pressure chamber indoctrination for each flight crewmember, after fully considering all comments received and all factors involved, we have concluded that such a requirement should not be adopted. We believe that the trainee experiencing hypoxia does not benefit from the experience as much as the persons who are objectively observing the occurrence; nor is he apt to recall what took place while under the effects of hypoxia. Flight crewmembers participating in the air carriers' approved training programs, which include films, lectures, and studies of all phases of the subject of high-altitude operations, will be equally well indoctrinated with the dangers attendant upon hypoxia and the need for compliance with the techniques and emergency procedures involved in the event of a rapid decompression.

Therefore, in lieu of experiencing the actual low pressure chamber indoctrination, we are requiring all flight crewmembers, as a part of

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their approved emergency training, to receive initial and recurrent instruction by means of lectures and films covering at least respiration, hypoxia, duration of consciousness at altitude when supplemental oxygen is not supplied, gas expansion, gas bubble formation, physical phenomena and incidents of decompression, and actual training and practice in the donning of the oxygen mask and operation of the oxygen equipment.

In lieu of the required films, the air carrier may use any other equivalent means of visual presentation which meets with the approval of a representative of the Administrator. One such means would be participation by flight crewmembers in actually observing other people undergoing high-altitude training in a low pressure chamber.

The rule also provides that each flight crewmember, prior to each flight, shall personally preflight his oxygen equipment to insure that the oxygen mask is functioning, fitted properly, and connected to appropriate supply terminals, and that the oxygen supply and pressure is adequate for use. Additionally, the rule requires that whenever it is necessary for one pilot to leave his station at the controls when operating above flight level 250, the remaining pilot shall don and use his oxygen mask until the other pilot has returned to his duty station.

Oxygen masks classified as quick-donning masks under the regulation in force prior to the effective date of this amendment will be considered as satisfactorily meeting the requirements prescribed by this amendment for quick-donning masks without further demonstration.

Interested persons have been afforded an opportunity to participate in the making of this amendment and due consideration has been given to all relevant matter presented. The Air Line Pilots Association (ALPA) requested that an industry-wide meeting be scheduled to review the subject of oxygen masks if the amendment adopted herein substantially differs from the intent of the proposals recommended by ALPA. Prior to publication of Draft Release 60-15, a conference was held by the Agency at which the ALPA and other representatives of the industry were afforded an opportunity to express their views and recommendations for the development of rules governing oxygen masks and their use. These views and recommendations were thoroughly considered in the preparation of proposals contained in Draft Release 60-15. In addition, interested persons also have been given an opportunity to submit written comments in response to Draft Release 60-15. All of the views and recommendations submitted in the conference and in response to the draft release have been carefully considered and evaluated in the preparation of this final rule. Moreover, as a result of this evaluation, many of these recommendations have been incorporated in the final rule. Accordingly, I find that additional rule making proceedings, as requested by the ALPA, are unnecessary for informed administrative action; and that this amendment should be adopted without further delay.

[Revised 40.203-T(c); Added 40.286(c)]

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CIVIL AIR REGULATIONS PART 40

IFR LANDING MINIMUMS FOR PILOTS WITH LESS THAN 100 HOURS AS PILOT IN COMMAND IN A PARTICULAR TYPE OF AIRPLANE

Effective: May 23, 1961 Amendment No. 40-29
Adopted: April 17, 1961 26 F.R. 3460

The Federal Aviation Agency published as a notice of proposed rule making (25 F.R. 3554) and circulated as Civil Air Regulations Draft Release No. 60-7 on April 18, 1960, a proposal to amend Parts 40, 41, and 42 of the Civil Air Regulations to require that higher landing minimums be made applicable to all pilots in command who have not served 100 hours as pilot in command in air carrier operations in a particular type of airplane.

Standard operating limitations, presently contained in the operations specifications of all air carriers subject to Part 40, require that ceiling and visibility minimums for IFR landings be increased by 100 feet ceiling and ½ mile visibility for those pilots who have not served 100 hours as pilot in command in air carrier operations in a particular type of airplane. As this requirement is applicable to all scheduled interstate air carriers and commercial operators subject to Part 40 of the Civil Air Regulations, it is appropriate that it be included in the Civil Air Regulations rather than in the air carriers' operations specifications.

These limitations, which are presently contained in the operations specifications, permit a pilot in command to operate at the lower IFR landing minimums prior to obtaining the required 100 hours experience if a company check pilot certifies that he is qualified to do so. Investigation of the practice among air carriers has revealed wide variations in making the determination that a pilot is qualified for the lower landing minimums prior to his attaining 100 hours as pilot in command in a particular type of airplane. This has resulted in pilots being certified to operate at the lower landing minimums after having attained, in some instances, only a small fraction of the required 100 hours.

While the air carriers, in commenting on Draft Release 60-7, expressed their belief that the limitations presently contained in the operations specifications are basically sound, the majority of all comments received in response to the draft release indicated concurrence with adoption of a regulation requiring higher IFR landing minimums for pilots who have not acquired a specified amount of experience as pilot in command in a particular type of airplane in air carrier operations. In addition, the majority of comment suggested that in no case should this requirement be subject to reduction at the discretion of a company check pilot.

There were also suggestions made that certain other factors, such as the pilot's previous experience, his overall proficiency, his knowledge of the particular airport, and the number of approaches and landings made in the new type of airplane, should be recognized and substituted for a portion of the required 100 hours. While these suggestions have merit, it is believed that the factors to be considered could become so numerous, and difficult to assess in terms of an equivalent number of flight hours, as to diminish the effectiveness of the rule.

The safe execution of an instrument approach to the lowest minimums requires the highest degree of pilot familiarity with the airplane, its controls, instruments, and performance characteristics. One hundred hours of experience in a new type of airplane as pilot in command in air carrier or commercial operations is necessary in order to achieve this degree of familiarity so essential to safe operations at the lowest landing minimums.

The Federal Aviation Agency therefore believes that, in the interest of safety, all pilots in command should use IFR landing ceiling and visibility weather minimums 100 feet higher and ½ mile greater than regularly approved minimums, until they have obtained 100 hours of air carrier or commercial operator pilot-in-command experience in a particular type of airplane.

[Added § 40.406 (e)]

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CIVIL AIR REGULATIONS PART 40

LANDING FLARE REQUIREMENTS

Effective: September 21, 1961 Amendment No. 40-30
Adopted: September 15, 1961 26 F. R. 8881

Section 40.200(d) of the Civil Air Regulations requires that each airplane used at night for extended overwater operations be equipped with landing flares.

In 1958, a requirement for the carriage of flares in night operations over land was deleted from Part 40 by Amendment 40-10 (23 F. R. 292). This requirement was deleted because there had been very little use of flares from 1947 to 1958, and the records revealed numerous instances of flares being inadvertently discharged on the ground or in the air, causing damage to the airplane, other airplanes, ramps, and hangars. Instances were also reported of flares contributing to the intensity of a fire following a crash. The Civil Aeronautics Board, after consideration of all the facts involved, concluded that equipping an airplane with flares should not be a mandatory safety requirement for operations conducted over land at night.

The military transport services discontinued the use of flares in their passenger transport operations several years ago for reasons involving cost, maintenance, the hazard of carrying flares, and their questionable value under emergency conditions.

Recently, the Federal Aviation Agency received several requests from air carriers for relief from the flare requirement for overwater operations at night. In view of those requests, the Agency has carefully reviewed the subject of flare requirements. Consideration has been given to all of the data available to the Board in 1958 when it deleted the requirement for the carriage of flares in night operations over land. In addition, the Agency has weighed the probability of having to ditch an airplane as opposed to diverting to a land area, in view of such factors as improved airplane performance, reliability, operating range, and the development of more accurate and dependable communication aids. In this connection, we consider it significant that to our knowledge no multiengine air carrier airplane has been involved in the dropping of flares during the past 14 years. Finally, it should be pointed out that the Air Transport Association and the Air Line Pilots Association have recently advised the Agency that they favor deletion of the requirement for flares in night overwater operations.

Upon consideration of the foregoing, the Agency has concluded that flares for passenger-carrying airplanes should not be required as mandatory safety equipment for air carrier overwater operations conducted at night. Deletion of the flare requirement will not preclude the carriage of flares by an air carrier who may desire to continue carrying them as optional equipment.

Since this amendment relieves a restriction and imposes no additional burden on any person, I find that notice and public procedure hereon are unnecessary, and it may be made effective on less than 30 days' notice.

[Deleted § 40.200(d)]

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their own procedures and instructions to appropriate personnel in recognition of a responsibility in this area. This regulation underlines that responsibility and requires all carriers to take steps more appropriate to existing conditions. In particular it will prevent exclusive reliance on the pilot as the carrier's sole agent for this purpose. Section 43.45 is not being amended because it is always the responsibility of the pilot in command to refuse permission for the carriage of any person who is under the influence of intoxicating liquor regardless of the action taken by other airline employees if presence of such person is known to him.

Comments received in regard to the 24 hour reporting period point out that due to crew rotations, weekends and periods when the air carriers' general offices are closed, coupled with the minimum time required to process these reports, such a short period would place a serious burden on the carriers. After consideration of these circumstances, it has been decided to lengthen the reporting period to 5 days. It is felt that this allows sufficient period in which to gather the information and make the necessary report.

In response to comments other changes have been made in paragraph (d). One comment received from an air carrier points out that the rule as proposed requires the making of a report even where a passenger who was unaware of the restriction imposed by paragraph (a) complies with it upon request. It has been determined that whatever advantages might be derived by requiring such reports would be outweighed by the embarrassment and possible adverse publicity to the carrier and passenger concerned. Consequently, the paragraph has been revised to require that only those violations of paragraph (a) which persist after the passenger has been informed of its provision must be reported. Also, the phrase "under the influence of alcoholic beverage" has been changed to "appears to be intoxicated". The purpose of this change is to bring the language in paragraph (d) into conformity with that presently found in paragraphs (b) and (c).

In addition to the changes made in response to comments, the Agency has made another change in paragraph (d). The proposed rule required a report of disturbances while boarding an air carrier aircraft. Upon further consideration there does not appear any necessity for requiring a report under these circumstances. If the person is not permitted to board the aircraft there has been no safety threat involved and no necessity for a report of the incident to the Federal Government.

[Added § 40.371 (c), (d)]

CARRIAGE OF CARGO IN PASSENGER COMPARTMENTS

Effective: January 2, 1962 Amendment No. 40-32
Adopted: November 27, 1961 26 F. R. 11354

The currently effective provisions of § 40.153 of the Civil Air Regulations govern the carriage of cargo in the passenger compartment of an air carrier airplane. This section provides, in part, that cargo shall not be carried aft of seated passengers. The intent of this provision was to safeguard passengers from any possible injury which could be caused by the shifting forward of cargo in the event the airplane was involved in a survivable crash involving high deceleration

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forces. The present rule, however, does not recognize that this desired safeguard could be accomplished equally well by the incorporation of suitable methods of cargo stowage designed to prevent the shifting of cargo in accidents of this nature.

As a result of a request from the air carrier industry to permit the carriage of cargo in the passenger compartment in cargo bins specifically designed for this purpose, the Federal Aviation Agency issued a notice of proposed rule making which was published in the FEDERAL REGISTER (24 F. R. 8302) and circulated as Civil Air Regulations Draft Release No. 59-15 dated October 6, 1959, and titled "Carriage of Cargo in Passenger Compartments." This notice proposed to amend Parts 40, 41, and 42 of the Civil Air Regulations to authorize the carriage of cargo in the passenger compartment without regard to its location with respect to seated passengers;

PROVIDED:

(a) The cargo is carried in approved bins which meet the strength and other safety provisions applicable to cargo and passenger compartments prescribed in Part 4b or other airworthiness part under which the airplane is type certificated, and

(b) The combined weight of the cargo and the approved bin or compartment does not exceed 35 percent of the load used in determining the design conditions for the structure (bin) involved.

It was also proposed in Draft Release 59-15 to continue the authorization to carry cargo forward of seated passengers in the passenger compartment under practically the same provisions as are presently in effect. However, one additional requirement was proposed to be incorporated into the current provision. This requirement was that cargo not carried in approved containers or compartments must be secured by tiedowns possessing sufficient strength to eliminate the possibility of shifting under emergency landing conditions.

The comments received in response to the draft release were for the most part favorable and they reflected endorsement of the principles of the proposal. However, definite opposition was expressed in the comments with regard to the requirement that tiedowns for cargo not carried in approved bins or compartments shall possess sufficient strength to withstand the inertia forces of an emergency landing condition. It was contended that to modify the existing rules by the addition of this requirement would prevent an operational practice which has been utilized for a number of years without adversely affecting safety. Therefore, in view of these comments, and since it was not the intent of the proposal to materially change the existing rule but only to provide additional means of safely carrying cargo in the passenger compartment, the final rule does not contain this requirement.

It will be noted that the final rule sets forth specific minimum requirements which a cargo bin must meet to be "approved" by a representative of the Administrator. Draft Release 59-15 contained notice of the Federal Aviation Agency's intention to require the use of "approved" cargo bins but did not specify the exact requirements for the "approval." The substance of the proposed rule on cargo bin specifications provided that the cargo bin would be required to meet the strength and other

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safety provisions of Part 4b or other appropriate part under which the airplane is type certificated, and that the bin would be considered as an item of mass for inertia force computations. After further study of these provisions it has been determined that the incorporation into the rule of specific minimum requirements for cargo bins would provide guidance to the industry and eliminate the need for additional directives by the Federal Aviation Agency on this subject. Accordingly, the final rule specifies the minimum requirements which such cargo bins must meet.

It will also be noted that this amendment deletes § 40.153-1, since the material covered by that section is either incorporated in § 40.153, or is no longer applicable.

[Revised § 40.153]

CARRIAGE OF CARGO IN PASSENGER COMPARTMENTS

Effective: January 2, 1962 Amendment No. 40-33
Adopted: December 28, 1961 26 F. R. 12762

On November 27, 1961, the Federal Aviation Agency issued Amendment 40-32 to Part 40 of the Civil Air Regulations (26 F. R. 11354), to become effective on January 2, 1962.

Subsequent to the issuance of this amendment, certain air carriers requested reconsideration of those provisions of the amendment restricting the height of the cargo bins which may be approved for the carriage of cargo in the passenger compartments. A preliminary reevaluation of this request indicates that the height restriction may be relaxed or eliminated without adversely affecting safety. Accordingly, in order to provide sufficient time for the completion of this reevaluation and to make other required clarifying changes, the effective date of Amendment 40-32 is being postponed from January 2, 1962, until January 20, 1962.

In view of the foregoing, I find that notice and public procedure hereon are impracticable, and good cause exists for making this amendment effective on less than 30 days' notice.

[Postponed effective date]

CARRIAGE OF CARGO IN PASSENGER COMPARTMENTS

Effective: January 20, 1962 Amendment No. 40-34
Adopted: January 19, 1962 27 F. R. 649

Section 40.153 of Part 40 was revised by Civil Air Regulations Amendment 40-32 (26 F. R. 11354) issued November 27, 1961, to become effective January 2, 1962. This section provides a means by which cargo may be safely carried in the passenger compartment of an air carrier airplane.

Subsequent to the issuance of Amendment 40-32, certain air carriers requested reconsideration of § 40.153 (a) (3) of that amendment which specified that approved cargo bins installed aft of passengers shall not be higher than the height of the passenger seats on the airplane. In

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addition, comments were received with regard to paragraphs (a)(1) and (4) which indicated a need for a clarification of the strength requirements which a cargo bin and its attachments must meet for approval.

The effective date of Amendment 40-32 was postponed from January 2, 1962, to January 20, 1962, by Amendment 40-33 (26 F. R. 12762). This postponement of the effective date was necessary to provide sufficient time for a complete reevaluation of the provisions of § 40.153(a)(3) and to make other clarifying changes.

As a result of this reevaluation it has been concluded that, regardless of its height, a properly loaded cargo bin which has been constructed and installed in the airplane to meet specific strength requirements will not adversely affect safety if it does not obscure any passenger's view of the "seat belt" or "no smoking" sign. Therefore, this amendment eliminates the height restriction for cargo bins and in lieu thereof adds provisions which

(1) require proper distribution of the weight of the cargo within the bin,
(2) prohibit use of bins which exceed the structural load limitation on components of the airplane, and
(3) prohibit installing the bin in a location which will obscure any passenger's view of the "seat belt" or "no smoking" sign, unless an auxiliary sign, or some other approved means for notification of the passenger is provided.

The provisions of paragraphs (a)(1) and (4) of this amendment specify the strength which a cargo bin and its attachments must meet for approval. It was intended, in Amendment 40-32, that this strength be such that in the event the airplane was involved in a survivable crash involving high decleration forces, the cargo bin would not shift forward or be dislodged and injure the passengers. To provide this safeguard, the strength of the bin and its attachments must be able to withstand at least the load factors and emergency landing conditions applicable to the passenger seats installed on the airplane. The combined weight of the cargo bin and its contents must be used to determine this strength. However, in view of the comments received, it appears that the wording of paragraphs (a)(1) and (4) of Amendment 40-32 did not make this strength requirement completely clear. Accordingly, this amendment rewords these paragraphs to specify more clearly the strength requirements which a cargo bin and its attachments must meet for approval.

In addition to the aforementioned changes, other editorial changes were made in this amendment for the purpose of clarification.

Since this amendment relaxes the height requirement of a previous rule which becomes effective January 20, 1962, and imposes no additional burden on any person, I find that notice and public procedure hereon are impractical and unnecessary, and good cause exists for making this amendment effective on less than 30 days' notice.

[Revised § 40.153]

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CIVIL AIR REGULATIONS PART 40

MECHANICAL RELIABILITY REPORTS

Effective: March 12, 1962
Adopted: February 6, 1962

Amendment No. 40-35
27 F. R. 1242

The Federal Aviation Agency published as a notice of proposed rule making (26 F. R. 1410) and circulated as Civil Air Regulations Draft Release No. 61-2 dated February 8, 1961, a proposal to amend Parts 40, 41, 42, and 46 of the Civil Air Regulations to establish requirements for the reporting of specific types of malfunctions, failures, and defects occurring to airplanes.

With the adoption of this amendment, it should be noted that the title, Daily Mechanical Report (DMR), is changed and will hereafter be known as the Mechanical Reliability Report (MRR). The Federal Aviation Agency believes the name to be appropriate in that it is more descriptive of the concept of the report.

The currently effective provisions of Part 40 require operators to submit daily a report known as a daily mechanical report (DMR) which contains information concerning each failure, malfunctioning, or other defect, regardless of where detected, which may reasonably be expected by the air carrier to cause a serious hazard in the operation of an airplane.

The lack of specific reporting requirements and the fact that each air carrier reported only those items which, in the opinion of the air carrier, constitute a hazard, heretofore resulted in inadequate and nonuniform reporting. Various attempts were made to correct these inadequacies, such as joint industry-government meetings and the use of a trial reporting guide for a six-month period. Some improvement in reporting was accomplished; however, satisfactory reporting was not achieved. In accordance with the proposal contained in Draft Release 61-2, this amendment specifies certain airplane and airplane component failures, malfunctions, or defects which must be reported by air carriers in mechanical reliability reports. In addition, an air carrier is required to report other airplane and airplane component failures, malfunctions, or defects, even though they are not specified in the rule, when the air carrier is of the opinion that they may seriously endanger the safe operation of its airplanes.

In Draft Release 61-2 it was proposed to require air carriers to report engine shutdowns during flight necessitated or caused by airplane component failure, malfunction, or defect. Although the Agency evaluates the significance of every engine shutdown, regardless of cause or effect, it has been determined that it is presently not necessary to require all engine shutdowns to be included in mechanical reliability reports. Accordingly, in this amendment, the proposed rule has been changed to require mandatory reporting of engine shutdowns only when they involve engine flameout, foreign object ingestion or icing, external damage to the engine or airplane structure, or when more than one engine is shutdown during flight. Paragraph (b)(17) of § 40.508 has been worded to make it clear that action taken to shutdown an engine in flight need not be reported as an emergency action under the requirements of that provision.

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CIVIL AIR REGULATIONS PART 40

Draft Release 61-2 contained a proposal to require reports of failures of the landing gear to extend or retract properly during flight. To avoid any misunderstanding of our intention that landing-gear doors be included in this reporting requirement, this final rule expressly provides for reporting the occurrence of a failure, malfunction, or defect which involves the extension or retraction of the landing gear, or the opening or closing of the landing-gear doors during flight.

Also, it will be noted that paragraph (b)(15) of § 40.508 has been changed from the original proposal so that failures, malfunctions, or defects in airplane structures are required to be reported only if a major repair is necessary.

Many failures, malfunctions, or defects are required to be included in the mechanical reliability report only if they occur during "flight." A note has been added to the rule to explain that in complying with the reporting requirements of § 40.508 an airplane is to be considered in "flight" from the moment it leaves the surface of the earth on takeoff until it touches down at a place of landing.

Attention is directed to the fact that Draft Release 61-2 proposed 13 specific reporting items while this amendment contains 17 reportable items. This increase in the number of items is the result of rewording and expanding the previous items to facilitate administrative handling of the reports within the Agency with automatic data processing equipment.

Another change has been made in this amendment which differs from the original proposal. This change provides that the report shall cover a 24-hour period beginning at 0900 hours local time each day and is to be submitted by 0900 hours of the following day rather than the midnight to midnight report period proposed. In this respect, local time is considered to be the time at each air carrier's main maintenance base. This revision does not alter the 24-hour interval made in the proposal, but is incorporated so that the reports can be handled more expeditiously by the Agency under its new automatic data processing system for evaluating individual reports and for distributing mechanical reliability report summaries.

Each air carrier is presently required by paragraph (a) of § 40.509 (Mechanical interruption summary report) to regularly file a summary report of "All interruptions to a scheduled flight, unscheduled changes of airplanes en route, and unscheduled stops and diversions from route which result from known or suspected mechanical difficulties or malfunctions." In response to comment received, paragraph (a) of § 40.509 is being amended to avoid duplicate reporting under paragraph (a) of those malfunctions or mechanical difficulties required to be reported under § 40.508.

The Federal Aviation Agency believes that reports of the failures, malfunctions, and defects required under this amendment, plus additional reports received from the air carriers regarding other occurrences of failures, malfunctions, and defects they consider hazardous, will provide complete, accurate, and uniform reporting. Safety will be served better by this amended reporting procedure as the Agency will be able to disseminate to industry improved reports of hazardous conditions

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pertaining to airplane systems, components, and equipment. In addition, through analysis of information developed from reports received, the Agency will be able to detect deteriorating conditions in airplane systems, components, and equipment, and issue Airworthiness Directives and Alert Notices before such conditions reach hazardous proportions.

[Revised § 40.508, completely; § 40.509 (a)]

ILLUMINATION OF PASSENGER EMERGENCY EXIT MARKINGS

Effective: March 20, 1962 — Amendment No. 40-36
Adopted: February 12, 1962 — 27 F.R. 1452

The Federal Aviation Agency published as a notice of proposed rule making (26 F.R. 9241) and circulated as Civil Air Regulations Draft Release No. 61-20 dated September 21, 1961, a proposal to amend Parts 40, 41, 42, and 46 of the Civil Air Regulations to require the illumination of passenger emergency exit markings during all takeoffs and landings, day and night.

In proposing these amendments, the Agency considered several recent accidents and incidents where illumination of the emergency exits during daylight hours may have resulted in a more effective evacuation of the passengers and crew. The Civil Air Regulations as originally adopted did not require daytime use of the emergency exit lighting system. It is now considered that this additional lighting during daylight hours is necessary to provide maximum safety where the evacuation of large numbers of passengers is concerned.

Interested persons have been afforded an opportunity to participate in the making of this regulation and due consideration has been given to all relevant matter presented. In general, all comments received from interested persons as a result of the Agency's notice of proposed rule making were favorable to the proposal.

[Revised § 40.173 (f) (2)]

EXTENSION OF PERIOD ALLOWED FOR COMPLIANCE WITH THE RECURRENT TRAINING REQUIREMENTS OF AIR CARRIER TRAINING PROGRAMS

Effective: August 3, 1962 — Amendment No. 40-37
Adopted: July 30, 1962 — 27 F.R. 7673

Paragraph (b) of § 40.289, Recurrent training, requires that each air carrier shall, at intervals established as part of the training program, but not to exceed 12 months, check the competence of each crewmember and dispatcher with respect to procedures, techniques, and information essential to the satisfactory performance of his duties.

The Federal Aviation Agency has received recommendations that the time interval between competence checks of crewmembers and dispatchers be specified in the same manner as in § 40.302, which permits pilot line and proficiency checks to be given in the month before or fol-

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lowing the month in which they are due. Such flexibility will simplify recordkeeping and administration of the crewmember and dispatcher competence check requirements of § 40.289(b) in the same way that the pilot line and proficiency check requirements have been simplified.

The FAA has considered the foregoing recommendations and believes that the requirements with respect to the frequency of crewmember and dispatcher competence checks should be amended to provide the flexibility recommended.

Civil Air Regulations Draft Release No. 61-7, dated April 14, 1961, subject "Qualification and Training Requirements for Pilots Other Than Pilots in Command," proposed, among other matters, to amend Parts 40, 41, and 42 to permit the competence checks of crewmembers and dispatchers to be given at any time during the month preceeding or following the month in which they become due.

No adverse comments were received with respect to this particular portion of Draft Release 61-7. Accordingly, since it will permit more efficient administration of air carrier training programs and will not adversely affect safety of the carriers' operations, it is being adopted at this time separately from the other proposals which were included in the draft release. The phrase 'not to exceed 12 months' contained in the present regulations and in Draft Release No. 61-7 has been changed to 'each 12 months' to make the wording consistent with that of revised Part 41 (27 F.R. 1977), which was circulated as Draft Release No. 60-19 (26 F.R. 12299) prior to its adoption. The remaining proposals and the comments received thereon are being evaluated by the Agency in conjunction with comments received in response to Draft Release 61-17, "Use of Aircraft Simulators for Pilot Training and Proficiency Checks," and Draft Release 62-9, "Approval of Air Carrier Training Programs."

Interested persons have been afforded an opportunity to participate in the making of this regulation (26 F.R. 3438), and due consideration has been given to all relevant matter presented. Since this regulatory action imposes no additional burden on any person, it may be made effective on less than 30 days' notice.
[Revised § 40.289(b)]

AIRBORNE DISTANCE MEASURING EQUIPMENT, LOW FREQUENCY RADIO RANGE, AND AUTOMATIC DIRECTION FINDING EQUIPMENT REQUIREMENTS

Effective: July 1, 1963 — Amendment No. 40-38
Adopted: January 11, 1963 — 28 F.R. 479

This amendment provides that after June 30, 1963, an airplane which is required by the Civil Air Regulations to be equipped with VOR navigational equipment, and operates at and above 24,000 feet MSL in the 48 contiguous states and the District of Columbia, must also be equipped with an approved distance measuring equipment unit, capable of receiving and indicating distance information from VORTAC facilities. When sufficient VORTAC facilities become available for use in Alaska and Hawaii, DME will also be required in these areas. In addition, the amendment requires that approved distance measuring equipment be installed on the following air carrier airplanes which are

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required to be equipped with VOR receivers and operate in the 48 contiguous states and the District of Columbia regardless of the altitude at which they operate after the following dates:

1. Turbojet airplanes - June 30, 1963;
2. Turboprop airplanes - December 31, 1963;
3. Pressurized reciprocating engine airplanes - June 30, 1964; and
4. Other airplanes having a maximum certificated takeoff weight of more than 12,500 pounds - June 30, 1965.

This amendment also authorizes the operation of an air carrier airplane over low frequency routes with only one low frequency radio range receiver or automatic direction finding receiver under certain conditions. In addition, it deletes the authority presently contained in § 40.232 (c) which permits operation with only one VOR receiver installed when navigation is predicated on the use of VOR ground aids.

The Federal Aviation Agency published as a notice of proposed rule making (26 F.R. 4455) and circulated as Civil Air Regulations Draft Release No. 61-11, dated May 24, 1961, a proposal to amend Parts 40, 41, 42, and 43 of the Civil Air Regulations to require the installation of distance measuring equipment (DME) in certain United States civil airplanes in accordance with a specific schedule.

Distance measuring equipment is that portion of the Rho Theta System of Short-range Navigation, the standard internationally adopted short-range system of navigation, which indicates to a pilot the distance his aircraft is from the ground station transmitter. To achieve the maximum safety and efficiency of operation possible from the use of the Rho Theta System of Short-range Navigation, or VORTAC System as commonly known, distance information is equally as important as bearing or azimuth information. The distance information obtained from distance measuring equipment assists a pilot in staying within the limits of the air space assigned him by his air traffic control clearance. It is invaluable information particularly with respect to jet aircraft approaching terminal areas at high speeds. It reduces the margin of error in estimating position and the proper time to begin a deceleration. Distance information also facilitates the accurate navigation of aircraft in the avoidance of severe weather turbulance, in holding, and in rerouting by air traffic control.

In 1957, the President's Air Coordinating Committee, with representation from all segments of the aviation industry, concluded that traffic volume, complexity of operations, safety requirements, efficient use of air space, and the expeditious movement of air traffic dictate that maximum use of both the azimuth and distance measuring capabilities of VORTAC be required by at least 1965 in the navigation of aircraft subject to positive separation and in the performance of air traffic control service for such aircraft. The committee recommended that by that time all aircraft to be operated under Instrument Flight Rules and those to be operated under Visual Flight Rules in such a manner that they will be subject to positive separation be required to have both distance measuring and azimuth capability. In accord with this recommendation, Draft Release 61-11 was published.

Subsequent to the publication of Draft Release 61-11, the report of the Task Force on Air Traffic Control, known as Project Beacon, set

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forth a long-range plan to insure the efficient and safe control of the nation's air traffic. This report, around which the nation's air navigation system is being built, firmly reiterated the need for DME in order to attain the degree of accuracy in navigation necessary for the safe control of air traffic.

In this connection the Agency conducted a public symposium in Washington, D. C., in February 1962, to discuss airborne equipment requirements associated with implementation of Project Beacon. The Agency emphasized that the RHO THETA system of air navigation, toward which the Federal government and the aviation industry had so long striven, required that VOR and DME be used in conjunction with each other. It was pointed out that the system had originally been adopted and developed with the concurrence of industry users and at considerable public expense. It was also stated that maximum safe utilization of the system is dependent on airborne navigation equipment being compatible with the ground environment, and that consideration must be given to the environment in which the airplane operates in determining the need for all navigational equipment, including DME.

All civil airplanes operating in the 48 contiguous states and the District of Columbia at altitudes of 24,000 feet and above are operating within the continental control area airspace. Additionally, they are in an environment of very high-speed air traffic which necessitates continuous position fixing capabilities and very accurate airborne navigational information. Therefore, in keeping with the concept that equipment requirements should be determined by the operational environment, it has been determined that distance measuring equipment should be required on all civil airplanes operating in the 48 contiguous states and the District of Columbia at altitudes of 24,000 feet and above after June 30, 1963, if VOR navigational equipment is required.

All DME ground installations serving the high-altitude route structure are scheduled to be completed by January 1, 1964. However, it is anticipated that virtually complete DME coverage for this route structure will be available by June 30, 1963. Other DME ground installations are proceeding rapidly and DME coverage in both the lower route structures and in terminal areas will be extensive by 1964-1965. These facts together with the availability of airborne DME meeting appropriate standards have been considered in the preparation of this amendment and in that pertaining to general aviation.

Public safety requires that all air carrier operations be conducted with the highest level of safety and with the best and most accurate navigational information available. In view thereof, and in consideration of the fact that large air carrier airplanes generally operate at higher speeds, in the higher density terminal areas, and in that airspace in which facilities and procedures for the use of DME are receiving priority, large air carrier airplanes operating in the 48 contiguous states and the District of Columbia, **irrespective of operating altitudes, should be required to have DME installed in accordance with a prescribed schedule.** In establishing this schedule, the Agency has taken into consideration the installation schedule of DME ground facilities and the types of airplanes which operate in the various airspace environments served by these facilities. Accordingly, whenever VOR navigational equipment is required, all airplanes operated by air

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carriers, and commercial operators conducting operations pursuant to Part 40, will be required to have DME installed as follows:

1. On July 1, 1963, all turbojet airplanes;
2. On January 1, 1964, all turboprop airplanes;
3. On July 1, 1964, all pressurized reciprocating engine airplanes; and
4. On July 1, 1965, all other airplanes having a maximum certificated takeoff weight of more than 12,500 pounds.

While this amendment requires DME only for operations in the 48 contiguous states and the District of Columbia, it will be extended to include operations in Alaska and Hawaii at such time as sufficient VORTAC facilities are installed in those areas.

A basic concept with respect to the safety standards applicable to air carriers is that their airplanes must be equipped with dual radio navigational and communications equipment in order to provide a high level of safety in the event of equipment failure. This concept will continue to be reflected in the regulations until such time as the reliability of the equipment indicates that a failure is most improbable. However, with respect to airborne DME, the Agency believes that the immediate demands on the available supply of this equipment will be such that the public interest would be better served if dual distance measuring equipment is not required at this time. This will assure the availability of airborne DME for installation at the times specified in the amendment and may permit such installation in advance of the times specified.

In addition to Draft Release 61-11 which pertained to DME requirements, the Agency, on October 6, 1961, issued a notice of proposed rule making (26 F.R. 9430) and circulated for comment Civil Air Regulations Draft Release No. 61-21. This draft release proposed to amend Part 40 of the Civil Air Regulations by amending § 40.232 (b) and by deleting § 40.232 (c) and the related § 40.232-1. Amendments to the rules pertaining to operations conducted pursuant to Parts 41 and 42 to effect the same regulatory changes were also proposed.

As explained in the draft release, the provisions which permitted air carriers, in certain instances, to equip their airplanes with only one VOR and one LF/MF receiver during the period of transition from an LF/MF airways system to a VOR airways system are no longer appropriate in view of the present coverage and the extensive use of VOR aids, and the rapidly diminishing number of LF/MF routes. It was, therefore, proposed to require all air carrier airplanes, which are to be operated IFR utilizing VOR aids, to be equipped with two VOR receivers. It was also considered feasible, and so proposed, to amend the regulations to permit an airplane equipped with two VOR receivers to operate on the few remaining low frequency route segments equipped with only one LF/MF receiver, provided the airplane is so fueled and VOR aids are so located that the airplane could, in the event of a failure of the LF/MF receiver, proceed safely to an airport by means of VOR aids and complete an instrument letdown by use of the remaining airplane radio system.

All comments received in response to this draft release have been given full consideration. In the judgment of the Agency, deletion of the

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provision contained in § 40.232 (c), which permitted airplanes to be equipped with only one VOR and one LF/MF navigation receiver for IFR operations within the United States during the transition period, is considered necessary in view of the existing air carrier safety requirement for dual equipment, and appropriate in view of the fact that the period of transition from LF/MF to VOR ground aids in the United States is essentially completed. It is also considered appropriate and not detrimental to the safety of operations to permit air carrier airplanes equipped with two VOR receivers and one LF/MF receiver, to operate over the few remaining LF/MF route segments until such time as these route segments are completely replaced by VOR airways, if an adequate alternate VOR routing is available by which the airplane could safely proceed, if necessary, due to the failure of the LF/MF receiver, and the airplane carries sufficient fuel in the event such routing becomes necessary. In order to provide sufficient leadtime for equipping airplanes which have only one VOR receiver installed with a second such receiver, this amendment is being made effective July 1, 1963.

The format of this amendment will be subject to such change as may be necessary for its recodification under the Agency's Recodification Program, announced in Draft Release No. 61-25 (26 F. R. 10698).

[Revised § 40.232 (b) and (c); Added § 40.232 (d)]

MINIMUM STANDARDS FOR APPROVAL OF AIRPLANE SIMULATORS

Effective: June 10, 1963 Amendment 40-39
Adopted: April 4, 1963 28 F.R.3474

This amendment to Part 40 sets forth the standards which must be met for approval of airplane simulators to be used in training programs which are substituted alternately for pilot proficiency checks.

The Federal Aviation Agency published as a notice of proposed rule making (26 F.R. 8461) and circulated as Civil Air Regulations Draft Release No. 61-17 on August 31, 1961, a proposal to amend Parts 40, 41, and 42 of the Civil Air Regulations to prescribe standards for the approval of aircraft simulators, for training courses in aircraft simulators, and for the use of synthetic trainers for proficiency flight check maneuvers.

In addition to the proposals contained in Draft Release 61-17, the Agency published on March 10, 1962, a separate notice of proposed rule making (27 F.R. 2319), circulated as Civil Air Regulations Draft Release No. 62-9, which conerns the proposed overall training standards to be used in approving an air carrier's training program. Therefore, all comments received in response to Draft Release 61-17 which concern training programs and standards will be considered in conjunction with the comments received on Draft Release 62-9. All other comments received which concern the minimum standards for the approval of airplane simulators have been considered in connection with this amendment.

Some of the comments received in response to Draft Release 61-17 indicated a basic assumption with respect to simulators which is not essentially correct. It was contended that simulator requirements should not be specified except in those areas directly related to maneu-

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vers which the pilot is required to perform, in an airplane, during the course of a proficiency flight check. This reasoning assumes that the simulator is only used as a substitute for an airplane in the conduct of proficiency flight checks. When the regulations were amended to allow substitution of an airplane simulator training course for each alternative proficiency flight check in an airplane, the added contribution to safety which is derived from the full simulator training courses was considered as a justification for the amendment. Accordingly, if the simulator is to be used it should perform to the degree required to accomplish such a training course. Thus, the standards and tolerances contained in this amendment as Appendix C to Part 40 are those which must be met prior to approval of an airplane simulator for use in a simulator training course which is to be used as a substitute for alternative pilot proficiency flight checks as provided by §§ 40.302(b)(3) and 40.305(b). To make this clear, the term "airplane simulator which meets the standards set forth in Appendix C" has been substituted in § 40.302(b)(3) of this amendment for the words "aircraft simulator," and the requirements in present § 40.302(b)(3) for approval of an airplane simulator have been incorporated in the Appendix.

In consideration of the many comments received in response to Draft Release 61-17, the standards contained in Appendix C for approval of the simulator differ somewhat from those proposed in the draft release. For example, the phraseology " * * * minimum and maximum limits of the systems * * * as shown in the approved Airplane Flight Manual and/or the maintenance section of the air carrier's manual" contained in section 1(a) of the proposal is being deleted for clarity. Industry objection to this terminology was based on the misunderstanding that it was applicable to flight characteristics, when in fact it applies only to airplane systems. To clarify this requirement this section has been changed by specifying the items of the systems which the simulator is required to simulate for approval.

The proposed section 1(c)(1) has been renumbered as section 1(b)(1) and revised to permit any adequate airplane data obtained from sources other than the approved Airplane Flight Manual, Type Inspection Report, or other flight test data provided by the airplane manufacturers, to be used for comparison purposes. As a determination by the Agency of the adequacy of such data cannot always be made immediately, this amendment requires the submission of these data by the carrier sufficiently in advance of the date set for the simulator evaluation to permit the Agency to investigate their adequacy.

Section 1(b)(2) provides for the acquisition of airplane data by flight tests conducted in the air carrier's airplane. This section clearly indicates that the procedures and methods to be followed in obtaining data must be coordinated with the FAA representative participating in the flight test program conducted to obtain these data. As such coordination, when accomplished, would require the concurrence of the participating FAA representative with the flight test methods and procedures to be utilized to obtain the data, the proposed reference to Part 4b of the Civil Air Regulations with respect to such flight tests is unnecessary and is deleted in this amendment. This section has also been changed to expressly provide that an Agency representative may permit the carrier to conduct such portions of the flight test program

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as he deems appropriate without participation by the representative.

The air carriers objected to the proposed requirements for airplane simulator maintenance. These objections indicated a need for rephrasing the requirements as proposed, without substantive change, to reflect more clearly the intent of the requirements. As a result, they have been rewritten and placed in §40.302(b)(3). As rewritten, the requirements provide:

(1) That the air carrier is responsible for maintaining the simulator to the same standards as required for initial approval;

(2) That simulator flight training and/or proficiency flight check activities must not be started with a "cold" simulator; however, in order not to hinder the carrier's flexibility in scheduling the use of a simulator, the functional preflight check of the simulator is required to be conducted only once each day that the simulator is to be used for training or the conduct of proficiency flight checks, and at any convenient time prior to commencing daily simulator operations;

(3) That a daily discrepancy log must be maintained;

(4) That the simulator be modified, if appropriate, when a modification is made to the airplane; and

(5) That procedures for the continued use of the simulator with certain inoperative instruments or equipment may be established.

The Air Transport Association objected to proposed paragraph (x) of section 3 on the ground that it would "give blanket authority to the FAA to require additional systems" not specifically required by regulations. As it is intended that all standards for the approval of airplane simulators will be promulgated with opportunity for the industry to participate in the rule making, paragraph (x) has been deleted.

In order to indicate more specifically the tolerances applicable in each area of performance, the format of section 4(a) has also been revised.

With respect to rate-of-climb tolerances, Appendix C, while specifying a tolerance of ± 50 feet per minute or 10 percent for propeller airplane simulators, allows ±100 feet per minute or 10 percent for jet airplane simulators in view of the much higher rates of climb encountered in the operation of jet airplanes.

A new item, section 4(a)(6), "Minimum control speed," has been inserted. As pointed out by industry comment, no airspeed tolerances had been proposed for V_{MC}.

Considerable objection was raised by the air carriers to the proposed requirement pertaining to stall speeds. As a result of consideration of comments received, these standards provide more flexibility with respect to the range between initial buffet and stall, and give recognition to the relatively greater importance of accurate simulation of stall warning (initial buffet). These standards also clarify the stall requirements by specifically listing the applicable configurations in

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which stall and stall warning speeds must be checked.

With respect to the standards applicable to simulator flight characteristics, as proposed in section 4(b), several changes have been made as a result of industry comment. These do not constitute substantive changes in the intent of the proposed standards but do more clearly state the applicable requirements. These changes are as follows:

(1) In lieu of the proposed reference to force reversal, these standards require that, with respect to static longitudinal stability, the slope of the stick force curve of the simulator shall be positive.

(2) The standards have been rewritten to preclude any interpretation which would permit an individual inspector to prescribe specific standards other than those contained in Appendix C. As the prescription of specific limitations in certain areas is not feasible, the FAA personnel who evaluate an airplane simulator will adjudge the adequacy of simulation in these areas.

(3) The requirement contained in the proposed section 4(b)(1) that the simulator return to trim speed within ±5 knots was unintentional. Comment received called attention to the fact that the airplane, during certification, is required to return to within 10 percent of trim speed. The standards contained in Appendix C require that the simulator return to trim within ±5 knots of the speed at [to] which the airplane returned during certification tests.

(4) The proposed sections 4(b)(3) and 4(b)(4) are being deleted as redundant in view of the fact that it is intended only to measure these forces in determining adequate simulation of minimum control speed as required in the proposed section 4(b)(5).

(5) Appendix C permits the authorized representative of the Administrator, in the event data pertaining to stick force versus "g" rudder and aileron forces at V_{MC} or roll rates are not available in the Type Inspection Report, to use judgment in determining the adequacy of simulation in these areas.

(6) The proposed section 4(b)(11) has been deleted as the standards contained herein are complete. Should additional standards be considered necessary in the future, they will be included in Appendix C only after due notice of proposed rule making and a thorough consideration of industry views thereon.

The air carriers objected to the requirements proposed in section 5 regarding the standards of tolerance for simulator navigational recorders on the basis that the recorder should be treated as nonrequired auxiliary equipment. There is merit to their contention that a check pilot can judge a pilot's performance without reference to the recorder, However, in order for a simulator to fulfill completely its training objectives, it must, in addition to being able to simulate indications of position with respect to radio navigational facilities, provide a record of the track and altitude flown. In order to do so realistically, its track, distance traveled, and, in the case of an ILS approach, its descent path, in still air, must correspond with heading, true air-

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speed, and, during ILS approaches, glide path, altitude, airspeed, and rate-of-descent indications. In addition, the path of flight must be recorded in such a manner as to be available to the trainee and to the instructor or check pilot for evaluation after completion of a flight. As the recorder unit, of which the recorder indicators are an integral part, is essential to the navigational ability of most simulators presently in general use, the proposal specified simulator navigational accuracy in terms of recorder accuracy. In order to indicate more clearly the intent of these standards with respect to simulator navigational ability, they have been rewritten to specify tolerances pertaining to the navigational accuracy of the simulator. With respect to the tolerances themselves, the tolerances for an ILS glide path have been liberalized in accordance with comment received.

Finally, section 6 of the proposal has been rewritten, in accordance with industry suggestions, to indicate more clearly that, while failure to maintain a simulator to prescribed standards and tolerances shall be cause for cancelling approval for its use in accordance with the provisions of § 40.302(b)(3) and § 40.305(b), training may be continued with certain instruments or equipment inoperative. Further, this provision has been placed in § 40.302(b)(3) instead of in the Appendix.

[Revised § 40.302(b)(3); Added Appendix C]

OPERATION OF THREE-ENGINE AIRPLANES

Effective: April 10, 1964 — Amendment 40-40
Adopted: April 2, 1964 — 29 F.R. 4993

The purpose of this amendment is to prescribe certain training and proficiency requirements for the pilot in command of a three-engine airplane and to authorize certain operations of three-engine airplanes under the same conditions authorized for four-engine airplanes.

On July 11, 1963, the Federal Aviation Agency issued as a notice of proposed rule making (28 F.R. 7398), circulated as Notice No. 63-26, a proposal to amend Parts 40, 41, and 42 to require that training and proficiency manuevers for pilots in command of three-engine airplanes include the operation of the airplane with the most critical combination of two engines inoperative, or operating at zero thrust, and to authorize the same prerogatives in the operation of three-engine airplanes that are permitted in the operation of four-engine airplanes with respect to:

1. Continuation of flight under certain circumstances beyond the nearest suitable airport with one engine inoperative; and
2. Location of the alternate airport at a distance up to two hours of flying time, with one engine inoperative, from the airport of takeoff.

Insofar as this amendment relates to the initial flight training of a pilot qualifying to serve as pilot in command of a three-engine airplane, § 40.282(b)(1)(ii) is amended to require flight in a three-engine airplane, including maneuvering to a landing, with the most critical combination of two engines inoperative. These maneuvers will then be required as part of the pilot in command proficiency check as well, since

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§ 40.302(b)(2)(ii) requires that the maneuvers set forth in §40.282(b)(1) be accomplished during that check. Also, with regard to the pilot in command proficiency check, CAM §§ 40.302-1(j) and 40.302-1(v) respectively require maneuvering and landing while itilizing 50 percent of the available power units. These sections are amended to make them applicable to three-engine airplanes by requiring the maneuvers to be performed in those airplanes with the center and one outboard engine in a simulated inoperative condition.

The Air Line Pilots Association's comments on these requirements were favorable provided that experience gained subsequent to the preparation of their comments proved that the maneuvers could be performed safely considering the actual performance characteristics of the airplanes which had not been certificated at that time. Experience gained subsequently with airplanes of this type has shown that airplane performance is adequate for these maneuvers.

The Aerospace Industries Association and the Air Transport Association opposed the two-engine-inoperative maneuver requirements. One basis of their opposition was the good engine reliability record of turbine-powered airplanes. They further contended that the requirement is more stringent than for four-engine airplanes; that maneuvering to a landing with two engines inoperative exposes the airplane to untoward incidents; and that proficiency in these maneuvers could be attained through the practice of other maneuvers such as engine failure on takeoff and jammed stabilizer landings.

The Federal Aviation Agency recognizes the commendable engine reliability record established to date by turbine-powered airplanes. However, while improved reliability reduces the probability of engine failures, the possibility factor has not been eliminated and cannot be ignored. The airplane is required to have certain performance capabilities with two engines inoperative so that the airplane may proceed to a landing in the event of two engine failures when operating more than 90 minutes from an airport. The Federal Aviation Agency believes that pilots must be competent to fly the airplane in any configuration in which it is certificated to fly.

The two-engine-inoperative landing maneuver is sufficiently different from other required maneuvers that proficiency in this maneuver is not attained by practice of the other maneuvers as was suggested by the air carriers. Concerning the industry contention that two-engine inoperative landings unnecessarily expose the airplane to an incident, experience has shown that when the degree of skill and judgment normally required in training type operations is used there is no reason to consider the two-engine-inoperative maneuvers to be unduly hazardous.

Section 40.75 provides for the en route operation of four-engine piston-powered airplanes along a track which is as much as 90 minutes from an available landing area when appropriate performance and gross weight requirements are complied with. Notice 63-26 contained a proposal to amend that section by broadening its applicability to include three-engine piston-powered airplanes. As a necessary corollary to this, it was proposed to amend §40.62(a) (which limits two- and three-engine airplanes to operation at distances of not more than 60 minutes

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from an airport) by deleting reference in it to all three-engine airplanes. After consideration of the fact that three-engine piston-powered airplanes are not now available nor envisioned in the foreseeable future, it has been decided that the proposed amendments to §§ 40.75 and 40.62(a), insofar as they apply to three-engine piston-powered airplanes, are unnecessary. Section 40.62(a) is amended by excepting from its provisions three-engine turbine-powered airplanes, but not three-engine piston-powered airplanes as was proposed. Excepting three-engine turbine-powered airplanes from the provisions of § 40.62(a) will enable them to be operated more than 60 minutes from an airport as provided in Section 40T.83 of SR-422B.

Interested persons have been afforded an opportunity to participate in the making of this amendment, and due consideration has been given to all relevant matter presented. The issuance of this amendment was withheld until sufficient flight experience had been obtained with a three-engine turbine-powered airplane. Inasmuch as this type of airplane has recently been certificated by the Agency and introduced into air carrier operations, I find that, in the interest of safety there is good cause for making it effective on less than 30 days' notice. [Revised §§ 40.62(a) and 40.282(b)(1)(ii).]

WING-FLAP-ACTUATED LANDING GEAR WARNING SYSTEM

Effective: May 22, 1964 — Amendment 40-41
Adopted: April 15, 1964 — 29 F.R. 5382

The Federal Aviation Agency published as a notice of proposed rule making (28 F.R. 4958), circulated as Notice No. 63-19 dated May 10, 1963, a proposal to amend Parts 4b, 40, 41, and 42 of the Civil Air Regulations to require the installation of a wing-flap-actuated landing gear warning system.

All airplanes airworthiness regulations require, for airplanes with retractable landing gear, that a means be provided for indicating to the pilot when the gear is secured in the extended and in the retracted positions; that, in addition, landplanes be provided with an aural warning device to function continuously when one or more throttles are closed if the gear is not fully extended and locked. The airplane airworthiness regulations that permit a manual shutoff for the aural warning device also require that it be installed so that reopening the throttles will reset the warning mechanism. A third safety provision, required in §§ 4b.740 and 40.357, is the cockpit check procedure (checklist) to be used by the flight crew during all phases of operation.

The Agency finds, from a review of the accident record over the past 8 years, that 17 inadvertent gear-up landing accidents involved airplanes operating under Parts 40, 41, and 42. Fifteen of these accidents involved a number of airplane models, irrespective of performance or type of powerplant used, whose maximum weight exceeded 12,500 pounds. Although these accidents did not result in either major injuries or fatalities, such accidents are potentially hazardous, particularly because of possible ignition of fuel which might be spilled.

From the analysis of the accident record and from a study of opera-

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tional practices relating to landing gear aural warning systems, the Agency finds that the currently prescribed throttle-actuated aural warning device and the other safety provisions are not sufficiently effective in preventing inadvertent gear-up landing accidents. The Agency further finds that installation of a wing-flap-actuated aural warning system should reduce the number of such accidents, thereby eliminating the potential hazard to the airplane occupants and preventing damage to the airplane.

Among the comments received in response to the notice of proposed rule making were objections to the proposed requirement. It was contended that the installation of a fourth safety device was unjustified. The Agency disagrees because 10 of the 15 inadvertent gear-up landing accidents involving transport category airplanes probably would have been prevented if a wing-flap-actuated warning system had been installed. These accidents occurred after long approaches with throttles retarded and with the aural warning device manually shut off and not reset prior to landing, or after long power-on approaches and the aural warning device actuated too late to discontinue the approach and initiate a go-around. (The remaining 5 accidents involved 2 deactivated aural warning circuits because of a missing fuze and a pulled circuit breaker; a landing with the pilot aware that the gear was still extending; a complete electrical failure; and a no-flap landing during training.) The comment went on to say that the justification in the notice refers only to jet airplanes but the specific proposal applies to all type airplanes. It should be noted that the notice states that "the currently prescribed landing gear warning system is inadequate because of the faster pace of present day operations (which reduces the effectiveness of the checklist on all airplanes) and because of the operational characteristics of jet transports (long straight-in approaches with throttles retarded, occassionally all the way to touchdown) * * *" The notice clearly speaks of all transport category airplanes and is not limited to any particular class. Although the notice refers only to jet transports in regard to long straight-in approaches with throttles retarded, 4 of the 10 transport gear-up landing accidents that the Agency believes would have been prevented by wing-flap-actuated landing gear warning involved propeller-driven airplanes making approaches with throttles retarded. The proposal, therefore, is applicable to all transport airplanes irrespective of method of propulsion.

A comment was received suggesting that the presently required throttle-actuated gear-up warning system is adequate on airplanes which do not have the optional manual shutoff on the aural device and, therefore, on such airplanes the proposed flap-actuated warning system should not be required. The throttle-actuated warning system is not activated during a power-on approach, even if the aural warning device is functioning. Of the transport airplane gear-up landing accidents previously mentioned, one definitely and probably two others occurred after a power-on approach. Therefore, the suggestion has not been accepted.

A comment was received questioning the validity of the premise in the notice that the faster pace of present day operations reduces the effectiveness of the landing checklist. It was contended that the landing checklist may be too long and cumbersome, and suggested shortening it so that flight crews would be more aware of important items such as extending the gear prior to landing. The Agency does not consider that

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landing checklists are unnecessarily long or cumbersome. In none of the gear-up accident investigations was this suggested by flight crewmembers. There is no evidence that shorter checklists would change the cockpit procedures to make the existing warning and indication systems more effective or reduce the frequency of inadvertent gear-up accidents.

A comment was received contending that on certain airplanes the presently required throttle-actuated warning system is ineffective because it activates too many nuisance warnings, and suggests that the proposed wing-flap-actuated system alone should be considered adequate. The proposed warning system is activated when wing flaps are extended beyond a prescribed position; however, if a landing is made in which the wing flaps are not extended beyond the prescribed position, the throttle-actuated warning system is needed. Therefore, the suggestion has not been accepted.

A comment was received which estimated the cost of modification of the total air carrier fleet to be over one million dollars and that this represents only the initial cost and does not include recurring costs for maintenance or delays due to malfunctioning equipment. The comment went on to state that if the proposed installation could contribute materially to safety the cost would not be excessive, but questioned that this has been demonstrated. The Agency does not agree that it is questionable that the proposed installation could contribute materially to safety, but finds that significant improvement in safety will be provided as evidenced in the foregoing discussion.

Several comments indicate that some interpretations of the proposal could result in the warning sounding for long periods of time during approach and takeoff. The intent of the proposal was that on those airplanes for which an approach flap position is determined by the climb performance requirements under which the airplane is type certificated, the warning system would be activated when the wing flaps are extended beyond the maximum approach position. On airplanes whose type certification basis does not include climb performance requirements that determine approach flap positions, the intent of the proposal was to activate the warning system when the flaps are extended beyond the position normally used during landing gear extension. The final rule is clarified in this respect.

A comment was received suggesting that flexibility be permitted in selecting the flap position at which the gear-up warning system is activated. If the selected position is less than that specified in the proposal, as clarified in the preceding paragraph, a large number of nuisance warnings would occur during approaches and takeoffs. On the other hand, if the selected position is greater than that specified in the proposal, as clarified above, the gear-up warning system would lose effectiveness because it would sound late in the approach. Therefore, the suggestion has not been accepted.

A comment suggested changing the proposal to apply only to those airplanes in which the main landing gear is used as a speed control device. None of the inadvertent gear-up landing accidents involved the main gear down and nose gear up, which would occur if the landing gear were not lowered after using the main gear to control airspeed. Therefore, this suggestion has not been accepted.

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CIVIL AIR REGULATIONS PART 40

One comment recommended that, if the proposal is adopted, provision should be made for continuation of flight with the device inoperative. This will be determined by a Flight Operations Evaluation Board for each model airplane affected by the rule and included in the appropriate part of each air carrier's manual, in accordance with § 40.391.

There were other comments which recommended amending the proposal to apply to all aircraft with retractable gears rather than limiting it to airplanes with a maximum weight of more than 12,500 pounds. This recommendation goes beyond the scope of the notice, and would require that an additional notice of proposed rule making be issued. The Agency is conducting a separate study of inadvertent gear-up landing accidents involving small airplanes. If the study indicates that amendments to the gear-up warning system requirements are needed, appropriate proposals will be made.

A number of comments requested that the proposal be revised to specify clearly that the flap position revising unit can be installed at either the flap or the flap control handle. The intent of the proposal was that that the sensing unit can be installed at any suitable location in the airplane and the final rule is so amended.

A comment was received requesting that the compliance date for installation of the proposed warning system be one year after adoption of the rule, to permit adequate time to design, fabricate, and install the system on all airplanes in air carrier operations. The Agency believes that this is a reasonable request and the final rule is amended accordingly. The Agency also considers it appropriate to provide for the possibility that an air carrier may not be able to meet the compliance date due to circumstances beyond his control. The final rule is further amended to include provisions whereby the Agency's assigned inspector may authorize a limited extension of the compliance date.

Interested persons have been afforded an opportunity to participate in the making of this regulation and due consideration has been given to all relevant matter presented. [Added new § 40.155 and revised § 40.-170(c)(1)]

MISCELLANEOUS AMENDMENTS

Effective: July 6, 1964 Amendment 40-42
Adopted: April 15, 1964 29 F.R. 5449

This amendment adds Part 43 [New] to the Federal Aviation Regulations to replace Part 18 of the Civil Air Regulations and is a part of the Agency recodification program announced in Draft Release 61-25, published in the FEDERAL REGISTER on November 15, 1961 (26 F.R. 10698).

Part 43 [New] was published as a notice of proposed rule making in the FEDERAL REGISTER on November 13, 1963 (28 F.R. 12096), and given further distribution as Notice No. 63-37.

During the life of the recodification project, Chapter I of Title 14 may contain more than one part bearing the same number. To differentiate between the two, the recodified parts, such as this one, will be labeled

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"[New]". The label will of course be dropped at the completion of the project as all of the regulations will be new.

Many of the comments received recommended specific substantive changes to the regulations. Although many of the recommendations appear to be meritorious, they cannot be adopted as a part of the recodification program. The purpose of the program is simply to streamline and clarify present regulatory language and delete obsolete or redundant provisions. To attempt substantive changes, other than relaxatory ones that are completely noncontroversial, would delay the project and be contrary to the ground rules specified for it in Draft Release 61-25. However, we recognize that an overall substantive review of the part is long overdue. This review is now being undertaken and all substantive comments received are being carefully studied.

A number of changes have been made in the proposal, both as a result of comments received and as a result of further review by the Agency. As proposed, amateur built aircraft would have been excluded from the applicability of Part 43 [New]. This exclusion has been broadened to include any experimentally certificated aircraft that had not previously been issued a different airworthiness certificate. These aircraft present unique maintenance requirements which can only be met on a case-by-case basis. To require compliance with Part 18 would be impractical and unnecessarily burdensome.

The maintenance authority of air carriers certificated under Part 40, 41, 42 or 46 and of commercial operators certificated under Part 42 has been transferred to those parts and consolidated with other rules relating to their basic responsibility for maintenance.

The definition of "major alteration" in Part 1 [New] is being amended to exclude alterations listed in the aircraft, aircraft engine, or propeller specifications. This makes the definition consistent with Appendix A of Part 43 [New]. In addition, the definition of "airframe" is being amended, for clarity, to specifically include rotors.

Other minor changes of a technical clarifying nature have been made. They are not substantive and do not impose any burden on regulated persons.

The definitions, abbreviations, and rules of construction contained in Part 1 [New] of the Federal Aviation Regulations apply to Part 43 [New].

Interested persons have been afforded an opportunity to participate in the making of this regulation, and due consideration has been given to all relevant matter presented. The Agency appreciates the cooperative spirit in which the public's comments were submitted. [Amended § 40.240]

MISCELLANEOUS AMENDMENTS

Effective: October 26, 1964 — Amendment 40-43
Adopted: April 21, 1964 — 29 F.R. 5627

This amendment amends presently effective Part 40 of the Civil Air Regulations which contains safety certification and operation rules governing air carriers holding economic certificate authority from the

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Civil Aeronautics Board to engage in interstate air transportation within the continental United States, exclusive of the State of Alaska.

Part 40 was extensively revised effective April 1, 1954. While numerous substantive amendments have been made to Part 40 since the last general revision, a review of the provisions of the part indicates a need for additional substantive changes to reflect current Agency and industry views with respect to operating procedures.

FAA proposals with regard to amending Part 40 were issued as a notice of proposed rule making which was published in the FEDERAL REGISTER June 14, 1963 (28 F.R. 6083), and circulated to the industry for comment as Notice No. 63-20. Comments received in response to these proposals were generally in concurrence therewith. However, some comments received took issue with certain of the rules proposed and pointed to the need for clarification of certain others.

The following is a discussion of the major issues raised in response to Notice No. 63-20 and changes made in the proposed rules.

1. Section 40.1 APPLICABILITY OF THIS PART.

The representatives of the air carriers expressed opposition to paragraph (b) of this section which specified that individuals other than an air carrier itself are subject to certain rules in Part 40. The Federal Aviation Agency believes it is essential that this paragraph be retained since a number of situations have been encountered where the safety of operations were affected by actions of individuals other than of the air carrier operating the aircraft.

2. Section 40.11 CONTENTS OF CERTIFICATE.

Comments received on the proposal concurred with the overall intent of this section to clarify the relationship of airports and routes to the operating certificate and operations specifications, but raised a question concerning the necessity for listing all of the airway segments in the operations specifications. The adoption of this amendment does not require the listing of all routes including airway routes and, in fact, permits the continuation of present procedures with the added protection (requested by the air carriers) of incorporating these routes by reference in the air carrier operating certificate.

3. Section 40.20 UTILIZATION OF OPERATIONS SPECIFICATIONS.

Representatives of the air carriers objected to this amendment on the grounds that identifying the source of authority with reference to operations specifications in the individual parts of the manual would be unneccessarily burdensome. This section is being adopted as proposed since the Agency believes it important that the users know which material is derived from or is a part of the operations specifications and which is company policy. The air carriers may exercise their option either to insert in their manual copies of the operations specifications or excerpts from them.

4. Section 40.21 AMENDMENT OF OPERATIONS SPECIFICATIONS.

In view of previous comments on this subject, the Agency has determined that an air carrier should be given an opportunity to present

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its views within a reasonable time whenever it has been determined by an authorized representative of the Administrator that safety in air transportation and the public interest require an amendment to an air carrier's operations specifications. Therefore, this section is being amended to provide that the supervising inspector of the FAA Air Carrier District Office shall give notice in writing to the air carrier fixing a period of not less than seven days within which the air carrier may submit written data, views, and arguments concerning the proposed amendment. After consideration of all relevant matter presented, the supervising inspector shall notify the air carrier of any amendment adopted or the rescission of his notice to amend the air carrier's operations specifications. No substantive changes are being made to the rule which affects the effective date of such an amendment or the air carrier's right of appeal to the Administrator.

5. Section 40.32 WIDTH OF ROUTES.

Comments from representatives of the air carriers indicated that this section as worded would restrict the full use of controlled airspace by the air carriers. However, this is not the purpose or intent of this rule. When routes are approved, the width of the routes, the minimum en route altitudes, the available communication facilities, the air traffic density, the air traffic control procedures, and the adequacy of the navigational aids upon which the route is premised are all taken into consideration. In particular instances, certain of these considerations may need to be inserted in the operations specifications as requirements. Accordingly, in the case of such approved routes, the rule adopted herein provides for the establishment of a route width only when an authorized representative of the Administrator determines it to be necessary. When such a determination is made, the route width will be specified in the operations specifications.

6. Section 40.36 EN ROUTE NAVIGATIONAL FACILITIES.

Comments received objected to the listing of required navigational facilities for routes approved outside of controlled airspace in the air carrier's operations specifications. The Agency has determined that only by means of this listing can adequate control be maintained over the approval of such routes. Therefore, the Agency is adopting the rule as proposed in the interest of safety.

7. Section 40.53(b) AIRPLANE FLIGHT MANUAL.

Comments from representatives of the air carriers stated that it would impose a burden upon the carriers to require that sections of the approved Airplane Flight Manual be identified as such when they are incorporated into the Air Carrier Manual. The Agency believes it important that the users know and appreciate which material is approved in accordance with §§ 4b.740(b) and 4b.740-1, and which is company policy. This section clarifies FAA policy specified in Part 4b regarding this matter. Therefore, this section is being adopted as proposed.

8. Sections 40.61, 40.62, 40.70, 40.90, and 40.110 (AIRPLANE CERTIFICATION AND OTHER SPECIAL REQUIREMENTS):

The limitation in these sections to airplanes used in passenger-carrying operations is deleted so as to make the requirements thereof

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applicable to all airplanes used in operations governed by Part 40. The Agency is currently making a special study in this connection as outlined in CAR Amendment 42-1. If the studies show that further rule making is warranted, the Agency will take appropriate rule making action accordingly affecting Parts 40, 41, and 42 uniformly.

9. Section 40.173 EMERGENCY EQUIPMENT FOR ALL OPERATIONS.

Paragraph (a) is being adopted as proposed in Notice 63-20. It incorporates the substance of § 40.18-4(f)(4) by requiring the air carriers to inspect the required emergency equipment at inspection periods established for the individual air carrier in the operations specifications. Paragraph (e) is being amended to indicate clearly that the intent of this rule is to insure that the emergency evacuation means shall be in a position for immediate installation and ready use. This does not necessarily mean that it must be installed at all times since in some instances this could be more of a hazard than a safeguard.

10. Section 40.174 SEATS AND SAFETY BELTS FOR ALL OPERATIONS.

The air carriers commented that the proposal to amend the current rule is complicated and unneeded. The Agency does not concur. The rule, as adopted, is needed to clarify, among other things, its application in regard to infants, and to expressly require the use of a safety belt by each person.

11. Section 40.176 COCKPIT CHECK PROCEDURE.

Comments received from the air carriers in response to this proposal objected to requiring approval of check procedures on the theory that it would delay any change in the procedures and thus restrict the responsiveness of the airplanes in lessons learned from daily operating experience. The Agency does not agree with this viewpoint and considers that such approval is necessary to insure, as stated in Notice 63-20, completeness and uniformity in cockpit check procedures for each type of airplane used. Accordingly, the rule is being adopted as proposed.

12. Section 40.177 PASSENGER INFORMATION FOR ALL OPERATIONS.

Instances of failure (and even refusal) of passengers to obey the no smoking and fasten seat belt signs have been brought to the attention of the Agency. Since the Agency believes it important that no passenger or cabin attendant be allowed to smoke while the no smoking sign is lighted and that all passengers should be required to keep their safety belts fastened while the safety belt sign is on, the Agency is adopting the rule as proposed.

13. Section 40.179 SHOULDER HARNESS.

Comments received on this proposal indicated that air carriers desired to make this requirement applicable only to future new airplane certifications. However, the benefits to be derived from the shoulder harness have been most apparent since the introduction of the turbine-powered, faster types, of transport airplanes manufactured since January 1, 1958, consequently this requirement is adopted as proposed.

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Representatives of the air carriers also took issue with the requirement for shoulder harnesses for the outboard facing flight engineer seats on those airplanes having a separate flight engineer station, since on this type of seat, a shoulder harness may not necessarily provide the restraining action through the body axis for which this harness is designed. The Agency cannot agree with this concept since the air carrier has a wide latitude in the selection of the harness and its installation, subsequent to approval by the FAA. Therefore, the Agency is adopting the rule as proposed.

14. Section 40.202 SUPPLEMENTAL OXYGEN; RECIPROCATING-ENGINE-POWERED AIRPLANES.

As a result of comments received, § 40.202(b) and (c) are being amended to incorporate the words "cabin pressure altitude" in lieu of the present words in order to clarify the intent of these paragraphs.

15. Section 40.206 EQUIPMENT FOR EXTENDED OVERWATER OPERATIONS.

Comments received indicated concern with the phrase in the proviso pertaining to the authority of the Administrator to "require the carriage of all the prescribed equipment or any item thereof, for any operation over water." The Agency cannot agree that the adoption of this language in the proviso would be unduly restrictive, as there could conceivably be overwater operations authorized which, while not in the extended overwater category, might require the carriage of certain prescribed survival equipment. Accordingly, the proviso has been adopted to make the requirements more explicit and to provide uniformity with parts 41 and 42.

16. Section 40.233 RADIO EQUIPMENT FOR EXTENDED OVER-WATER OPERATIONS.

In light of certain comments received, the provisions of this section have been revised to delete the proposed requirements pertaining to operations other than extended overwater operations. We concur with industry comments that the nature of the terrain over which domestic air carriers operate is such that the need for special equipment for search and rescue operations is remote.

17. Sections 40.280 through 40.300(a) (AIR CARRIER TRAINING PROGRAMS):

These sections as proposed in Notice 63-20 are not included herein, but are being handled by a separate amendment as proposed in Draft Releases 61-7, 61-17, and 62-9.

18. Section 40.302 PILOT CHECKS.

Comments from representatives of the air carriers took issue with the proposal on the grounds of increased stringency of the regulations caused by the inclusion in the part of various maneuvers which were previously included as "Rules" in the Civil Aeronautics Manual. The maneuvers referred to have been required by the Civil Aeronautics Manual for many years and the regulations being adopted have the same effect as these CAM's. Therefore, the Agency is adopting the proposal as presented.

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CIVIL AIR REGULATIONS PART 40

19. SECTION 40.307 FLIGHT ENGINEER QUALFICIATION FOR DUTY.

Comments received from representatives of the air carriers objected to this proposal on the grounds that restricting the conduct of initial qualification checks or requalification checks in scheduled air transportation was unreasonable and unwarranted based on airline operating experience. However, after considering all relevant matter regarding this proposal, the Agency still believes it important not to conduct initial and requalification checks in scheduled air transportation. The regulation as adopted herein is most flexible in that it provides for different qualifying alternatives, depending on previous experience. However, it rightfully precludes the accomplishing of an initial qualifying flight check for a flight engineer in the course of a scheduled flight in air transportation. Accordingly, the Agency is adopting the rule as proposed.

20. Section 40.310 AIRCRAFT DISPATCHER QUALFICATION FOR FOR DUTY.

Notice 63-20 proposed to amend this section to permit greater overall flexibility of the dispatcher route qualification requirements. Representatives of the dispatchers association opposed any changes in the present rules as being unnecessary. However, the Agency has determined that this requirement, in its revised form, will not compromise the high level of safety required in air transportation. Accordingly, paragraph (b) is being adopted as proposed to require at least "a one-way qualfication trip" rather than a mandatory round trip over "the particular area" in which the dispatcher serves within the 12-month period. This change permits a one-way trip, or, in the event that a round trip is made, the return trip may be made over either the same or a different route.

21. Section 40.360 EMERGENCY DECISIONS; PILOT IN COMMAND AND AIRCRAFT DISPATCHER.

In response to comments received, paragraph (c) is being clarified to insure that both the appropriate air traffic control facility and the appropriate air carrier dispatch center will be kept fully informed regarding the progress of a flight whenever emergency authority is exercised by the pilot in command.

22. Section 40.361 REPORTING POTENTIALLY HAZARDOUS METEOROLIGICAL CONDITIONS AND IRREGULARITIES OF GROUND AND NAVIGATIONAL FACILITIES.

Comments received indicated some opposition to the proposal which clarified the responsibility of air carriers to report all information received regarding irregularities in ground or navigational facilities to the authority directly responsible for its operation. The comments suggested that such irregularities should be reported to the FAA. However, since some air carriers utilize communications and navigational facilities in particular instances other than those operated by the U. S. Federal Government, the Agency is adopting the rule as proposed.

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CIVIL AIR REGULATIONS PART 40

23. Section 40.363 ENGINE FAILURE OR PRECAUTIONARY STOPPAGE.

Notice 63-20 had proposed to delete subparagraph (2) of § 40.363(b) which includes a requirement that pilots must consider the availability of the inoperative engine for use before proceeding to an airport of his selection. Notwithstanding contrary industry opinions, this factor has been deleted as proposed. The Agency believes that it should not be a consideration due to the inherent danger from fire and other sources when a malfunctioning engine is restarted after shutdown. There have been cases where this was used in pilots' written reports as one of the justifications for proceeding, when a subsequent investigation proved that, if the engines had been restarted, there would have been serious fire hazards. Therefore, the Agency is adopting the rule as proposed.

24. Section 40.388 ALTERNATE AIRPORT FOR DEPARTURE.

The proviso formerly contained in section 40.388 has been deleted in this rule inasmuch as it negated the entire purpose of the rule. As stated, the proviso would permit an air carrier to dispatch an airplane from an airport without a specified alternate when the weather is 300-1 even though higher takeoff minimums are specified at a particular airport due to obstructions.

25. Section 40.391 CONTINUANCE OF FLIGHT; FLIGHT HAZARDS.

Comments received objected to the requirement that air carriers have approved minimum equipment lists incorporated in the air carrier manuals, not only for initial dispatch of aircraft, but for continuation of flight in the event any required equipment becomes inoperable.

As noted in Notice 63-20, for a number of years the Agency has considered it necessary and made a practice of approving minimum equipment "go-no-go" lists governing en route operations with required equipment inoperative. This was done in accordance with the proviso in the amended § 40.391(b) which specified "that the Administrator may authorize the incorporation in the air carrier manual of procedures for the continued operation of an airplane beyond a scheduled terminal * * *."

Notice 63-20 also stated that the Agency still considers the current practice of approving minimum equipment lists and procedures governing en route operations with required equipment inoperative to be necessary. This is especially important in connection with those procedures which apply to large, turbine-powered, complex airplanes introduced into service in recent years. Similar reasons were also given for the adoption of this rule in the preamble to Part 41 which became effective in March 1963.

Accordingly, the rule is being adopted as proposed.

26. Section 40.501 CREWMEMBER AND DISPATCHER RECORDS.

Representatives of the air carriers opposed the increase from three to six months for record retention for crewmembers and dispatchers whose service with the airlines are terminated. However, the Agency has found that there is a need for this increase in the period of record retention since it is often necessary to investigate occurences from two to four months after they occurred. Former airline personnel

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are often involved. These investigations, conducted in the interest of safety, are hampered by the premature destruction of records and, therefore, the Agency believes it to be in the public interest to adopt the rule as proposed.

27. Section 40.507 MAINTENANCE LOG.

Upon further consideration and in light of comments received from the representatives of the pilot's and flight engineers' organizations, the Agency has determined that it should not delete the requirement concerning information contained in the maintenance log relative to the time interval since the last overhaul of the airframe and engines. This information is stated to be of considerable importance to the flight crews in the performance of their duties. Accordingly, the proposed change to this section is not being made.

Interested persons have been afforded an opportunity to participate in the making of these rules, and due consideration has been given to all relevant matter presented. [Made numerous revisions throughout Part 40]

EMERGENCY EQUIPMENT FOR OVERWATER OPERATIONS

Effective: November 2, 1964 Amendment 40-44
Adopted: April 30, 1964 29 F.R. 5941

The purpose of this amendment is to require survivor locator lights on life preservers and liferafts for extended overwater operations.

The Federal Aviation Agency published as a notice of proposed rule making (28 F.R. 8214), and circulated as Notice No. 63-32 on August 5, 1963, a proposal to amend Parts 40, 41, and 42 of the Civil Air Regulations to require that each preserver and liferaft, when carried in accordance with these regulations, be equipped with a means of illumination (survivor locator light) for the purpose of facilitating the location at night of persons who have survived a water landing in an aircraft.

All of the comments received in response to this notice were in general agreement with the proposal it contained.

The desirability of requiring life preservers and liferafts to be equipped with a means of illumination, which would materially assist in the rescue of persons from the water at night, has long been recognized. Such a requirement would have been prescribed in 1954 if lights had been developed to a level of reliability sufficient to justify a mandatory requirement at that time.

The Agency has developed standards for survivor locator lights in its Technical Standard Order TSO-C85 issued concurrently with this rule. Lights meeting these standards are commercially available in quantity, and can be readily approved by the Agency. In addition, survivor locator lights which have been fitted to life preservers and liferafts on a voluntary basis in the past generally conform to TSO-C85. However, in order to allow an adequate time for procurement, installation, and approval of the prescribed lights for all operators, this amendment is made effective 180 days after its date of publication in the FEDERAL REGISTER. [Added §40.206(a)(5)]

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CIVIL AIR REGULATIONS PART 40

CLOSING AND LOCKING FLIGHT CREW COMPARTMENT DOORS

Effective: August 6, 1964
Adopted: May 1, 1964

Amendment 40-45
29 F.R. 6003

The purpose of this amendment is to revise the present operating rule to require the door which separates passenger compartments from flight crew compartments of large passenger-carrying airplanes operated by air carriers to be closed and locked during certain operations of these airplanes.

On December 6, 1962, the Federal Aviation Agency issued a notice of proposed rule making outlining this proposal which was published in the FEDERAL REGISTER December 20, 1962 (27 F.R. 12649), and circulated as Civil Air Regulations Draft Release No. 62-54. Many of the comments received opposed the proposal as contained therein. Objections were primarily addressed to the point that a locked door will not prevent a determined individual from entering the flight crew compartment. The Agency recognizes that there can be no perfect protection from crime or insanity but believes that locked doors will deter passengers from entering the cockpit and in general will serve the purpose for which the rule is designed; namely, to require the locking of the crew compartment door to preclude inadvertent entry and to act as a deterrent to all unauthorized persons predisposed to enter the flight deck.

Consideration has been given to comments with respect to when and how the crew compartment door must be locked. The notice took into consideration certain aircraft whose flight crew compartment doors must be placarded to indicate that they must be open during takeoff and landing in that it is a means of access to a required passenger emergency exit. This thought has been incorporated into the regulation thereby eliminating the problem on most aircraft as to when and where the door is to be unlocked.

The regulations have for many years restricted the admission of passengers and other unauthorized persons from the flight crew compartment of large airplanes used by air carriers. In conjunction with this requirement, a means for locking all companionway doors which separate the passenger compartment from the flight crew compartment has been required as a part of the basic equipment for most airplanes. The requirement to lock these doors should not, therefore, pose a problem for the air carriers, many of whom have, in fact, always made it a practice to lock these particular doors in flight. [Added §40.373]

REQUIREMENTS FOR AIR CARRIER CONTINUOUS AIRWORTHINESS PROGRAM

Effective: October 19, 1964
Adopted: May 13, 1964

Amendment 40-46
29 F.R. 6522

The Federal Aviation Agency published as a notice of proposed rule making (27 F.R. 12191), and circulated as Civil Air Regulations Draft Release No. 62-51, dated December 3, 1962, a proposal to amend Parts

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40, 41, 42, and 46 of the Civil Air Regulations to require each air carrier to establish an approved quality control program, including a maintenance and inspection organization, to assure the proper performance of maintenance.

The notice stated that regulations governing air carrier maintenance programs, maintenance personnel, and performance of maintenance have been found to be basically sound. However, investigation of several major accidents and surveillance of air carrier maintenance activities by the Agency have indicated weaknesses in the airworthiness program of some air carriers, with the significant deficiency being in the inspection area.

As a result of a study of the comments received in response to Draft Release 62-51 and a further analysis of the problems involved, the Agency decided that several changes were necessary to the rule as proposed in Draft Release 62-51. These changes were set forth in a revised proposal which was incorporated in a Notice of Public Hearing issued December 26, 1963 (29 F.R. 50), by the Director, Flight Standards Service, and a hearing was held on January 29, 1964, in Washington, D. C., to receive the written and oral views of interested persons on the revised proposal.

Although the provisions of the proposal refer to applicable sections of Part 40, identical provisions were also proposed to the comparable sections of Parts 41, 42, and 46. Therefore, the discussion and comments relating to the proposal have been combined in a single preamble for all the parts using references to the applicable sections of Part 40. However, any comment or discussion in the preamble referring to a particular section of Part 40 is equally applicable to the corresponding sections of Parts 41, 42, and 46. In addition, although the proposal referred only to air carriers, it is equally applicable to commercial operators conducting operations under those parts.

At the public hearing conducted by the Agency a spokesman for the Agency described the proposed amendments and the basic reasons for this regulatory action. The merits of the pertinent comments submitted by the industry in response to Draft Release 62-51 and the Notice of Public Hearing, and the changes made in the proposal as a result of such comments, were discussed. Therefore, further discussion of those comments is not considered necessary and the comments discussed herein are limited to those received at the hearing.

A comment made at the public hearing pointed out that the term "executive level" as used in § 40.241(c) of the proposal is ambiguous and does not clearly indicate the point at which separation between the inspection and maintenance organization should occur. The Agency believes there is merit in such comment and in order to clearly define the area in which the separation between the inspection functions and the maintenance and alteration functions must take place, the rule now provides that such separation must occur below that level of administrative control at which overall responsibility for the management of both the maintenance and inspections is exercised.

In another comment regarding § 40.241(c) it was pointed out that the clause "unless the Administrator or his authorized representative de-

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termines in a particular situation that the separation of functions is not necessary or feasible'' is not appropriate because the separation in functions is necessary all of the time and under all situations. The Agency agrees that a separation between the inspection organization and the maintenance organization is necessary at all times when the inspection of required items is being performed in addition to maintenance. Therefore, since this regulation is specifically concerned with inspections of required inspection items, the Agency believes that the subject clause serves no useful purpose and it has been deleted from the regulation.

For the purpose of providing a more suitable arrangement to the provisions of the regulation, certain of the requirements of §§ 40.240 and 40.241 have been combined. In this connection, it should be noted that paragraph (c) of § 40.241 now contains only the requirements concerning the separation of the maintenance and inspection functions and makes it clear that the organizational separation applies both to the air carrier and the person with whom it arranges for the performance of such functions. In addition, § 40.241(f)(8) has been revised to make it consistent with the provisions of § 40.241(c) concerning the point at which inspection and maintenance functions come under common control. Finally, the provisions of § 40.241(j) have been revised to make it clear that the air carrier does not have to maintain the listing of individuals who have been trained, qualified, and authorized to inspect required inspection items, if it is determined that the person with whom the carrier arranges for the performance of its inspections maintains such a list.

A comment expressed concern with the proposed provisions of § 40.242(b) which would give an authorized representative of the Administrator the authority to require an air carrier to make such changes in its maintenance and inspection programs as are necessary to meet the requirements of the regulations. The comment was based upon an apprehension that ''undue power'' would be given to the local FAA inspectors if this provision was adopted without a right of appeal by the air carrier from any decision made by such representative of the Administrator. Since the rules permit each air carrier to design and establish maintenance and inspection programs which are compatible with its particular operation, the local FAA inspector, as the authorized representative of the Administrator, is the proper person to determine whether the particular program established by the carrier meets the requirements of this regulation. In this respect it is to be noted that the Agency's rule-making procedures provide that any interested person may appear informally before an appropriate official of the FAA to present, adjust, or determine a question or controversy relating to a rule-making function of the FAA (§ 11.37 [New]). Although this provision covers situations involving a controversy between the local inspector and the air carrier as to the requirements of regulations, § 40.242 has been amended to prescribe the procedures by which such a petition for reconsideration may be made.

There were also comments opposing the provisions of § 40.511(b)(3) which permit a certificated repairman to sign a release for the airworthiness of an aircraft. These comments were based upon the belief that a repairman is qualified only to sign for the work which he has performed and for which he is certificated and, therefore, should not be al-

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lowed to assume a responsibility in excess of his training, authorization, or certificate. In this connection, it should be pointed out that the regulation was intended to permit a repairman to sign the release only for work for which he is employed and certificated. Under this regulation, the repairman would not be assuming responsibilites in excess of his learning or ability and would be signing only for work for which he is employed and certificated. However, to make this clear § 40.511(b)(3) has been changed to expressly limit the authority of the repairman to sign the release or entry for work for which he is employed and certificated. In addition, a question was raised as to whether the release or entry may be signed by a certificated mechanic or repairman who is not a person authorized to perform required inspections. Since this authority was intended, the language of § 40.511(b)(3) has been changed by deleting the words "a person authorized to perform inspections" and merely referring to a certificated mechanic or repairman as the person who may be authorized to sign the release or entry.

Subsequent to the issuance of the Notice of Public Hearing, the Agency amended Parts 40, 41, 42, and 46 (Amendments 40-42, 41-8, 42-7, 46-8; 29 F.R. 5450) by transferring from Part 18 to §§ 40.240, 41.240, 42.240, and 46.240, the provisions regarding the maintenance authority of an air carrier or commercial operator certificated under that part. However, in order to place these amendments in their proper sequence in Parts 40, 41, 42, and 46, the provisions concerning the maintenance authority of the air carrier or commercial operator have been moved without change by this amendment to new §§ 40.246, 41.246, 42.246, and 46.246.

Interested person have been afforded an opportunity to participate in the making of this amendment and due consideration has been given to all relevant matters presented.

This amendment is subject to the FAA Recodification Program announced in Draft Release No. 61-25 (26 F.R. 10698); however, it will not result in any substantive change in the rules as adopted herein. [Revised §§ 40.240, 40.241 and 40.511; redesignated §§ 40.243 and 40.245; added new §§ 40.242, 40.244 and 40.246; and deleted § 40.511-1]

MISCELLANEOUS AMENDMENTS

Effective: July 12, 1964 — Amendment 40-47
Adopted: June 26, 1964 — 29 F.R. 8405

The Federal Aviation Agency published as a notice of proposed rule making (29 F.R. 2880) and circulated as Civil Air Regulations Notice 64-10 dated February 29, 1964, a proposal to amend Parts 40, 41, and 42 of the Civil Air Regulations to provide for the operation of the non-transport category C-46 airplane in cargo operations.

As indicated in the notice, the Agency believes that the C-46 airplane can continue to be operated with reasonable safety without full compliance with the certification and operating requirements applicable to transport category airplanes. However, there is a need for improvement in the safety requirements over and above the applicable requirements in old Part 42.

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The purpose of this amendment is to set forth the minimum safety requirements necessary for the continued use of the C-46 nontransport category airplane in cargo operations.

Although the provisions of the proposal specifically referred to C-46 nontransport category cargo-only operations which are conducted under Part 42 of the Civil Air Regulations, it was proposed to make similar amendments to Parts 40 and 41 to provide for the use of such airplanes in cargo operations conducted under those parts. As adopted herein, the final amendment also permits the nontransport category C-46 to be used in parts 40 and 41 cargo operations under the same conditions as such airplanes are used for the carriage of cargo-only under Part 42. Since the type of engines required for the C-46 airplanes, the performance data related to such airplanes, and the minimum acceptable means of compliance with the special airworthiness requirements are identical for the operation of the C-46 under Parts 40, 41, and 42, these requirements are set forth in a new Appendix C to Part 42 and incorporated by reference in Parts 40 and 41.

Because the amendments to Parts 40, 41, and 42 are identical, the discussion of the comments relating to the proposal have been combined in a single preamble for all the parts, using references to the applicable sections of Part 42. Consequently, any comment or discussion in this preamble referring to a particular section of Part 42, is equally applicable to the corresponding sections of Parts 40 and 41.

Comments received in response to Notice 64-10 were primarily concerned with the Agency's proposal to require the installation of R2800-51-M1 or R2800-75-M1 engines or other engines acceptable to the Administrator on nontransport category C-46 airplanes used in cargo-only operations. The Agency proposed that if engines other than those specified were used, the approved takeoff gross weight would be reduced from 48,000 pounds to 45,000 pounds.

While one organization indicated general agreement with this proposal, they requested that conversion to the 51-M1 and 75-M1 engines be made at each scheduled engine change that occurs after the effective date of the rule, with all "B" engines being changed or converted prior to March 1, 1965. They further suggested that during this period operation of the airplanes be permitted to continue at a maximum gross takeoff weight of 48,000 pounds.

With respect to the compliance dates for these amendments, the Agency agrees that the C-46 operators should be given a period of time in excess of that specified in the proposal in which to show compliance with all of the special airworthiness requirements and to accomplish the engine conversion required by this amendment. The Agency believes that full compliance with such requirements can reasonable be accomplished by January 1, 1965, without imposing an undue burden on any operator, and the amendments adopted herein specify such date for compliance. Compliance with the airplane performance operating limitations set forth in §§ 42.90 through 42.94 (or the comparable sections of Parts 40 and 41), is not required under these amendments until August 12, 1964, if the requirements of § 42.14-1(b) of Part 42 in effect on November 10, 1963, are complied

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with. These amendments also permit continued use of the airplanes at a maximum gross takeoff weight of 48,000 pounds through December 31, 1964 with unmodified R2800 "B" series engines. After that date, C-46 nonstransport category airplanes equipped with such unmodified engines may continue to be used in cargo operations but at a reduced maximum gross takeoff weight not exceeding 45,000 pounds. However, such airplanes must be in full compliance with all the other provisions of this regulation.

In addition, certain of the Alaskan operators objected to the proposal insofar as it required the installation of M1 engines. They contend that in their area of operation, they have experienced no problem of engine cooling in operating the R2800-51 or R2800-75 unmodified engines. In fact, they state that it is almost impossible to get the cylinder head temperatures with unmodified engines above 140° — 150° during winter operation; and, quite often, cylinder head temperatures of 120° are difficult to maintain. The Alaskan operators also contend that, in their geographical area of operations, they have never encountered high cylinder head temperatures or difficulty in maintaining desired temperatures during single-engine operations. On the other hand, they contend that if they are required to install the M1 engines, considerably lower cylinder head temperatures can be expected, to a point where safety would be adversely affected. They also point out that operators using the M1 engines in the colder climates are continually trying to devise methods for raising engine cylinder head temperatures to the normal operating range.

As expressed in Notice 64-10, engine cooling during one-engine-out operations is one area in the operation of C-46 nontransport category cargo-only airplanes which the Agency believes needs improvement. The R2800-51-M1 or R2800-75-M1 engines are known to operate cooler than unmodified "B" series engines when either type are installed in nontransport category C-46 airplanes. In most areas, this feature of the M1 type engines will provide increased safety during one-engine-out operations at high gross weight and utilizing high engine horsepower on the remaining engine. However, since it is quite possible that operations in some areas of Alaska with modified R2800 M1 engines may produce problems that cannot be corrected by other means, the Agency agrees that some relief should be provided those C-46 Alaskan operators who operate only in those areas, provided, the Alaskan operators can show that adequate safety will be provided with unmodified R2800 "B" series engines. Therefore, the regulation, as adopted herein, permits an Alaskan operator of C-46 cargo airplanes to continue to operate such airplanes at a maximum takeoff weight in excess of 45,000 pounds with unmodified R2800 "B" series engines, if such operator shows to the satisfaction of the FAA that the installation of the M1 engines is not necessary to provide adequate cooling in one-engine-out operations. The use of such unmodified engines is made subject to such conditions and limitations as may be found necessary and incorporated in the appropriate operations specifications of the operator concerned.

Another operator located in the southwestern part of the United States also objected to the proposal to either convert to the M1 engine or to accept a load penalty of 3,000 pounds. It was not clear to him as

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to whether the oil temperature or the cylinder head temperature was considered critical under METO engine operations and maximum gross weight. Thus it was difficult for him to rationalize how the arbitrary reduction in gross weight of 3,000 pounds was selected. The proposal referred to engine cooling as an area requiring improvement. The cooling of both the oil and the cylinder heads are relevant to this problem and must be considered in its solution. The selection of a 45,000-pound maximum takeoff weight for operation with unmodified engines provides a needed improvement in the airplane's single-engine performance. Moreover, the performance charts and related information are readily available at this gross weight and pilots and operators are generally familiar with the airplane's operation and performance at such weight.

Comments were also received concerning the proposed content of the new Appendix C of Part 42, which sets forth the acceptable means of compliance with the special airworthiness requirements of §§ 42.110 through 42.154.

In response to a comment received, the language of the section of the Appendix relating to § 42.115, has been changed to make it clear that a C-46 main cabin is considered a Class A compartment if it meets all the requirements specified in that section of the Appendix.

Another comment requested clarification of the "barrier cable assembly" also referred to in the Appendix provision relating to § 42.115. It was not intended that the barrier assembly meet the G load requirements of transport category airplanes. The barrier was proposed primarily to fix the forward cabin boundary beyond which cargo cannot be carried, and thus prevent the storing of cargo too close to components of the airplane which are essential to its safe operation, and to protect the forward cabin from damage that may be caused by small pieces of cargo not retained by the cargo tiedown equipment. The Appendix has been revised to clarify the requirements for a cargo barrier in accordance with the foregoing.

In addition, a comment requested that, if the forward and aft lower baggage compartments are used, the external skin be considered minimum acceptable compliance with the fire-resistant liner requirement for Class B compartments. The Agency has considered this comment and finds that the external skin would not be acceptable as fire-resistant lining in Class B compartments.

The proposal contained a requirement, relating to §§ 42.127 and 42.128, that the combustion heater compartments of nontransport category C-46 airplanes be modified to comply with Airworthiness Directive (AD) 49-18-1. Paragraph (5) of that AD requires the installation of a manual fuel shutoff valve. One comment received by the Agency requested that an electric fuel shutoff valve also be considered as acceptable. The Agency agrees with this comment and the Appendix has been changed to provide for the acceptability of a fail safe electric fuel shutoff valve in lieu of a manually operated fuel shutoff valve.

Compliance with AD 49-18-1 also requires the installation of a fixed fire extinguisher in the C-46 airplane combustion heater compartment. One comment requested that a portable fire extinguisher be considered

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as acceptable compliance with that portion of the AD. The Agency does not agree that a portable fire extinguisher can provide the necessary protection because of the restricted access, in flight, to C-46 heater compartments. Since any fire in this area is serious, immediate extinguishment must be available.

With respect to the requirement for a shutoff valve in the alcohol supply line between the supply tank and those alcohol pumps located under the main cabin floor, one comment requested that the valve not be required if the alcohol pumps are located above the main cabin floor. Since this result was intended in the proposal, the language has been revised to make it clear that the valve is required only if the alcohol pumps are located under the main cabin floor.

Certain of the comments received in response to Notice 64-10 indicated some concern as to the type of C-46 engine fire-extinguishing system proposed by the Agency. As stated by the Agency in Notice 64-10, "The fire-extinguishing systems, the quantity of extinguishing agent, and the rate of discharge shall be such as to provide a minimum of one adequate discharge for each designated fire zone." The notice further explained that "insofar as the engine compartment is concerned, the system shall be capable of protecting the entire compartment against the various types of fires likely to occur in the compartment." For the purpose of further clarification, the provision in the Appendix relating to § 42.136 has been revised to state that to meet the requirement of one adequate discharge for each fire zone, requires the installation of a separate fire extinguisher for each engine compartment. The notice also mentioned types of engine fire-extinguishing systems that would meet the foregoing adequacy requirements. One such type was described as a system which "provides the same or equivalent protection to that demonstrated by the CAA in tests conducted in 1941 and 1942 using a CW-20 type engine nacelle (without diaphragm)."

Comments received from the National Air Carrier Association (NACA) citing CAA Technical Development Report No. 37, titled "Determination of Means to Safeguard Aircraft From Powerplant Fires in Flight" — Part II, dated October 1943, furnished a comparison between data contained in CAA Report No. 37 and the flow rates and distribution of fire-extinguishing agent provided by one type of C-46 engine fire-extinguishing system now in use. The comparison, according to NACA, shows that the system they describe does provide fire protection equivalent to that demonstrated by the CAA in the CW-20 tests. Furthermore, the system they describe was approved by FAA February 9, 1953, for American Airmotive, Miami, Florida, as presented in American Airmotive Report No. 128-52-1, titled "Engine Section CO_2 Fire Extinguishing System Installation (C-46 airplanes)," dated November 25, 1952.

The Agency has evaluated the material submitted by NACA and has concluded that C-46 engine fire-extinguishing systems which conform to all other applicable airworthiness requirements in design and installation, and which provide the flow rates and distribution of extinguishing agent at least equivalent to that approved for American Airmotive in their report No. 128-52-1, would meet the requirements of § 42.136.

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From the comments received concerning the provision in the Appendix relating to § 42.154, it appears that there is a general lack of familiarity with the "Logair cargo configuration" referred to therein. Therefore, reference to such Logair configuration is deleted from the final rule.

Interested persons have been afforded an opportunity to participate in the making of these amendments, and due consideration has been given to all relevant matter presented. The provisions of these amendments, with the exception of the minimum oil requirement, become effective at least 30 days from the date of publication. The Agency finds that compliance with the oil requirement is necessary and good cause exists for making it effective without further delay. [Added new § 40.61(c)]

INSTALLATION OF COCKPIT VOICE RECORDERS IN LARGE AIRPLANES USED BY AN AIR CARRIER OR A COMMERCIAL OPERATOR

Effective: September 2, 1964 Amendment 40-48
Adopted: June 26, 1964 29 F.R. 8401

The purpose of these amendments is to require the installation of approved cockpit voice recorders in certain large airplanes used by air carriers or commercial operators. The requirements include rules for the operation of the recorders, standards of performance for their approval, and standards governing the method of installation on an airplane.

On December 18, 1963, the Federal Aviation Agency published a notice of proposed rule making circulated as Notice 63-46 (28 F.R. 13786), containing proposals to amend Parts 4b, 40, 41, and 42 of the Civil Air Regulations, Part 91 [New] of the Federal Aviation Regulations, and Part 514 of the Regulations of the Administrator, to accomplish this purpose. As stated in the notice, the Agency believes that cockpit voice recorders would be a valuable tool in the investigation of accidents by providing firsthand information of the flight crews' observation and analysis of conditions aboard the airplane and the procedures employed by them to cope with an emergency. This information would also facilitate the development and establishment of appropriate corrective procedures and standards by the Agency and industry.

A large number of comments were received in response to Notice 63-46. These comments have been carefully studied by the Agency and, where appropriate, changes have been made in this final rule. The following is a discussion of the major issues raised in response to the notice and the action, if any, taken by the Agency in the final rule.

1. CRASH AND MAINTENANCE RECORDERS.

The Air Transport Association urged government and industry to devote their current efforts and funds to crash and maintenance recorders and to exclude a separate voice recorder effort. This comment was based on the belief that the potential benefits of improved crash or maintenance recorders are far greater than those of the cockpit voice recorders proposed in the notice. The ATA pointed out that voice recordings could be misleading in the investigation of accidents, because

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the spoken words might describe one situation (e.g., approach lights are not visible) and immediately thereafter the situation might change (approach lights are seen) but with no words being spoken.

The Agency agrees that improved flight (crash) or maintenance recorders would be of great assistance in accident investigation; however, it does not believe that the development and eventual installation of such recorders will obviate the present or future need for cockpit voice recorders. Although the flight or maintenance recorder supplies information about the airplane itself, the cockpit voice recorder is needed to supply firsthand information concerning the flight crew's observation or analysis of the situation and the procedures employed by them. Fragmentary information from voice recorders may, in some instances, be misleading. Nevertheless the Agency believes that the information provided by the voice recorder will in most instances be helpful.

2. EXEMPTION OF CERTAIN CLASSES OF AIRPLANES.

The ATA also recommended that reciprocating twin-engine airplanes (e.g., DC-3, Convair 240, 340, 440, Martin 202, 404) be excluded from the cockpit voice recorder requirements because these airplanes have a proven safety record as shown by extensive service experience, and their remaining useful life is relatively short. The Agency finds merit in this recommendation, especially since flight recorders are not required on such aircraft and the effectiveness of the voice recorder on such aircraft may be reduced because of the high cockpit sound level. Further, the Agency considers that this reasoning applies also to nonpressurized reciprocating four-engine airplanes. The installation of cockpit voice recorders is therefore being required only for airplanes in the following classes:

(1) All large turbine powered airplanes;

(2) All large pressurized reciprocating four engine airplanes.

3. RESTRICTED USE OF RECORD.

Several comments recommended that the rules prohibit the use of cockpit voice recording for any purpose other than accident investigation. One comment recommended a rule that recordings shall not be used in any civil penalty, or certificate action, and shall not be disclosed publicly when such disclosure would adversely affect the interests of persons involved and is not in the interest of the public. Another comment recommended that only specified unbiased agencies (e.g., the Bureau of Standards, FBI, or Flight Safety Foundation) be authorized to perform readout of tapes.

The Agency agrees that its only purpose in requiring the recorded information is to assist in determining the cause of accidents or occurrences, and that the information should be used only in connection with the investigation of accidents or occurrences pursuant to Part 320 of the Board's Accident Investigation Regulations, (14 CFR Part 320) and not in any civil penalty or certificate action. A provision to this effect has been adopted. The Agency cannot, of course, bind the Courts or the Civil Aeronautics Board with respect to accident information and could not, even if it found it desirable, specify by rule those persons who would be authorized to read out voice recorder tapes.

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4. BULK ERASURE.

Recommendations were made that a "bulk erasure" device be required in the recorder. The Agency believes that the provision of a bulk erasure feature should be a matter of individual determination by the air carriers involved and the rules being adopted neither require nor prohibit a bulk erasure feature. If bulk erasure devices are used the rules as adopted herein include a requirement that the installation minimize the probability of inadvertent operation or the actuation of the device during crash impact.

5. LOCATION OF RECORDER.

The Civil Aeronautics Board recommended that the recorder unit which contains the record be located well back in the pressurized area of the fuselage (to minimize damage in a crash), since the proposed standards for the cockpit voice recorder specify an impact test of only 100g acceleration. Another comment made a similar recommendation.

The Board has supplied information concerning the damage which has occurred to flight recorders during accidents involving severe damage. This information indicates that in 13 out of 15 such accidents, the flight recorder was broken open and in 8 accidents fire also occurred. In all 15 of these accidents, flight recorders were mounted in the radio rack, wheel well, or center section. Thus service experience shows that flight recorders located in the radio rack, wheel well, or center section frequently break open during crashes, and expose the record medium to subsequent fire in about half of these crashes.

The Agency agrees with the recommendation of the Civil Aeronautics Board. Cockpit voice recorders designed to the current 100g impact standard can reasonably be expected to break open as frequently as the presently used flight recorders. The magnetic tape used in cockpit voice recorders should be kept below 250° F., in order to preserve the record, and is, therefore, much more vulnerable to heat damage than is the metal tape used in flight recorders. Therefore, voice recorder records would probably be lost in a number of accidents if the record containers have the same crash resistance and the same location in the airplane as the currently installed flight recorders.

There is no statistical evidence to make a direct comparison of the damage suffered by flight recorders in forward and aft locations. However, accident investigators have found that the aft portion of an airplane generally suffers less damage than the forward portion during crash impact.

In accordance with the recommendation of the Board § 4b.656(e) as adopted herein requires that the recorder container be located as far aft as practicable so as to minimize the probability of rupture of the container as a result of crash impact and consequent heat damage to the record because of fire. However, it need not be located outside the pressurized compartment and must not be located where aft mounted engines are likely to crush the container during impact.

6. CRASH RESISTANCE CRITERIA.

A recommendation was received that the proposed standard for

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impact shock and fire protection tests (section 3.13 of "Minimum Performance Standards for Cockpit Voice Records" dated November 1, 1963) be revised in adopting the final rules by increasing the impact acceleration from 100g for 11 milliseconds to 1000g for 0.5 milliseconds, by adding a crusing force test of 4000 pounds for 5 minutes, and by replacing the 1100 degree C. flame test with a two-step oven test at 1100 degrees C. and 200 degrees C. respectively. It was also recommended that the immersion test specified in section 3.12 be revised to include skydrol as well as sea water. The manufacturer making these recommendations further recommended that the deadline dates for completing recorder installations be delayed six months to enable the development of a recorder meeting the higher crash resistance standards.

The impact acceleration specified in the notice is the same as that currently specified in the standards for flight recorders, except that the 11 millisecond duration has been added. This impact test was specified in the Agency's development program for cockpit voice recorders, and recorders meeting this test are now ready for production.

The Agency plans to include an investigation of crash resistance in a program to develop improved aircraft data recorders. However, before new crash resistance standards could be considered for cockpit voice recorders, it would first be necessary to conduct an experimental test program to verify that the new standards are adequate and can reasonably be met. Although this recommendation may have merit, this procedure may delay the installation program more than one year. On the other hand, the installation of presently available recorders in an aft location which provides increased crash resistance could be accomplished in a shorter time. Accordingly, the rules being adopted at this time incorporate the impact, fire, and immersion test standards that were proposed in the notice.

7. COMPLIANCE DATES.

Notice 63-46 proposed the following deadline dates for completing cockpit voice recorder installations:

(1) July 1, 1965, for all turbine powered airplanes;

(2) January 1, 1966, for all pressurized reciprocating four-engine airplanes; and

(3) July 1, 1966, for all other airplanes.

In commenting on the notice, manufacturers recommended that these dates be postponed six months to allow time for determining suitable locations for microphones and for designing and testing the complete installation. Airlines recommended that the proposed dates be postponed 18 months (setting the deadline for turbine powered airplanes at January 1, 1967), in order to avoid the severe economic and operational effects which would result from taking airplanes out of service to make the installations. One airline having 105 turbine powered airplanes estimated that it would be necessary to remove 31 of these airplanes from service to meet the proposed July 1, 1965, deadline, assuming that the rules were adopted 15 months before the deadline. It was stated that the loss of revenue from removing these airplanes from service (at other than the scheduled maintenance periods) would

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be about twice the cost of installing the recorders.

Using the airline's estimate that approximately 70 percent of the installations could be completed in 15 months, it appears that the entire turbine powered fleet could be completed in 22 months. Allowing two months additional engineering time for designing the aft installations, the total time from adoption of rules to completion of installations would be approximately two years. Accordingly, the following dates are prescribed in the amendments to Parts 40, 41, and 42 for completing cockpit voice recorder installations in certain large airplanes used by an air carrier or a commercial operator:

(1) July 1, 1966, for all turbine powered airplanes; and

(2) January 1, 1967, for all pressurized reciprocating four-engine airplanes.

8. SOURCE OF ELECTRIC POWER.

Several comments referred to the installation requirements proposed for Part 4b. One comment pointed out that the proposed requirement specifying that the cockpit voice recorder be connected with the bus of maximum reliability might jeopardize the operation of other equipment essential to the safe operation of the airplane. The Agency agrees and the adopted rule therefore specifies that the cockpit voice recorder shall receive its electric power from the bus which provides the maximum reliability for operation without jeopardizing service to essential or emergency loads.

9. CHANNEL PRIORITY.

Other comments pointed out the difficulties that might arise on some airlines if more than one cockpit-mounted area microphone is connected to a single channel, or if loudspeaker systems are connected to the flight recorder. The Agency believes these comments are valid. Accordingly, the channel assignments in § 4b.656(b) have been revised to eliminate these difficulties. In particular, the cockpit-mounted area microphone most suitably located for recording voice communications originating at the first and second pilot's stations has been assigned a separate channel.

10. INTELLIGIBILITY.

A recommendation was made that a definite minimum requirement of at least 95 percent intelligibility be prescribed for recordings made under any normal flight operating condition. Studies made by the Agency have shown that this goal is not attainable in the present state of the art and achieved depends upon the cockpit noise environment of the particular airplane type. For these reasons, the rule being adopted requires that the cockpit-mounted area microphones shall be located so that the intelligibility of the recorded communications will be as high as practicable.

11. EJECTION MECHANISM AND LOCATOR AIDS.

One comment recommended that the recorder:

(a) Be ejectable from the airplane upon impact (to remove it from any crash fire);

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(b) be designed to float on water;

(c) be fitted with an impact-triggered homing radio transmitter;

(d) have additional channels; and

(e) be painted a distinctive color as a locator aid.

The Agency believes that the impact and fire test standards set forth in TSO-C84, coupled with the requirement for aft location of the recorder, will serve to preserve the voice record in the event of a ground crash fire without additional ejection features. The suggested ejecting, floating, and signal-transmitting features would apparently be helpful in preserving the voice record in the case of crashes at sea. The Agency is studying the need to require these features (which were not proposed in Notice 63-46) for both voice and flight recorders; if justifiable, further rule making along these lines will be undertaken. As to the matter of additional channels to record additional parameters, the Agency believes such a requirement would be premature in view of the program now under way for the development of improved aircraft data recorders.

The Agency agrees that the recorder container should have a bright distinctive color to assist in locating it after an accident. Such a minor additional requirement should not delay the installation program and it has been included in the installation requirements. Accordingly, the amendments to Part 4b require the recorder container to be painted bright orange.

12. TIME CORRELATION WITH FLIGHT RECORDER.

One comment noted that it would be desirable to provide time correlation between the cockpit voice recording and the flight recorder record. Such a requirement is unnecessary because a crash impact, if it occurs, should provide an adequate means of correlation between the records.

13. SENSITIVITY.

A recorder manufacturer recommended that consideration be given to the need for minimum sensitivity standards for the voice recorder amplifiers. Although no sensitivity requirement is contained in TSO-C84, the Agency believes that adequate sensitivity is prescribed, in effect, by the Part 4b installation rquirement (adopted with this rule making action) dealing with the play-back intelligibility of the voice record. Accordingly, sensitivity standards are not being adopted at this time. For similar reasons, the Agency is not adopting a separate recommendation that distortion limits be specified at the extremes of the frequency range.

14. OPERATION WITH INOPERATIVE VOICE RECORDER.

The ATA also commented on the proposed amendments to §§ 91.36(c)(1) and 91.36(c)(2) concerning continuation of flight with the cockpit voice recorder inoperative. The comments apparently assumed that these provisions of Part 91 [New] would apply to all air carrier and commercial operations. This assumption is not correct. Part 91 [New] applies, in this respect, only to general operations with air carrier air-

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planes, such as training and ferry flights. Air carrier and commercial operations, on the other hand are governed under Parts 40, 41, and 42, wherein the matter of proceeding with inoperative equipment is treated in the "go-no-go" section of the air carrier's or commercial operator's manual. It is anticipated that the "go-no-go" sections of the air carrier's and commercial operator's manuals, dealing with cockpit voice recorders, will be similar to those dealing with flight recorders. Since the provisions being adopted for cockpit voice recorders in Part 91 [New] are identical with corresponding requirements therein for flight recorders, they have been incorporated in § 91.35.

Interested persons have been afforded an opportunity to participate in the making of these amendments, and due consideration has been given to all relevant matter presented. [Added new § 40.212]

EMERGENCY EQUIPMENT FOR OVERWATER OPERATIONS: POSTPONEMENT OF EFFECTIVE DATE

Effective: November 2, 1964 — Amendment No. 40-49
Adopted: October 29, 1964 — 29 F.R. 14874

On April 30, 1964, the Agency adopted amendments 40-44, 41-9, 42-8 (29 F.R. 5491; May 6, 1964), requiring each air carrier or commercial operator subject to Parts 40, 41, and 42 to install, by November 2, 1964, approved survivor locator lights on each required life preserver and life raft. The pupose of this amendment is to postpone the effective date of amendments 40-44, 41-9, and 42-8, until January 4, 1965.

At the time that amendments 40-44, 41-9, and 42-8 were adopted, the Agency felt that 180 days from the time of publication of the amendments in the FEDERAL REGISTER would be adequate to allow for the approval, procurement, and installation of the prescribed lights for all operators.

However, subsequent to the adoption of the subject amendments, some difficulty was encountered in procuring lights that could be approved as well as in adapting the available lights to the operational needs of individual air carriers and commercial operators. Therefore, in order to provide the additional time necessary for the procurement and installation of the required lights, the Agency is postponing the effective date of amendments 40-44, 41-9, and 42-8 until January 4, 1965.

In view of the imminence of the effective date of the subject amendments, I find that notice and public procedure hereon are impracticable, and that good cause exists for making this amendment effective on less than 30 days' notice. [Postponed the effective date of new § 40.206(a)(5)]

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CIVIL AIR REGULATIONS PART 40

SCHEDULED INTERSTATE AIR CARRIER CERTIFICATION AND OPERATION RULES

Effective: April 1, 1954
Adopted: March 31, 1954

PILOT IN COMMAND

Adopted by the Civil Aeronautics Board at its office in Washington, D. C., on the 26th day of March 1954.

The Board has been asked for an interpretation of the duties, power and responsibilities of a pilot in command as delineated in revised Part 40, which will become effective on April 1, 1954.

"Crew member" is defined in Part 40 as an individual who is assigned by the air carrier for performance of duty in flight. Within the classification of crew members is a "flight crew member" who is defined as "a crew member assigned to duty on an airplane as a pilot or flight engineer".

The pilot in command, by definition, is the pilot designated by the carrier as being responsible for the operation and safety of the airplane during flight time. It is axiomatic that a single individual must have complete control and responsibility for an airplane in flight. One of the functions of command is the power to override the decisions of subordinate crew members. In accordance with the responsibility vested in the pilot in command, 40.351(c) states that "The pilot in command shall during flight time be in command of the airplane and crew and shall be responsible for the safety of the passengers, crew members, cargo, and airplane". It should be noted at this point that the only crew member specifically delegated emergency authority in Part 40 is the pilot in command (40.360).

The Board had no desire at the time of the promulgation of revised Part 40 and has no desire now to invade the prerogative of management to apportion the various duties of operating its aircraft among the flight crew members as it may see fit, subject of course, to review by the Administrator of the safety aspects thereof. Indeed, 40.50 and 40.51(a)(2) provide that the carrier is responsible to prepare and maintain a manual which sets forth the duties and responsibilities of each crew member. However, 40.51(a) also provides that nothing in the manual may be contrary to any Federal regulation. It follows, then, that no assignment of duties or responsibilities by an air carrier may in any way derogate from the responsibilities, powers or prerogatives vested by the Board's regulations in the pilot in command.

The Board has been informed that some persons interpret the final sentence of 40.261(d) as a limitation on the authority of the pilot in command over a flight engineer unless the pilot in command himself holds a flight engineer certificate. The Board intended, and the regulatory history clearly indicates, that the sentence in question was intended to provide specific authority for a pilot to serve in the capacity of a flight engineer in the event of an emergency without the necessity of holding a flight engineer certificate in addition to his pilot certificate. Conversely, however, if a pilot were scheduled for a flight in the capacity of a flight engineer, he would be required specifically to hold a valid flight engineer certificate (see 40.260 - 40.263). Further, the definition of "flight engineer" clearly indicates that the flight engineer is subordinate to the pilot in command.

In view of the foregoing, the Board hereby issues the following interpretation, which in accordance with section 3 (a) of the Administrative Procedure Act will be published in the FEDERAL REGISTER and will be incorporated in Part 40 of the Civil Air Regulations, which becomes effective on April 1, 1954.

PILOT IN COMMAND

The Board interprets and construes 40.351(c) as conferring on the pilot in command, with respect to matters concerning the operation of the airplane, full control and authority without limitation over all other crew members and their duties during flight time, whether or not he holds a valid certificate authorizing him to perform the duties and functions of such other crew members.

(Sec. 205, 52 Stat. 984; 49 U.S.C. 425. Interprets or applies secs. 601, 604, 52 Stat. 1007, 1010, as amended; 49 U.S.C. 551, 554)

By the Civil Aeronautics Board.

(SEAL)

M. C. Mulligan,
Secretary.

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CIVIL AIR REGULATIONS PART 40

SCHEDULED INTERSTATE AIR CARRIER CERTIFICATION AND OPERATION RULES

Authority: §§40.1 to 40.511 issued under sec. 205, 52 Stat. 984; 49 U.S.C. 425. Interpret or apply secs. 601, 604, 605, 52 Stat. 1007, 1010 as amended; 49 U.S.C. 551, 554, 555. (Revised, Revision, December 31, 1955)

APPLICABILITY AND DEFINITIONS

40.1 APPLICABILITY OF THIS PART.

The provisions of this part are applicable to the following persons:

(a) An air carriers holding a certificates of public convenience and necessity issued ~~in accordance with Title IV of the Federal Aviation Act of 1958, as amended~~ by the Board which authorizes unlimited service over designated routes, when ~~they~~ it engages with airplanes in scheduled interstate air transportation within the continental limits of the United States, ~~PROVIDED, That the provisions of this part shall not apply to operations conducted pursuant to economic exemption authority issued by the Board for a period of 90 days or less: AND PROVIDED FURTHER, That the Administrator may authorize any air carrier holding authority to engage in scheduled cargo operations pursuant to Title IV of the Federal Aviation Act of 1958, as amended, to conduct such operations in accordance with the air carrier certification and operations rules prescribed in Part 42 of this subchapter: AND PROVIDED FURTHER, That in the case of~~ excluding the State of Alaska and to operations by the carrier over segments of routes extending beyond the continental limits of the United States, if the Administrator ~~may~~ has authorized an air carrier to conduct operations over such route segments ~~pursuant to the provisions of~~ under this part.

(b) Any airman or other person employed or used by an air carrier in the conduct of operations subject to this part (including the operation, inspection, maintenance, and overhaul of aircraft) and any person while on board an airplane operated by an air carrier under this part.

40.2 APPLICABILITY OF PARTS 43 AND 60 OF THIS SUBCHAPTER.

The provisions of Parts 43 and 60 of this subchapter shall be applicable to all air carrier operations conducted under the provisions of this part unless otherwise specified in this part.

40.5 DEFINITIONS.

As used in this part terms shall be defined as follows:

ACCELERATE-STOP DISTANCE.

Accelerate-stop distance is the distance required to accelerate an airplane to a specified speed and, assuming failure of the critical engine at the instant that speed is

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attained, to bring the airplane to a stop. (See the pertinent airworthiness requirements for the manner in which such distance is determined.)

ADMINISTRATOR.

The Administrator is the Administrator of The Federal Aviation Agency. (Revised SR-430, December 31, 1958)

AIR CARRIER

An air carrier is any citizen of the United States who undertakes directly, or by lease or by other arrangement, the carriage by airplane of persons or property as a common carrier for compensation or hire, or the carriage of mail by airplane. (Revised Revision, December 31, 1955)

~~AIR TRAFFIC CLEARANCE.~~

~~An air traffic clearance is an authorization issued by air traffic control for an airplane to proceed under specified conditions.~~

~~AIR TRAFFIC CONTROL~~

~~Air traffic control is a service provided for the purpose of:~~

~~(1) Preventing collisions between airplanes, and, on the airport ground maneuvering area, between airplanes and obstructions; and~~

~~(2) expediting and maintaining an orderly flow of air traffic.~~

AIRCRAFT DISPATCHER.

An aircraft dispatcher is an individual holding a valid aircraft dispatcher certificate issued by the Administrator who exercises responsibility with the pilot in command in the operational control of each flight.

AIRFRAME.

Airframe means any and all kinds of fuselages, booms, nacelles, cowlings, fairings, empennages, airfoil surfaces, and landing gear, and all parts, accessories, or controls, or whatever description, appertaining thereto, but not including engines and and propellers. (Revised, Revision, December 31, 1955)

AIRPLANE.

An airplane is a power-driven fixed-wing aircraft, heavier than air, which is supported by the dynamic reaction of the air against its wings. (Revised, Revision, December 31, 1955)

AIRPORT.

An airport is an area of land or water which is used, or intended for use, for the landing and take-off of airplanes.

ALTERNATE AIRPORT.

An alternate airport is an approved airport to which a flight may proceed if a landing at the airport to which the flight was dispatched becomes inadvisable.

APPLIANCES.

Appliances are instruments, equipment, apparatus, parts, appurtenances, or accessories of whatever description, which are used, or are capable of being or intended to be used, in the navigation, operation, or control of airplanes in flight (including communication equipment, eletronic devices, and any other mechanism or mechanisms installed in or attached to airplanes during flight, but excluding parachutes), and which are not a part or parts of airframes, engines, or propellers. (Revised, Revision, December 31, 1955)

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APPROVED.

Approved, when used alone or as modifying terms such as means, method, action, equipment, etc., means approved by the Administrator. (Revised, Revision, December 31, 1955)

AUTHORIZED REPRESENTATIVE OF THE ADMINISTRATOR.

An authorized representative of the Administrator is any employee of the Federal Aviation Agency or any private person, authorized by the Administrator to perform particular duties of the Administrator under the provisions of this part. (Revised SR-430, December 31, 1958)

CEILING.

Ceiling is the height above the ground or water of the lowest layer of clouds or obscuring phenomena that is reported as "broken", "overcast", or "obscuration" and not classified as "thin" or "partial".

CHECK AIRMAN.

A check airman is an airman designated by the air carrier and approved by the Administrator to examine other airmen to determine their proficiency with respect to procedures and technique and their competence to perform their respective airman duties.

~~CONTROL AREA~~.

~~Control area is airspace having defined dimensions, designated by the Administrator, which extends upward from an altitude of 700 feet above the surface, within which air traffic control is exercised. In the case of operations conducted in the airspace of a foreign country, control area shall mean the airspace designated by the appropriate authority of such country.~~

~~CONTROL ZONE~~

~~Control zone is airspace having defined dimensions, designated by the Administrator, which extends upward from the surface, which includes one or more airports, and within which rules additional to those governing control areas apply for the protection of air traffic. In the case of control zones located in foreign countries, the control zone shall be designated by the appropriate authority of such country.~~

CREW MEMBER.

A crew member is any individual assigned by an air carrier for the performance of duty on an airplane in flight.

CRITICAL ENGINE.

The critical engine is that engine the failure of which gives the most adverse effect on the airplane flight characteristics relative to the case under consideration.

CRITICAL-ENGINE-FAILURE SPEED, V_1 (Transport Category Airplanes)

The critical-engine-failure speed is the airplane speed used in the determination of the take-off distance required at which the critical engine is assumed to fail. (See the pertinent airworthiness requirements for the manner in which such speed is determined.)

DISPATCH RELEASE.

A dispatch release is an authorization issued by an air carrier specifying the conditions for the origination or continuance of a particular flight.

DUTY ALOFT.

Duty aloft includes the entire period during which an individual is assigned as a member of an airplane crew during flight time.

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EFFECTIVE LENGTH OF RUNWAY –

(1) TAKE-OFF.

The effective length of runway for take-off as used in the take-off operating limitations for nontransport category airplanes is the distance from the end of the runway at which the take-off is started to the point at which the obstruction clearance plane associated with the other end of the runway intersects the center line of the runway.

(2) LANDING.

The effective length of runway for landing as used in the landing operating limitations for both transport and nontransport category airplanes is the distance from the point at which the obstruction clearance plane associated with the approach end of the runway intersects the center line of the runway to the far end thereof.

EN ROUTE.

En route means the entire flight from the point of origination to the point of termination, including intermediate stops.

EXTENDED OVERWATER OPERATION.

An extended overwater operation ~~shall be considered~~ is an operation over water conducted at a distance in excess of 50 miles from the nearest shore line.

FIREPROOF.

Fireproof material means a material which will withstand heat equally well or better than steel in dimensions appropriate for the purpose for which it is to be used. When applied to material and parts used to confine fires in designated fire zones, fireproof means that the material or part will perform this function under the most severe conditions of fire and duration likely to occur in such zones.

FIRE–RESISTANT.

When applied to sheet or structural members, fire-resistant material means a material which will withstand heat equally well or better than aluminum alloy in dimensions appropriate for the purpose for which it is to be used. When applied to fluid-carrying lines, this term refers to a line and fitting assembly which will perform its intended protective functions under the heat and other conditions likely to occur at the particular location.

FLAME–RESISTANT.

Flame-resistant material means a material which will not support combustion to the point of propagating, beyond safe limits, a flame after the removal of the ignition source.

FLAMMABLE.

Flammable fluids or gases mean those which will ignite readily or explode.

FLASH–RESISTANT.

Flash-resistant material means material which will not burn violently when ignited.

FLIGHT CREW MEMBER.

A flight crew member is a crew member assigned to duty on an airplane as a pilot or flight engineer.

FLIGHT ENGINEER.

A flight engineer is an individual holding a valid flight engineer certificate issued

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by the Administrator and whose primary assigned duty during flight is to assist the pilots in the mechanical operation of an airplane.

FLIGHT TIME.

Flight time is the time from the moment the airplane first moves under its own power for the purpose of flight until it comes to rest at the next point of landing (block-to-block time).

~~HIGH ALTITUDE OPERATION.~~

~~High altitude operation is flight conducted at or above 12,500 feet above sea level east of longitude 100° W. and at or above 14,500 feet above sea level west of longitude 100° W.~~

IFR.

IFR is the symbol used to designate instrument flight rules.

INTERSTATE AIR TRANSPORTATION.

Interstate air transportation is the carriage by airplane of persons or property as a common carrier for compensation or hire or the carriage of mail by airplane, in commerce between a place in any State of the United States, or the District of Columbia; and a

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place in any other State of the United States, or the District of Columbia; or between places in the same State of the United States, or the District of Columbia; whether such commerce moves wholly by airplane or partly by airplane and partly by other forms of transportation.

MAXIMUM CERTIFICATED TAKE-OFF WEIGHT.

Maximum certificated take-off weight is the maximum take-off weight authorized by the terms of the airplane airworthiness certificate.[1]

NOTE: The airplane airworthiness certificate incorporates as a part thereof the airplane operating record or that portion of an Airplane Flight Manual which contains the pertinent limitations.

MINIMUM CONTROL SPEED.

The minimum control speed is the minimum speed at which an airplane can be safely controlled in flight after an engine suddenly becomes inoperative. (See pertinent airworthiness requirements for the manner in which such speed is determined.

MONTH.

A month ~~shall mean~~ is that period of time extending from the first day of any month as delineated by the calendar through the last day thereof.

NIGHT.

Night is the time between the ending of evening civil twilight and the beginning of morning civil twilight as published in the American Air Almanac converted to local time for the locality concerned.

[2] NOTE: The American Air Almanac containing the ending of evening twilight and the beginning of morning twilight tables may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Information is also available concerning such tables in the Offices of the Civil Aeronautics Administration or the United States Weather Bureau.

OBSTRUCTION CLEARANCE AREA–

(1) TAKE-OFF.

A take-off obstruction clearance area as used in the take-off operating limitations for nontransport category airplanes is an area on the earth's surface defined as follows: The center line of the obstruction clearance area in plan view shall coincide with and prolong the center line of the runway, beginning at the point where the obstruction clearance plane intersects the center line of the runway and proceeding to a point not less than 1,500 feet from the beginning point. Thereafter the center line shall proceed in a path consistent with the take-off procedure for the runway or, where such a procedure has not been established, consistent with turns of at least 4,000–foot radius until a point is reached beyond which the obstruction clearance plane clears all obstructions. The obstruction clearance area shall extend laterally for a distance of 200 feet on each side of the center line at the point where the obstruction clearance plane intersects the runway and shall continue at this width until the end of the runway; thence it shall increase uniformly to 500 feet on each side of the center line at a point 1,500 feet from the intersection of the obstruction clearance plane with the runway; thereafter it shall extend laterally for a distance of 500 feet on each side of the center line.

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(2) LANDING.

A landing obstruction clearance area as used in the landing operating limitations for both transport and nontransport category airplanes is an area on the earth's surface defined as follows: The center line of the obstruction clearance area in plan view shall coincide with and prolong the center line of the runway, beginning at the point where the obstruction clearance plane intersects the center line of the runway and proceeding to a point not less than 1,500 feet from the beginning point. Thereafter the center line shall proceed in a path consistent with the instrument approach procedure for the runway or, where such a procedure has not been established, consistent with turns of at least 4,000-foot radius until a point is reached beyond which the obstruction clearance plane clears all obstructions. The obstruction clearance area shall extend laterally for a distance of 200 feet on each side of the center line at the point where the obstruction clearance plane intersects the runway and shall continue at this width until the end of the runway; thence it shall increase uniformly to 500 feet on each side of the center line at a point 1,500 feet from the intersection of the obstruction clearance plane with the runway; thereafter it shall extend laterally for a distance of 500 feet on each side of the center line.

OBSTRUCTION CLEARANCE PLANE.

An obstruction clearance plane is a plane which is tangent to or clears all obstructions within the obstruction clearance area and which slopes upward from the runway at a slope of 1:20 to the horizontal as shown in a profile view of the obstruction clearance area.

OPERATIONAL CONTROL.

Operational control is the exercise of authority over initiation, continuation, diversion, or termination of a flight.

OPERATIONS SPECIFICATIONS.

Operations specifications are rules of particular applicability issued by the Administrator ~~and are not part of the~~ to an air carrier ~~operating certificate~~ pursuant to the provisions of this part.

OVER-THE-TOP.

Over-the-top means the operation of an airplane above a layer of clouds or obscuring phenomena that is reported as "broken," "overcast," or "obscuration" and not classified as "thin" or "partial". (Revised Revision, December 31, 1955)

PILOT IN COMMAND.

The pilot in command is the pilot designated by the air carrier as the pilot responsible for the operation and safety of the airplane during the time defined as flight time.

PILOTAGE.

Pilotage is navigation by means of visual reference to landmarks.

PROPELLER.

A propeller is a device for propelling an airplane through the air, having blades mounted on a power-driven shaft, which when rotated produces by its action on the air a thrust approximately parallel to the longitudinal axis of the airplane. (Revised Revision, December 31, 1955)

PROVISIONAL AIRPORT.

A provisional airport is an airport approved for use by an air carrier for the purpose of providing service to a community when the regular airport serving that community is not available.

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RATING.

A rating is an authorization issued with a certificate, and forming a part thereof, delineating special conditions, privileges, or limitations pertaining to such certificate. (Revised Revision, December 31, 1955)

REFUELING AIRPORT.

A refueling airport is an airport approved as an airport to which flights may be dispatched only for refueling.

REGULAR AIRPORT.

A regular airport is an airport approved as a regular terminal or intermediate stop on an authorized route.

ROUTE.

A route is the airspace on either side of a course joining those points on the surface of the earth between which an air carrier provides air transportation in accordance with the terms of its certificate of public convenience and necessity issued by the Board.

ROUTE SEGMENT.

A route segment is a portion of a route each terminus of which is identified by:

(1) A continental or insular geographic location, or

(2) A point at which a definite radio fix can be established.

RUNWAY.

A runway is a clearly defined area of an airport suitable for the safe landing or take-off of airplanes.

SCHEDULED FOR DUTY ALOFT.

Scheduled for duty aloft means the assignment of a flight crew member on the basis of the flight time established in the operations schedules rather than the actual flight time. (Revised Revision, December 31, 1955)

SECOND IN COMMAND.

Second in command means a pilot other than the pilot in command who is designated by the air carrier to act as second in command of an airplane.

SHOW.

Show means to demonstrate or prove to the satisfaction of the Administrator prior to the issuance of the air carrier operating certificate and at any time thereafter required by the Administrator. (Revised Revision, December 31, 1955)

SYNTHETIC TRAINER.

A synthetic trainer is a device the use of which is approved to simulate certain operating conditions.

TAKE–OFF SAFETY SPEED, V_2.

The take-off safety speed is the airplane speed used in the determination of the take-off flight path at which the climb-out following take-off can be safely executed with one engine inoperative and with the airplane in the take-off configuration. (See the pertinent airworthiness requirements for the manner in which such speed is determined.)

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TIME IN SERVICE.

Time in service, as used in computing maintenance time records, is the time from the moment an airplane leaves the ground until it touches the ground at the end of a flight.

TRANSPORT CATEGORY AIRPLANE.

A transport category airplane is an airplane which has been type certificated in accordance with the requirements of Part 4b of this subchapter or the transport category requirements of Part 4a of this subchapter.

TYPE.

With regard to airman qualifications, type ~~shall~~ means all airplanes of the same basic design, including all modifications thereto except those modifications which the Administrator has found result in a substantial change in characteristics pertinent to the airman concerned.

VFR.

VFR is the symbol used to designate visual flight rules.

V_{S_o}.

V_{S_o} is the symbol used to designate the true indicated stalling speed or the minimum steady flight speed in the landing configuration.

VISIBILITY.

Visibility is the greatest distance at which conspicuous objects can be seen and identified.

(1) FLIGHT VISIBILITY.

Flight visibility is the average range of visibility forward from the cockpit of an airplane in flight to see and identify prominent unlighted objects by day and prominent lighted objects by night.

(2) GROUND VISIBILITY.

Ground visibility is the visibility at the earth's surface as reported by the United States Weather Bureau or by a source approved by the Weather Bureau.

WEEK.

A week ~~shall mean~~ is that period of time extending from the first day of any week as delineated by the calendar through the last day thereof.

YEAR.

A year ~~shall mean~~ is that period of time extending from the first day of any year as delineated by the calendar through the last day thereof.

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CIVIL AIR REGULATIONS PART 40

CERTIFICATION RULES AND OPERATIONS

SPECIFICATIONS REQUIREMENTS
(Added SR-430, December 31, 1958)

40.10 CERTIFICATE REQUIRED.

No person subject to the provisions of this part shall operate an airplane in scheduled interstate air transportation without, or in violation of the terms of, an air carrier operating certificate issued by the Administrator.

40.11 CONTENTS OF CERTIFICATE.

~~An~~ The air carrier operating certificate shall ~~specify the points~~ contain the name of the air carrier, and the airports to ~~and~~ or from which, and the routes over which, ~~an~~ the air carrier is authorized to operate:

PROVIDED, That such airports and routes shall be listed in the operations specifications of the air carrier and incorporated into the contents of the air carrier operating certificate by reference thereto in the certificate.

NOTE: The airports, and locations thereof, are listed under the "airport authorizations and limitations" part of the operations specifications. The routes including the airways where applicable are listed in the "En route Flight Procedures" — Form ACA-514A of the operations specifications.

M 40.12 APPLICATION FOR CERTIFICATE.

An application for an air carrier operating certificate shall be made in the form and manner and contain information prescribed by the Administrator.

40.13 ISSUANCE OF CERTIFICATE.

(a) An air carrier operating certificate shall be issued by the Administrator to an applicant having a certificate of public convenience and necessity issued by the Civil Aeronautics Board when the Administrator finds, after investigation, that such person is properly and adequately equipped and able to conduct a safe operation in accordance with the requirements of this part and with the operations specifications authorized in this part.

(b) Whenever, upon investigation, the Administrator finds that the general standards of safety required for air carrier operations in airplanes of 12,500 pounds or less maximum certificated take-off weight, or for air carrier operations conducted pursuant to a temporary authorization issued under Title IV of the Federal Aviation Act of 1958, as amended, require or permit a deviation from any specific requirement for a particular operation or class of operations for which an application for an air carrier operating certificate has been made, he may issue operations specifications prescribing requirements which deviate from the requirements of this part. (Revised SR-430, December 31, 1958)

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(c) An air carrier holding economic authority to engage in scheduled cargo-only operations in interstate air transportation may, upon application, be authorized by the Administrator to conduct such operations in accordance with the air carrier certification and operation rules prescribed in Part 42 of this chapter (Civil Air Regulations).

40.14 AMENDMENT OF CERTIFICATE.

(a) ~~The administrator shall, after notice and opportunity for hearing to the carrier concerned, amend~~ An air carrier operating certificate may be amended by the Administrator in accordance with section 609 of the Federal Aviation Act of 1958, and the applicable procedures in Part 13 of the Federal Aviation Regulations whenever he ~~finds~~ determines ~~that such amendment is reasonably required in the interest of~~ safety in air transportation and the public interest so require.

(b) Upon application by an air carrier, an authorized representative of the Administrator ~~shall~~ may amend an air carrier operating certificate ~~when~~ if he ~~finds~~ determines that ~~the general standards of~~ safety and the public interest permit such an amendment. Within 30 days after the refusal of an authorized representative of the Administrator to approve an air carrier's application for amendment, the air carrier may petition the Administrator for a review of such refusal.

(c) Applications by an air carrier for amendments of air carrier operating certificates shall be submitted to the local FAA Air Carrier District Office charged with the overall inspection of the air carrier's operations at least 15 days prior to the proposed effective dates of such amendments, unless an authorized representative of such office approves a shorter filing period.

40.15 DISPLAY OF CERTIFICATE.

The air carrier operating certificate shall be available at the principal operations office of an air carrier for inspection by an authorized representative of the Board or the Administrator.

40.16 DURATION OF CERTIFICATE.

(a) An air carrier operating certificate shall remain in effect until termination of the certificate of public convenience and necessity or other economic authorization issued by the Board held by the air carrier, or until surrendered, suspended, revoked, or otherwise terminated by order of the Administrator. After suspension or revocation it shall be returned to the Administrator. (Revised SR-430, December 31, 1958)

(b) Nothing in this section shall be construed to deny or to defeat the jurisdiction of the Federal Courts, the Administrator, or the Board to impose any authorized sanction, including revocation of the certificate, for a violation of the Federal Aviation Act of 1958, as amended, regulations in this subchapter, or the air carrier operating certificate occurring during the effective period of such certificate. (Revised SR-430, December 31, 1958)

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CIVIL AIR REGULATIONS PART 40

40.17 TRANSFERABILITY OF CERTIFICATE.

An air carrier operating certificate is not transferable, except with the written consent of the Administrator.

40.18 OPERATIONS SPECIFICATIONS REQUIRED.

(a) No person subject to the provisions of this part shall operate as an air carrier without, or in violation of, operations specifications issued by the Administrator. (Revised Revision, December 31, 1955)

M (b) New or amended specifications shall be issued by the Administrator for operations subject to this part in a form and manner prescribed by him and in accordance with the provisions of this part. (Added Revision, December 31, 1955)

40.19 CONTENTS OF SPECIFICATIONS.

The operations specifications shall contain the following:

(a) Types of operations authorized;
(b) Types of airplanes authorized for use;
(c) En route authorizations and limitations;
(d) Airport authorizations and limitations;
M (e) Time limitation for overhauls, inspections, and checks of airframes, engines, propellers, and appliances, or standards by which such time limitations shall be determined;
M (f) Procedures used to maintain control of weight and balance of airplanes;
(g) Interline equipment interchange requirements, if pertinent; and
(h) Such additional items as the Administrator determines, under the enabling provisions of this part, are necessary to cover a particular situation.

40.20 UTILIZATION OF OPERATIONS SPECIFICATIONS.

The air carrier shall keep its personnel informed with respect to the contents of the operations specifications and all amendments thereto applicable to the individual's duties and responsibilities. A set of specifications shall be maintained by the air carrier as a separate and complete document. Pertinent excerpts from the specifications or references thereto shall be inserted in the manual issued by the air carrier in such a manner that they do not lose their identity in any respect.

40.21 AMENDMENT OF OPERATIONS SPECIFICATIONS.

The following procedures apply to the amendment of operations specifications (except those which are a part of the air carrier operating certificate issued under § 40.13) issued to an air carrier under this part:

(a) ~~Any~~ Upon application by the air carrier an authorized representative of the Administrator may amend an operations specification ~~may be amended by the Administrator~~ if he ~~finds~~ determines that safety in air transportation ~~so requires or~~ and the public interest permits such an amendment;

(b) Applications for amendments of operations specifications shall be submitted to the local FAA Air Carrier District Office charged

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with the overall inspection of the air carrier's operations at least 15 days prior to the proposed effective dates of such amendments, unless an authorized representative of such office approves a shorter filing period;

(c) Within 30 days after a notice of refusal to approve an air carrier's application for amendment, the air carrier may petition the Administrator to reconsider the refusal to amend;

(d) An authorized representative of the Administrator may amend an operations specification if he determines that safety in air transportation and the public interest require such an amendment. In such instances, the supervising inspector of the FAA Air Carrier District Office shall give notice in writing to the air carrier of a proposed amendment in the operations specifications, fixing a reasonable period, not less than 7 days, within which the air carrier may submit written data, views, and arguments concerning the proposed amendment. After consideration of all relevant matter presented, the supervising inspector shall notify the air carrier of any amendment adopted, or a rescission of the notice. The amendment shall become effective not less than 30 days after receipt by the air carrier of the notice of amendment, unless the air carrier petitions the Administrator for reconsideration of the amendment, in which case the effective date of the amendment shall be stayed pending a decision by the Administrator. ~~Except in the case of~~ If the supervising inspector finds that an emergency exists requiring immediate action ~~in~~ with respect to safety in air transportation ~~or upon consent of~~ which makes the provisions prescribed by this paragraph impracticable, or contrary to the public interest, he may notify the air carrier ~~concerned no~~ of an amendment ~~shall become effective prior to thirty days after the date the air carrier has been notified of such amendment~~ to the operations specifications without giving prior notice, or make the amendment effective without stay upon receipt by the air carrier of notice thereof, or both. In such instances he will incorporate the finding and a brief statement of the reasons therefor in the notice of the amended operations specifications to be adopted.

40.22 INSPECTION AUTHORITY.

An authorized representative of the Administrator shall be permitted at any time and place to make inspections or examinations to determine an air carrier's compliance with the requirements of the Federal Aviation Act of 1958, as amended, the regulations in this subchapter, the provisions of the air carrier's operating certificate, and the operations specifications. (Revised SR-430, December 31, 1958)

40.23 OPERATIONS AND MAINTENANCE BASE AND OFFICE.

Each air carrier shall, 30 days in advance of a change in the address of its principal business office, its principal operations base, or its principal maintenance base, give written notice thereof to the ~~Administrator of his principal business office, his principal operations base, and his principal maintenance base. Thereafter, prior to any change in~~

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~~any such office or base, he shall give written notice to the Administrator.~~ FAA Air Carrier District Office charged with overall inspection of the air carrier's operations.

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CIVIL AIR REGULATIONS PART 40

REQUIREMENTS FOR SERVICES AND FACILITIES

M 40.30 GENERAL ROUTE REQUIREMENTS. ~~DEMONSTRATION OF COMPETENCE.~~

The air carrier shall show for route approvals that it is competent to conduct scheduled operations over any route or route segment to be used between any regular, provisional, or refueling airport and that the facilities and services required by §§ 40.33 through 40.38 are available are and adequate for the type of operation proposed. Routes outside of controlled airspace will be approved unless the Administrator determines that traffic density is such that an adequate level of safety cannot be assured. ~~The Administrator shall not require~~ Actual flight over a route or route segment ~~if~~ will be required, unless the air carrier shows that such flight is not essential to safety, ~~The air carrier may thereafter conduct operations between regular, provisional, or refueling airports on any approved route or routes on which the operational facilities and procedures are substantially similar: PROVIDED, That high-altitude VFR operations may be conducted over any route.~~ considering the availability and adequacy of airports, lighting, maintenance, communication, navigation, fueling, ground and aircraft radio facilities, and the competence of personnel to be used in the proposed operations.

~~40.31~~ 40.32 WIDTH OF ROUTES.

A Routes ~~or route segment shall include the navigable airspace on each side of an approved course or course; and~~ approved for operations over U. S. Federal airways or foreign airways shall have a width equal to the designated ~~by the Administrator consistent with~~ width of such airways. In the case of other approved routes, when an authorized representative of the Administrator determines it to be necessary, he shall establish route widths taking into consideration terrain clearance and minimum en route altitudes, available ground and airborne navigational aids, air traffic density, and air traffic control procedures. ~~PROVIDED, That for high-altitude VFR operations, courses need not be approved and the width of navigable airspace on each side thereof need not be designated by the Administrator.~~ In such instances the route widths shall be specified in the air carrier's operations specifications.

~~40.32 IFR ROUTES OUTSIDE OF CONTROL AREAS.~~

~~IFR routes outside of control areas shall be approved if the air carrier shows that the navigational and communications facilities are adequate for the operations proposed, unless the Administrator finds that because of traffic density an adequate level of safety cannot be insured in a particular area: PROVIDED, That IFR routes outside of control areas shall not be approved for high-altitude operations.~~

M 40.33 AIRPORTS.

The air carrier shall show that each route has sufficient airports found by the Administrator to be properly equipped and adequate for the type of operations to be conducted. Consideration shall be given to items such as size, surface, obstructions, facilities, public protection, lighting, navigational and communication aids, and traffic control. (Revised Revision, December 31, 1955)

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40.34 COMMUNICATIONS FACILITIES.

The air carrier shall show that a two-way air/ground radio communication system is available at such points as will insure reliable and rapid communications under normal operating conditions over the entire route, either direct or via approved point-to-point circuits for the following purposes: (Revised 40-3, April 1, 1954)

(a) Communications between airplanes and the appropriate dispatch office, in which case such systems shall be independent of systems operated by the Federal Government, and

M (b) Communications between airplanes and the appropriate air traffic control unit, in which case the Administrator may permit the use of communications systems operated by the Federal Government.

40.35 WEATHER REPORTING FACILITIES.

The air carrier shall show that sufficient weather reporting services are available along the route to insure weather reports and forecasts necessary for the operation. Forecasts used to control flight movements shall be prepared from weather reports furnished in accordance with paragraphs (a) and (b) of this section as appropriate. (Revised 40-1, June 22, 1956)

(a) For operations within the continental limits of the United States, weather reports used to control flight movements shall be those prepared by the United States Weather Bureau, or by a source approved by the Weather Bureau. (Revised 40-1, June 22, 1956)

(b) For operations authorized in accordance with § 40.1 to be conducted outside the continental limits of the United States, weather reports used to control flight movements may be those prepared by any source approved by the Administrator. (Revised 40-1, June 22, 1956)

40.36 EN ROUTE NAVIGATIONAL FACILITIES.

The air carrier shall show that nonvisual ground aids to air navigation are available along each route, that they are so located as to permit navigation to any regular, provisional, refueling, or alternate airport within the degree of accuracy necessary for the operation involved, and that they are available for the navigation of airplanes within the degree of accuracy required for air traffic control:

PROVIDED, That ~~no~~ nonvisual ground aids to navigation are not required for (a) day VFR operations ~~where the characteristics of the terrain are such that navigation~~ which the carrier shows can be conducted safely by pilotage, ~~or for~~ because of the characteristics of the terrain, (b) night VFR operations ~~along lighted airways or~~ on routes ~~where the Administrator has determined that~~ which the air carrier shows have reliably lighted landmarks which are adequate for safe operations. Nonvisual ground navigational aids required for approval of routes outside of controlled airspace are specified in the air carrier operations specifications, except those aids required for routes to alternate airports.

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M 40.37 SERVICING AND MAINTENANCE FACILITIES.

The air carrier shall show that competent personnel and adequate facilities and equipment, including spare parts, supplies, and materials, are available at such points along the air carrier's routes as are necessary for the proper servicing, maintenance, repair, and inspection of airplanes and auxiliary equipment.

40.38 LOCATION OF DISPATCH CENTERS.

The air carrier shall show that it has a sufficient number of dispatch centers adequate for the operations to be conducted and located at such points as are necessary to insure the proper operational control of each flight.

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CIVIL AIR REGULATIONS PART 40

MANUAL REQUIREMENTS

40.50 PREPARATION OF MANUAL.

The air carrier shall prepare and keep current a manual for the use and guidance of flight and ground operations personnel in the conduct of its operations.

40.51 CONTENTS OF MANUAL.

(a) The manual shall contain instructions, information, and data necessary for the personnel concerned to carry out their duties and responsibilities with a high degree of safety. It shall be in a form to facilitate easy revision, and each page shall bear the date of the last revision thereof. The contents of such manual shall not be contrary to the provisions of any Federal regulations, operations specifications, or the operating certificate. The manual may be in two or more separate parts (e.g., flight operations, ground operations, maintenance, communications, etc.) to facilitate use by the personnel concerned, but each part shall contain so much of the information listed below as is appropriate for each group of personnel:

(1) General policies;

(2) Duties and responsibilities of each crew member and appropriate members of the ground organization;

(3) Reference to appropriate regulations in this subchapter and Civil Aeronautics Manuals;

(4) Flight dispatching and control, including procedures for coordinated dispatch;

(5) En route flight, navigation, and communication procedures, including procedures for the dispatch or continuance of flight, if any item of equipment required for the particular type of operation becomes inoperative or unserviceable en route;

(6) Appropriate information from the en route operations specifications, including for each approved route the types of airplanes authorized, their crew complement, the type of operation (i.e., VFR, IFR, day, night) and other pertinent information;

(7) Appropriate information from the airport operations specifications, including for each airport its location, its designation (i.e., regular, alternate, provisional, etc.,) types of airplanes authorized, instrument approach procedures, landing and take-off minimums, and other pertinent information;

(8) Take-off, en route, and landing weight limitations;

(9) Procedures for familiarizing passengers with the use of emergency equipment during flight;

(10) Emergency procedures and equipment;

(11) The method of designating succession of command of flight crew members;

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(12) Procedures for determining the usability of landing and take-off areas and for dissemination of pertinent information to operations personnel;

(13) Procedures for operation during periods of icing, hail, thunderstorms, turbulence, or any potentially hazardous meteorological conditions;

(14) Airman training programs, including appropriate ground, flight, and emergency phases;

(15) Instructions and procedures for maintenance, repair, overhaul, and servicing;

(16) Time limitations for overhaul, inspection, and checks, of airframes, engines, propellers, and appliances, or standards by which such time limitations shall be determined; (Revised 40-3, April 1, 1954)

(17) Procedures for refueling airplanes, elimination of fuel contamination, protection from fire including electrostatic protection, and the supervision and protection of passengers during refueling;

(18) Inspections for airworthiness, including instructions covering procedures, standards, responsibilities, and authority of the inspection personnel;

M (19) Methods and procedures for maintaining the airplane weight and center of gravity within approved limits;

(20) Pilot and dispatcher route and airport qualification procedures;

(21) Accident notification procedures; and

(22) Other data or instructions related to safety.

(b) At least one complete master copy of the manual containing all parts thereof shall be retained at the appropriate operations base of the air carrier.

40.52 DISTRIBUTION OF MANUAL.

(a) Copies of the entire manual, or appropriate portions thereof, together with revisions thereto shall be furnished to the following:

(1) Appropriate ground operations and maintenance personnel of the air carrier;

(2) ~~Flight~~ Crewmembers; and

(3) Authorized representatives of the Administrator assigned to the air carrier to act as aviation safety agents.

(b) All copies of the manual shall be kept up to date.

40.53 AIRPLANE FLIGHT MANUAL.

(a) The air carrier shall keep current an approved Airplane Flight Manual for each type of transport category airplane which it operates. (Added 40-16, August 25, 1955)

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(b) An approved Airplane Flight Manual or a manual complying with § 40.50 and containing information required for the Airplane Flight Manual shall be carried in each transport category airplane. (Added 40-16, August 25, 1955)

AIRPLANE REQUIREMENTS
(Added 40-15, December 30, 1958)

40.60 GENERAL.

Airplanes shall be identified, certificated, and equipped in accordance with the applicable airworthiness requirements of the regulations in this subchapter. No ~~air carrier~~ operator shall ~~operate~~ use any airplane in ~~scheduled~~ operations governed by this part unless such airplane meets the requirements of this part, and is in an airworthy condition, is registered as a civil aircraft of the United States, and carrys an appropriate and currently effective certificate of airworthiness issued by the Administrator. In determining compliance with the applicable airworthiness requirements and operating limitations, an approved weight and balance control system based upon average, assumed, or estimated weights may be utilized.

40.61 AIRPLANE CERTIFICATION REQUIREMENTS.

(a) AIRPLANES CERTIFICATED ON OR BEFORE JUNE 30, 1942.

Airplanes certificated as a basic type on or before June 30, 1942, shall either:

(1) Retain their present airworthiness certification status and meet the requirements of § 40.90, or

(2) Comply with either the performance requirements of § 4a.737-T through § 4a.750-T of this subchapter or the performance requirements of § 4b.110 through § 4b.125 of this subchapter and in addition shall meet the requirements of § 40.70: PROVIDED, That should any type be so qualified, all airplanes of any one operator of the same or related types shall be similarly qualified and operated. (Revised Revision, December 31, 1955)

(b) AIRPLANES CERTIFICATED AFTER JUNE 30, 1942.

Airplanes certificated as a basic type after June 30, 1942, ~~and used in passenger operations~~ shall be certificated as transport category airplanes and shall meet the requirements of § 40.70.

(c) C-46 TYPE AIRPLANES. (Added 40-47, July 12, 1964)

Notwithstanding the provisions of paragraph (b) of this section, a nontransport category C-46 type airplane may be used in cargo operations under the following conditions: (Added 40-47, July 12, 1964)

(1) It is certificated at a maximum gross takeoff weight not in excess of 48,000 pounds; (Added 40-47, July 12, 1964)

(2) It meets the requirements of §§ 40.90 through 40.94 using the performance data specified in Appendix C of Part 42, revised effective November 11, 1963, except that it may be

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operated without meeting such requirements until August 12, 1964, if it meets the requirements of § 42.14-1(b) of this chapter, in effect on November 10, 1963; (Added 40-47, July 12, 1964)

(3) Prior to each flight, each engine is serviced to a minimum of 25 gallons of oil; and (Added 40-47, July 12, 1964)

(4) After December 31, 1964 — (Added 40-47, July 12, 1964)

(i) It is powered by a type and model engine as specified in Appendix C of Part 42 of this chapter, revised effective November 11, 1963, when certificated at a maximum gross takeoff weight in excess of 45,000 pounds; and (Added 40-47, July 12, 1964)

(ii) It complies with the special airworthiness requirements as set forth in §§ 40.110 through 40.154 or in Appendix C of Part 42 of this chapter, revised effective November 11, 1963. (Added 40-47, July 12, 1964)

40.62 AIRPLANE LIMITATION FOR TYPE OF ROUTE.

All airplanes used ~~in passenger air transportation~~ shall be multi-engine airplanes and shall comply with the following requirements:

(a) TWO- OR THREE-ENGINE AIRPLANES.

Except for three-engine turbine-powered airplanes two- or three-engine airplanes shall not be used ~~in passenger-carrying operations~~ unless adequate airports are located along the route that the airplanes will at no time be at a greater distance therefrom than one hour of flying time in still air at normal cruising speed with one engine inoperative: PROVIDED, That the Administrator may specify distances greater or less than those set forth herein when he determines that the character of the terrain, the type of operation, or the performance of the airplanes to be used so permit or require. (Revised 40-40, April 10, 1964)

(b) LAND AIRPLANES ON EXTENDED OVERWATER ROUTES.

Land airplanes operated on flights involving extended overwater operations shall be certificated or approved as adequate for ditching in accordance with the ditching provisions of Part 4b of this subchapter (Civil Air Regulations):

PROVIDED, That the DC-3, C-46, CV-340, and CV-440 type airplanes need not be so certificated or approved.

40.63 PROVING TESTS.

(a) A type of airplane not previously proved for use in scheduled operation shall have at least 100 hours of proving tests, in addition to the airplane certification tests, accomplished under the supervision of an authorized representative of the Administrator. As part of the 100-hour total at least 50 hours shall be flown over authorized routes and at least 10 hours shall be flown at night.

(b) A type of airplane which has been previously proved shall be tested for at least 50 hours, of which at least 25 hours shall be flown over authorized routes, unless deviations are specifically authorized by the Administrator on the ground that the special cir-

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cumstances of a particular case make a literal observance of the requirements of this paragraph unnecessary for safety, when the airplane: (Revised 40-7, June 1, 1954)

(1) Is materially altered in design, or

(2) Is to be used by an air carrier who has not previously proved such a type.

A type of airplane has been materially altered in design when the alterations include:

(1) Installation of powerplants other than the powerplants of a type similar to those with which the airplane is certificated, or

(2) a major alteration to the airplane or its components which materially affects the flight characteristics.

(c) During proving tests only those persons required to make the tests and those designated by the ~~Board or the~~ Administrator shall be carried. Mail, express, and other cargo may be carried when approved ~~by the Administrator~~.

AIRPLANE PERFORMANCE OPERATING LIMITATIONS; TRANSPORT CATEGORY

40.70 TRANSPORT CATEGORY AIRPLANE OPERATING LIMITATIONS.

M (a) In operating any ~~passenger-carrying~~ transport category airplane not subject to paragraph (b) of this section, the provisions of this paragraph and §§ 40.71 through 40.78 shall be complied with: ~~unless~~

PROVIDED, That an authorized representative of the Administrator may authorize deviations ~~therefrom are specifically authorized by the Administrator on the ground that the~~ from such provisions when special circumstances of a particular case make a literal observance of the requirements unnecessary for safety.

NOTE: Deviations authorized will be specified in operations specifications of the air carrier.

M ~~(b)~~ (1) ~~For transport category airplanes~~ The performance data contained in the Airplane Flight Manual shall be applied in determining compliance with these provisions. Where conditions differ from those for which specific tests were made, compliance shall be determined by interpolation or by computation of the effects of changes in the specific variables where such interpolations or computations will give results substantially equaling in accuracy the results of a direct test.

M ~~(c)~~ (2) ~~No~~ The airplane shall not be taken off at a weight which exceeds the allowable weight for the runway being used as determined in accordance with the takeoff runway limitations of the transport category operating rules of this part, after taking into account the temperature operating correction factors required by §§ 4a.749a-T or 4b.117 of this subchapter, and set forth in the Airplane Flight Manual for the airplane.

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(b) In operating any turbine-powered transport category airplane certificated in accordance with the performance requirements of Special Civil Air Regulations Nos. SR-422, SR-422A, or SR-422B, the operating rules specified in the applicable Special Civil Air Regulation shall be complied with in lieu of §§ 40.71 through 40.78.

M 40.71 WEIGHT LIMITATIONS.

(a) No airplane shall be taken off from any airport located at an elevation outside of the altitude range for which maximum take-off weights have been determined, and no airplane shall depart for an airport of intended destination or have any airport specified as an alternate which is located at an elevation outside of the altitude range for which maximum landing weights have been determined.

(b) The weight of the airplane at take-off shall not exceed the authorized maximum take-off weight for the elevation of the airport from which the take-off is to be made.

(c) The weight at take-off shall be such that, allowing for normal consumption of fuel and oil in flight to the airport of intended destination, the weight on arrival will not exceed the authorized maximum landing weight for the elevation of such airport.

M 40.72 TAKE-OFF LIMITATIONS TO PROVIDE FOR ENGINE FAILURE.

No take-off shall be made except under conditions which will permit compliance with the following requirements:

(a) It shall be possible, from any point in the take-off up to the time of attaining the critical-engine-failure speed, to bring the airplane to a safe stop on the runway as shown by the accelerate-stop distance data.

(b) It shall be possible, if the critical engine should fail at any instant after the airplane attains the critical-engine-failure speed, to proceed with the take-off and attain a height of 50 feet, as indicated by the take-off path data, before passing over the end of the runway. Thereafter it shall be possible to clear all obstacles, either by at least 50 feet vertically, as shown by the take-off path data, or by at least 200 feet horizontally within the airport boundaries and by at least 300 feet horizontally after passing beyond such boundaries. In determining the allowable deviation of the flight path in order to avoid obstacles by at least the distances above set forth, it shall be assumed that the airplane is not banked before reaching a height of 50 feet, as shown by the take-off path data, and that a maximum bank thereafter does not exceed 15°.

(c) In applying the requirements of paragraphs (a) and (b) of this section, corrections shall be made for any gradient of the take-off surface. To allow for wind effect, take-off data based on still air may be corrected by not more than 50 percent of the reported wind component along the take-off path if opposite to

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the direction of take-off, and shall be corrected by not less than 150 percent of the reported wind component if in the direction of take-off.

40.73 EN ROUTE LIMITATIONS; ALL ENGINES OPERATING.

No airplane shall be taken off at a weight in excess of that which would permit a rate of climb (expressed in feet per minute), with all engines operating, of at least 6 V_{S_o} (when V_{S_o} is expressed in miles per hour) at an altitude of at least 1,000 feet above the elevation of the highest ground or obstructions within 10 miles on either side of the intended track. Transport category airplanes certificated under Part 4a of this subchapter are not required to comply with this section. For the purpose of this section it shall be assumed that the weight of the airplane as it proceeds along its intended track is progressively reduced by normal consumption of fuel and oil.

40.74 EN ROUTE LIMITATIONS; ONE ENGINE INOPERATIVE.

(a) No airplane shall be taken off at a weight in excess of that which would permit a rate of climb (expressed in feet per minute), with one engine inoperative, of at least

$$\left(0.06 - \frac{0.08}{N}\right) V_{S_o}^2$$

(when N is the number of engines installed and V_{S_o} is expressed in miles per hour) at an altitude of at least 1,000 feet above the elevation of the highest ground or obstruction within 10 miles on either side of the intended track ~~PROVIDED~~ except that for transport category airplanes certificated under Part 4a of this subchapter, the rate of climb shall be 0.02 $V_{S_o}^2$. ~~For the purpose of this section it shall be assumed that the weight of the airplane as it proceeds along its intended track is progressively reduced by normal consumption of fuel and oil.~~

(b) As an alternative to the provisions of paragraph (a) of this section, an air carrier may utilize an approved procedure whereby its airplanes are operated at an all-engine-operating altitude such that in the event of an engine failure the airplane can continue flight to an alternate airport where a landing can be made in accordance with the provisions of §40.78, the flight path clearing all terrain and obstructions along the route within 5 miles on either side of the intended track by at least 2,000 feet. In addition, if such a procedure is utilized, subparagraphs (1) through (6) of this paragraph shall be complied with:

(1) The rate of climb (as presented 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

$$\left(0.06 - \frac{0.08}{N}\right) V_{S_o}^2$$

(when N is the number of engines installed and V_{S_o} is expressed in miles per hour) for airplanes certificated under Part 4b of this subchapter and by 0.02 $V_{S_o}^2$ for airplanes certificated under Part 4a of this subchapter.

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(2) The all-engine-operating altitude shall be such that, in the event the critical engine becomes inoperative at any point along the route, the flight will be capable of proceeding to a predetermined alternate airport by use of this procedure. For the purpose of determining the take-off weight, the airplane shall be 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: PROVIDED, That the Administrator may authorize a procedure established on a different basis where adequate operational safeguards are found to exist.

(3) The airplane shall 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 shall include an approved method of accounting for winds and

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temperatures which would otherwise adversely affect the flight path. (Added 40-14, May 9, 1955)

(5) In complying with this procedure fuel jettisoning shall be permitted if the Administrator finds that the air carrier has an adequate training program, proper instructions are given to the flight crew, and all other precautions are taken to insure a safe procedure. (Added 40-14, May 9, 1955)

(6) The alternate airport shall be specified in the dispatch release and shall meet the provisions of §40.390. (Added 40-14, May 9, 1955)

(c) For the purposes of this section it shall be assumed that the weight of the airplane as it proceeds along its intended track is progressively reduced by normal consumption of fuel and oil. (Added 40-14, May 9, 1955)

40.75 EN ROUTE LIMITATIONS; TWO ENGINES INOPERATIVE.

The provisions of this section shall apply only to airplanes certificated in accordance with the performance requirements of Part 4b of this subchapter. No airplane having four or more engines shall be flown along an intended track except under the conditions of either paragraph (a) or paragraph (b) of this section. (Revised 40-6, May 18, 1954)

(a) No place along the intended track shall be more than 90 minutes away from an available landing area at which a landing can be made in accordance with the requirements of §40.78, assuming all engines to be operating at cruising power. (Revised 40-6, May 18, 1954)

(b) The take-off weight shall not be greater than that which would permit the airplane, with the two critical engines inoperative, to have a rate of climb in feet per minute equal to $0.01\ V_{S_o}{}^2$ (V_{S_o} being expressed in miles per hour) along all points of the route, from the point where the two engines are assumed to fail simultaneously to the landing area, either at an altitude of 1,000 feet above the elevation of the highest ground or obstruction within 10 miles on either side of the intended track or at an altitude of 5,000 feet, whichever is higher. The point where the two engines are assumed to fail shall be that point along the route which is most critical with respect to the take-off weight. In showing compliance with this prescribed rate of climb, the following shall apply: (Revised 40-6, May 18, 1954)

(1) It shall be permissible to consider that the weight of the airplane as it proceeds along its intended track is progressively reduced by normal consumption of fuel and oil with all engines operating up to the point where the two engines are assumed to fail and with two engines operating beyond that point. (Added 40-6, May 18, 1954)

(2) 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 an the prescribed minimum altitude at which the rate of descent become zero, if the latter is sufficiently above the prescribed minimum altitude to assure compliance with the prescribed rate of climb at the prescribed minimum altitudes during the subsequent portion of the flight. if, at the end of the descent and during the subsequent portion of the flight, the prescribed rate of climb is met at the prescribed minimum altitudes. The descent shall be assumed to be along a net flight path and the rate of descent for the appropriate weight and altitude shall be assumed to be $0.01\ V_{s_o}2$ greater than indicated by the performance information approved by the Administrator.

(3) If fuel jettisoning is provided, the airplane's weight at the point where the two engines are assumed to fail shall be considered to be not less than that which would include sufficient fuel to proceed to an available landing area at which a landing can be made in accordance with the requirements of § 40.78 and to arrive there at an altitude of at least 1,000 feet directly over the landing area.

M 40.76 SPECIAL EN ROUTE LIMITATIONS.

The 10-mile lateral distance specified in §§ 40.73 through 40.75 may, for a distance of no more than 20 miles, be reduced to 5 miles, if operating VFR, or if air navigational facilities are so located as to provide a reliable and accurate identification of any high ground or obstruction located outside of such 5-mile lateral distance but within the 10-mile distance.

M 40.77 LANDING DISTANCE LIMITATIONS; AIRPORT OF DESTINATION.

No airplane shall be taken off at a weight in excess of that which, under the conditions stated in this part would permit the airplane to be brought to rest at the field of intended destination within 60 percent of the effective length of the runway from a point 50 feet directly above the intersection of the obstruction clearance plane and the runway. For the purpose of this section it shall be assumed that the take-off weight of the airplane is reduced by the weight of the fuel and oil expected to be consumed in flight to the field of intended destination.

(a) It shall be assumed that the airplane is landed on the most favorable runway and direction in still air.

(b) It shall be assumed, considering the probable wind velocity and direction, that the airplane is landed on the most suitable runway, taking due account of the ground handling characteristics of the airplane type involved and other conditions (e.g., landing aids, terrain, etc.) and allowing for the effect on the landing path and roll of not more than 50 percent of the wind component along the landing path if opposite to the direction of landing, or not less than 150 percent of the wind component if in the direction of landing.

(c) If the airport of intended destination will not permit full compliance with paragraph (b) of this section, the airplane may be taken off if an alternate airport is designated which permits compliance with § 40.78.

40.78 LANDING DISTANCE LIMITATIONS; ALTERNATE AIRPORTS.

No airport shall be designated as an alternate airport in a dispatch release unless the airplane at the weight anticipated at the time of arrival at such airport can comply with the requirements of § 40.77: PROVIDED, That the airplane can be brought to rest within 70 percent of the effective length of the runway.

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CIVIL AIR REGULATIONS PART 40

AIRPLANE PERFORMANCE OPERATING LIMITATIONS;

NONTRANSPORT CATEGORY

M 40.90 NONTRANSPORT CATEGORY AIRPLANE OPERATING LIMITATIONS.

In operating any large, nontransport category airplane, ~~in passenger service~~ the provisions of § 40.91 through § 40.94 shall be complied with: ~~unless~~

PROVIDED, That an authorized representative of the Administrator may authorize deviations ~~therefrom as specifically authorized by the Administrator on the ground that~~ from such provisions when the special circumstances of a particular case make a literal observance of the requirements unnecessary for safety. Approved performance data ~~published or approved by the Administrator for each nontransport category airplane~~ only shall be used in determining compliance with the provisions of § 40.91 through § 40.94.

NOTE: Deviations authorized will be specified in operations specifications of the air carrier.

M 40.91 TAKE-OFF LIMITATIONS.

No take-off shall be made at a weight in excess of that which will permit the airplane to be brought to a safe stop within the effective length of the runway from any point during the take-off up to the time of attaining 105 percent of minimum control speed or 115 percent of the power-off stalling speed in the take-off configuration, whichever is the greater. In applying the requirements of this section:

(a) It may be assumed that take-off power is used on all engines during the acceleration;

(b) Account may be taken of not more than 50 percent of the reported wind component along the take-off path if opposite to the direction of take-off, and account shall be taken of not less than 150 percent of the reported wind component if in the direction of the take-off;

(c) Account shall be taken of the average runway gradient when the average gradient is greater than 1/2 percent. The average runway gradient is the difference between the elevations of the end points of the runway divided by the total length;

(d) It shall be assumed that the airplane is operating in the standard atmosphere.

M 40.92 EN ROUTE LIMITATIONS; ONE ENGINE INOPERATIVE.

(a) No take-off shall be made at a weight in excess of that which will permit the airplane to climb at a rate of at least 50 feet per minute with the critical engine inoperative at an altitude of at least 1,000 feet above the elevation of the highest obstacle within 5 miles on either side of the intended track or at an altitude of 5,000 feet, whichever is the higher; PROVIDED, That in the alternative an air carrier may utilize a

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procedure whereby the airplane is operated at an altitude such that, in event of an engine failure, the airplane can clear the obstacles within 5 miles on either side of the intended track by 1,000 feet, if the air carrier can demonstrate to the satisfaction of the Administrator that such a procedure can be used without impairing the safety of operation. If such a procedure is utilized, the rate of descent for the appropriate weight and altitude shall be assumed to be 50 feet per minute greater than indicated by the performance information published or approved by the Administrator. Before approving such a procedure, the Administrator shall take into account, for the particular route, route segment, or areas concerned, the reliability of wind and weather forecasting, the location and types of aids to navigation, the prevailing weather conditions, particularly the frequency and amount of turbulence normally encountered, terrain features, air traffic control problems, and all other operational factors which affect the safety of an operation utilizing such a procedure.

(b) In applying the requirements of paragraph (a) of this section, it shall be 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 positions;
(4) The operative engine or engines are operating at the maximum continuous power available;
(5) The airplane is operating in the standard atmosphere; and
(6) The weight of the airplane is progressively reduced by the weight of the anticipated consumption of fuel and oil.

M 40.93 LANDING DISTANCE LIMITATIONS; AIRPORT OF INTENDED DESTINATION.

No take-off shall be made at a weight in excess of that which, allowing for the anticipated weight reduction due to consumption of fuel and oil, will permit the airplane to be brought to a stop within 60 percent of the effective length of the most suitable runway at the airport of intended destination.

(a) This weight shall in no instance be greater than that permissible if the landing were to be made:

(1) On the runway with the greatest effective length in still air; and

(2) On the runway required by the probable wind, taking into account not more than 50 percent of the probable headwind component and not less than 150 percent of the probable tail-wind component.

(b) In applying the requirements of this section it shall be 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 air speed of at least 1.3 V_{So};

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(2) The landing is made in such a manner that it does not require any exceptional degree of skill on the part of the pilot; and (Revised Revision, December 31, 1955)

(3) The airplane is operating in the standard atmosphere.

M 40.94 LANDING DISTANCE LIMITATIONS; ALTERNATE AIRPORTS.

No airport shall be designated as an alternate airport in a dispatch release unless the airplane at the weight anticipated at the time of arrival at such airport can comply with the requirements of §40.93: PROVIDED, That the airplane can be brought to rest within 70 percent of the effective length of the runway. (Added 40-3, April 1, 1954)

SPECIAL AIRWORTHINESS REQUIREMENTS

40.110 FIRE PREVENTION.

All airplanes ~~used in passenger service~~, powered by engines rated at more than 600 horsepower each for maximum continuous operation and which have not been certificated in accordance with the provisions of Part 4b of this subchapter in effect on or after November 1, 1946, shall comply with the requirements contained in §40.111 through §40.143: PROVIDED, That if the Administrator finds that in particular models of existing airplanes literal compliance with specific items of these requirements might be extremely difficult of accomplishment and that such compliance would not contribute materially to the objective sought, he may accept such measures of compliance as he finds will effectively accomplish the basic objectives of these regulations.

40.111 SUSCEPTIBILITY OF MATERIALS TO FIRE.

The Administrator shall prescribe the heat conditions and testing procedures which any specific material or individual part must meet where necessary for the purpose of applying the following defined terms: fireproof, fire-resistant, flame-resistant, flash-resistant, and flammable.

40.112 CABIN INTERIORS.

All compartments occupied or used by the crew or passengers shall comply with the following provisions:

(a) Materials shall in no case be less than flash-resistant.

(b) The wall and ceiling linings, the covering of all upholstering, floors, and furnishings shall be flame-resistant.

(c) Compartments where smoking is to be permitted shall be equipped with ash trays of the self-contained type which are completely removable. All other compartments shall be placarded against smoking.

(d) All receptacles for used towels, papers, and wastes shall be of fire-resistant material and shall incorporate covers or other provisions for containing possible fires started in the receptacles.

40.113 INTERNAL DOORS.

Where internal doors are equipped with louvres or other ventilating means, provision convenient to the crew shall be made for closing the flow of air through the door when such action is found necessary.

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CIVIL AIR REGULATIONS PART 40

40.114 VENTILATION.

All passenger and crew compartments shall be suitably ventilated. Carbon monoxide concentration shall not exceed one part in 20,000 parts of air, and fuel fumes shall not be present. Where partitions between compartments are equipped with louvres or other means allowing air to flow between such compartments, provision convenient to the crew shall be made for closing the flow of air through the louvres or other means when such action is found necessary.

40.115 FIRE PRECAUTIONS.

Each compartment shall be designed so that, when used for the purpose of storing cargo or baggage, it shall comply with all of the requirements prescribed for cargo or baggage compartments. It shall include no controls, wiring, lines, equipment, or accessories the damage or failure of which would affect the safe operation of the airplane, unless such item is adequately shielded, isolated, or otherwise protected so that it cannot be damaged by movement of cargo in the compartment, and so that any breakage or failure of such item would not create a fire hazard in the compartment. Provision shall be made to prevent cargo or baggage from interfering with the functioning of the fire-protective features of the compartment. All materials used in the construction of cargo or baggage compartments, including tie-down equipment, shall be flame-resistant or better. In addition, all cargo and baggage compartments shall include provisions for safeguarding against fires according to the following classifications:

(a) Cargo and baggage compartments shall be classified in the "A" category, if presence of a possible fire therein can be readily discernible to a member of the crew while at his station, and if all parts of the compartment are easily accessible in flight. A hand fire extinguisher shall be available for such compartment.

(b) Cargo and baggage compartments shall be classified in the "B" category, if sufficient access is provided while in flight to enable a member of the crew to move by hand all contents and to reach effectively all parts of the compartment with a hand fire extinguisher. Furthermore, the design of the compartment shall be such that, when the access provisions are being used, no hazardous quantity of smoke, flames, or extinguishing agent will enter any compartment occupied by the crew or passengers. Each compartment in this category shall be equipped with a separate system of an approved type smoke detector or fire detector to give warning at the pilot or flight engineer station. Hand fire extinguishers shall be readily available for use in all compartments of this category. Compartments in this category shall be completely lined with fire-resistant material, except that additional service lining of flame-resistant material may be imployed. (Revised 40-16, Aguust 25, 1955)

(c) Cargo and baggage compartments shall be classified in the "C" category, if they do not conform with the requirements ~~for~~ of the "A", ~~or~~ "B", "D", or "E" categories. Each compartment of the "C" category shall be equipped with:

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(1) A separate system of an approved type smoke detector or fire detector to give warning at the pilot or flight engineer station, and (Revised 40-16, August 25,1955)

(2) an approved built-in fire-extinguishing system controlled from the pilot or flight engineer station.Means shall be provided to exclude hazardous quantities of smoke, flames, or extinguishing agent from entering into any compartment occupied by the crew or passengers.Ventilation and drafts shall be further controlled within each such cargo or baggage compartment to the extent that the extinguishing agent provided can control any fire which may start within the compartment. All cargo and baggage compartments of this category shall be completely lined with fire-resistant material, except that additional service lining of flame-resistant material may be employed.

(d) CLASS D.

Cargo and baggage compartments shall be classified in the "D" category if they are so designed and constructed that a fire occurring therein will be completely confined without endangering the safety of the airplane or the occupants. Compliance shall be shown with subparagraphs (1) through (4) of this paragraph.

(1) Means shall be provided to exclude hazardous quantities of smoke, flames, or other noxious gases from entering into any compartment occupied by the crew or passengers.

(2) Ventilation and drafts shall be controlled within each compartment so that any fire likely to occur in the compartment will not progress beyond safe limits.

NOTE: For compartments having a volume not in exess of 500 cubic feet, an airflow of not more than 1,500 cubic feet per hour is considered acceptable. For larger compartments lesser airflow may be applicable.

(3) The compartment shall be completely lined with fire resistant material.

(4) Consideration shall be given to the effect of heat within the compartment on adjacent critical parts of the airplane.

(e) CLASS E.

On airplanes used for the carriage of cargo only it shall be acceptable to classify the cabin area as a Class "E" compartment. Compliance shall be shown with subparagraphs (1) through (5) of this paragraph.

(1) The compartment shall be completely lined with fire-resistant material.

(2) The compartment shall be equipped with a separate system of an approved type smoke or fire detector to give warning at the pilot or flight engineer station.

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(3) Means shall be provided to shut off the ventilating airflow to or within the compartment. Controls for such means shall be accessible to the flight crew in the crew compartment.

(4) Means shall be provided to exclude hazardous quantities of smoke, flames, or noxious gases from entering the flight crew compartment.

(5) Required crew emergency exits shall remain accessible under all cargo loading conditions.

40.116 PROOF OF COMPLIANCE.

Compliance with those provisions of §40.115 which refer to compartment accessibility, the entry of hazardous quantities of smoke or extinguishing agent into compartments occupied by the crew or passengers, and the dissipation of the extinguishing agent in Category "C" compartments shall be demonstrated by tests in flight. It shall also be demonstrated during these tests that no inadvertent operation of smoke or fire detectors in adjacent or other compartments within the airplane would occur as a result of fire contained in any one compartment either during or after extinguishment, unless the extinguishing system floods such compartments simultaneously.

40.117 PROPELLER DE-ICING FLUID.

If combustible fluid is used for propeller de-icing, the provisions of §40.131 shall be complied with. (Revised Revision, December 31, 1955)

40.118 PRESSURE CROSS-FEED ARRANGEMENTS.

Pressure cross-feed lines shall not pass through portions of the airplane devoted to carrying personnel or cargo unless means are provided to permit the flight personnel to shut off the supply of fuel to these lines, or unless the lines are enclosed in a fuel and fumeproof enclosure that is ventilated and drained to the exterior of the airplane. Such enclosures need not be used if these lines incorporate no fittings on or within the personnel or cargo areas and are suitably routed or protected to safe-guard against accidental damage. Lines which can be isolated from the remainder of the fuel system by means of valves at each end shall incorporate provisions for the relief of excessive pressures that may result from exposure of the isolated line to high ambient temperatures.

40.119 LOCATION OF FUEL TANKS.

Location of fuel tanks shall comply with the provisions of §40.132. In addition, no portion of engine nacelle skin which lies immediately behind a major air egress opening from the engine compartment shall act as the wall of an integral tank. Fuel tanks shall be isolated from personnel compartments by means of fume- and fuel-proof enclosures.

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40.120 FUEL SYSTEM LINES AND FITTINGS.

Fuel lines shall be installed and supported in a manner that will prevent excessive vibration and will be adequate to withstand loads due to fuel pressure and accelerated flight conditions. Lines which are connected to components of the airplane between which relative motion may exist shall incorporate provisions for flexibility. Flexible connections in lines which may be under pressure and subjected to axial loading shall employ flexible hose assemblies rather than hose clamp connections. Flexible hose shall be of an acceptable type or proven suitable for the particular application.

40.121 FUEL LINES AND FITTINGS IN DESIGNATED FIRE ZONES.

Fuel lines and fittings in all designated fire zones (see §40.131) shall comply with the provisions of §40.134.

40.122 FUEL VALVES.

In addition to the requirements contained in §40.133 for shutoff means, all fuel valves shall be provided with positive stops or suitable index provisions in the "on" and "off" positions and shall be supported in such a manner that loads resulting from their operation or from accelerated flight conditions are not transmitted to the lines connected to the valve.

40.123 OIL LINES AND FITTINGS IN DESIGNATED FIRE ZONES.

Oil lines and fittings in all designated fire zones (see §40.131) shall comply with the provisions of §40.134.

40.124 OIL VALVES.

Requirements of §40.133 for shutoff means shall be complied with. Closing of oil shutoff means shall not prevent feathering the propeller, unless equivalent safety provisions are incorporated. All oil valves shall be provided with positive stops or suitable index provisions in the "on" and "off" positions, and shall be supported in such a manner that loads resulting from their operation or from accelerated flight conditions are not transmitted to the lines attached to the valve.

40.125 OIL SYSTEM DRAINS.

Accessible drains shall be provided to permit safe drainage of the entire oil system and shall incorporate either a manual or automatic means for positive ~~or automatic~~ locking in the closed position. (See also § 40.135).

40.126 ENGINE BREATHER LINE.

Engine breather lines shall be so arranged that condensed water vapor which may freeze and obstruct the line cannot accumulate at any point. Breathers shall discharge in a location which will not constitute a fire hazard in case foaming occurs and so that oil emitted from the line will not impinge upon the pilots' windshield. The breather shall not discharge into the engine air induction system.(See also §40.135).

40.127 FIRE WALLS.

All engines, auxiliary power units, fuel-burning heaters, and other combustion equipment which are intended for operation in flight shall be isolated from the remainder of the airplane by means of fire walls or shrouds, or other equivalent means.

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CIVIL AIR REGULATIONS PART 40

40.128 FIRE-WALL CONSTRUCTION.

Fire walls and shrouds shall be constructed in such a manner that no hazardous quantity of air, fluids, or flame can pass from the engine compartment to other portions of the airplane. All openings in the fire wall or shroud shall be sealed with close-fitting fireproof grommets, bushings, or fire-wall fittings. Fire walls and shrouds shall be constructed of fireproof material and shall be protected against corrosion. The following materials have been found to comply with this requirement:

(a) Heat and corrosion resistant steel 0.015 inch thick;
(b) Low carbon steel, suitably protected against corrosion, 0.018 inch thick.

40.129 COWLING.

Cowling shall be constructed and supported in such a manner as to be capable of resisting all vibration, inertia, and air loads to which it may normally be subjected. Provision shall be made to permit rapid and complete drainage of all portions of the cowling in all normal ground and flight attitudes. Drains shall not discharge in locations constituting a fire hazard. Cowling, unless otherwise specified by these regulations, shall be constructed of fire-resistant material. Those portions of the cowling which are subjected to high temperatures due to their proximity to exhaust system ports or exhaust gas impingment shall be constructed of fireproof material.

40.130 ENGINE ACCESSORY SECTION DIAPHRAGM.

Unless equivalent protection can be demonstrated by other means, a diaphragm shall be provided on air-cooled engines to isolate the engine power section and all portions of the exhaust system from the engine accessory compartment. This diaphragm shall comply with the provisions of §40.128.

40.131 POWERPLANT FIRE PROTECTION.

Engine accessory sections, installations where no isolation is provided between the engine and accessory compartment, also regions wherein lie auxiliary power units, fuel-burning heaters, and other combustion equipment shall be referred to as designated fire zones. Such zones shall be protected from fire by compliance with §40.132 through §40.135.

40.132 FLAMMABLE FLUIDS.

No tanks or resevoirs which are a part of a system containing flammable fluids or gases shall be located in designated fire zones, except where the fluid contained, the design of the system, the materials used in the tank, the shutoff means, and all connections, lines, and controls are such as to provide equivalent safety. Not less than 1/2 inch of clear air space shall be provided between any tank or resevoir and a fire wall or shroud isolating a designated fire zone.

40.133 SHUTOFF MEANS.

Means for each individual engine shall be provided for shutting off or otherwise preventing hazardous quantities of fuel, oil, de-icer, and other flammable fluids from flowing into, within, or through an designated fire zone, except that means need not be provided to shut off flow

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in lines forming an integral part of an engine. In order to facilitate rapid and effective control of fires, such shutoff means shall permit an emergency operating sequence which is compatible with the emergency operation of other equipment, such as feathering the propeller. Shutoff means shall be located outside of designated fire zones, unless equivalent safety is provided (see §40.132), and it shall be shown that no hazardous quantity of such flammable fluid will drain into any designated fire zone after shutting off has been accomplished. Adequate provisions shall be made to guard against inadvertent operation of the shutoff means and to make it possible for the crew to reopen the shutoff means after it has once been closed.

40.134 LINES AND FITTINGS.

All lines and fittings for same located in designated fire zones which carry flammable fluids or gases and which are under pressure, or which attach directly to the engine, or are subject to relative motion between components, exclusive of those lines and fittings forming an integral part of the engine, shall be flexible, fire-resistant lines with fire-resistant, factory-fixed, detachable, or other approved fire-resistant ends. Lines and fittings which are not subject to pressure or to relative motion between components shall be of fire-resistant materials.

40.135 VENT AND DRAIN LINES.

All vent and drain lines and fittings for same located in designated fire zones and which carry flammable fluids or gases shall comply with the provisions of §40.134, if the Administrator finds that rupture or breakage of a particular drain or vent line may result in a fire hazard.

40.136 FIRE-EXTINGUISHING SYSTEM. (Revised Revision, December 31, 1955)

(a) Unless ~~it can be demonstrated~~ the air carrier shows that equivalent protection against destruction of the airplane in case of fire is provided by the use of fireproof materials in the nacelle and other compartments which would be subjected to flame, fire-extinguishing systems shall be provided to serve all designated fire zones.

(b) Materials in the fire-extinguishing system shall not react chemically with the extinguishing agent so as to constitute a hazard.

40.137 FIRE-EXTINGUISHING AGENTS.

Extinguishing agents employed shall be methyl bromide, carbon dioxide, or any other agent which has been demonstrated to provide equivalent extinguishing action. If methyl bromide or any other toxic extinguishing agent is employed, provisions shall be made to prevent the entrance of harmful concentrations of fluid or fluid vapors into any personnel compartment either due to leakage during normal operation of the airplane or as a result of discharging the fire extinguisher on the ground or in flight when a defect exists in the extinguishing system. If a methyl bromide system is provided, the containers shall be charged with dry agent and shall be sealed by the fire-extinguisher manufacturer or any other party employing satisfactory recharging equipment. If carbon dioxide is used, it shall not be possible to discharge sufficient gas into personnel compartments to constitute a hazard from the standpoint of suffocation of the occupants. (Revised Revision, December 31, 1955)

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40.138 EXTINGUISHING AGENT CONTAINER PRESSURE RELIEF.

Extinguishing agent containers shall be provided with a pressure relief to prevent bursting of the container due to excessive internal pressures. The discharge line from the relief connection shall terminate outside the airplane in a location convenient for inspection on the ground. An indicator shall be provided at the discharge end of the line to provide a visual indication when the container has discharged.

40.139 EXTINGUISHING AGENT CONTAINER COMPARTMENT TEMPERATURE.

Precautions shall be taken to assure that the extinguishing agent containers are installed in locations where reasonable temperatures can be maintained for effective use of the ~~extinguisher~~ extinguishing system.

40.140 FIRE-EXTINGUISHING SYSTEM MATERIALS.

All components of fire-extinguishing systems located in designated fire zones shall be constructed of fireproof materials, except for connections which are subject to relative motion between components of the airplane, in which case they shall be of flexible fire-resistant construction so located as to minimize the possibility of failure.

40.141 FIRE-DETECTOR SYSTEMS.

Quick-acting fire detectors shall be provided in all designated fire zones and shall be sufficient in number and location to assure the detection of fire which may occur in such zones.

40.142 FIRE DETECTORS.

Fire detectors shall be constructed and installed in such a manner as to assure their ability to resist without failure, all vibration, inertia, and other loads to which they may normally be subjected. Detectors shall be unaffected by exposure to oil, water, or other fluids or fumes which may be present.

40.143 PROTECTION OF OTHER AIRPLANE COMPONENTS AGAINST FIRE.

All airplane surfaces aft of the nacelles in the region of one nacelle diameter on both sides of the nacelle center line shall be constructed of fire-resistant material. This provision need not be applied to tail surfaces lying behind nacelles unless the dimensional configuration of the airplane is such that the tail surfaces could be affected readily by heat, flames, or sparks emanating from a designated fire zone or engine compartment of any nacelle.

40.150 CONTROL OF ENGINE ROTATION.

All airplanes shall be provided with means for individually stopping and restarting the rotation of any engine in flight, except that for turbine engine installations means for completely stopping the rotation need be provided only if the Administrator finds that rotation could jeopardize the safety of the airplane. (Revised 40-17, July 25, 1955)

40.151 FUEL SYSTEM INDEPENDENCE.

Airplane fuel systems shall be arranged in such manner that the failure of any one component will not result in the irrecoverable loss of

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power of more than one engine. A separate fuel tank need not be provided for each engine if the ~~Administrator finds~~ air carrier shows that the fuel system incorporates features which provide equivalent safety.

40.152 INDUCTION SYSTEM ICE PREVENTION.

Means for preventing the malfunctioning of each engine due to ice accumulation in the engine air induction system shall be provided for all airplanes.

40.153 CARRIAGE OF CARGO IN PASSENGER COMPARTMENTS.

Cargo shall not be carried in the passenger compartment of an airplane except as provided in either paragraph (a) or (b) of this section. (Revised 40-34, January 20, 1962)

(a) Cargo carried aft of the foremost seated passengers shall be carried in an approved cargo bin. Approved cargo bins shall meet the requirements of subparagraphs (1) through (8) of this paragraph. (Revised 40-34, January 20, 1962)

(1) The bins shall be capable of withstanding the load factors and emergency landing conditions applicable to the passenger seats of the airplane in which the bin is to be installed multiplied by a factor of 1.15. The combined weight of the bin and the maximum weight of cargo which may be carried in the bin shall be used to determine this strength. (Revised 40-34, January 20, 1962)

(2) The maximum weight of cargo which the bin is approved to carry and any instructions necessary to insure proper weight distribution within the bin shall be conspicuously marked on the bin. (Revised 40-34, January 20, 1962)

(3) The bin shall not impose any load on the floor or other structure of the airplane which exceeds the structural load limitations of such components. (Revised 40-34, January 20, 1962)

(4) The bin shall be attached to the seat tracks or to the floor structure of the airplane, and its attachments shall withstand the load factors and emergency landing conditions applicable to the passenger seats of the airplane in which the bin is installed multiplied by either the factor 1.15 or the seat attachment factor specified for the airplane, whichever is greater. The combined weight of the bin and the maximum weight of cargo which may be carried in the bin shall be used to determine this strength. (Revised 40-34, January 20, 1962)

(5) The bin shall not be installed in a position which restricts access to or use of any required emergency exit, or the use of the aisle in the passenger compartment. (Revised 40-34, January 20, 1962)

(6) The bin shall be fully enclosed and constructed of material which is at least flame resistant. (Revised 40-34, January 20, 1962)

(7) Suitable safeguards shall be provided within the bin to prevent the cargo from shifting under emergency landing conditions. (Revised 40-34, January 20, 1962)

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(8) The bin shall not be installed in a position which obscures any passenger's view of the "seat belt" or "no smoking" sign, nor shall any required exit sign be blocked from view, unless an auxiliary sign or other approved means for proper notification of such passenger is provided. (Added 40-34, January 20, 1962)

(b) Cargo carried forward of the foremost seated passengers shall be carried either in approved cargo bins as specified in paragraph (a) of this section, or in accordance with the following requirements: (Added 40-32, January 2, 1962)

(1) It shall be properly secured by means of safety belts or other tiedowns having sufficient strength to eliminate the possibility of shifting under all normally anticipated flight and ground conditions;

(2) It shall be packaged or covered in a manner to avoid possible injury to passengers; (Renumbered 40-32, January 2, 1962)

(3) It shall not impose any load on seats or the floor structure which exceeds the structural load limitation for those components; (Revised 40-34, January 20, 1962)

(4) It shall not be located in a position which restricts the access to or use of any required emergency or regular exit, or the use of the aisle in the passenger compartment; and (Revised 40-34, January 20, 1962)

(5) It shall not be located in a position which obscures any passenger's view of the "seat belt" or "no smoking" signs, nor shall any required exit sign be blocked from view, unless an auxiliary sign or other approved means for proper notification of such passenger is provided. (Revised 40-34, January 20, 1962)

40.154 CARRIAGE OF CARGO IN CARGO COMPARTMENTS.

When cargo is carried in cargo compartments which are so designed as to require the physical entry of a crewmember to extinguish any fire which may occur during flight, the cargo shall be so loaded as to permit a crewmember to effectively reach all parts of the compartment with the contents of a hand fire extinguisher.

40.155 LANDING GEAR AURAL WARNING DEVICE. (Added 40-41, May 22, 1964)

(a) Except as otherwise provided in paragraph (b) of this section, on and after May 1, 1965, landplanes having a maximum weight of more than 12,500 pounds shall be provided with a landing gear aural warning device to function continuously when the wing flaps are extended in accordance with subparagraph (1) or (2) of this paragraph and the landing gear is not fully extended and locked. There shall be no manual shutoff provided for the warning device. The flap position sensing unit may be installed at any suitable location in the airplane. The wing-flap-actuated warning system shall be in addition to the throttle-actuated device installed in compliance with the airworthiness requirements under which

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the landplane was type certificated. The system required by this paragraph may utilize any portion of the throttle-actuated system including the aural warning device.

(1) For landplanes having an established approach wing-flap position, when the wing flaps are extended beyond the maximum certificated approach climb configuration position in the Airplane Flight Manual.

(2) For landplanes without an established approach climb wing-flap position, when the wing flaps are extended beyond the position at which landing gear extension normally is performed.

(b) Prior to February 1, 1965, the air carrier may submit to the assigned Federal Aviation Agency principal inspector, in writing, a request for extension of the May 1, 1965, date specified in paragraph (a) of this section, together with supporting data along the lines set forth in subparagraphs (1) and (2) of this paragraph. The inspector may extend the May 1, 1965, compliance date, but in no event shall such compliance date be extended beyond August 1, 1965, if he finds that the air carrier —

(1) Made a diligent effort to comply with the May 1, 1965, date, but will not be able to comply by that date due to procurement or installation problems beyond its control; and

(2) Has undertaken specific action to comply with the requirements of paragraph (a) of this section at the earliest practicable date following May 1, 1965.

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CIVIL AIR REGULATIONS PART 40

INSTRUMENTS AND EQUIPMENT FOR ALL OPERATIONS

40.170 AIRCRAFT INSTRUMENTS AND EQUIPMENT FOR ALL OPERATIONS.

M (a) Instruments and equipment required by §§ 40.171 through ~~§ 40.232~~ 40.233 shall be approved and shall be installed in accordance with the provisions of the airworthiness requirements applicable to the instruments or equipment concerned.

(b) ~~The following provisions apply to air-speed limitations, air-speed indicators, and related information:~~

~~(1) Air-speed limitations and related information contained in the Airplane Flight Manual and pertinent placards shall be expressed in the same units as used on the air-speed indicator.~~

~~(2) When more than one air-speed indicator is required, all such indicators shall be calibrated to read in the same units.~~

~~(3) When an air-speed indicator is calibrated in statute miles per hour, a readily usable means shall be provided for the flight crew to convert statute miles per hour to knots.~~

~~(4) On and after April 1, 1956,~~ All air-speed indicators shall be calibrated in knots, and all air-speed limitations and related information contained in the Airplane Flight Manual and pertinent placards shall be expressed in knots.

M (c) The following instruments and equipment shall be in operable condition prior to take-off, except as provided in §40.391(b) for continuance of flight with equipment inoperative: (Renumbered 40-4,Oct. 1,1954)

(1) Instruments and equipment required to comply with airworthiness requirements under which the airplane is type certificated and as required by the provisions of § 40.110 and §§ 40.150 through 40.155; and

(2) Instruments and equipment specified in §§ 40.171 through ~~§ 40.178~~ 40.179 for all operations, and the instruments and equipment specified in §§ 40.200 through ~~§ 40.232~~ 40.233 for the type of operation indicated, wherever these items are not already provided in accordance with subparagraph (1) of this paragraph.

40.171 FLIGHT AND NAVIGATIONAL EQUIPMENT FOR ALL OPERATIONS.

The following flight and navigational instruments and equipment are required for all operations:

(a) An air-speed indicating system with heated pitot tube or equivalent means for preventing malfunction due to icing;
(b) Sensitive altimeter;
(c) Clock (sweep-second);
(d) Free-air temperature indicator;
(e) Gyroscopic bank and pitch indicator (artificial horizon)
(f) Gyroscopic rate-of-turn indicator combined with a slip-skid indicator (turn and bank indicator);
(g) Gyroscopic direction indicator (directional gryo or equivalent); (Revised Revision, December 31, 1955)

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(h) Magnetic compass; and (Revised Revision, December 31, 1955)
(i) Vertical speed indicator (rate-of-climb indicator).

40.172 ENGINE INSTRUMENTS FOR ALL OPERATIONS.

The following engine instruments are required for all operations, except that the Administrator may permit or require different instrumentation for turbine-powered airplanes to provide equivalent safety: (Added 40-17, July 25, 1955)

(a) Carburetor air temperature indicator for each engine;
(b) Cylinder head temperature indicator for each air-cooled engine;
(c) Fuel pressure indicator for each engine;
(d) Fuel flowmeter or fuel mixture indicator for each engine not equipped with an automatic altitude mixture control;
(e) Means for indicating fuel quantity in each fuel tank;
(f) Manifold pressure indicator for each engine;
(g) Oil pressure indicator for each engine;
(h) Oil quantity indicator for each oil tank when a transfer or separate oil reserve supply is used;
(i) Oil-in temperature indicator for each engine;
(j) Tachometer for each engine;
(k) An independent fuel pressure warning device for each engine, or a master warning device for all engines with means for isolating the individual warning circuits from the master warning device; and (Revised Revision, December 31, 1955)
(l) Effective July 1, 1956, a means shall be provided for each reversible propeller on airplanes equipped with reversible propellers, which will indicate to the pilots when the propeller is in reverse pitch. Such means may be actuated at any point in the reversing cycle between the normal low pitch stop position and full reverse pitch. No indication shall be given at or above the normal low pitch stop position. The source of indication shall be actuated by the propeller blade angle or be directly responsible to the propeller blade angle. (Revised 40-19, September 1, 1955)

40.173 EMERGENCY EQUIPMENT FOR ALL OPERATIONS.

(a) GENERAL. (Added Revision, December 31, 1955)

The emergency equipment specified in ~~paragraphs (b), (c), and (d) of~~ this section is required for all operations and shall be inspected regularly in accordance with inspection periods established in the operations specifications to insure the continued serviceability and immediate readiness of such equipment for its intended emergency purposes. ~~Such~~ All required equipment shall be readily accessible to the crew, and the method of operation shall be plainly indicated. When such equipment is carried in compartments or containers, the compartments or containers shall be so marked as to ~~be readily identifiable~~ contents and date of last inspection.

M (b) HAND FIRE EXTINGUISHERS FOR CREW, PASSENGER, AND CARGO COMPARTMENTS.

Hand fire extinguishers of an approved type shall be provided for use in crew, passenger, and cargo compartments in accordance with the following requirements:

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(1) The type and quantity of extinguishing agent shall be suitable for the type of fires likely to occur in the compartment where the extinguisher is intended to be used.

(2) At least one nand fire extinguisher shall be provided and conveniently located on the flight deck for use by the flight crew.

(3) At least one hand fire extinguisher shall be conveniently located in the passenger compartment of airplanes accomodating more than six but less than 31 passengers. On airplanes accomodating more than 30 passengers, at least two fire extinguishers shall be provided. None need be provided in passenger compartments of airplanes accomodating six or less persons. (Revised Revision, December 31, 1955)

(c) FIRST-AID EQUIPMENT.

Approved first-aid ~~equipment suitable~~ kits as specified in Appendix D to this part for treatment of injuries likely to occur in flight or in minor accidents shall be provided. ~~in a quantity appropriate to the number of passengers and crew accommodated in the airplane.~~

NOTE: See Appendix D for type and contents of first-aid kits.

(d) CRASH AX.

All airplanes shall be equipped with at least one crash ax. (Revised 40-18, September 1, 1955)

(e) MEANS FOR EMERGENCY EVACUATION.

~~After August 31, 1957~~, On all passenger-carrying airplanes, at all emergency exits which are more than 6 feet from the ground with the airplane on the ground and with the landing gear extended, means shall be provided to assist the occupants in descending from the airplane. At floor level exits approved as emergency exits, such means shall be a chute or equivalent device suitable for the rapid evacuation of passengers. During flight time this means shall be in a position for ready use: PROVIDED, That the requirements of this paragraph do not apply to emergency exits over the wing where the greatest distance from the lower sill of the exit to the wing surface does not exceed 36 inches.

(f) INTERIOR EMERGENCY EXIT MARKING.

(1) After May 31, 1957, all passenger emergency exits, their means of access, and their means of opening shall be marked conspicuously. The identity and location of emergency exits shall be recognizable from a distance equal to the width of the cabin. The location of the emergency exit operating handle and the instructions for opening shall be marked on or adjacent to the emergency exit and shall be readable from a distance of 30 inches by a person with normal eyesight. (Revised 40-11, May 17, 1958)

(2) In all passenger-carrying airplanes a source or sources of light with an energy supply independent of the main lighting system shall be installed to illuminate all passenger emergency exit markings. Such lights shall be designed to function automatically in a crash landing and to continue to function thereafter, and shall also be operable manually, or shall be designed only for manual operation and also continue to function following a crash landing. When such lights require arming

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of the system to function automatically, the system shall be armed prior to each takeoff and landing. When such lights require manual operation to function, they shall be turned on prior to each takeoff and landing. (Revised 40-36, March 20, 1962)

40.174 SEATS AND SAFETY BELTS FOR ALL OCCUPANTS.

(a) The air carrier shall provide and make available at all times during the takeoff, en route flight, and landing of an airplane which it is operating:

(1) An approved seat or berth for each person over 2 years of age aboard the airplane, and

(2) An approved safety belt for separate use by each person over 2 years of age aboard the airplane, except that two persons occupying a berth may be provided with one approved safety belt to be shared by both such persons, and two persons occupying a multiple lounge or divan seat may be provided with one approved safety belt to be shared by both such persons during en route flight only.

(b) ~~A seat and an individual safety belt are required for each passenger and crew member excluding infants, who are in other than a recumbent position~~ During the takeoff and landing of an air carrier airplane, each person on board shall occupy an approved seat or berth and secure himself with the approved ~~One~~ safety belt ~~only is required in a~~ provided for the occupant of such seat or berth, ~~for one or two persons in a recumbent position during takeoff and landing. During flight betwen takeoff and landing, one safety belt is sufficient for two person occupying a multiple lounge or divan seat~~ except that a person 2 years of age or less may be held by an adult person occupying a seat or berth. A safety belt provided for the occupant of a seat shall not be used by more than one adult during takeoff and landing.

40.175 MISCELLANEOUS EQUIPMENT FOR ALL OPERATIONS.

All airplanes shall have installed the following equipment:

(a) If protective fuses are used, spare fuses of a number approved for the particular airplane and appropriately described in the air carrier manual;

(b) Windshield wiper or equivalent for each pilot station; (Revised Revision, December 31, 1955)

M (c) A power supply and distribution system capable of producing and distributing the load for all required instruments and equipment using an external power supply in the event of failure of any one power source or component of the power distribution system: PROVIDED, That the Administrator may authorize the use of common elements in the power distribution system when he finds that such elements are so designed as to be reasonably protected against malfunction. Engine-driven sources of energy, when used, shall be on separate engines. (Revised Revision, December 31, 1955)

(d) Means for indicating the adequacy of the power being supplied to required flight instruments. (Revised Revision, December 31, 1955)

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(e) Two independent static pressure systems, so vented to the outside atmospheric pressure that they will be least affected by air flow variation, moisture, or other foreign matter, and so installed as to be airtight, except for the vent. When a means is provided for transferring an instrument from its primary operating system to an alternate system, such means shall include a positive positioning control and shall be marked to indicate clearly which system is being used.

(f) Means for locking all companionway doors which separate passenger compartments from flight crew compartments. Keys for all doors which separate passenger compartments from other compartments having emergency exit provisions shall be readily available to all crew members. Any door which is the means of access to a required passenger emergency exit shall be placarded to indicate that it must be open during take-off and landing. All doors which lead to compartments normally accessible to passengers and which are capable of being locked by passengers shall be provided with means for unlocking by the crew in the event of an emergency.

(g) For seaplanes only, anchor light or lights, a warning bell for signaling when not under way during fog conditions, and an anchor adequate for the size of the seaplane.

40.176 COCKPIT CHECK PROCEDURE. (Revised Revision, December 31, 1955)

The air carrier shall provide for each type of airplane an approved cockpit check procedure. ~~This~~ The approved procedures shall include all items necessary for flight crewmembers to check for safety prior to starting engines, prior to taking off, prior to landing, and in engine and systems emergencies, ~~It~~ and shall be so designed as to obviate the necessity for a flight crewmember to rely upon his memory for items to be checked.~~and~~ The approved procedures shall be readily usable in the cockpit of each airplane and shall be followed by the flight crew when operating the airplane.

40.177 PASSENGER INFORMATION FOR ALL OPERATIONS.

All airplanes shall be equipped with signs visible to passengers and cabin attendants to notify such persons when smoking is prohibited, and when safety belts should be fastened. These signs shall be capable of on-off operation by the crew and shall be placed in the "on position" for all takeoffs and landings and when otherwise deemed necessary by the pilot in command. No passenger or cabin attendant will smoke while the no smoking sign is lighted and all passengers will fasten their seat belts and keep them fastened while the seat belt sign is lighted.

40.178 EXTERIOR EXIT AND EVACUATION MARKINGS FOR ALL OPERATIONS.

Effective January 1, 1956, exterior surfaces of the airplane shall be marked to identify clearly all required emergency exits. When such exits are operable from the outside, markings shall consist of or include information indicating the method of opening. (Revised 40-20, November 28, 1955)

40.179 SHOULDER HARNESS.

All transport type airplanes certificated after January 1, 1958, shall be equipped with shoulder harnesses at the pilot in command, the second in command, and flight engineer stations.

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CIVIL AIR REGULATIONS PART 40

INSTRUMENTS AND EQUIPMENT FOR SPECIAL OPERATIONS

40.200 INSTRUMENTS AND EQUIPMENT FOR OPERATIONS AT NIGHT.

Each airplane operated at night shall be equipped with the following instruments and equipment in addition to those required by §§ 40.171 through ~~40.178~~ 40.179:

(a) Position lights; [See SR 392] (Revised 40-3, April 1, 1957)

(b) An anti-collision light for airplanes having a maximum certificated weight of more than 12,500 pounds; (Revised 40-3, April 1, 1957)

(c) Two landing lights; (Renumbered 40-8, August 15, 1954)

(d) (Deleted 40-30, September 21, 1961)

(e) Instrument lights providing sufficient illumination to make all instruments, switches, etc., easily readable, so installed that their direct rays are shielded from the flight crew members' eyes and that no objectionable reflections are visible to them. A means of controlling the intensity of illumination shall be provided unless it is shown that nondimming instrument lights are satisfactory; (Renumbered 40-8, August 15, 1954)

(f) An air-speed indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to icing; and (Renumbered 40-8, August 15, 1954)

(g) A sensitive altimeter. (Renumbered 40-8, August 15, 1954)

40.201 INSTRUMENTS AND EQUIPMENT FOR OPERATIONS UNDER IFR OR OVER-THE-TOP.

Each airplane operated under IFR or over-the-top shall be equipped with the following instruments and equipment in addition to those required by §§ 40.171 through ~~40.178~~ 40.179:

(a) An air-speed indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to icing;

(b) A sensitive altimeter; and

(c) Instrument lights providing sufficient illumination to make all instruments, switches, etc., easily readable, so installed that their direct rays are shielded from the flight crew members' eyes and that no objectionable reflections are visible to them. A means of controlling the intensity of illumination shall be provided unless it is shown that nondimming instrument lights are satisfactory.

M 40.202 SUPPLEMENTAL OXYGEN; RECIPROCATING-ENGINE-POWERED AIRPLANES. (Revised 40-12, September 1, 1958)

(a) GENERAL.

Except where supplemental oxygen is provided in accordance with the requirements of § 40.203, supplemental oxygen shall be furnished and used as set forth in paragraphs (b) and (c) of this section. The amount of supplemental oxygen required for a particular operation to comply with the rules in this part shall be determined on the basis of flight altitudes and flight duration consistent with the operating procedures established for each such operation and route. As used in the oxygen requirements hereinafter set forth, 'cabin pressure altitude' shall mean the pressure altitude corresponding with the pressure in the cabin of the airplane, and 'flight altitude' shall mean the altitude above sea level at which the airplane is operated; for airplanes not equipped with pressurized cabins, 'cabin pressure altitude' and 'flight altitude' shall be considered identical.

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M (b) CREW MEMBERS.

M (1) At cabin pressure altitudes above 10,000 feet to and including 12,000 feet oxygen shall be provided for, and used by, each member of the flight crew on flight deck duty, and provided for all other crew members during the portion of the flight in excess of 30 minutes within this range of altitudes.

(2) At cabin pressure altitudes above 12,000 feet oxygen shall be provided for, and used by, each member of the flight crew on flight deck duty, and provided for all other crew members during the entire flight time at such altitudes.

M (c) PASSENGERS.

Each air carrier shall provide a supply of oxygen for passenger safety as approved by the Administrator in accordance with the following standards:

(1) For flights of over 30-minute duration at cabin pressure altitudes above 8,000 feet to and including 14,000 feet, a supply of oxygen sufficient to furnish oxygen for 30 minutes to 10 percent of the number of passengers carried shall be required.

(2) For flights at cabin pressure altitudes above 14,000 feet to and including 15,000 feet, a supply of oxygen sufficient to provide oxygen for the duration of the flight at such altitudes for 30 percent of the number of passengers carried shall generally be considered adequate.

(3) For flights at cabin pressure altitudes above 15,000 feet, a supply of oxygen sufficient to provide oxygen for each passenger carried during the entire flight at such altitudes shall be required.

40.202-T SUPPLEMENTAL OXYGEN FOR SUSTENANCE; TURBINE-POWERED AIRPLANES. (Added 40-12, September 1, 1958)

(a) GENERAL.

Prior to November 30, 1959, turbine-powered airplanes shall comply with the provisions of § 40.202 or, alternatively with the provisions of this section except that effective November 30, 1959, all turbine-powered airplanes shall comply with the provisions of this section. Sustaining oxygen and dispensing equipment shall be furnished by the air carrier for use as set forth in this section. The amount of oxygen provided shall be at least that quantity which will be necessary to comply with paragraphs (b) and (c) of this section. As used in the oxygen requirements hereinafter set forth, "cabin pressure altitude" shall mean the pressure altitude corresponding with the pressure in the cabin of the airplane, and "flight altitude" shall mean the altitude above sea level at which the airplane is operated; for airplanes not equipped with pressurized cabins, "cabin pressure altitude" and "flight altitude" shall be considered identical. The amount of sustaining and first-aid oxygen required for a particular operation to comply with the rules in this part shall be determined on the basis of cabin pressure altitudes and flight duration consistent with the operating procedures established for each such operation and route. The requirements for airplanes with pressurized cabins shall be determined on the basis of cabin pressure altitude and the assumption that a cabin pressurization failure will occur at that altitude or point of flight which is most critical from the standpoint of oxygen need, and that after such failure the airplane will descend in accordance with the emergency procedures specified in the Airplane Flight Manual without exceeding its operating limitations to a flight altitude that will permit successful termination of the flight. Following such a failure the cabin pressure altitude shall be considered to be the same as the flight altitude unless it can be shown that no probable failure of the cabin or

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pressurization equipment will result in a cabin pressure altitude equal to the flight altitude, under which circumstances the maximum cabin pressure altitude attained may be used as a basis for certification and/or determination of oxygen supply.

(b) CREW MEMBERS.

A supply of oxygen for crew members shall be provided in accordance with the following requirements:

(1) At cabin pressure altitudes above 10,000 feet to and including 12,000 feet, oxygen shall be provided for and used by each member of the flight crew on flight deck duty and provided for all other crew members during the portion of the flight in excess of 30 minutes within this range of altitudes.

(2) At cabin pressure altitudes above 12,000 feet, oxygen shall be provided for and used by each member of the flight crew on flight deck duty and provided for all other crew members during the entire flight at such altitudes.

(c) PASSENGERS.

A supply of oxygen for passengers shall be provided in accordance with the following requirements:

(1) For flights at cabin pressure altitudes above 10,000 feet to and including 14,000 feet, oxygen shall be provided for the duration of flight in excess of 30 minutes for 10 percent of the number of passengers carried.

(2) For flights at cabin pressure altitudes above 14,000 feet to and including 15,000 feet, oxygen shall be provided for the duration of flight at such altitude for 30 percent of the number of passengers carried.

(3) For flights at cabin pressure altitudes above 15,000 feet, oxygen shall be provided for each occupant carried for the duration of flight at such altitude.

40.203 SUPPLEMENTAL OXYGEN REQUIREMENTS FOR PRESSURIZED CABIN AIRPLANES; RECIPROCATING-ENGINE-POWERED AIRPLANES.

When operating pressurized cabin airplanes, the air carrier shall so equip such airplanes as to permit compliance with the following requirements in the event of cabin pressurization failure:

M (a) FOR CREW MEMBERS.

When operating such airplanes at flight altitudes above 10,000 feet, the air carrier shall provide sufficient oxygen for all crew members for the duration of the flight at such altitudes: PROVIDED, That not less than a 2-hour supply of oxygen shall be provided for the flight crew members on flight deck duty. The oxygen supply required by § 40.205 may be considered in determining the supplemental breathing supply required for flight crew members on flight deck duty in the event of cabin pressurization failure.

M (b) FOR PASSENGERS.

When operating such airplanes at flight altitudes above 8,000 feet, the air carrier shall provide the following amounts of oxygen:

(1) When an airplane is not flown at a flight altitude of over 25,000 feet, a supply of oxygen sufficient to furnish oxygen for 30 minutes to 10 percent of the number of passengers carried shall be considered adequate, if at any point along the route to be flown the airplane can safely descend to a flight altitude of 14,000 feet or less within 4 minutes.

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(2) In the event that such airplane cannot descend to a flight altitude of 14,000 feet or less within 4 minutes, the following supply of oxygen shall be provided:

(i) For the duration of the flight in excess of four minutes at flight altitudes above 15,000 feet a supply sufficient to comply with § 40.202 (c)(3);

(ii) For the duration of the flight at flight altitudes above 14,000 feet to and including 15,000, a supply sufficient to comply with § 40.202(c)(2); and

(iii) For flight at flight altitudes above 8,000 feet to and including 14,000 feet, a supply sufficient to furnish oxygen for 30 minutes to 10 percent of the number of passengers carried.

(3) When an airplane is flown at a flight altitude above 25,000 feet, sufficient oxygen shall be furnished in accordance with the following requirements to permit the airplane to descend to an appropriate flight altitude at which the flight can be safely conducted. Sufficient oxygen shall be furnished to provide oxygen for 30 minutes to 10 percent of the number of passengers carried for the duration of the flight above 8,000 feet to and including 14,000 feet and to permit compliance with § 40.202(c)(2) and (c)(3) for flight above 14,000 feet.

(c) For purposes of this section it shall be assumed that the cabin pressurization failure will occur at a time during flight which is critical from the standpoint of oxygen need and that after such failure the airplane will descend, without exceeding its normal operating limitations, to flight altitudes permitting safe flight with respect to terrain clearance.

40.203-T SUPPLEMENTAL OXYGEN FOR EMERGENCY DESCENT AND FOR FIRST AID; TURBINE-POWERED AIRPLANES WITH PRESSURIZED CABINS. (Added 40-12, September 1, 1958)

(a) GENERAL.

Prior to November 30, 1959, turbine-powered airplanes with pressurized cabins shall comply with the provisions of § 40.203, with the additional requirement that, when operating at flight altitudes above 25,000 feet, all flight crew members on flight deck duty shall be provided with oxygen masks, connected to appropriate supply terminals, which shall be immediately available for use; or, alternatively, with the provisions of this section except that effective November 30, 1959, all such turbine-powered airplanes shall comply with the provisions of this section. When operating pressurized cabin airplanes, the air carrier shall furnish oxygen and dispensing equipment necessary to permit compliance with the requirements set forth in this section in the event of cabin pressurization failure. (Revised 40-17, July 29, 1959)

(b) CREW MEMBERS.

When operating at flight altitudes above 10,000 feet, oxygen shall be provided to permit compliance with §40.202-T except that not less than a 2-hour supply shall be provided for the flight crew members on flight deck duty. The oxygen required by §40.205 may be included in determining the supply required for flight crew members on flight deck duty in the event of cabin pressurization failure. (Added 40-12, September 1, 1958)

(c) USE OF OXYGEN MASKS BY FLIGHT CREWMEMBERS.

(1) When operating above flight level 250, each flight crewmember on flight deck duty shall be provided with an oxygen mask so designed that it is capable of being rapidly placed on the face from its ready position, properly secured, sealed, and supplying oxygen upon demand; and so designed that upon completion of the donning action the oxygen mask does not prevent the flight crewmember from being able immediately to communicate with other crewmembers over the air-

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plane intercommunication system. When not being used above flight level 250, the oxygen mask shall be kept at all times in a condition for ready use and so located as to be within the immediate reach at all times of the flight crewmember while at his duty station.

(2) When operating ~~at~~ above flight ~~altitudes~~ level ~~25,000 feet~~ 250, one pilot at the controls of the airplane shall at all times wear and use an oxygen mask ~~at all times and all other flight crew members on flight deck duty shall be provided with oxygen masks, connected to appropriate supply terminals, which shall be worn in a manner that will permit immediate placing of the masks on their faces for use, properly~~ secured, ~~and~~ sealed, and supplying oxygen: PROVIDED, That the one pilot need not wear a and use an oxygen mask while at or below ~~30,000 feet~~ flight level 350 if ~~all~~ each flight crewmembers ~~are equipped~~ on flight deck duty is provided with a quick-donning type of oxygen mask which ~~is~~ the air carrier has demonstrated to ~~be~~ the ~~satisfactory~~ satisfaction ~~to~~ of a representative of the Administrator is capable of being placed on the face from its ready position, properly secured, sealed, and supplying oxygen upon demand, with one hand and within 5 seconds. The air carrier shall also demonstrate that the donning of the mask can be accomplished without disturbing eye glasses and without delaying the flight crewmember from proceeding with his assigned emergency duties. Upon completion of the donning action, the oxygen mask shall not prevent the flight crewmember from being able immediately to communicate with other crewmembers over the airplane intercommunication system.

(3) Notwithstanding the provisions in subparagraph (2) of this paragraph, when operating above flight level 250, if at any time it is necessary for one pilot to leave his station at the controls of the airplane for any reason, the remaining pilot at the controls shall don and use his oxygen mask until the other pilot has returned to his duty station.

(4) Prior to takeoff of a flight, each flight crewmember shall personally preflight his oxygen equipment to insure that the oxygen mask is functioning, fitted properly, connected to appropriate supply terminals, and that the oxygen supply and pressure is adequate for use.

(d) USE OF PORTABLE OXYGEN EQUIPMENT BY CABIN ATTENDANTS. (Added 40-12, September 1, 1958)

Portable oxygen equipment of not less than a 15-minute oxygen supply shall be carried by each attendant during the entire time flight is conducted above 25,000 feet flight altitude, unless it is shown that sufficient portable oxygen units equipped with masks or spare outlets and masks are distributed throughout the cabin to insure immediate availability of oxygen to the cabin attendants regardless of their location at the time of cabin depressurization. (Added 40-12, September 1, 1958)

(e) PASSENGER CABIN OCCUPANTS. (Added 40-12, September 1, 1958)

When operating at flight altitudes above 10,000 feet, the following supply of oxygen shall be provided for the use of passenger cabin occupants: (Added 40-12, September 1, 1958)

(1) When an airplane is certificated to operate at flight altitudes to and including 25,000 feet, and if at any point along the route to be flown the airplane can descend safely to a flight altitude of 14,000 feet or less within 4 minutes, oxygen shall be available at the rate prescribed by this part for a 30-

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minute period for not less than 10 percent of the number of passenger cabin occupants carried. (Added 40-12, September 1, 1958)

(2) When an airplane is operated at flight altitudes to and including 25,000 feet and cannot descend safely to a flight altitude of 14,000 feet within 4 minutes, or when an airplane is operated at flight altitudes above 25,000 feet, oxygen shall be available at the rate prescribed by this part for not less than 10 percent of the number of passenger cabin occupants carried for the duration of flight following cabin depressurization at cabin pressure altitudes above 10,000 feet to and including 14,000 feet and, as applicable, to permit compliance with §40.202-T(b)(2) and (3), except that not less than a 10-minute supply for all passenger cabin occupants shall be provided. (Added 40-12, September 1, 1958)

(3) For first-aid treatment of occupants who for physiological reasons might require undiluted oxygen following descent from cabin pressure altitudes above 25,000 feet, a supply of oxygen in accordance with the requirements of §4b.651(b)(4) (see §40.204) shall be provided for 2 percent of the occupants for the duration of flight following cabin depressurization at cabin pressure altitudes above 8,000 feet, but in no case to less than one person. An appropriate number of acceptable dispensing units, but in no case less than 2, shall be provided. Means shall be provided to enable the cabin attendants to use this supply. (Added 40-12, September 1, 1958)

(f) PASSENGER BRIEFING. (Added 40-12, September 1, 1958)

Before flight is conducted above 25,000 feet, a crew member shall give instructions and demonstrations to the passengers sufficient to insure that all passengers are adequately informed regarding the location and operation of the oxygen-dispensing equipment and the necessity of using oxygen in the event of cabin depressurization. (Added 40-12, September 1, 1958)

40.204 EQUIPMENT STANDARDS.

(a) RECIPROCATING-ENGINE-POWERED AIRPLANES. (Added 40-12, September 1, 1958)

The oxygen apparatus, the minimum rates of oxygen flow, and the supply of oxygen necessary to comply with the requirements of §40.202 shall meet the standards established in §4b.651 of this subchapter effective July 20, 1950: PROVIDED, That ~~where~~ if the air carrier shows full compliance with such standards ~~is found by the Administrator~~ to be impracticable, ~~he~~ an authorized representative of the Administrator may authorize such changes in these standards as he finds will provide an equivalent level of safety.

(b) TURBINE-POWERED AIRPLANES. (Added 40-17, July 29, 1959)

Prior to November 30, 1959, turbine-powered airplanes shall comply with the provisions of paragraph (a) of this section, or alternatively, with the provisions of this paragraph except that effective November 30, 1959, all turbine-powered airplanes shall comply with the provisions of this paragraph. The oxygen apparatus, the minimum rate of oxygen flow, and the supply of oxygen to comply with the requirements of §§ 40.202-T and 40.203-T shall meet the standards established in § 4b.651 of this subchapter effective September 1, 1958: PROVIDED, That ~~where~~ if the air carrier shows full compliance with such standards ~~is found by the Administrator~~ to be impracticable, he an authorized representative of the Administrator may authorize such changes in these standards as he finds will provide an equivalent level of safety.

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CIVIL AIR REGULATIONS PART 40

M 40.205 PROTECTIVE BREATHING EQUIPMENT FOR THE FLIGHT CREW.

(a) PRESSURIZED CABIN AIRPLANES.

Each required flight crew member on flight deck duty shall have easily available at his station protective breathing equipment covering the eyes, nose, and mouth, or the nose and mouth where accessory equipment is provided to protect the eyes, to protect him from the effects of smoke, carbon dioxide, and other harmful gases. Not less than a 300-liter STPD supply of oxygen for each required flight crew member on flight deck duty shall be provided for this purpose.

M (b) NONPRESSURIZED CABIN AIRPLANES.

The requirement stated in paragraph (a) of this section shall apply to nonpressurized cabin airplanes, if the Administrator finds that it is possible to obtain a dangerous concentration of smoke, carbon dioxide, or other harmful gases in the flight crew compartments in any attitude of flight which might occur when the airplane is flown in accordance with either the normal or emergency procedures approved by the Administrator.

40.206 EQUIPMENT FOR EXTENDED OVERWATER OPERATIONS. (Revised 40-43, October 26, 1964)

(a) The following equipment shall be carried on an airplane used in extended overwater operations: (Revised 40-43, October 26, 1964)

PROVIDED, That an authorized representative of the Administrator may, by amending the operations specifications of an air carrier as provided in § 40.31, require the carriage of all the prescribed equipment or any item thereof for any operation over water or, upon application of an air carrier, permit deviation from these requirements for a particular extended overwater operation: (Added 40-43, October 26, 1964)

(1) A life preserver for each occupant of the airplane; (Revised 40-43, October 26, 1964)

(2) Liferafts sufficient in number and of such rated capacity and buoyancy as to accommodate all occupants of the airplane; (Revised 40-20, November 28, 1958)

(3) Suitable pyrotechnic signaling devices; and

(4) One portable emergency radio signaling device, capable of transmission on the appropriate emergency frequency or frequencies, which is not dependent upon the airplane power supply and which is self-buoyant and water-resistant. (Revised 40-20, November 28, 1955)

(5) Each life preserver and liferaft required under subparagraphs (1) and (2) of this paragraph shall be equipped with an approved survivor locator light.

(b) All required liferafts, life preservers and signaling devices shall be easily accessible in the event of a ditching without appreciable time for preparatory procedures. This equipment shall be installed in conspicuously marked approved locations. (Revised 40-43, October 26, 1964)

(c) A survival kit, appropriately equipped for the route to be flown, shall be attached to each required liferaft. (Revised 40-43, October 26, 1964)

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40.207 EQUIPMENT FOR OPERATIONS IN ICING-CONDITIONS.

(a) For all operations in icing conditions each airplane shall be equipped with means for the prevention or removal of ice on windshields, wings, empennage, propellers, and other parts of the airplane where ice formation will adversely affect the safety of the airplane.

(b) For operations in icing conditions at night means shall be provided for illuminating or otherwise determining the formation of ice on the portions of the wings which are critical from the standpoint of ice accumulation. When illuminating means are used, such means shall be of a type which will not cause glare or reflection which would handicap crew members in the performance of their normal functions.

40.208 FLIGHT RECORDERS. (Added 40-6, September 9, 1957)

(a) An approved flight recorder which records at least time, altitude, airspeed, vertical acceleration, and heading shall be installed in accordance with the following requirements:

(1) On all airplanes of more than 12,500 pounds maximum certificated takeoff weight which are certificated for operations above 25,000 feet altitude; and

(2) On and after November 1, 1960, on all turbine-powered airplanes of more than 12,500 pounds maximum certificated takeoff weight; PROVIDED, That, the Director, Bureau of Flight Standards, or his authorized representative, may extend the November 1, 1960, compliance date for any carrier, prior to September 1, 1960, submits to the Federal Aviation Agency, in writing, a request for approval for such an extension, together with substantiating data, which shows to the satisfaction of the Director, or his authorized representative:

(i) That the air carrier will be unable to comply with the November 1, 1960, date due to flight recorder procurement or installation problems, and;

(ii) The action the air carrier has undertaken to insure that a progressive installation of the required flight recorder equipment will be completed at the earliest practicable date following November 1, 1960. In no event will the November 1, 1960, compliance date be extended beyond May 1, 1961.

(b) When a flight recorder is installed it shall be ~~operating~~ operated continuously ~~during flight~~ from the instant the airplane commences the takeoff roll until it has completed the landing roll at an airport.

(c) ~~The~~ Recorded information shall be retained by the air carrier for a period of at least 60 days. For a particular flight or series of flights, the information shall be retained for a longer period if requested by an authorized representative of the Administrator or the Civil Aeronautics Board.

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40.212 COCKPIT VOICE RECORDERS.

(a) On or before the following dates an approved cockpit voice recorder shall be installed in each of the following airplanes having a maximum certificated takeoff weight of more than 12,500 pounds:

(1) July 1, 1966, for all turbine powered airplanes; and

(2) January 1, 1967, for all pressurized reciprocating four-engine airplanes.

(b) Each air carrier shall establish a schedule for the progressive completion of the cockpit voice recorder installation in each airplane specified in paragraph (a) of this section before the dates prescribed in that paragraph. The schedule shall include a list of any airplane specified in paragraph (a) of this section that the air carrier intends to discontinue using before the dates prescribed in that paragraph. The air carrier shall submit the schedule to the Administrator before October 1, 1964.

(c) The cockpit voice recorder shall be installed in accordance with the requirements of Part 4b of this chapter.

(d) The cockpit voice recorder shall be operated continuously from the start of the use of the checklist, prior to starting engines for the purpose of flight, to the completion of the final checklist at the termination of flight. In complying with this requirement, an approved cockpit voice recorder having an erasure feature may be utilized, so that at any instant during the operation of the recorder, information recorded more than 30 minutes earlier may be erased or otherwise obliterated.

(e) In the event of an accident or occurrence requiring immediate notification to the Board, under Part 320 of its regulations, the recorded information shall be retained by the air carrier for a period of at least 60 days or, if requested by the Administrator or the Board, for a longer period. Information obtained from the record is used to assist in determining the cause of accidents or occurrences in connection with investigations pursuant to Part 320 of the Board's regulations. The Administrator does not use the record in any civil penalty or certificate action.

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RADIO EQUIPMENT

M 40.230 RADIO EQUIPMENT.

Each airplane used in scheduled air transportation shall be equipped with radio equipment specified for the type of operation in which it is engaged. Where two independent radio systems are required by §40.231 and §40.232, each system shall have an independent antenna installation: PROVIDED, That where rigidly supported nonwire antennas or other antenna installations of equivalent reliability are used, only one such antenna need be provided.

40.231 RADIO EQUIPMENT FOR OPERATIONS UNDER VFR OVER ROUTES NAVIGATED BY PILOTAGE.

(a) For operations conducted under VFR over routes on which navigation can be accomplished by pilotage, each airplane shall be equipped with such radio equipment as is necessary under normal operating conditions to fulfill the following functions: (Revised 40-3, April 1, 1954)

(1) Communicate with at least one appropriate ground station (as specified in§40.34) from any point on the route and other airplanes operated by the air carrier; (Revised 40-3, April 1, 1954)

(2) Communicate with airport traffic control towers from any point in the control zone within which flights are intended; (Revised 40-3, April 1, 1954)

(3) Receive meteorological information from any point en route by either of two independent systems. (Revised 40-3, April 1, 1954)

(b) For all operations at night conducted under VFR over routes on which navigation can be accomplished by pilotage, each airplane shall be equipped with such radio equipment as is necessary under normal operating conditions to fulfill the functions specified in paragraph (a) of this section and to receive radio navigational signals applicable to the route flown except that no marker beacon receiver of ILS receiver need be provided.

40.232 RADIO EQUIPMENT FOR OPERATIONS UNDER VFR OVER ROUTES NOT NAVIGATED BY PILOTAGE OR FOR OPERATIONS UNDER IFR OR OVER-THE-TOP.

(a) For operations conducted under VFR over routes on which navigation cannot be accomplished by pilotage or for operations conducted under IFR or over-the-top, each airplane shall be equipped with such radio equipment as is necessary under normal operating conditions to fulfill the functions specified in §40.231(a) and to receive satisfactorily, by either of two independent systems, radio navigational signals from all primary en route and approach navigational facilities intended to be used, except that only one marker beacon receiver which provides visual and aural signals and one ILS receiver need be provided. Equipment provided to receive signals en route may be used to receive signals on approach, if it is capable of receiving both signals. (Revised 40-3, April 1, 1954)

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(b) In the case of operation over routes on which navigation is based on low frequency radio range or automatic direction finding, only one low frequency radio range receiver or ADF receiver need be installed: PROVIDED, That the airplane is equipped with two VOR receivers, and VOR navigational aids are so located and the airplane is so fueled that, in the case of failure of the low frequency radio range receiver or ADF receiver, the flight may proceed safely to a suitable airport by means of VOR aids and complete an instrument letdown by use of the remaining airplane radio systems. (Revised 40-38, July 1, 1963)

(c) Whenever VOR navigational receivers are required by paragraphs (a) or (b) of this section, at least one approved distance measuring equipment unit (DME), capable of receiving and indicating distance information from VORTAC facilities, shall be installed on each airplane when operated within the 48 contiguous states and the District of Columbia at and above 24,000 feet MSL after June 30, 1963, and on each of the following airplanes, irrespective of the altitude flown, when operating within the 48 contiguous states and the District of Columbia after the following dates: (Revised 40-38, July 1, 1963)

(1) Turbojet airplanes -- June 30, 1963; (Added 40-38, July 1, 1963)

(2) Turboprop airplanes -- December 31, 1963; (Added 40-38, July 1, 1963)

(3) Pressured reciprocating engine airplanes -- June 30, 1964; and (Added 40-38, July 1, 1963)

(4) Other airplanes having a maximum certificated takeoff weight of more than 12,500 pounds -- June 30, 1965. (Added 40-38, July 1, 1963)

(d) In the event that the distance measuring equipment (DME) becomes inoperative en route, the pilot shall notify Air Traffic Control of such failure as soon as it occurs. (Added 40-38, July 1, 1963)

40.233 RADIO EQUIPMENT FOR EXTENDED OVERWATER OPERATIONS.

For extended overwater operations each airplane shall be equipped with such radio equipment as is necessary to fulfill the functions specified in § 40.232 and in addition, by an independent system, the functions specified in § 40.231(a)(1).

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CIVIL AIR REGULATIONS PART 40

MAINTENANCE ~~AND INSPECTION REQUIREMENTS~~ OF AIRPLANES

40.240 ~~MAINTENANCE~~ RESPONSIBILITY ~~AND AUTHORITY~~ FOR AIRWORTHINESS OF AIRPLANES.

(a) ~~Irrespective of whether the air carrier has made arrangements with any other person for the performance of maintenance and inspection functions,~~ Each air carrier shall ~~have the primary responsibility~~ is primarily responsible for:

(1) The airworthiness of its airplanes, ~~and required equipment~~ including airframes, powerplants, propellers, appliances, and parts thereof; and

~~(b)~~ (2) ~~An air carrier may perform~~ The performance of the maintenance, ~~preventive maintenance,~~ and alterations, as ~~provided in its continuous airworthiness and inspection program~~ and inspections of its airplanes, including airframes, powerplants, propellers, appliances, and parts thereof, in accordance with its ~~maintenance~~ manual and the regulations of this chapter. ~~In addition, an air carrier may perform these functions for another air carrier as provided in the continuous airworthiness maintenance and inspection program and maintenance manual of the other air carrier.~~

(b) An air carrier may make arrangements with another person for the performance of any or all of the maintenance, alteration, or inspection of its airplanes, including airframes, powerplants, propellers, appliances, or parts thereof. However, the air carrier is not relieved of the responsibility specified in paragraph (a) of this section even though the person with whom the arrangements are made for the performance of any or all of its maintenance, alterations, or inspections holds a certificate from the Administrator to perform such maintenance, alteration, and inspection.

~~(c) An air carrier may approve any aircraft, airframe, aircraft engine, propeller, or appliance for return to service after maintenance, preventive maintenance, or alterations that it performed under paragraph (b) of this section. However, in the case of a major repair or major alteration, the work must have been done in accordance with technical data approved by the Administrator.~~

40.241 MAINTENANCE AND INSPECTION ~~REQUIREMENTS~~ ORGANIZATION AND PROGRAM.

(a) ~~The~~ Each air carrier ~~or the person with whom arrangements have been made for the performance of~~ that performs any of its maintenance ~~and inspection functions~~ shall ~~establish an adequate inspection~~ or alterations, and each person with whom an air carrier arranges for the performance of any of the air carrier's maintenance or alterations, shall have a maintenance organization ~~responsible for determining that the workmanship, methods employed, and material used are in conformity with the requirements of the regulations of this subchapter, with accepted standards and good practices, and that any airframe, engine, propeller,~~

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~~or appliance released for flight is airworthy~~ adequate to perform the work.

(b) ~~Any individual who is directly in charge of inspection, maintenance, overhaul, or repair of any airframe, engine, propeller, or appliance shall hold an appropriate license or airman certificate.~~

Each air carrier that performs inspections in addition to maintenance or alterations shall have a maintenance and inspection organization to perform that work. An air carrier may not arrange with another person to have its inspections performed in addition to its maintenance or alterations, unless that person has a maintenance and inspection organization adequate to perform that work.

(c) The structure of the organization of each air carrier, performing inspections of required inspection items in addition to maintenance or alterations shall provide for the separation of the inspection functions from the maintenance and alteration functions. This separation shall occur below the level of administrative control at which overall responsibility for the management of both the maintenance and inspection functions is exercised. The structure of the organization of any person with whom the air carrier arranges for the performance of inspection of required inspection items must provide the same separation.

(d) The air carrier's manual shall contain a chart or description of the air carrier's organization required by paragraph (a) or (b) of this section and a list of persons with whom it has made arrangements for the performance of any of its maintenance, alterations, or required inspections, including a general description of the work that will be performed.

(e) Each air carrier shall have a maintenance program and an inspection program to insure that:

(1) All maintenance, alterations, and inspections performed by the air carrier, or by persons with whom the air carrier has made arrangements therefor, are performed in accordance with the air carrier's manual;

(2) Competent personnel and adequate facilities and equipment are provided for the proper performance of all maintenance, alteration, and inspection functions; and

(3) Each airplane released to service is airworthy and has been properly maintained for operation in air transportation.

(f) The air carrier's manual must contain the maintenance program and the inspection program of the air carrier which the air carrier, or the person with whom the air carrier has arranged for the performance of any maintenance, alterations, or inspections, must follow in the performance of maintenance, alterations, and inspections of its airplanes, including airframes, powerplants, propellers, appliances, and parts thereof, and must include at least the following:

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(1) The method of performing the maintenance, both routine and nonroutine, and alterations;

(2) A designation of the items of maintenance and alteration which must be inspected (required inspection items), which must include at least those of maintenance and alteration which could result in a failure, malfunction, or defect endangering the safe operation of the airplane, if not performed properly or if improper parts or materials are used;

(3) The method of accomplishment of the inspection of required inspection items and a designation by occupational title of personnel authorized to perform each inspection;

(4) Procedures for the reinspection of work performed pursuant to previous inspection findings (buy-back procedures);

(5) Procedures, standards, and limitsnecessary for inspection and acceptance or rejection of required inspection items and for periodic inspection and calibration of precision tools, measuring devices, and test equipment;

(6) Procedures to insure that all required inspection items are inspected;

(7) Instructions to prevent any person who performs the work from performing the inspection of a required inspection item;

(8) Instructions and procedures to prevent the inspection decision of an inspector regarding a required inspection item from being countermanded by persons other than supervisory personnel of the inspection unit or an individual at that level of administrative control which has overall responsibility for the management of both the maintenance and inspection functions; and

(9) Procedures to insure that maintenance, alterations, and inspections which are not completed as a result of shift changes or similar work interruptions are properly completed before the airplane is released to service.

(g) Only appropriately certificated individuals who have been properly trained, qualified, and authorized may be utilized to inspect required inspection items.

(h) Each person performing the inspection of a required inspection item must be under the supervision and control of the inspection unit when performing the inspection of the item.

(i) A person may not inspect a required inspection item if he performed the maintenance or alteration on the item.

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(j) Each air carrier shall maintain or shall determine that each person with whom it arranges for the performance of its inspections maintains a current listing of individuals who have been trained, qualified, and authorized to inspect its required inspection items. The individuals must be identified by name, occupational title, and the inspections that the individual is authorized to perform. All persons so authorized shall be informed in writing as to the extent of their responsibilities, authorities, and inspectional limitations. This list shall be available for inspection by the Administrator or his authorized representative upon request.

40.242 CONTINUING ANALYSIS AND SURVEILLANCE.

(a) Each air carrier shall establish and maintain a system for the continuing analysis and surveillance of the performance and effectiveness of its maintenance program and inspection program and for the correction of any deficiency in these programs, regardless of whether such maintenance, alterations, and inspections are performed by the air carrier or by another person with whom the air carrier has arranged for the performance of maintenance, alterations, and inspections.

(b) Whenever the Administrator or his authorized representative finds that the maintenance program or the inspection program established by an air carrier does not contain adequate procedures or standards to meet the requirements of this part, the air carrier shall upon notice thereof by the Administrator or his authorized representative make such changes in these programs as are necessary to meet such requirements.

(c) The air carrier may petition the Administrator to reconsider the notice to make a change in its program. The petition shall be filed with the local FAA Air Carrier District Office charged with the overall inspection of the air carrier's operations within 30 days after the receipt of 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 or the person authorized by him to consider the petition.

~~40.242~~ 40.243 MAINTENANCE AND INSPECTION TRAINING PROGRAM.

The air carrier, or the person with whom arrangements have been made for the performance of maintenance and inspection functions, shall establish and maintain a training program to insure that all maintenance and inspection personnel charged with determining the adequacy of work performed are fully informed with respect to all procedures and techniques and with new equipment introduced into service, and are competent to perform their duties.

40.244 CERTIFICATE REQUIREMENTS.

Each individual who is directly in charge of maintenance or alteration of any airplane, engine, propeller, or appliance, and each individual

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who performs the inspection of required inspection items must hold an appropriate airman certificate.

~~40.243~~ 40.245 MAINTENANCE AND INSPECTION PERSONNEL DUTY TIME LIMITATIONS.

All maintenance and inspection personnel shall be relieved of all duty for a period of at least 24 consecutive hours during any 7 consecutive days or equivalent thereof within any one month. (Revised 40-3, April 1, 1954)

40.246 AUTHORITY TO PERFORM AND APPROVE MAINTENANCE, INSPECTION, AND ALTERATIONS.

(a) An air carrier may perform maintenance, preventive maintenance, and alterations as provided in its continuous airworthiness and inspection program and its maintenance Manual. In addition, an air carrier may perform these functions for another air carrier as provided in the continuous airworthiness maintenance and inspection program and maintenance manual of the other air carrier.

(b) An air carrier may approve any airplane, airframe, airplane engine, propeller, or appliance for return to service after maintenance, preventive maintenance, or alterations that it performed under paragraph (a) of this section. However, in the case of a major repair or major alteration, the work must have been done in accordance with technical data approved by the Administrator.

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CIVIL AIR REGULATIONS PART 40

AIRMAN AND CREW MEMBER REQUIREMENTS

40.260 UTILIZATION OF AIRMAN.

(a) No air carrier shall utilize an individual as an airman unless he holds ~~a valid~~ an appropriate and currently effective airman certificate issued by the Administrator and is otherwise qualified for the particular operation in which he is to be utilized. He shall have appropriate airman and medical certificates in his personal possession while engaged in operations under this part, and shall present the same for examination to any authorized representative of the Administrator upon request.

(b) No individual who has reached his 60th birthday shall be utilized or serve as a pilot on any aircraft while engaged in air carrier operations. (Added 40-22, March 15, 1960)

40.261 COMPOSITION OF FLIGHT CREW.

(a) No air carrier shall operate an airplane with less than the minimum flight crew specified in the airworthiness certificate or in the Airplane Flight Manual approved for ~~the~~ such type of airplane and required ~~in~~ by this part for the type of operation being conducted.

(b) Where the provisions of this part require the performance of two or more functions for which an airman certificate is necessary, such requirement shall not be satisfied by the performance of multiple functions at the same time by any airman.

(c) Where the air carrier is authorized to operate under instrument conditions or operate airplanes of more than 12,500 pounds maximum certificated weight, the minimum pilot crew shall consist of two pilots, one of whom shall be designated as pilot in command and the other as second in command. (Revised 40-21, January 1, 1961)

(d) On flights requiring a flight engineer, at least one other flight crew member shall be sufficiently qualified, so that in the event of illness or other incapacity, emergency coverage can be provided for that function for the safe completion of the flight. A pilot need not hold a flight engineer certificate to function in the capacity of a flight engineer for such emergency coverage. (Revised 40-20, November 28, 1955) [See Interpretation No. 1]

40.263 FLIGHT ENGINEER.

An airman holding a valid flight engineer certificate shall be required on all airplanes certificated for more than 80,000 pounds maximum certificated take-off weight. Such airman shall also be required on all four-engine airplanes certificated for more than 30,000 pounds maximum certificated take-off weight where the Administrator finds that the design of the airplane used or the type of operation is such as to require engineer personnel for the safe operation of the airplane.

40.265 FLIGHT ATTENDANT.

At least one flight attendant shall be provided by the air carrier on all flights carrying passengers in airplanes of 10-passenger capacity or more.

40.266 AIRCRAFT DISPATCHER.

Each air carrier shall provide an adequate number of qualified dispatchers at each dispatch center to insure the proper operational control of each flight.

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40.267 ASSIGNMENT OF EMERGENCY EVACUATION FUNCTIONS FOR EACH CREW MEMBER.

After May 31, 1956, each air carrier shall assign all necessary emergency functions for each crew member to perform in the event of circumstances requiring emergency evacuation. The air carrier shall show that functions so assigned are praticable of accomplishment. These functions shall be described in the air carrier manual.

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TRAINING PROGRAM

40.280 TRAINING REQUIREMENTS.

(a) Each air carrier shall establish a training program sufficient to insure that each crew member and dispatcher used by the air carrier is adequately trained to perform the duties to which he is to be assigned. The initial training phases shall be satisfactorily completed prior to serving in scheduled operations.

(b) Each air carrier shall be responsible for providing adequate ground and flight training facilities and properly qualified instrutors. There also shall be provided a sufficient number of check airmen to conduct the flight checks required by this part. Such check airmen shall hold the same airman certificates and ratings as are required for the airman being checked. (Revised 40-3, April 1, 1954)

(c) The training program for each flight crew member shall consist of appropriate ground and flight training including proper flight crew co-ordination. Procedures for each flight crew function shall be standardized to the extent that each flight crew member will know the functions for which he is responsible and the relation of those functions to those of other flight crew members. The initial program shall include at least the appropriate requirements specified in §§ 40.281 through 40.286.

(d) The crew member emergency procedures training program shall include at least the requirements specified in § 40.286.

(e) The appropriate instructor, supervisor, or check airman responsible for the particular training or flight check shall certify to the proficiency of each crew member and dispatcher upon completion of his training, and such certification shall become a part of the individual's record.

40.281 INITIAL PILOT GROUND TRAINING.

Ground training for the pilots include instruction in at least the following:

(a) The appropriate provisions of the air carrier operations specifications and appropriate provisions of the regulations of this subchapter with particular emphasis on the operation and dispatching rules and airplane operating limitations;

(b) Dispatch procedures and appropriate contents of the manuals;

(c) The duties and responsibilities of crew members;

(d) The type of airplane to be flown, including a study of the airplane, engines, all major components and systems, performance limitations, standard and emergency operating procedures, and appropriate contents of the approved Airplane Flight Manual;

(e) The principles and methods of determining weight and balance limitations for take-off and landing;

(f) Navigation and use of appropriate aids to navigation, including the instrument approach facilities and procedures which the air carrier is authorized to use;

(g) Airport and airways traffic control systems and procedures, and ground control letdown procedures if pertinent to the operation;

(h) Meteorology sufficient to insure a practical knowledge of the principles of icing, fog, thunderstorms, and frontal systems; and

(i) Procedures for operation in turbulent air and during periods of ice, hail, thunderstorms and other potentially hazardous meteorological conditions.

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40.282 INITIAL PILOT FLIGHT TRAINING.

(a) Flight training for each pilot shall include at least take-offs and landings, during day and night, and normal and emergency flight maneuvers in each type of airplane to be flown by him in scheduled operations, and flight under simulated instrument flight conditions. A pilot qualifying to serve as other than pilot in command or as second in command shall demonstrate to a representative of the Administrator or to a check pilot his ability to take off and land each type of airplane in which he is to serve.

(b) Flight training for a pilot qualifying to serve as pilot in command shall include flight instruction and practice in at least the following maneuvers and procedures:

(1) In each type of airplane to be flown by him in scheduled operations:

(i) At the authorized maximum take-off weight, take-off using maximum take-off power with simulated failure of the critical engine. For transport category airplanes the simulated engine failure shall be accomplished as closely as possible to the critical engine failure speed (V_1), and climb-out shall be accomplished at a speed as close as possible to the take-off safety speed (V_2). Each pilot shall ascertain the proper values for speeds V_1 and V_2;

At the authorized maximum landing weight, flight, including maneuvering to a landing, in a three- or four-engine airplane, ~~where appropriate,~~ with the most critical combinations of two engines inoperative, or operating at zero thrust, utilizing, where appropriate, applicable climb speeds as set forth in the Airplane Flight Manual.

(iii) At the authorized maximum landing weight, simulated pullout from the landing and approach configurations accomplished at a safe altitude with the critical engine inoperative or operating at zero thrust;

(iv) Suitable combinations of airplane weight and power less than those specified in subdivisions (i), (ii), and (iii) of this subparagraph may be employed if the performance capabilities of the airplane under the above conditions are simulated.

(2) Conduct of flight under simulated instrument conditions, utilizing all types of navigational facilities and the letdown procedures used in normal operations. If a particular type of facility is not available in the training area, such training may be accomplished in a synthetic trainer.

(c) Flight training for a pilot qualifying to serve as second in command shall include flight instruction and practice in at least the following maneuvers and procedures; (Added 40-21, January 1, 1961)

(1) In each type of airplane to be flown by him in scheduled operation: (Added 40-21, January 1, 1961)

(i) Assigned flight duties as second in command, including flight emergencies, (Added 40-21, January 1, 1961)

(ii) Taxiing, (Added 40-21, January 1, 1961)

(iii) Takeoffs and landings, (Added 40-21, January 1, 1961)

(iv) Climbs and climbing turns, (Added 40-21, January 1, 1961)

(v) Slow flight, (Added 40-21, January 1, 1961)

(vi) Approach to stall, (Added 40-21, January 1, 1961)

(vii) Engine shutdown and restart, (Added 40-21, January 1, 1961)

(viii) Takeoff and landing with simulated engine failure, (Added 40-21, January 1, 1961)

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(ix) Conduct of flight under simulated instrument conditions, including instrument approach at least down to circling approach minimum and missed-approach procedures. (Added 40-21, January 1, 1961)

(2) Conduct of flight under simulated instrument conditions, utilizing all types of navigation facilities and the letdown procedures used in normal operations. Except for those approach procedures for which the lowest minimums are approved, all other letdown procedures may be given in a synthetic trainer which contains the radio equipment and instruments necessary to simulate other navigational and letdown procedures approved for use by the air carrier. (Added 40-21, January 1, 1961)

40.284 INITIAL FLIGHT ENGINEER TRAINING.

(a) The training for flight engineers shall include at least the instructions specified in § 40.281 (a) through (e). (Revised Revision, December 31, 1955)

(b) Flight engineers shall be given sufficient training in flight to become proficient in those duties assigned them by the air carrier. Except for emergency procedures, this training may be accomplished during scheduled flight under the supervision of a qualified flight engineer.

40.286 INITIAL CREW MEMBER EMERGENCY TRAINING.

(a) The training in emergency procedures shall be designed to give each crew member appropriate individual instruction in all emergency procedures, including assignments in the event of an emergency, and proper coordination between crew members. At least the following subjects as appropriate to the individual crew member shall be taught: The procedures to be followed in the event of the failure of an engine, or engines, or other airplane components or systems, emergency decompression, fire in the air or on the ground, ditching, evacuation, the location and operation of all emergency equipment, and power setting for maximum endurance and maximum range.

M (b) Synthetic trainers may be used for training of crew members in emergency procedures where the trainers sufficiently simulate flight operating emergency conditions for the equipment to be used.

(c) All crewmembers performing duties on pressurized airplanes operated above flight level 250, shall, as a part of their approved emergency procedure training, receive instructions by means of lectures and films covering at least: Respiration, hypoxia, duration of consciousness at altitude when supplemental oxygen is not supplied, gas expansion, gas bubble formation, physical phenomena and incidents of decompression; and receive actual training and practice in the donning of the oxygen mask and operation of the oxygen equipment. In lieu of the required films, the air carrier may use any other equivalent means of visual presentation which, after demonstration, meets with the approval of a representative of the Administrator.

40.288 INITIAL AIRCRAFT DISPATCHER TRAINING.

(a) The training program for aircraft dispatchers shall provide for training in their duties and responsibilities and shall include a study of the flight operation procedures, air traffic control procedures, the performance of the airplanes used by the air carrier, navigational aids and facilities, and meteorology. Particular emphasis shall be placed upon the procedures to be followed in the event of emergencies, including the alerting of proper Governmental, company, and private agencies to render maximum assistance to an airplane in distress.

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(b) Each aircraft dispatcher shall, prior to initially performing the duty of an aircraft dispatcher, satisfactorily demonstrate to the supervisor or ground instructor authorized to certify to his proficiency, his knowledge of the following subjects:

(1) Contents of the air carrier operating certificate;

(2) Appropriate provisions of the air carrier operating specifications, manual, and regulations of this subchapter;

(3) Characteristics of the airplanes operated by the air carrier;

(4) Cruise control data and cruising speeds for such airplanes;

(5) Maximum authorized loads for the airplanes for the routes and airports to be used;

(6) Air carrier radio facilities;

(7) Characteristics and limitations of each type of radio and navigational facility to be used;

(8) Effect of weather conditions on airplane radio reception;

(9) Airports to be used and the general terrain over which the airplanes are to be flown;

(10) Prevailing weather phenomena;

(11) Sources of weather information available;

(12) Pertinent air traffic control procedures; and

(13) Emergency procedures.

40.289 RECURRENT TRAINING.

(a) Each air carrier shall provide such training as is necessary to insure the continued competence of each crew member and dispatcher and to insure that each possesses adequate knowledge of and familiarity with all new equipment and procedures to be used by him. (Revised Revision, December 31, 1955)

(b) Each air carrier shall, ~~at intervals established~~ as a part of the training program, ~~but not to exceed 12 months,~~ check the competence of each crewmember and dispatcher each 12 months with respect to procedures, techniques, and information essential to the satisfactory performance of his duties. The competence check may be given at any time during the month preceding or following the month in which it becomes due. The effective date of the check, if given within the preceding or following month, shall be the same as if given within the month in which it became due. Where the check of the pilot in command or second in command requires actual flight, such check shall be considered to have been met by the checks accomplished in accordance with §§ 40.302 and 40.305, respectively.

(c) The appropriate instructor, supervisor, or check airman shall certify as to the proficiency demonstrated, and such certification shall become a part of the individual's record. (Added 40-21, January 1, 1961)

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40.290 APPROVAL OF TRAINING PROGRAM.

The training program established under the provisions of §§ 40.280 through 40.289 by the air carrier shall meet with the approval of an authorized representative of the Administrator: *Provided*, That the curriculum of such training program shall be submitted in appropriate form to an authorized representative of the Administrator not later than May 1, 1960.

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CIVIL AIR REGULATIONS PART 40

FLIGHT CREW MEMBER AND DISPATCHER QUALIFICATION

40.300 QUALIFICATION REQUIREMENTS.

(a) No air carrier shall utilize any flight crew member or dispatcher, nor shall any such airman perform the duties authorized by his airman certificate, unless he satisfactorily meets the appropriate requirements of § 40.280 or § 40.289, and §§ 40.301 through 40.310. All pilots serving as pilot in command shall hold appropriate airline transport pilot certificates and ratings. All other pilots shall hold at least commercial pilot certificates and instrument ratings.

(b) Check airmen shall certify as to the proficiency of all pilots being examined, as required by §§ 40.302, 40.303, and 40.305, and such certification shall become a part of the airman's record. (Revised 40-21, January 1, 1961)

40.301 PILOT RECENT EXPERIENCE.

No air carrier shall schedule a pilot in command or second in command to serve as such in scheduled air transportation unless within the preceding 90 days he has made at least 3 take-offs and 3 landings in the airplane of the particular type on which he is to serve. (Revised 40-21, January 1, 1961)

40.302 PILOT CHECKS.

(a) LINE CHECK.

~~Prior to serving~~ An air carrier shall not utilize a pilot as pilot in command, ~~and at least once each 12 months thereafter, a pilot shall~~ until he has satisfactorily ~~accomplish~~ passed a line check in one of the types of airplanes normally to be flown by him. Thereafter, he shall not serve as pilot in command unless each 12 months he successfully completes a similar line check. The line check may be given at any time during the month preceding or following the month in which it becomes due. The effective date of the check, if given within the preceding or following month, shall be the same as if given within the month in which it became due. This check shall be given by a check pilot who is both qualified ~~for~~ on the airplane and on the route. It shall consist of at least a scheduled flight ~~between terminals~~ over a typical portion of the air carrier's routes to which the pilot is normally assigned ~~during which~~ and shall be of sufficient duration for the check pilot ~~shall~~ to determine whether the individual being checked satisfactorily exercises the duties and responsibilities of pilot in command.

(b) PROFICIENCY CHECK.

(1) An air carrier shall not utilize a pilot as pilot in command until he has satisfactorily demonstrated to a check pilot or a representative of the Administrator his ability to pilot and navigate airplanes to be flown by him. Thereafter, he shall not serve as pilot in command unless each 6 months he successfully completes a similar pilot proficiency check. The proficiency check may be given at any time during the month preceding or following the month in which it becomes due. The effective date of the check, if given within the preceding or following month, shall be the same as if given within the month in which it became due. Where such pilots serve in more than one airplane type, at least every other successive proficiency check shall be given in flight

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in the larger airplane type. If performance of any of the proficiency check items specified in subparagraph (2) of this paragraph is unsatisfactory in the judgment of the check pilot he may, at his discretion, give additional training to the pilot during the course of the proficiency check. If the pilot being checked is unable to demonstrate satisfactory performance to the check pilot, he shall not be used in operations under this part until such time as he shall have demonstrated proficiency.

(2) The pilot proficiency check shall include at least the following:

(i) Equipment examination (oral or written), taxiing, runup, takeoff, climb, climbing turns, steep turns, maneuvers at minimum speeds, approach to stalls, propeller feathering, maneuvers with one or more engine(s) out, rapid descent and pullout, ability to tune radio, orientation, and approach procedures, missed approach and traffic control procedures, crosswind landing, landing under circling approach conditions, takeoffs and landings with engine(s) failures, demonstration of pilot judgment; and emergency procedures.

NOTE: An equipment examination given to an airman in the air carrier's ground school within the preceding 6 months may be accepted as the equivalent oral or written examination at the discretion of the check pilot.

~~(i)~~ (ii) The flight maneuvers specified in § 40.282(b)(1), except that the simulated engine failure during take-off need not be accomplished at speed V_1, nor at actual or simulated maximum authorized weight; and

(ii) (iii) Flight maneuvers approved by the Administrator accomplished under simulated instrument conditions utilizing the navigational facilities and letdown procedures normally used by the pilot: PROVIDED, That maneuvers other than those associated with approach procedures for which the lowest minimums are approved may be given in a synthetic trainer which contains the radio equipment and instruments necessary to simulate other navigational and letdown procedures approved for use by the air carrier.

(3) Subsequent to the initial pilot proficiency check, an approved course of training conducted in an approved airplane simulator, if satisfactorily completed, may be substituted at alternate 6-month intervals for the proficiency checks required by subparagraph (1) of this paragraph if the simulator meets the minimum standards set forth in Appendix C and: (Revised 40-39, June 10, 1963)

(i) The simulator is maintained at the same level as required for initial for initial approval; (Revised 40-39, June 10, 1963)

(ii) A functional preflight check of the simulator is performed each day prior to commencing simulator flight training or proficiency checks; (Revised 40-39, June 10, 1963)

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(iii) A daily discrepancy log is maintained and an entry of each discrepancy is made by the simulator instructor or check airman before termination of each training or check flight; and

(iv) If a modification is made to the airplane, a corresponding modification is made to the simulator if necessary for flight crew training or proficiency checks.

The simulator may be used with inoperative instruments or equipment, if they are not applicable to the particular phase of training being given.

(c) Prior to serving as pilot in command in a particular type of airplane, a pilot shall have accomplished during the preceding 12 months either a proficiency check or a line check in that type of airplane.

40.303 PILOT ROUTE AND AIRPORT QUALIFICATION REQUIREMENTS.

(a) An air carrier shall not utilize a pilot as pilot in command until he has been qualified for the route on which he is to serve in accordance with the provisions of this section and the appropriate instructor or check pilot has so certified. (Revised 40-13, September 24, 1958)

(b) Each such pilot shall demonstrate adequate knowledge concerning the subjects listed below with respect to each route to be flown. Those portions of the demonstration pertaining to holding procedures and instrument approach procedures may be accomplished in a synthetic trainer which contains the radio equipment and instruments necessary to simulate the navigational and letdown procedures approved for use by the air carrier:

(1) Weather characteristics,

(2) Navigational facilities,

(3) Communication procedures,

(4) Type of en route terrain and obstruction hazards,

(5) Minimum safe flight levels,

(6) Position reporting points,

(7) Holding procedures,

(8) Pertinent traffic control procedures, and

(9) Congested areas, obstructions, physical layout, and all instrument approach procedures for each regular, provisional, and refueling airport approved for the route.

(c) Each pilot shall make an entry as a member of the flight crew at each regular, provisional, and refueling airport into which he is scheduled to fly. Such entry shall include a landing and take-off. The qualifying pilot shall occupy a seat in the pilot compartment and he shall be accompanied by a pilot who is qualified at the airport. (Revised 40-13, September 24, 1958)

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(d) Such pilot shall not be required to meet the entry requirements of paragraph (c) of this section when: (Added 40-13, September 24, 1958)

(1) The initial entry is made under VFR weather conditions at the particular airport involved; or (Added 40-13, September 24, 1958)

(2) The air carrier shows that the pilot airport qualification can be accomplished by an approved pictorial means; or (Added 40-13, September 24, 1958)

(3) The air carrier notifies the Administrator that it intends to conduct operations at an airport in close proximity to an airport into which the pilot involved is presently qualified by entry, and the Administrator finds that such pilot is adequately qualified at the new airport. The Administrator, in making such finding, shall take into consideration at least the familiarity of the pilot with the layout, surrounding terrain, location of obstacles, and instrument approach and traffic control procedures at the new airport. (Added 40-13, September 24, 1958)

(e) On routes or route segments on which navigation must be accomplished by pilotage and on which flight is to be conducted at or below the level of the adjacent terrain which is within a horizontal distance of 25 miles on either side of the center line of the route to be flown, the pilot shall be familiarized with such route or route segments by not less than two one-way trips on the flight deck over the route or route segments under VFR weather conditions to permit the qualifying pilot to observe the terrain along the route. (Revised 40-13, September 24, 1958)

40.304 MAINTENANCE AND REESTABLISHMENT OF PILOT ROUTE AND AIRPORT QUALIFICATIONS FOR PARTICULAR TRIPS.

(a) To maintain pilot route and airport qualifications, each pilot being utilized as pilot in command, within the preceding 12-month period, shall have made at least one trip as pilot or other member of the flight crew between terminals into which he is scheduled to fly and shall have complied with the provisions of §40.303 (e), if applicable. (Revised 40-13, September 24, 1958)

(b) In order to reestablish pilot route and airport qualifications after absence from a route for a period in excess of 12 months, a pilot shall comply with the appropriate provisions of § 40.303. (Revised Revision, December 31, 1955

40.305 ~~COMPETENCE~~ PROFICIENCY CHECKS~~;~~ ~~OTHER PILOTS~~ SECOND IN COMMAND.

(a) ~~Prior to serving as pilot, and thereafter, each 6 months each pilot not being utilized as pilot in command shall demonstrate that he is capable of flying by instruments.~~ An air carrier shall not utilize a pilot as second in command until he has satisfactorily demonstrated to a check pilot or a representative of the Administrator his ability to pilot and navigate airplanes to be flown by him and to perform his assigned duties. Thereafter, he shall not serve as second in command unless each 12 months he successfully completes a similar pilot proficiency check. ~~This demonstration~~ The proficiency check may be given at any time during the month preceding or following the month in which it becomes due. The effective date of the ~~demonstration~~ check, if given within the preceding or following month, shall be the same as if given within the month in which it became due. ~~The demonstration flight may be made to a pilot serving as pilot in command or a check pilot of the air carrier during scheduled flight.~~ Where such pilots serve in more than one airplane type, at least every other successive proficiency check shall

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be given in flight in the larger airplane type. The pilot proficiency check shall include at least an oral or written equipment examination, and the procedures and flight maneuvers specified in § 40.282 (c) (1). The pilot proficiency check may be demonstrated from either the right or left pilot seat. (Revised 40-21, January 1, 1961)

(b) Subsequent to the initial pilot proficiency check for the second in command, an approved course of training in an airplane simulator which meets the requirements of § 40.302 (b) (3), if satisfactorily completed, may be substituted at alternate 12-month intervals for the proficiency check required by paragraph (a) of this section.

(c) Satisfactory completion of the proficiency check in accordance with the requirements of § 40.302 (b) will also meet the requirements, of this section.

M 40.307 FLIGHT ENGINEER QUALIFICATION FOR DUTY.

A flight engineer shall not be assigned to nor perform duties for which he is required to be certificated as a flight engineer unless, within the preceding 6-month period, he has had at least 50 hours of experience as a flight engineer on the type airplane on which he is to serve, or until the air carrier or an authorized representative of the Administrator has checked such flight engineer and determined that he is familiar with all essential current information and operating procedures relating to the type of airplane to which he is to be assigned and is competent with respect to such airplane. This check shall include a check in flight, but such flight check shall not be accomplished in scheduled air transportation: PROVIDED, That in the case of a flight engineer who has been previously qualified in the type airplane, the check may be accomplished in a synthetic trainer in lieu of a check in flight.

40.310 AIRCRAFT DISPATCHER QUALIFICATION FOR DUTY.

(a) Prior to dispatching airplanes over any route or route segment, an aircraft dispatcher shall be familiar, and the air carrier shall determine that he is familiar, with all essential operating procedures for the entire route and with the airplanes to be used: PROVIDED, That where he is qualified only on a portion of such route, he may dispatch airplanes, but only after coordinating with dispatchers who are qualified for the other portions of the route between the points to be served.

(b) An aircraft dispatcher shall not dispatch airplanes in the area over which he is authorized to exercise dispatch jurisdiction unless within the preceding 12 months he has made at least ~~one-round trip~~ a one-way qualification trip over the particular area on the flight deck of an airplane. The trip selected for qualification purposes shall be one which includes entry into as many points as practicable, but it shall not be necessary for the aircraft dispatcher to make a flight over each route in the area.

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FLIGHT TIME LIMITATIONS

40.320 FLIGHT TIME LIMITATIONS.

(a) An air carrier shall not schedule any flight crew member for duty aloft in scheduled air transportation or in other commercial flying if his total flight time in all commercial flying will exceed the following flight time limitations:

(1) 1,000 hours in any year;

(2) 100 hours in any month;

(3) 30 hours in any ~~week~~ seven consecutive days.

(b) An air carrier shall not schedule any flight crew member for duty aloft for more than 8 hours during any 24 consecutive hours, unless he is given an intervening rest period at or before the termination of 8 scheduled hours of duty aloft. Such rest period shall equal twice the number of hours of duty aloft since the last preceding rest period, and in no case shall the rest period be less than 8 hours. [See SR-405]

(c) When a flight crew member has been on duty aloft in excess of 8 hours in any 24 consecutive hours he shall, upon completion of his assigned flight or series of flights, be given at least 16 hours for rest before being assigned any further duty with the air carrier.

(d) Time involved in transportation, not local in character, required of a flight crew member by an air carrier and provided by the air carrier for the purpose of transporting the flight crew member to an airport at which he is required to serve on a flight as a crew member, or from the airport at which he was relieved from duty as a crew member to return to his home station, shall not be considered as part of any required rest period.

(e) Each flight crew member engaged in scheduled air transportation shall be relieved from all duty with the air carrier for at least 24 consecutive hours during any seven consecutive days.

(f) No flight crew member shall be assigned any duty with an air carrier during any rest period prescribed by this part.

(g) A flight crew member shall not be considered to be scheduled for duty in excess of prescribed limitations, if the flights to which he is assigned are scheduled and normally terminate within such limitations, but due to exigencies beyond the air carrier's control, such as adverse weather conditions, are not at the time of departure expected to reach their destination within the scheduled time.

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CIVIL AIR REGULATIONS PART 40

DUTY TIME LIMITATIONS; AIRCRAFT DISPATCHER

40.340 AIRCRAFT DISPATCHER DAILY DUTY TIME LIMITATIONS.

(a) The daily duty period for an aircraft dispatchers shall commence at such time as will permit him to become thoroughly familiar with existing and anticipated weather conditions along the route prior to the dispatch of any airplane. He shall remain on duty until all airplanes dispatched by him have completed their flights, or have proceeded beyond his jurisdiction, or until he is relieved by another qualified aircraft dispatcher.

(b) The following rules will govern the hours of duty for an aircraft dispatchers, except when circumstances or emergency conditions beyong the control of the air carrier require otherwise:

(1) MAXIMUM CONSECUTIVE HOURS OF DUTY.

No dispatcher shall be scheduled for duty as such for a period of more than 10 consecutive hours.

(2) MAXIMUM SCHEDULED HOURS OF DUTY IN 24 CONSECUTIVE HOURS.

If a dispatcher is scheduled for duty as such for more than 10 hours in a period of 24 hours, he shall be given a rest period of not less than 8 hours at or before the termination of 10 hours of dispatcher duty.

(3) DISPATCHER'S TIME OFF.

Each aircraft dispatcher shall be relieved from all duty with the air carrier for a period of at least 24 consecutive hours during any 7 consecutive days, or the equivalent thereof within any one month. (Revised 40-3, April 1, 1954)

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CIVIL AIR REGULATIONS PART 40

FLIGHT OPERATIONS

40.351 OPERATIONAL CONTROL.

The air carrier shall be responsible for operational control.

(a) JOINT RESPONSIBILITY OF AIRCRAFT DISPATCHER AND PILOT IN COMMAND.

The aircraft dispatcher and the pilot in command shall be jointly responsible for the preflight planning, delay, and dispatch release of the flight in compliance with the applicable regulations of this subchapter and operations specifications.

(b) RESPONSIBILITY OF DISPATCHER.

The aircraft dispatcher shall be responsible:

(1) For monitoring the progress of each flight and the issuance of instructions and information necessary for the continued safety of the flight.

(2) For the cancellation or redispatch of a flight if, in his opinion or in the opinion of the pilot in command, the flight cannot operate or continue to operate safely as planned or released.

(c) RESPONSIBILITY OF PILOT IN COMMAND.

The pilot in command shall during flight time be in command of the airplane and crew shall be responsible for the safety of the passengers, crew members, cargo, and airplane. [See Interpretation No. 1]

40.352 OPERATIONS NOTICES.

Each air carrier shall notify the appropriate operations personnel promptly of all changes in equipment and operating procedures, including known changes in the use of navigational aids, airports, air traffic control procedures and regulations, local airport traffic control rules, and of all known hazards to flight, including icing and other potentially hazardous meteorological conditions and irregularities of ground and navigational facilities.

40.353 OPERATIONS SCHEDULES.

In establishing flight operations schedules, each air carrier shall allow sufficient time for the proper servicing of airplanes ~~with fuel and oil~~ at intermediate stops, and it shall consider the prevailing winds along the particular route and the cruising speed of the type of airplane to be flown which shall not exceed the specified cruising output of the airplane engines.

40.354 FLIGHT CREW MEMBERS AT CONTROLS.

All required flight crew members when on flight deck duty shall remain at their respective stations while the airplane is taking off or landing, and while en route except when the absence of one such flight crew member is necessary for the performance of his duties in connection with the operation of the airplane. All flight crew members shall keep their seat belts fastened when at their respective stations. (Revised 40-16, April 22, 1959)

40.355 MANIPULATION OF CONTROLS.

No person other than a qualified pilot of the air carrier shall manipulate the flight controls during flight, except that any one of the following persons may, with the permission of the pilot in command, manipulate such controls: (Revised)

M (a) Authorized pilot safety representatives of the Administrator or the Board who are qualified on the airplane and are engaged in checking flight operations, or

M (b) Pilot personnel of another air carrier properly qualified on the airplane and authorized by the operating carrier.

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M 40.356 ADMISSION TO FLIGHT DECK.

No persons, other than crew members, shall be admitted to the flight deck of an airplane except those authorized in paragraphs (a) and (b) of this section. For the purposes of this section the Administrator shall determine what constitutes the flight deck ~~of an airplane~~.

(a) ~~In addition to the crew members assigned to a particular airplane, CAA Aviation Safety Agents~~ CAA Flight Operations and Airworthiness Inspectors and authorized representatives of the Board while in the performance of official duties shall be admitted to the flight deck ~~of an airplane~~.

NOTE: Nothing contained in this paragraph shall be construed as limiting the emergency authority of the pilot in command to exclude any person from the flight deck in the interest of safety.

(b) The persons listed below may be admitted to the flight deck when authorized by the pilot in command:

(1) An employee of the Federal Government or of an air carrier or other aeronautical enterprise whose duties are such that his presence on the flight deck is necessary or advantageous to the conduct of safe air carrier operations, or

NOTE: Federal employees who deal responsibly with matters relating to air carrier safety and such air carrier employees as pilots, dispatchers, meteorologists, communication operators, and mechanics whose efficiency would be increased by familiarity with flight conditions may be considered eligible under this requirement. Employees of traffic, sales, and other air carrier departments not directly related to flight operations cannot be considered eligible unless authorized under subparagraph (2) of this paragraph.

(2) Any other person specifically authorized by the air carrier management and the Administrator.

(c) All persons admitted to the flight deck shall have seats available for their use in the passenger compartment except:

(1) CAA ~~Aviation Safety agents~~ Flight Operations and Airworthiness Inspectors or other authorized representatives of the Civil Aeronautics Administration or the Civil Aeronautics Board engaged in checking flight operations;

(2) Air traffic controllers who have been authorized by the Administrator to observe ATC procedures;

(3) Certificated airmen of the air carrier; whose duties with the carrier require an airman certificate; ~~and~~

(4) Certificated airmen of another air carrier whose duties with such carrier require an airman certificate and who have been authorized by the air carrier concern to make specific trips over the route.

(5) Employees of the air carrier, whose functions are directly related to the conduct or planning of flight operations or the in-flight monitoring of aircraft equipment or operating procedures, but only when their presence in the cockpit is required in the furtherance of such functions and when specifically authorized in writing by a responsible supervisor in the operations department of the air carrier, who is listed in the Operations Manual as having such authority; and

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(6) Technical representatives of the manufacturer of the airplane or its components whose functions are directly related to the in-flight monitoring of aircraft equipment or operating procedures, but only when their presence in the cockpit is required in the furtherance of such functions and only when specifically authorized in writing by the Administrator and by a responsible supervisor in the operations department of the air carrier, who is listed in the Operations Manual as having such authority.(Added 40-5, August 15, 1957)

~~40.357 USE OF COCKPIT CHECK PROCEDURE.~~

~~The cockpit check procedure shall be used by the flight crew for each procedure as set forth in § 40.176.~~

~~40.358~~ 40.357 ~~PERSONAL~~ FLYING EQUIPMENT.

The pilot in command shall insure that the following equipment is aboard the airplane for each flight:

(a) Appropriate aeronautical charts containing adequate information concerning navigational aids and instrument approach procedures, and (Revised Revision December 31, 1955)

(b) FLASHLIGHTS.

Each crewmember shall have readily available for his use on each flight a flashlight in good working order. ~~in the possession of each crew member.~~

~~40.359~~ 40.358 RESTRICTION OR SUSPENSION OF OPERATION.

When conditions known to the air carrier exist which constitute a hazard to the conduct of safe air carrier operations, including airport and runway conditions, the air carrier shall restrict or suspend operations until such hazardous conditions are corrected.

40.359 OPERATIONS OVER APPROVED ROUTES REQUIRED.

Except when a deviation is necessary in accordance with § 40.360, a pilot shall not operate an air carrier airplane in scheduled air transportation over any route or route segment other than as specified in the operations specifications of the air carrier, nor operate other than in accordance with the limitations prescribed therein.

40.360 EMERGENCY DECISIONS; PILOT IN COMMAND AND AIRCRAFT DISPATCHER.

(a) In emergency situations which require immediate decision and action, the pilot in command may follow any course of action which he considers necessary under the circumstances. In such instances the pilot in command, to the extent required in the interest of safety, may deviate from prescribed operations procedures and methods, weather minimums, and the regulations of this subchapter.

(b) If an emergency situation arises during the course of a flight which requires immediate decision and action on the part of the aircraft dispatcher, and which is known to him, he shall advise the pilot in command of such situation. The aircraft dispatcher

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shall ascertain the decision of the pilot in command and shall cause the same to be made a matter of record. If unable to communicate with the pilot, the dispatcher shall declare an emergency and follow any course of action which he considers necessary under the circumstances.

(c) When emergency authority is exercised by the pilot in command or by the dispatcher, the appropriate air traffic control facility and appropriate dispatch center shall be kept fully informed regarding the progress of the flight. ~~and within 10 days after the completion of the particular flight~~ A written report of any deviation shall be submitted by the individual declaring the emergency ~~to the Administrator~~ through the air carrier operations manager to an authorized representative of the Administrator. Such report shall be submitted by a dispatcher within 10 days from the date of the emergency and by a pilot in command within 10 days after his return to his home base.

40.361 REPORTING POTENTIALLY HAZARDOUS METEOROLOGICAL CONDITIONS AND IRREGULARITIES OF GROUND AND NAVIGATIONAL FACILITIES.

When any meteorological condition or irregularity of ground or navigational facilities is encountered in flight, the knowledge of which the pilot in command considers essential to the safety of other flights, he shall notify an appropriate ground radio station as soon as practicable. Any such information pertaining to irregularities received by an air carrier shall ~~thereupon~~ be ~~relayed by that station~~ reported to the ~~appropriate governmental agency~~ authority directly responsible for the operation of the particular facility involved.

40.362 REPORTING MECHANICAL IRREGULARITIES.

The pilot in command shall enter or cause to be entered in the maintenance log of of the airplane all mechanical irregularities encountered during flight. He shall, prior to each flight, inspect the log to ascertain the status of any irregularities entered in the log at the end of the last preceding flight.

40.363 ENGINE FAILURE OR PRECAUTIONARY STOPPAGE.

(a) Except as provided in paragraph (b) of this section, when one engine of an airplane fails or where the rotation of an engine of an airplane is stopped in flight as a precautionary measure to prevent possible damage, a landing shall be made at the nearest suitable airport in point of time where a safe landing can be effected.

(b) The pilot in command of an airplane having 3 or more engines may, if not more than one engine fails or the rotation thereof is stopped, proceed to an airport of his selection, if, upon consideration of the following factors, he determines such action to be as safe a course of action as landing at the nearest suitable airport: (Revised 40-40, April 10, 1964)

(1) The nature of the malfunctioning and the possible mechanical difficulties which may be encountered if flight is continued;

~~(2) The availability of the inoperative engine for use;~~

(3) The altitude, airplane weight, and usable fuel at the time of engine stoppage;

(4) The weather conditions en route and at possible landing points;

(5) The air traffic congestion;

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(6) The type of terrain; and

(7) The familiarity of the pilot with the airport to be used.

(c) When engine rotation is stopped in flight, the pilot in command shall immediately notify the proper ground radio station and shall keep such station fully informed regarding the progress of the flight. (Revised 40-40, April 10, 1964)

(d) In cases where the pilot in command selects an airport other than the nearest suitable airport in point of time, he shall, upon completion of the trip, submit a written report, in duplicate, to his operations manager setting forth his reasons for determining that the selection of an airport other than the nearest was as safe a course of action as landing at the nearest suitable airport. The operations manager shall, within ~~7~~ 10 days after ~~completion of the trip~~ the pilot's return to his home base furnish a copy of this report with his own comments thereon to the Administrator.

40.364 INSTRUMENT APPROACH PROCEDURES.

When an instrument approach is necessary, the instrument approach procedures and weather minimums authorized in the operations specifications shall be adhered to.

40.365 REQUIREMENTS FOR AIR CARRIER EQUIPMENT INTERCHANGE.

(a) Prior to conducting any operations pursuant to an interchange agreement ~~authorized by the Civil Aeronautics Board~~, the air carrier shall show that:

(1) The procedures proposed for the conduct of such operations by the carriers involved conform with the provisions of this subchapter and with safe operating practices;

(2) All ~~operations personnel~~ required crewmembers and dispatchers involved meet the approved training requirements for the airplanes and equipment used in the interchange and are familiar with the ~~airplanes and equipment of the air carrier with whom interchange is to be effected, and with the~~ communications and dispatching procedures to be used;

(3) All maintenance personnel involved meet the training requirements for the airplanes and equipment, and are familiar with the ~~airplanes and equipment, and the~~ maintenance procedures ~~of the air carrier with whom~~ applicable to the interchange; ~~is to be effected~~

(4) The flight crew and the dispatchers involved meet the appropriate route and airport qualifications; and

(5) All airplanes operated are essentially similar to those airplanes of the carrier with whom interchange is to be effected with respect to flight instruments and their arrangement and with respect to the arrangement and motion of controls critical to safety, unless the Administrator determines that adequate training programs have been established to insure that any dissimilarities which might be a potential hazard will be safely overcome by flight crew familiarization.

(b) The pertinent provisions and procedures affecting the carriers involved shall be included in their manuals.

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40.370 BRIEFING OF PASSENGERS. (Added 40-20, September 28, 1955)

After May 31, 1956, each air carrier engaged in extended overwater operations shall assure that all passengers are briefed orally concerning the location and method of operation of life ~~vests~~ preservers and emergency exits and the location of life rafts. The procedure to be followed in presenting this briefing shall be described in the air carrier manual. Such a briefing shall include a demonstration of the method of donning and inflating a life ~~vest~~ preserver. Where the airplane proceeds directly over water after take-off, the briefing on location of the life ~~vests~~ preservers and emergency exits shall be accomplished prior to take-off, and the remainder of the briefing shall be accomplished as soon thereafter as practicable. Where the airplane does not proceed directly over water after take-off, no part of the briefing need be accomplished prior to take-off but the entire briefing shall be accomplished prior to reaching the overwater portion of the flight.

40.371 DRINKING AND SERVING OF ALCOHOLIC BEVERAGES. (Added 40-24, March 10, 1960)

(a) No person shall drink any alcoholic beverage aboard an air carrier aircraft unless such beverage has been served to him by the air carrier operating the aircraft. (Added 40-24, March 10, 1960)

(b) No air carrier shall serve any alcoholic beverage to any person aboard an air carrier aircraft if such person appears to be intoxicated. (Added 40-24, March 10, 1960)

(c) No air carrier shall permit any person to board an air carrier aircraft if such person appears to be intoxicated. (Added 40-31, November 21, 1961)

(d) An air carrier shall report to the Administrator within 5 days any incident in which a person aboard its aircraft refuses to comply with paragraph (a) of this section, or any disturbance caused by a person who appears to be intoxicated while aboard its aircraft. (Added 40-31, November 21, 1961)

40.372 MINIMUM ALTITUDES FOR USE OF AUTOMATIC PILOT.

(a) EN ROUTE OPERATIONS.

Except as provided in paragraph (b) of this section, an automatic pilot may only be used during en route flight operations, including climb or descent, at an altitude above the terrain not less than twice the maximum altitude loss established for the automatic pilot malfunction in the particular airplane under cruise conditions as specified in the Airplane Flight Manual for the airplane involved, or 5000 feet, whichever is higher.

(b) APPROACHES.

Except as provided in subparagraph (1) of this paragraph, when using an instrument approach facility, an automatic pilot may remain engaged down to an altitude above the terrain not less than twice the maximum altitude loss established for the automatic pilot in the

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particular airplane under approach conditions as specified in the Airplane Flight Manual for the airplane involved, or not less than 50 feet below the minimum ceiling approved for the facility being used, whichever is higher.

(1) ILS APPROACHES UTILIZING AN APPROACH COUPLER —

(i) UNDER INSTRUMENT FLIGHT RULE WEATHER CONDITIONS.

When the reported weather conditions are less than the basic weather conditions specified in § 91.105 [New] of this chapter (Federal Aviation Regulations), an automatic pilot utilizing an approach coupler may remain engaged for ILS approaches down to an altitude above the terrain not less than 50 feet higher than the maximum altitude loss established for the automatic pilot and approach coupler in the particular airplane under approach conditions as specified in the Airplane Flight Manual for the airplane involved.

(ii) UNDER VISUAL FLIGHT RULE WEATHER CONDITIONS.

When reported weather conditions are equal to or better than the basic VFR minimums specified in § 91.105 [New] of this chapter (Federal Aviation Regulations), an automatic pilot utilizing an approach coupler may remain engaged for ILS approaches down to an altitude above the terrain not less than the maximum altitude loss established for the automatic pilot and approach coupler in the particular airplane under approach conditions as specified in the Airplane Flight Manual for the airplane involved, or 50 feet, whichever is higher.

40.373 CLOSING AND LOCKING OF FLIGHT CREW COMPARTMENT DOORS. (Added 40-45, August 6, 1964)

The pilot in command shall be responsible for ascertaining that the door separating the flight crew compartment from the passenger compartment of a large airplane operated by an air carrier when carrying passengers is closed and locked during flight except as follows: (Added 40-45, August 6, 1964)

(a) During takeoff and landing of the airplane when such door is the means of access to a required passenger emergency exit. (Added 40-45, August 6, 1964)

(b) At such times as it may be necessary to provide access to the flight crew or passenger compartments for the crewmembers in the performance of their duties, or to provide access for other persons authorized admission to the flight crew compartment by § 40.356. (Added 40-45, August 6, 1964)

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CIVIL AIR REGULATIONS PART 40

DISPATCHING RULES

40.381 NECESSITY FOR DISPATCHING AUTHORITY.

No flight shall be started without specific authority from an aircraft dispatcher, except when an airplane has landed at an intermediate airport specified in the original dispatch release and has remained there for one hour or less.

40.382 FAMILIARITY WITH WEATHER CONDITIONS.

No aircraft dispatcher shall release a flight unless he is thoroughly familiar with ~~existing and anticipated~~ reported and forecast weather conditions along the route to be flown.

40.383 FACILITIES AND SERVICES.

The dispatcher shall furnish to the pilot in command all available current reports or information pertaining to irregularities of navigational facilities and airport conditions which may affect the safety of the flight. He shall also furnish the pilot, while en route, any additional available information concerning meteorological conditions and irregularities of facilities and services which may affect the safety of the flight.

40.384 AIRPLANE EQUIPMENT REQUIRED FOR DISPATCH.

All airplanes dispatched shall be airworthy and shall be equipped in accordance with the provisions of §40.170.

40.385 COMMUNICATIONS AND NAVIGATIONAL FACILITIES REQUIRED FOR DISPATCH.

No airplane shall be dispatched over any route or route segment unless the communications and navigational facilities required by § 40.34 and § 40.36 are in satisfactory operating condition. (Revised 40-3, April 1, 1954)

40.386 DISPATCHING UNDER VFR.

Airplanes shall be dispatched for operation under VFR only if the appropriate weather reports and forecasts, or a combination thereof, indicate that the ceilings and visibilities along the route to be flown are, and will remain, at or above the minimums required for flight under VFR until the flight arrives at the airport or airports of intended landing specified in the dispatch release.

40.387 DISPATCHING UNDER IFR OR OVER-THE-TOP.

Airplanes shall be dispatched for operation under IFR or over-the-top only if the appropriate weather reports and forecasts, or a combination thereof, pertaining to the airport or airports to which dispatched indicate that the ceilings and visibilities will be at or above the minimums approved by the Administrator at the estimated time of arrival thereat. (Revised 40-3, April 1, 1954)

40.388 ALTERNATE AIRPORT FOR DEPARTURE.

(a) If the weather conditions at the airport of take-off are below the approved landing minimums for that airport, no airplane shall be dispatched from that airport unless an alternate airport located with respect to the airport of take-off as follows is specified in the dispatch release: ~~PROVIDED, That such alternate need not be selected if the~~

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~~ceiling and visibility respectively at the take-off airport are at least 300 feet and one mile; 400 feet and three-quarters mile, or 500 feet and one-half mile:~~

(1) AIRPLANES HAVING 2 ENGINES. (Revised 40-40, April 10, 1964)

Alternate airport located at a distance no greater than one hour of flying time in still air at normal cruising speed with one engine inoperative.

(2) AIRPLANES HAVING 3 OR MORE ENGINES. (Revised 40-40, April 10, 1964)

Alternate airport located at a distance no greater than 2 hours of flying time in still air at normal cruising speed with one engine inoperative.

(b) The alternate airport weather requirements shall be those specified in §40.390.

(c) All required alternate airports shall be listed in the dispatch release.

40.389 ALTERNATE AIRPORT FOR DESTINATION; IFR OR OVER-THE-TOP.

(a) For all IFR or over-the-top operations there shall be at least one alternate airport designated for each airport of destination and, when the weather conditions forecast for the destination and first alternate are marginal, at least one additional alternate airport: PROVIDED, That no alternate need be designated when, for the period two hours before to two hours after the estimated time of arrival, the ceiling at the airport to which the flight is dispatched is forecast to be at least 1,000 feet above the minimum initial approach altitude applicable to such airport and the visibility at such airport is forecast to be at least three miles. (Revised 40-3, April 1, 1954)

(b) The alternate airport weather requirements shall be those specified in §40.390.

(c) All required alternate airports shall be listed in the dispatch release.

40.390 ALTERNATE AIRPORT WEATHER MINIMUMS.

An airport shall not be specified in the dispatch release as an alternate airport unless ~~the weather conditions existing there at the time of dispatch are equal to or above the ceiling and visibility minimums approved for such airport when using it as an alternate, and~~ the appropriate weather reports and or forecasts, or a combination thereof, indicate that the ~~weather conditions~~ ceilings and visibilities will be at or above ~~such~~ the alternate minimums ~~until~~ specified in the air carrier's operations specifications for such airport when the flight shall arrive thereat. ~~The weather minimums at such alternate airport shall not be less than one of the following and in no event less than the corresponding minimums specified for the airport when used as a regular airport:~~

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~~PROVIDED, That the Administrator may approve higher or lower minimums at particular airports where the safe conduct of flight requires or permits, considering the character of the terrain being traversed, the meteorological service and navigational facilities available, and other conditions affecting flight.~~

~~(a) An airport served by an approved radio navigational facility and either an instrument landing system or a ground control approach system which the carrier has been authorized to use: Ceiling 800 feet and visibility of one mile; or ceiling 700 feet and visibility of 1 1/2 miles; or ceiling 600 feet and visibility of two miles;~~

~~(b) An airport served by an approved radio navigational facility: Ceiling 1,000 feet and visibility of one mile; or ceiling 900 feet and visibility of 1 1/2 miles; or ceiling 800 feet and visibility of two miles;~~

~~(c) An airport not served by an approved radio navigational facility: if overcast; ceiling 1,000 feet above the minimum en route instrument altitude applicable to the route to such alternate airport and visibility of two miles; if broken clouds, ceiling 1,000 feet above the elevation of the airport and visibility of two miles.~~

40.391 CONTINUANCE OF FLIGHT; FLIGHT HAZARDS.

(a) No airplane shall be continued in flight toward any airport to which it has been dispatched when, in the opinion of the pilot in command or the aircraft dispatcher, the flight cannot be completed with safety, unless in the opinion of the pilot in command there is no safer procedure. In the latter event, continuation shall constitute an emergency situation as set forth in § 40.360. (Revised 40-3, April 1, 1954)

(b) If any instrument or item of equipment required pursuant to the regulations ~~of~~ in this ~~sub~~chapter for the particular operation being conducted becomes unserviceable en route, the pilot in command shall comply with the approved procedures specified in the Air Carrier Manual for such occurrences. ~~PROVIDED, That~~ An authorized representative of the Administrator may ~~authorize the~~ approve for incorporation in the Air Carrier Manual ~~of~~ the minimum equipment list and procedures for ~~the continued operation of an airplane~~ continuance of flight beyond a ~~scheduled~~ terminal point with equipment referred to in § 40.170(c) inoperative, ~~where~~ if he finds that, in the particular circumstances of the case, literal compliance with ~~this~~ that requirement is not necessary in the interest of safety.

40.392 OPERATION IN ICING CONDITIONS.

(a) An airplane shall not be dispatched, en route operations continued, or landing made when, in the opinion of the pilot in command or aircraft dispatcher, icing conditions are expected or encountered which might adversely affect the safety of the flight.

M (b) No airplane shall take off when frost, snow, or ice is adhering to the wings, control surfaces, or propellers of the airplane.

40.393 REDISPATCH AND CONTINUANCE OF FLIGHT.

(a) Any regular, provisional, or refueling airport the use of which

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is authorized for the type of airplane to be operated may be specified as a destination for the purpose of original dispatch.

(b) An airport specified as a destination or alternate for the purpose of original dispatch may be changed en route to another airport which is authorized for the type of airplane to be operated, provided that the appropriate requirements of §40.381 through §40.409 and §40.70 or §40.90 are met at the time of redispatch.

(c) No flight shall be continued to any airport to which it has been dispatched unless the weather conditions at an alternate airport specified in the dispatch release remain at or above the minimums specified for such airport when used as an alternate: PROVIDED, That the dispatch release may be amended en route to include any approved alternate airport lying within the fuel range of the airplane as specified in § 40.396 through § 40.397. (Revised 40-3, April 1, 1954)

(d) When the dispatch release is amended while the airplane is en route, such amendments shall be made a matter of record.

40.394 DISPATCH TO AND FROM PROVISIONAL AIRPORT.

(a) No aircraft dispatcher shall dispatch an airplane to a provisional airport unless such airport complies with all of the requirements of this part pertinent to regular airports.

(b) Dispatch from a provisional airport shall be accomplished in accordance with the same regulations governing dispatch from a regular airport.

40.395 TAKE-OFFS FROM ALTERNATE AIRPORTS OR FROM AIRPORTS NOT LISTED IN THE OPERATIONS SPECIFICATIONS.

(a) ~~No airplane~~ A pilot shall not take off an airplane from ~~an alternate airport or from~~ an airport ~~which is~~ not listed in the air carrier's operations specifications unless:

~~(a)~~ (1) Such airport and related facilities are adequate for the operation of the airplane;

~~(b)~~ (2) In taking off, it is possible to comply with the applicable airplane ~~operating~~ operation limitations;

~~(d)~~ (3) The airplane is dispatched in accordance with all dispatching rules applicable to operation from an approved airport; and

~~(c)~~ (4) The ~~weather conditions~~ ceiling and visibility at ~~that~~ the airport are equal to or better than ~~those prescribed for such airport; and~~ the following:

(i) AIRPORTS WITHIN THE UNITED STATES.

The ceiling and visibility minimums for takeoff prescribed in Part 97 [New] of this chapter (Federal Aviation Regulations), but in no case less than 300-1. Where such minimums are not prescribed for the airport, the ceiling and visibility shall be 800-2, 900-1 1/2, or 1000-1.

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(ii) AIRPORTS OUTSIDE THE UNITED STATES.

The ceiling and visibility minimums for takeoff prescribed or approved by the government of the country in which the airport is located, but in no case less than 300-1. Where such minimums are not prescribed or approved for the airport, the ceiling and visibility shall be 800-2, 900-1 1/2, or 1000-1.

(b) A pilot shall not take off an airplane from an alternate airport unless the ceiling and visibility at the airport are equal to or better than the minimums prescribed in the air carrier's operations specifications for alternate airports.

40.396 FUEL SUPPLY FOR ALL OPERATIONS.

No airplane shall be dispatched unless it carries sufficient fuel:

(a) To fly to the airport to which dispatched, and thereafter;

(b) To fly to and land at the most distant alternate for the airport to which dispatched where such alternate is required and thereafter;

(c) To fly for a period of at least 45 minutes at normal cruising consumption.

40.397 FACTORS INVOLVED IN COMPUTING FUEL REQUIRED.

In computing the fuel required, consideration shall be given to the wind and other weather conditions forecast, traffic delays anticipated, an instrument approach and possible missed approach at destination, and any other conditions which might delay the landing of the airplane. Required fuel shall be additional to unusable fuel.

40.405 TAKE-OFF AND LANDING WEATHER MINIMUMS; VFR.

Irrespective of any clearance which may be obtained from air traffic control, no airplane shall take off or land under VFR when the reported ceiling or ground visibility is less than specified below: PROVIDED, That where a local surface restriction to visibility exists, such as smoke, dust, or blowing snow or sand, the visibility for both day and night operations may be reduced to one-half mile, if all turns after take-off and prior to landing and all flight beyond a mile from the airport boundary can be accomplished above or outside, the area so restricted.

(a) For day operations: 1,000-foot ceiling and one-mile visibility;
(b) For night operations: 1,000-foot ceiling and two-mile visibility.

40.406 TAKE-OFF AND LANDING WEATHER MINIMUMS; IFR.

M (a) Except as provided in paragraphs (c) and (d) of this section, irrespective of any clearance which may be obtained from air traffic control, no airplane shall take off or land under IFR when the ceiling or ground visibility reported by the U.S. Weather Bureau or by a source approved by the Weather Bureau is less than the minimum approved for the airport when used as a regular airport. (Revised 40-1, June 22, 1956)

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M (b) Except as provided in paragraphs (c) and (d) of this section, no instrument approach procedure shall be executed when the latest weather report prepared by the U.S. Weather Bureau or by a source approved by the Weather Bureau indicates the ceiling or visibility is less than the landing minimum approved for the airport when used as a regular airport. (Revised 40-1, June 22, 1956)

M (c) An instrument approach procedure may be executed when the weather report prepared by the U.S. Weather Bureau or by a source approved by the Weather Bureau indicates that the ceiling or visibility is less than approved minimum for landing, if the airport is served by ILS and PAR in operative condition and both are used by the pilot, and thereafter a landing may be made, if weather conditions equal to or better than the prescribed minimums are found to exist by the pilot in command upon reaching the authorized landing minimum altitude. (Revised 40-1, June 22, 1956)

(d) If an instrument approach procedure is initiated when the current report prepared by the U.S. Weather Bureau or by a source approved by the Weather Bureau indicates that the prescribed ceiling and visibility minimums exist and a later weather report indicating below minimum conditions is received after the airplane (1) is on an ILS final approach and has passed the outer marker, or (2) is on a final approach using a radio range station or comparable facility and has passed the appropriate facility and has reached the authorized landing minimum altitude, or (3) is on GCA final approach and has been turned over to the final approach controller, such ILS, Range, or GCA approach may be continued and a landing may be made in the event weather conditions equal to or better than the prescribed minimums for the airport are found to exist by the pilot in command of the flight upon reaching the authorized landing minimum altitude. (Revised 40-1, June 22, 1956)

(e) The ceiling and visibility landing minimums prescribed in the air carrier's operations specifications for regular, provisional, or refueling airports shall be increased by 100 feet ceiling and ½ mile visibility whenever the pilot in command has not served 100 hours as pilot in command in air carrier or commercial operations in the particular type of airplane being operated by him. The ceiling and visibility minimums need not be increased above those applicable to the airport when used as an alternate airport. The sliding scale, when authorized in the air carrier's operations specifications, shall not be applied until the pilot in command has served 100 hours as pilot in command in air carrier or commercial operations in the particular type of airplane being operated by him. (Revised 40-29, May 23, 1961)

40.407 APPLICABILITY OF REPORTED WEATHER MINIMUMS.

In the conduct of operations subject to §§ 40.405 and 40.406, the ceiling and visibility values contained in the main body of the latest weather report shall be the controlling criteria for VFR and IFR take-offs and landings and for instrument approach procedures on all runways of an airport except that when the latest weather report, including an oral report from the control tower, contains a visibility value specified as runway visibility or runway visual range for a particular runway of an airport, such specified value shall be controlling for VFR and IFR landings and takeoffs and straight-in instrument approaches for such runway.

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CIVIL AIR REGULATIONS PART 40

40.408 FLIGHT ALTITUDE RULES.

Except when necessary for take-off and landing, the flight altitude rules prescribed in paragraphs (a) and (b) of this section, in addition to the applicable provisions of §60.17 of this subchapter, shall govern air carrier operations: PROVIDED, That other altitudes may be established by the Administrator for any route or portion thereof where he finds, after considering the character of the terrain being traversed, the quality and quantity of meteorological service, the navigational facilities available, and other flight conditions, that the safe conduct of flight permits or requires such other altitudes.

(a) DAY VFR PASSENGER OPERATIONS.

No airplane engaged in passenger operations shall be flown at an altitude less than 1,000 feet above the surface or less than 1,000 feet from any mountain, hill, or other obstruction to flight.

(b) NIGHT VFR OR IFR OPERATIONS INCLUDING OVER-THE-TOP.

No airplane shall be flown at an altitude less than 1,000 feet above the highest obstacle located within a horizontal distance of five miles from the center of the course intended to be flown, or, in mountainous terrain designated by the Administrator, 2,000 feet above the highest obstacle located within a horizontal distance of five miles from the center of the course intended to be flown: PROVIDED, That in VFR operations at night in such mountainous areas airplanes may be flown over a lighted civil airway at a minimum altitude of 1,000 feet above such obstacle: ~~AND PROVIDED FURTHER, That in the case of high-altitude operations, the minimum altitude shall be not less than 2,000 feet above the elevation of the highest ground within 25 miles of the intended track:~~ AND PROVIDED FURTHER, That adherence to a minimum flight altitude will not be required during the time a flight is proceeding in accordance with paragraph (c) of this section.

(c) DAYTIME OVER-THE-TOP OPERATIONS BELOW MINIMUM EN ROUTE ALTITUDES.

Over-the-top operations may be conducted at flight altitudes lower than the minimum en route IFR altitudes by day only and in accordance with the following provisions:

(1) Such operations shall be conducted at least 1,000 feet above the top of lower broken or overcast cloud cover;

(2) The top of the lower cloud cover shall be generally uniform and level;

(3) Flight visibility shall be at least five miles; and (Revised Revision, December 31, 1955)

(4) The base of any higher broken or overcast cloud cover shall be generally uniform and level and shall be at least 1,000 feet above the minimum en route IFR altitude for the route segment.

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40.409 ALTITUDE MAINTENANCE ON INITIAL APPROACH.

(a) When making an initial approach to a radio navigational facility under IFR (excluding over-the-top conducted in accordance with the provisions of §40.408(c)), an airplane shall not descend below the pertinent minimum altitude for initial approach specified by the Administrator for such facility until arrival over the radio facility has been definitely established;

(b) When making an initial approach on a flight being conducted in accordance with the provisions of §40.408(c), a pilot shall not commence an instrument approach until arrival over the radio facility has definately been established. In executing an instrument approach procedure under such circumstances, the airplane shall not be flown at an altitude lower than 1,000 feet above the top of the lower cloud or the minimum altitude specified by the Administrator for that portion of the instrument approach procedure being flown, whichever is the lower.

40.411 PREPARATION OF DISPATCH RELEASE.

A dispatch release shall be prepared for each flight between specified points from information furnished by the authorized aircraft dispatcher. This release shall be signed by the pilot in command and by the authorized aircraft dispatcher only when both believe the flight can be made with safety. The aircraft dispatcher may delegate authority to sign such release for a particular flight, but he shall not delegate the authority to dispatch.

40.412 PREPARATION OF LOAD MANIFEST.

The air carrier shall be responsible for the preparation and accuracy of a load manifest form prior to each take-off. This form shall be prepared by personnel of the air carrier charged with the duty of supervising the loading of airplanes and the preparation of load manifest forms or by other qualified persons authorized by the air carrier.

M 40.501 CREWMEMBER AND DISPATCHER RECORDS.

Each air carrier shall maintain current records of every crewmember and aircraft dispatcher. These records shall contain such information concerning the qualifications of each such crewmember and dispatcher as is necessary to show compliance with the appropriate requirements of the regulations of this subchapter; e.g., proficiency and route checks, airplane and route qualifications, training, physical examinations, and flight time records. The ~~disposition of~~ termination or other action taken in regard to any flight crewmember or aircraft dispatcher released from the employ of the air carrier, or who becomes physically or professionally disqualified, shall be indicated in these records which shall be retained by the air carrier for at least ~~three~~ 6 months.

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40.502 LIST OF AIRPLANES.

Each air carrier shall maintain a current list of all airplanes being operated by it in scheduled air transportation: PROVIDED, That airplanes of another air carrier being operated in accordance with an interchange agreement may be incorporated by reference. A copy of the current list and all changes thereto shall be submitted to the FAA Air Carrier District Office charged with the overall inspection of the air carrier's operations.

40.503 DISPATCH RELEASE FORM.

(a) The dispatch release may be in any form but shall contain at least the following information with respect to each flight:

(1) Identification number of the airplane to be used, and the trip number;

M (2) Airport of departure, intermediate stops, destination, and alternates therefor;

(3) Minimum fuel supply;

(4) Type of operation, e.g., IFR, VFR.

(b) The dispatch release shall contain, or have attached thereto, weather reports, available weather forecasts, or a combination thereof, for the destination, intermediate stops, and alternates specified therein which shall be the latest available at the time the dispatch release is signed by the pilot in command and dispatcher. It shall include such additional weather reports and forecasts, as available, considered necessary or desirable by the pilot in command and aircraft dispatcher.

40.504 LOAD MANIFEST.

(a) The load manifest shall contain at least the following information with respect to the loading of an airplane at the time of take-off:

(1) The weight of:

(i) Airplane,

(ii) Fuel and oil

(iii) Cargo, including mail and baggage, and

(iv) Passengers;

(2) The maximum allowable weight applicable for the particular flight;

(3) The total weight computed in accordance with approved procedures; and

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(4) Evidence that the airplane is loaded in accordance with an approved schedule which insures that the center of gravity is within approved limits.

(b) The load manifest shall be prepared and signed for each flight by qualified personnel of the air carrier charged with the duty of supervising the loading of the airplane and the preparation of load manifest forms, or by other qualified personnel authorized by the air carrier.

40.505 DISPOSITION OF LOAD MANIFEST, DISPATCH RELEASE FORM, AND FLIGHT PLANS.

Copies of the completed load manifest, or information therefrom except with respect to cargo and passenger distribution, the dispatch release form, and the flight plan shall be in the possession of the pilot in command and shall be carried in the airplane to its destination. Copies also shall be kept for at least 3 months. (Revised 40-14, November 5, 1958)

40.506 MAINTENANCE RECORDS.

(a) Each air carrier shall keep at its principal maintenance base current records of the total time in service, the time since last overhaul, and the time since last inspection of all major components of the airframe, engines, propellers, and, where practicable, appliances.

(b) Records of total time in service may be discontinued when it has been shown that the service life of component parts is safely controlled by other means, such as inspection, overhaul, or parts retirement procedures. The Administrator may require the keeping of total time records for specific parts when it is found that other procedures will not safely limit the service life of such parts.

(c) An airplane component, engine, propeller or appliance for which complete records are not available may be placed in service, provided that:

(1) It is of a type for which total time in service records are not required under the provisions of paragraph (b) of this section,

(2) Parts which are limited by the Administrator or manufacturer to a specific service time are retired and replaced by new parts, and

(3) It has been properly overhauled or rebuilt, and a record of such overhaul or rebuilding is included in the maintenance records.

40.507 MAINTENANCE LOG.

A legible record shall be made in the airplane's maintenance log of the action taken in each case of reported or observed failures or malfunctions of airframes, engines, propellers, and appliances critical to the safety of the flight. The air carrier shall establish an approved procedure for retaining an adequate number of such records in the airplane in a place readily accessible to the flight crew and shall incorporate such procedure in the air carrier manual. The maintenance log shall contain information from which the flight crew may readily determine the time since last overhaul of the airframe and engines.

40.508 MECHANICAL RELIABILITY REPORTS.
[EDITOR'S NOTE: The material contained in this section has been so completely revised that no attempt has been made to show the original wording.]

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(a) Each air carrier shall report the occurrence or detection of those failures, malfunctions, or defects specified in paragraph (b) of this section. In addition, each air carrier shall report any other failure, malfunction, or defect which occurs or is detected at any time in an airplane or airplane component (including airplane systems, appliances, powerplants, and propellers) used by the air carrier, when, in the carrier's opinion, such failure, malfunction, or defect has endangered or may endanger the safe operation of an airplane used by the air carrier. The report shall be in written form covering a period of 24 hours beginning at 0900 hours local time of each day and ending at 0900 hours local time the next day, and shall be submitted to the Federal Aviation Agency maintenance inspector assigned to the air carrier by 0900 hours local time of the following day:

PROVIDED, That reports which are due on Saturday or Sunday may be submitted on the following Monday and in case of legal holidays on the following workday.

NOTE: Failures, malfunctions, or defects reported in accordance with the accident reporting provisions of Part 320 of the Regulations of the Civil Aeronautics Board need not be included.

(b) The air carrier shall report each occurrence or detection of a failure, malfunction, or defect involving:

(1) Fires during flight and whether the related fire-warning system functioned properly;

(2) Fires during flight and whether the related fire-warning system did not function properly;

(3) Fires during flight not protected by a related fire-warning system;

(4) False fire warning during flight;

(5) Engine exhaust systems which result during flight in damage to engine, adjacent structure, equipment, or components;

(6) An airplane component which results during flight in the accumulation or circulation of smoke, vapor, or toxic or noxious fumes in the crew compartment or cabin;

(7) Engine shutdown during flight due to engine flameout;

(8) Engine shutdown during flight when external damage to the engine or to the airplane structure has occurred;

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(9) Engine shutdown during flight due to foreign object ingestion or icing;

(10) Engine shutdown during flight of more than one engine on an airplane;

(11) Propeller feathering system or ability of the system to control overspeeding during flight;

(12) Fuel or fuel-dumping systems affecting fuel flow or causing hazardous leakage during flight;

(13) Landing gear extension or retraction or opening or closing of landing-gear doors during flight;

(14) Brake system components which result in loss of brake actuating force while the airplane is in motion on the ground;

(15) Airplane structure which requires major repair;

(16) Cracks, permanent deformation, or corrosion of airplane structure which exceed the maximum limits acceptable to the manufacturer or the Federal Aviation Agency; and

(17) Airplane components or systems which result during flight in the taking of emergency actions; except that action taken to shutdown an engine need not be reported as an emergency under this provision.

NOTE: Under the provisions of this paragraph, an airplane is in flight from the moment it leaves the surface of the earth on takeoff until it touches down at a place of landing.

(c) Reports required by paragraph (a) of this section shall be transmitted in a manner and on a form convenient to the air carrier's system of communication and procedure, and shall include in the first daily report as much of the following information as is available:

(1) Type and identification number of the airplane, name of the operator, date, flight number, and stage during which the incident occurred; e.g., preflight, takeoff, climb, cruise, descent, landing, inspection;

(2) Emergency procedure effected; e.g., unscheduled landing, emergency descent;

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(3) Nature of condition; e. g., fire, structural failure;

(4) Identification of part and system involved, including available information pertaining to type designation of the major component and time since overhaul;

(5) Apparent cause of trouble; e. g., wear, crack, design deficiency, personnel error;

(6) Disposition; e. g., repaired, replaced, airplane grounded, part sent to manufacturer; and

(7) Brief narrative summary of other pertinent information necessary for more complete identification, determination of seriousness, and corrective action.

(d) Reports required by paragraph (a) shall not be withheld pending accumulation of all information specified in paragraphs (b) and (c) of this section. When additional information is obtained relative to the incident, including any that may be furnished by the manufacturer or other outside agency, it shall be expeditiously submitted as a supplement to the first report, referencing the date and place of submission of such report.

40.509 MECHANICAL INTERRUPTION SUMMARY REPORT.

Each air carrier shall submit regularly and promptly to the Administrator a summary report containing information on the following occurrences:

(a) All interruptions to a scheduled flight, unscheduled changes of airplanes en route, and unscheduled stops and diversions from route which result from known or suspected mechanical difficulties or malfunctions that are not required to be included in mechanical reliability reports.

(b) The number of engines removed prematurely because of mechanical trouble, listed by make and model of engine and the airplane type in which the engine was installed.

(c) The number of propeller featherings in flight, listed by type of propeller and type of engine and the airplane on which the propeller is installed. Propeller featherings accomplished for training, demonstration, or flight check purposes need not be reported. (Revised 40-3, April 1, 1954)

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CIVIL AIR REGULATIONS PART 40

40.510 ALTERATION AND REPAIR REPORTS.

~~Reports~~ Upon completion of a major alterations or major repairs ~~of~~ to an airframes, engines, propellers, and or appliances, a report thereof shall be promptly prepared by the air carrier. A copy of the major alteration report shall be submitted to the representative of the Administrator assigned to the air carrier and a copy of the report of the major repair shall be made available to ~~the Administrator promptly upon completion of such alterations or repairs~~ him.

40.511 AIRWORTHINESS RELEASE OR AIRPLANE LOG ENTRY. (Revised 40-46, October 19, 1964)

(a) If maintenance, alterations, or inspections are performed on an airplane, the air carrier, or the person with whom the air carrier has arranged for the performance of the maintenance, alterations, or inspections, shall prepare or cause to be prepared an airworthiness release or appropriate entry into the airplane log before the air carrier uses the airplane in operations governed by this part. (Redesignated and revised 40-46, October 19, 1964)

(b) The release or entry must: (Added 40-46, October 19, 1964)

(1) Be prepared in accordance with the procedures set forth in the air carriers manual; (Added 40-46, October 19, 1964)

(2) Include a certification that the work was performed in accordance with the requirements of the air carrier's manual, that all required inspection items were inspected by an authorized person who made a determination that the work was satisfactorily completed, that the airplane is in condition for safe operation, and that no known condition exists that would render the airplane unairworthy; and (Added 40-46, October 19, 1964)

(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 he is employed and certificated. (Added 40-46, October 19, 1964)

(c) When a release form is prepared, a copy shall be given to the pilot in command and a record shall be kept for at least 2 months. (Redesignated and revised 40-46, October 19, 1964)

40.512 COMMUNICATION RECORDS. (Added 40-14, November 5, 1958)

Each air carrier shall maintain, and retain for a period of 30 days, records of radio contacts ~~by or with~~ between the air carrier and its pilots en route.

NOTE: The record-keeping and reporting requirements of this regulation have been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942.

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APPENDIX C

MINIMUM STANDARDS FOR THE APPROVAL OF AIRPLANE SIMULATORS

1. APPLICATION FOR APPROVAL.

An application for approval of an airplane simulator is submitted, in triplicate, to the authorized representative of the Administrator. The application must include the following:

(a) Information sufficient to show that the simulator adequately simulates the type of airplane with respect to the items and systems listed in section 3 of this appendix.

(b) Comparative data sheets showing that the performance and flight characteristics of the airplane simulator have been flight checked and found to be within the limits prescribed for the items listed in section 4 of this appendix. The airplane data used for comparison purposes must be applicable to the currently certificated airplanes. Such data may be obtained:

(1) From the approved Airplane Flight Manual, Type Inspection Reports, or other flight test data provided by the airplane manufacturer. Other sources of airplane data may be used if approved by the authorized representative of the Administrator. Such data must be submitted so as to allow sufficient time for investigation of their adequacy.

(2) By flight tests conducted in the air carrier's own airplane. If this procedure is used, performance and flight characteristics data for the center of gravity limits and weights used during training will be satisfactory. Before starting these flights, an outline of the tests to be conducted in the airplane must be prepared and coordinated by the air carrier with the authorized representative of the Administrator. This outline must contain procedures to be followed and data to be obtained during each phase of the flight testing program. The authorized representative of the Administrator may observe and participate in the flight test program to the extent he considers necessary and appropriate. Any data so obtained will be acceptable for use by other air carriers using the same type of airplane if appropriate arrangements are made with the air carrier originating the data.

2. GENERAL REQUIREMENTS.

(a) The effect of changes on the basic forces and moments must be introduced for all combinations of drag and thrust normally encountered in flight. The effect of changes in airplane attitude, power, drag, altitude, temperature, gross weight, center of gravity location, and configuration must be included.

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(b) In response to control movement by a flight crew member, all instrument indications involved in the simulation of the applicable airplane must be entirely automatic in character unless otherwise specified.

(c) The rate of change of simulator instrument readings and of control forces must, unless specific tolerances are otherwise specified in this Appendix, reasonably correspond to the rate of change which would occur on the applicable airplane under actual flight conditions, for any given change in the applied load on the controls, in the applied power or in aircraft configuration.

(d) Control forces and degree of actuating control travel must, unless specific tolerances are otherwise specified in this Appendix, reasonably correspond to that which would occur in the airplane under actual flight conditions.

(e) Through the medium of instrument indication, it must be possible to use the simulator for the training and checking of a pilot in the operational use of controls and instruments on the applicable airplane model during the simulated execution of ground operation, takeoff, landing, normal flight, unusual attitudes, navigation problems, and instrument approach procedures. In addition, the simulator must be designed so that malfunction of aircraft engines, propellers, and primary systems may be presented and corrective action taken by the crew to cope with such emergencies.

(f) Suitable course and altitude recorders must be provided.

(g) Communication and navigation aids of the applicable airplane must be simulated for on-the-ground and in-flight operations.

3. MINIMUM STANDARDS FOR SIMULATION OF AIRPLANE SYSTEMS.

The simulator shall simulate at least the following items and systems which are appropriate to the airplane being simulated:

(a) All normal cockpit noise related to engine or aerodynamic noise (adjustable volume is permissible);

(b) All flight controls;

(c) Gust locks;

(d) Trim tabs;

(e) Landing gear operation;

(f) Wheel brakes;

(g) Steering mechanisms used on the ground;

(h) Wing flaps and spoilers;

(i) Powerplant operations;

(j) Propeller controls and circuitry;

(k) Antidetonation injection systems;

(l) Fuel and oil systems;

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(m) Cockpit--the simulator shall represent a full scale mockup, including normal flight crew stations and accommodations for the instructor or check airman, and shall be representative of a typical fleet airplane;

(n) Circuit breaker stations manageable by the flight crew in the flight compartment (those not related to essential flight equipment or systems need not be operative);

(o) Hydraulic systems;

(p) Fire detection and extinguishing systems;

(q) Pneumatic systems (including emergency airbrakes);

(r) Electrical systems;

(s) Interior cockpit lights;

(t) Exterior light controls;

(u) Pressurization and air-conditioning systems (instrument indication and warning signals);

(v) Deicing and anti-icing systems;

(w) Supplemental breathing systems (the systems may be charged with or vented to air).

4. MINIMUM STANDARDS OF TOLERANCE FOR PERFORMANCE AND FLIGHT CHARACTERISTICS.

The simulator shall simulate the performance and flight characteristics of the particular type of airplane being simulated within the tolerance limits specified in paragraphs (a) and (b) of this section. If alternate tolerance limits are given, whichever is the greater shall apply.

(a) PERFORMANCE CHARACTERISTICS.

(Airplane weight and center of gravity optional.)

(1) Propeller feathering time, ±3 seconds.

(2) Landing gear operating time, ±3 seconds.

(3) Wing flap operating time, ±3 seconds.

(4) Takeoff acceleration time, ±10 percent.

(5) Calibration of gyrocompass and turn-and-bank indicator in standard rate turns and 30-degree banked turns, through a range of 180 degrees. Average rate of turn shall be within ±10 percent.

(6) Minimum control speed (in flight), ±5 knots.

(7) Stall speeds and stall warning speeds (wings level), as follows:

(i) Stall warning speed (initial buffet) in the takeoff approach, and landing configuration; ±3 knots.

(ii) Stall speeds in the takeoff, approach, and landing configuration, ±5 knots.

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(iii) The difference between stall warning (initial buffet) and stall speed shall be within ±5 knots of that for the appropriate airplane, but in no case should the stall occur before the stall warning.

(8) Engine power (thrust) calibration at takeoff and maximum continuous ratings over an altitude range, as follows:

(i) Reciprocating engines: MP, for a given BMEP and RPM, ±1 inch.

(ii) Turbine engines: N_1 and N_2, for a given EPR, ± 2 percent.

(iii) Critical altitude, piston engine simulators only ±800 feet or ±10 percent.

(9) Speed versus power in level flight at cruise altitude, ±5 knots, or 3 percent, or 0.03 Mach.

(10) Rates of climb versus altitude in the following configurations (propeller airplane simulators, ±50 feet or 10 percent; jet airplane simulators, ±100 feet or 10 percent):

(i) Takeoff, gear down (one engine inoperative),

(ii) Takeoff, gear up (one engine inoperative),

(iii) Final takeoff (one engine inoperative),

(iv) All engines en route,

(v) One-engine-inoperative en route climb,

(vi) Two-engine-inoperative en route climb (for airplanes with four or more engines),

(vii) Approach (one engine inoperative), and

(viii) Landing.

NOTE: At least two airplane weights must be included in at least one configuration, and at least two outside air temperatures must be included in at least one other configuration.

(11) Rates of climb versus airspeed for one takeoff, and one en route configuration (propeller airplane simulators ±50 feet or ±10 percent; jet airplane simulators ±100 feet or ±10 percent).

(12) In determining compliance with subparagraphs (9), (10), and (11) of this paragraph, MP/BMEP/RPM relationships shall conform to airplane data within the tolerance specified in subparagraph (8)(i), and EPR/Compressor RPM relationships shall conform to airplane data within the tolerance specified in subparagraph (8)(ii) of this paragraph.

(b) FLIGHT CHARACTERISTICS.

(Airplane weight and center of gravity optional.)

(1) Static longitudinal control stability: In the landing, approach, cruise (high and low altitude), and climb configurations,

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return to trim, when the simulator speed is caused to depart 15 percent from trim speed, shall be within ±5 knots of approved airplane data. The slope of the stick force curve shall be positive. One of these configurations shall cover a center of gravity range.

(2) Control forces: Simulator control forces in the following areas shall be within ±8 pounds or ±25 percent of the forces encountered in the airplane as indicated by the required data; except that, in regard to rudder forces, the tolerance shall be ± 10 pounds or ±20 percent:

(i) Longitudinal control forces during flap retraction (power off and power on), flap extension, power or thrust application, go-around following a balked landing.

(ii) Minimum control speed (in flight), rudder and aileron forces.

(iii) Stick force per "g".

(3) The roll rate of the simulator shall be within ± 2 seconds or ±25 percent, whichever is greater, of that of the airplane.

NOTE: If data for items in subparagraphs (2)(ii), (2)(iii) and (3) of this paragraph are not contained in the Type Inspection Report, the authorized representative of the Administrator may adjudge the adequacy of simulation.

(4) In the following areas, specified tolerance limitations are not set forth in these standards. In these areas of flight characteristics, when appropriate to the type of airplane being simulated, the adequacy of simulation shall be subject to the approval of the authorized representative of the Administrator:

(i) Compressibility trim change.

(ii) Approaches to stall in the takeoff, approach, and landing configuration (wings level), from initial buffet to stall; except that at least one approach to a stall must be done in a 20-degree bank turn.

(iii) Buffet at high Mach numbers up to design Mach limits.

(iv) Dutch roll.

(v) Emergency descents.

5. MINIMUM STANDARDS OF TOLERANCE FOR SIMULATOR NAVIGATIONAL ACCURACY.

At any altitude, on any heading, and at any airspeed, the navigational accuracy of the simulator must be as follows:

(a) The distance traveled with zero wind in a particular time interval must be equivalent to ±5 percent of the horizontal component of the true airspeed multiplied by the time interval.

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(b) The track of the simulator with no wind must agree with the true heading of the simulator within ±3 degrees which shall include allowances for instrument error. (This shall apply when the simulator is turning as well as flying a straight course.)

(c) During simulated ILS approaches with zero wind, the descent path of the simulator, as indicated by airspeed, altitude, and rate of descent, must agree with the descent path as indicated by the flight instrument indicating glide path deviation, within ±20 feet from 0 to 200 feet, ±10 percent of the height above the runway, from 200 to 1,000 feet, and ±100 feet from 1,000 to 5,000 feet above the airport elevation.

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APPENDIX D

FIRST-AID KITS

Approved first-aid kits required by § 40.173 shall meet the following specifications and requirements.

(1) Each first-aid kit shall be dust and moisture proof, and contain only materials which meet Federal Specifications GG-K-291a, as revised.

(2) The type of first-aid kit and the contents thereof based upon the capacity of the airplane is as follows:

(a) No. 1 kit for airplanes of 1 to 5 persons capacity.

CONTENTS	No.
Adhesive bandage compresses, 1-inch (16 per unit)	1
Antiseptic swabs, 10 mm. (10 per unit)	1
Ammonia inhalants, 6 mm. (10 per unit)	1
2-inch bandage compresses (4 per unit)	1
4-inch bandage compresses (1 per unit)	1
Triangular bandage compressed, 40-inch (1 per unit)	2
Burn compound, 1/8 oz. (5 per unit) or equivalent amount of other burn remedy	1
Ophthalmic ointment, 1/8 oz. (6 per unit)	1

(b) No. 2 kit for airplanes of 6 to 25 persons capacity.[1]

CONTENTS	No.
Adhesive bandage compresses, 1-inch (16 per unit)	2
Antiseptic swabs, 10 mm. (10 per unit)	2
Ammonia inhalants, 6 mm. (10 per unit)	1
2-inch bandage compresses (4 per unit)	3
4-inch bandage compresses (1 per unit)	2
Triangular bandage compressed, 40-inch (1 per unit)	3
Burn compound, 1/8 oz. (6 per unit) or equivalent amount of other burn remedy	2
Ophthalmic ointment, 1/8 oz. (6 per unit)	1

(c) No. 3 kit for airplanes of over 25 persons capacity.

CONTENTS	No.
Adhesive bandage compresses, 1-inch (16 per unit)	4
Antiseptic swabs, 10 mm. (10 per unit)	4
Ammonia inhalants, 6 mm. (10 per unit)	2
2-inch bandage compresses (4 per unit)	3
4-inch bandage compresses (1 per unit)	3

[1]Kit No. 2 in canvas may also be used on liferafts.

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CONTENTS No.

Triangular bandage compresses, 40-inch (1 per unit) 5
Burn compound, 1/8 oz. (6 per unit) or an equivalent amount of other burn remedy 2
Ophthalmic ointment, 1/8 oz. (6 per unit) 1

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