UNITED STATES OF AMERICA
FEDERAL AVIATION AGENCY
WASHINGTON, D. C.

Civil Air Regulations Amendment 41-28
Effective: January 1, 1961 *
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PART 41—CERTIFICATION AND OPERATION RULES FOR SCHEDULED AIR CARRIER OPERATIONS OUTSIDE THE CONTINENTAL LIMITS OF THE UNITED STATES

Approval of Air Carrier Training Programs; Qualification of Pilots Other Than Pilots in Command; Proficiency Checks for Pilots Other Than Pilots in Command

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 41 of the Civil Air Regulations to require: (1) Essentially the same training program requirements in Part 41 as are currently contained in Part 40; (2) FAA approval of air carrier training programs; (3) appropriate aircraft ratings for pilots serving as other than pilots in command; and (4) more specific initial training and proficiency checks for pilots serving as other than pilots in command.

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. *Training program requirements for Part 41.* Parts 40 and 42 of the Civil Air Regulations currently require each air carrier to establish a training program sufficient to insure that each crew member used by the air carrier is adequately trained and maintains adequate proficiency to perform the duties to which he is assigned. Part 41 of the Civil Air Regulations currently required periodic instruction to be given all pilots, but does not contain a specific requirement for the establishment of a training program for each crew member.

Accordingly, as proposed in Draft Release 59-3, in the interest of safety and uniformity in air carrier operations, this amendment incorporates into Part 41 training program requirements essentially the same as those contained in Part 40. In adopting the training program requirements prescribed herein, due consideration has also been given to all comments received in response to Civil Aeronautics Board Draft Release No. 58-24 dated December 24, 1958 (24 F.R. 145) which proposed, among other things, training program requirements for Part 41 essentially the same as those now contained in Part 40.

2. *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 Federal Aviation

*(Except as otherwise provided in § 41.53h)

Agency 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 section 41.53. 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 Federal Aviation Agency for prior approval.

3. *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 competence 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, or as second in command of an aircraft requiring three or more pilots.

Part 41 currently provides for two different types of pilot crew complements: namely, (a) a two-pilot crew and (b) a three or more pilot crew. With respect to the two-pilot crew, upon reevaluation of the original proposal in light of comments received, it appears that the objective of the original proposal can be achieved without requiring the second in command in a two-pilot crew to obtain an appropriate aircraft type rating, provided adequate flight training for such a pilot 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 for the second in command in a two-pilot crew. In lieu of a type rating, this regulation prescribes in § 41.53b(c) certain minimum maneuvers and procedures in which it is considered necessary that pilots serving as second in command in a two-pilot crew be proficient, and requires that they receive instructions and practice in such maneuvers and procedures during initial flight training.

With regard to an operation requiring a crew combination of three or more pilots, Part 41 presently provides that the pilot in command and second in command shall hold valid airline transport pilot certificates and ratings for the aircraft when serving in such a crew combination. Since the pilot designated as second in command in a crew requiring three or more pilots is required by the present regulations to have the same basic qualifications as the pilot in command, it is deemed reasonable to require such second in command to be initially trained on the aircraft to a degree of proficiency commensurate to that of the pilot in command. Accordingly, the provisions of this amendment require a pilot serving as second in command in an operation requiring three or more pilots to comply with the same initial training requirements as apply to the pilot in command.

With respect to pilots other than the pilot in command and second in command in a crew complement requiring three or more pilots, the original proposal has been modified so as not to require such pilots to obtain an aricraft type rating. In lieu of a type rating, this regulation requires in the interest of safety that such pilots accomplish the initial training prescribed in § 41.53b(a). In this connection it should be understood that such pilots will not be required to comply with the training requirements specifically applicable to a pilot in command, or a second in command serving in a crew requiring three or more pilots.

4. *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.

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 che[illegible] by a designated check pilot or a rep[illegible] sentative 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 § 41.53b(a). However, the original proposal is being modified by this amendment to provide that the proficiency check for the second in command of a two-pilot crew shall include an oral or written equipment examination, and at least the procedures and flight maneuvers specified in new § 41.53b(c).

The original proposal is also modified with respect to the second in command of a crew requiring three or more pilots to require the second in command to take the same proficiency check as is presently required for a pilot in command, except that the second in command is required to take the proficiency check only once each 12 months.

Comment received indicated that interested persons opposing Draft Release 59–3 believed the proposal would require copilots to acquire and demonstrate [illegible] same level of proficiency as is presen[illegible] 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 41, a pilot assigned to duty on an aircraft as second in command in a crew of two pilots is presently 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 certificate with appropriate aircraft type ratings. In view of this difference in the certification requirements, pilots serving as second in command in two pilot crews 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 in capacitated during flight.

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 proficie[illegible] check maneuvers will make it necess[illegible] 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 41 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 amendment may result in some additional costs to the air carriers, it appears that such costs are outweighed by the considerations of safety involved.

In consideration of the foregoing, the Federal Aviation Agency hereby amends Part 41 of the Civil Air Regulations (14 CFR Part 41, as amended) as follows:

§ 41.52 [Amendment]

1. By deleting paragraph (a) of § 41.52.

2. By deleting § 41.53 and adding a new § 41.53, and §§ 41.53a through 41.53k to read as follows:

§ 41.53 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 instructors. 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.

(c) The training program for each flight crew member shall consist of appropriate ground and flight training including proper flight crew coordination. 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 §§ 41.53a through 41.53e.

(d) The crew member emergency procedures training program shall include at least the requirements specified in § 41.53e.

(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.

41.53a Initial pilot ground training.

Ground training for all pilots shall 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 takeoff 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.

§ 41.53b Initial pilot flight training.

(a) Flight training for each pilot shall include at least takeoffs 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.

(b) Flight training for a pilot qualifying to serve as pilot in command or as second in command in a crew requiring three or more pilots 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 takeoff weight, takeoff using maximum takeoff 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 climbout shall be accomplished at a speed as close as possible to the takeoff safety speed (V_2). Each pilot shall ascertain the proper values for speeds V_1 and V_2;

(ii) At the authorized maximum landing weight, flight in a four-engine airplane, where appropriate, with the most critical combinations of two engines inoperative, or operating at zero thrust, utilizing appropriate 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 combination 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 in a crew requiring two pilots 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 operation:

(i) Assigned flight duties as second in command, including flight emergencies,

(ii) Taxiing,

(iii) Takeoffs and landings,

(iv) Climbs and climbing turns,

(v) Slow flight,

(vi) Approach to stall,

(vii) Engine shutdown and restart,

(viii) Takeoff and landing with simulated engine failure,

(ix) Conduct of flight under simulated instrument conditions including instrument approach at least down to circling approach minimum and missed-approach procedures.

(2) Conduct of flight under simulated instrument conditions, utilizing all types of navigational 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.

§ 41.53c Initial flight navigator training.

(a) The training for flight navigators shall include the applicable portions of at least paragraphs (a) through (d), and (f) through (h) of § 41.53a.

(b) Prior to serving as a required flight crew member each flight navigator shall be given sufficient ground and flight training to become proficient in those duties assigned him by the air carrier. The flight training may be accomplished during scheduled flight under the supervision of a qualified flight navigator.

§ 41.53d Initial flight engineer training.

(a) The training for flight engineers shall include at least the instruction specified in § 41.53a (a) through (e).

(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.

§ 41.53e 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, includ-

ing 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.

(b) Synthetic trainers may be used for training of crew members in emergency procedures where the trainers sufficently simulate flight operating emergency conditions for the equipment to be used.

§ 41.53f 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 meterology. 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.

(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 operations 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.

§ 41.53g 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.

(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 crew member and dispatcher with respect to procedures, techniques, and information essential to the satisfactory performance of his duties. 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 §§ 41.53j or 41.53k, 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.

§ 41.53h Approval of training program.

The training program established by the air carrier under the provisions of §§ 41.53 through 41.53g 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.

§ 41.53i 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 §§ 41.48, 41.50, 41.51; 41.53 or 41.53g; and 41.53j through 41.53k; and 41.68 through 41.88.

(b) Check airmen shall certify as to the proficiency of the pilot being examined, as required by §§ 41.50, 41.53j, and 41.53k, and such certification shall be made a part of the airman's record.

§ 41.53j Pilot checks; pilot in command.

(a) *Line check.* Prior to serving as pilot in command, and at least once each 12 months thereafter, a pilot shall satisfactorily accomplish a line check in one of the types of airplanes normally to be flown by him. This check shall be given by a check pilot who is qualified for the route. It shall consist of at least a scheduled flight over a typical portion of the air carrier's routes to which the pilot is normally assigned, and shall be of sufficient duration for the check pilot 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 flight in the larger airplane type.

(2) The pilot proficiency check shall include at least the following:

(i) The flight maneuvers specified in § 41.53b(b)(1), except that the simulated engine failure during takeoff need not be accomplished at speed V_1, nor at actual or simulated maximum authorized weight.

(ii) 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 in an aircraft simulator, if satisfactorily completed, may be substituted at alternate 6-month intervals for the proficiency check required by subparagraph (1) of this paragraph. The air carrier shall show that the flight characteristics, performance, instrument reaction, and control loadings of the applicable aircraft are accurately simulated in the aircraft simulator through all ranges of normal and emergency operations in accordance with subdivisions through (vii) of this subparagraph.

(i) The simulator shall represent a full-scale mockup of the cockpit interior, including normal flight crew stations and accommodations for the instructor or check airman.

(ii) The effect of changes on the basic forces and moments shall 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 locations, and configuration shall be included.

(iii) In response to control movement by a flight crew member, all instrument indications involved in the simulation of the applicable airplane shall be entirely automatic in character unless otherwise specified. The rate of change of simulator instrument readings and of control forces shall 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. Control forces and degree of actuating control travel shall correspond to that which would occur in the airplane under actual flight conditions.

(iv) Through the medium of instrument indication, it shall 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 in-

strument approach procedures. In addition, the simulator shall 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.

(v) Suitable course and altitude recorders shall be included.

(vi) Communication and navigation aids of the applicable airplane shall be simulated for on-the-ground and in-flight operations.

(vii) Other aircraft systems and components shall be simulated to the extent found necessary by the Administrator.

(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.

§ 41.53k Proficiency checks; second in command.

(a) 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. 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 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 § 41.53b(c)(1). The pilot proficiency check may be demonstrated from either the right or left pilot seat.

(b) The proficiency check for the second in command of a crew requiring 3 or more pilots shall be the same as required under § 41.53j(b).

(c) Subsequent to the initial pilot proficiency check, an approved course of training in an aircraft simulator which meets the requirements of 41.53j(b)(3), if satisfactorily completed, may be substituted at alternate 12-month intervals for the proficiency check required by paragraph (a) of this section.

(d) Satisfactory completion of the proficiency check in accordance with the requirements of § 41.53j(b) will also meet the requirements of this section.

The provisions of this amendment shall become effective January 1, 1961, except as otherwise provided in § 41.53h.

(Secs. 313(a), 601, 604, 605, 72 Stat. 752, 775, 778; 49 U.S.C. 1354, 1421, 1424, 1425)

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JAMES T. PYLE,
Acting Administrator.

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