UNITED STATES OF AMERICA
CIVIL AERONAUTICS BOARD
WASHINGTON, D. C.

Civil Air Regulations Amendment 41-1
Effective: October 5, 1948
Adopted: October 5, 1948

ADDITIONAL CREW COMPLEMENT REQUIREMENTS

DENIAL OF PETITIONS FOR RELIEF FROM SECTION 41.320

On April 14, 1948, the Board, after public notice of rule-making and public hearing thereon, adopted Civil Air Regulations Amendment 41-19 and Civil Air Regulations Amendment 61-17, both effective May 19, 1948. Sections 41.320 and 61.56 of the Civil Air Regulations as thus amended required in substance, among other things, that after December 1, 1948, an airman holding a flight engineer certificate should be required on all aircraft certificated for more than 80,000 pounds maximum take-off weight when such aircraft were used in scheduled air transportation.

Subsequently, there was published a notice of proposed rule-making dated June 9th, 1948 (13 FR 3097), proposing, among other things, to modify sections 41.320 and 61.56 to make the requirement regarding an airman holding a flight engineer's certificate applicable only to four-engine aircraft within the weight class rather than to all aircraft, and to clarify certain questions concerning the performance of multiple functions by an airman. Such notice provided for the submission of written comments thereon within thirty days after its date.

On July 15, 1948, American Airlines, Inc. filed a petition for relief from the aforementioned provisions in the Board's regulations relating to flight engineers, particularly with respect to the applicability of such provisions to the DC-6 aircraft. American's petition for relief stated that it was a petition for reconsideration of Amendments 41-19 and 61-17 insofar as they amended sections 41.320 and 61.56 of the Civil Air Regulations, a petition under section 4(d) of the Administrative Procedure Act for amendment and repeal of the aforesaid sections 41.320 and 61.56, and a petition in connection with the proposed amendment to these sections. American sought to have the Board conduct scientific studies alleged to be essential to the solution of the problem of requiring flight engineers on large aircraft and then hold a hearing affording an opportunity to comment on such studies, meanwhile revoking or suspending sections 41.320 and 61.56 as to the DC-6 aircraft.

A number of other petitions requesting similar relief and generally supporting the petition of American Airlines were also filed by the Air Transport Association, National Airlines, Inc., Braniff Airways, Inc. and Delta Airlines, Inc. (the latter as to Amendment 61-17 only). In addition to the foregoing, comments were received from Eastern Airlines, Inc., Colonial Airlines, Inc., Pan American-Grace Airways, Inc., and Chicago and Southern Airlines, Inc., which generally supported American's petition although not formally petitioning for similiar relief. This is in response to all said petitions and comments to the extent that they sought relief from requirements of section 41.320 either as originally enacted or as proposed to be amended. (Simultaneously herewith, like action is being taken with respect to Section 61.56 by Civil Air Regulations Amendment 61-3.)

The Board has given the most careful consideration to the data and views presented in the aforementioned petitions and comments. It has also reviewed all of the information and data available to it through the medium of the public hearing held in relation to this matter, written comments received prior and subsequent to the promulgation of Sections 41.320 and 61.56 and proposed amendments thereto, and relevant material available in its files. On the basis thereof, and taking into consideration the duty resting upon air carriers to perform their services with the highest possible degree of safety in the public interest, the Board has concluded that the crew of all four-engine aircraft now being produced which are certificated for a maximum take-off weight of more than 80,000 pounds should include an airman holding a flight engineer certificate when such aircraft are used in scheduled air transportation. The Board finds that this requirement is necessary to provide adequately for and assure safety in air transportation and constitutes a necessary and reasonable minimum safety standard for the operation of air carriers.

The Board's reasons and grounds for its conclusions are as set forth hereafter. There are only three aircraft types now being produced, or expected to be produced in the foreseeable future, which are in the class of four-engine aircraft certificated for maximum take-off weight in excess of 80,000 pounds. These are the Lockheed Constellation, the Douglas DC-6, and the Boeing 377. Despite the automatic devices which are available and installed in such aircraft, they have so many items calling for the pilots' attention and are so complex in operation that the pilots' ability to accomplish all duties imposed upon them may at times be exceeded, if provision is not made for a flight engineer. The flight engineer will contribute substantially to reduction of pilot fatigue and resultant accident-provoking sequences. In particular, the flight engineer can relieve the pilots of burden some mechanical duties which, if required to be performed when the aircraft is being flown on instruments, when there are difficult navigational problems,

when radio communications are erratic, or when the pilots are attempting to follow complicated traffic control procedures, and accomplish instrument approaches, would be exceptionally onerous. The flight engineer is able to perform important duties and add to safety of flight, even when riding in the jump seat of a plane in which no flight engineer station has been provided.

In addition to the foregoing, the flight engineer with a specialized engineer training will be useful in case of fire or other malfunctioning, both in overcoming the difficulty and restoring normal functioning, and in relieving the pilots of various mechanical duties, particularly those which would require one of them to leave his pilot's station, while they concentrate on flying the aircraft during any period of emergency. The flight engineer will also contribute to the level of safety by assuming responsibility for proper completion of ground maintenance for the correction of any malfunctioning which has been discovered in flight.

The duties which the flight engineer can assume and efficiently perform are numerous but the Board does not believe it is desirable to specify in regulations the exact duties to be performed by any airman any more than it believes it desirable to dictate other air carrier operating procedures which may vary from company to company without any adverse effect on safety.

The Board believes that the introduction of a flight engineer into the crew complement does not create a serious crew coordination problem, and that the benefits to be derived by the inclusion of a flight engineer clearly outweigh any difficulties of coordination that may be presented.

On the basis of experience to date, all four-engine aircraft in excess of 80,000 pounds maximum take-off weight are, and in the foreseeable future will be, of such complexity as to require the utilization of a flight engineer in the interest of achieving the necessary level of safety. If, at any time, there should hereafter be such advances as would enable the production of an aircraft in this class of such simplified design that it does not present the operational problems of today's aircraft in this class, the Board will then modify its regulations accordingly.

The Board at this time is modifying § 41.320 as originally adopted for the purpose of making it applicable only to four-engine aircraft, whereas heretofore it has been applicable to all aircraft within the weight class. The Board is also amending §§ 41.320, 41.310, 41.330, and 41.309 to indicate more clearly that the Board in requiring a crew member for the performance of a specified function intended to limit such a crew member to that function for the period of time during which it is required, but that the Board did not intend to restrict the crew member from performing other duties at other times. It is intended, for example, that a flight engineer, when required, shall not be assigned other duties at the same time for which an airman certificate is necessary. On the other hand an individual could relieve a pilot for a part of a trip, and at a subsequent time relieve the flight engineer provided he held the appropriate certificates. There is also included, for greater clarity and uniformity in administration, a definition of "route segment".

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. Since this amendment is merely interpretative in nature and imposes no additional burden on any person, it may be made effective immediately.

In consideration of the foregoing, the Civil Aeronautics Board hereby amends Part 41 of the Civil Air Regulations (14 CFR, Part 41, as amended) effective immediately as follows:

1. By amending § 41.309 to read as follows:

41.309 Composition of flight crew.

(a) No air carrier shall operate an aircraft with less than the minimum flight crew required for the type of operation and the make and model aircraft as determined by the Administrator in accordance with the standards hereinafter prescribed and specified in the air carrier operating certificate for each route or route segment.

(b) Where the provisions of this part require for a particular route, route segment or aircraft 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 over such route or route segment.

2. By amending § 41.316 to read as follows:

41.316 Flight radio operator - when required. An airman holding a flight radio operator certificate shall be required for flight over any area, route, or route segment over which the Administrator has determined that radiotelegraphy is necessary for communication with ground stations during flight.

3. By amending § 41.320 to read as follows:

41.320 Flight engineer - when required. After December 1, 1948, an airman holding a flight engineer certificate shall be required on all four-engine aircraft certificated for more than 80,000 pounds maximum take-off weight, and on all other four-engine aircraft certificated for more than 30,000 pounds maximum take-off weight where the Administrator finds that the design of the aircraft used or the type of operation is such as to require a flight engineer for the safe operation of the aircraft.

4. By amending § 41.330 to read as follows:

41.330 Flight navigator - when required. An airman holding a flight navigator certificate shall be required for flight over any area, route. or route segment when the Administrator has determined either that celestial navigation is necessary or that other specialized means of navigation necessary for the safe conduct of flight cannot be adequately accomplished from the pilot station.

5. By adding a new paragraph 41.99 (q) to read as follows:

41.99 (q) Route segment. A route segment is a portion of a route, the boundaries of which are identified by:

(a) a continental or insular geographic location;

(b) a point at which some specialized aid to air navigation is located; or

(c) a point at which a definite radio fix is located.

(Sec. 205(a), 601, 604, 52 Stat. 984, 1007, 1010; 49 U.S.C. 425(a), 551, 554)

By the Civil Aeronautics Board:

/s/ M. C. Mulligan

M. C. Mulligan
Secretary

(SEAL)

Lee, Member, dissented.

Part 41 last printed July 20, 1948.