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

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SPECIAL CIVIL AIR REGULATION

APPLICATION OF TRANSPORT CATEGORY PERFORMANCE REQUIREMENTS TO C-46 TYPE AIRCRAFT

Special Civil Air Regulation SR-391 permits operators of C-46 type aircraft used in the carriage of passengers to operate at a maximum certificated take-off weight of 44,300 pounds except for those airplanes having certain type propellers which are allowed an additional 1,000 pounds. These weights were established by the Board provisionally pending the determination by the Administrator of the weights at which the C-46 is capable of a rate of climb equivalent to $.035V_{S_1}^2$ in the take-off configuration at sea level with the landing gear retracted and the propeller of the critical engine feathered. No determination has been made by the Administrator of a weight or weights other than those specified in SR-391. Special Civil Air Regulation SR-391 permits such operations only until July 1, 1954.

Part 42 of the Civil Air Regulations currently requires that airplanes certificated as a basic type after June 30, 1942, and prior to July 1, 1951, which are not certificated as transport category airplanes shall be so certificated prior to July 1, 1954. Although changes have been made from time to time in the date by which such a requirement is to become effective, there has existed in the Civil Air Regulations for several years a requirement for ultimate certification of the C-46 in the transport category in order to be used in passenger carrying operations after a date certain. During this period the Board has been called upon to reconsider this requirement. Interested persons have been afforded opportunity to present facts, views, and arguments with respect to whether a requirement for the certification of C-46 in the transport category should be permitted to come into effect for aircraft used in passenger operations and to submit alternative proposed regulations.

Two proposals relating to the regulatory status of the C-46 were circulated by the Board in Draft Release 54-15 and public comment thereon solicited. Since the date of this publication other proposals have been received by the Board. On the basis of these proposals, the comments received in response to Draft Release 54-15, and the voluminous record compiled by the Board as a consequence of several years of rule making activity relating to the C-46, the Board has determined that the public interest requires final disposition of this matter without further delay.

There appears to be complete unanimity concerning the fact that the C-46 is economically capable of being modified, and should be so modified, to meet the transport category requirements in all major respects with the exception of performance. With respect to the performance limitations of the transport category, serious difference of opinion exists. Operators of C-46 aircraft generally believe that, without substantial amendment, the imposition of the transport category performance limitations would effectively ground the aircraft.

Although several reputable agencies have represented that the aircraft may be modified at reasonable cost to meet these performance limitations, other agencies maintain that the entire United States civil C-46 fleet could not be accommodated with available stocks of engines and parts necessary to such modification and that, even if such materiel were available, the cost of modification would be prohibitive. The Board is of the opinion that sufficient evidence exists to indicate that, following a decision

by the Board with respect to the future disposition of the C-46 in civil air carrier operations, means for accommodating the entire civil C-46 fleet may be put at the disposal of operators in a relatively short time.

The C-46 does not enjoy the qualities possessed by the DC-3 which prompted the Board to exempt the latter aircraft indefinitely from the performance limitations of the transport category. The DC-3 possesses performance capabilities which enable it to exceed the limitations of the transport category by a considerable margin at maximum take-off weights commonly used. In fact, were the same deviations authorized for the DC-3 as are now embodied in Special Civil Air Regulation SR-391 with respect to the C-46, very substantial increases in operating weights could result if the DC-3 structure would permit. The Board is of the opinion, therefore, that we would be ill-advised to exempt the C-46 indefinitely from the performance requirements of the transport category except to the extent specified herein.

Since agreement exists among interested persons that the birdproof windshield requirement of Part 4b would prove an onerous and expensive problem of compliance in the C-46 and since many other aircraft used in air carrier passenger service are not compelled to comply with this requirement, the Board is of the opinion that it is unnecessary in the interest of safety to require the C-46 to comply with this rule.

In view of the foregoing, the Board has determined that the C-46, in order to be used in passenger service, should ultimately comply with all but certain few selected provisions of Part 4b, effective July 20, 1950, in the following sequence:

By October 1, 1955, the C-46 should be so modified as to comply with all the requirements of the transport category except the flight requirements of §§ 4b.100 through 4b.190. This would have the principal effect of requiring improvement in the fire protection of the nacelle and engine cooling. Both the Foundation proposal and that of ACES-ATA provide for such modification. This is apparently true also of modifications developed by other agencies.

By April 1, 1956, the C-46 should be required to comply with the transport category performance limitations except that the use of auto-indication will be permitted in lieu of the requirement to meet the first and second segment climb requirements with the propeller of the inoperative engine windmilling.

On and after April 1, 1956, the C-46 should be required to meet the performance operating limitations applicable to transport category aircraft except that the use of a driftdown procedure will be permitted in lieu of literal compliance with the en route climb requirement when such a procedure is approved by the Administrator.

Pending the coming into force on April 1, 1956, of the transport category operating limitations with respect to the C-46, the Board intends that the C-46 may continue to be used in passenger service on the basis of the same provisions formerly contained in Special Civil Air Regulation SR-391. Accordingly, its provisions have been incorporated herein. Since this extension of the provisions of SR-391 is intended to permit sufficient time for aircraft modifications required for compliance with Part 4b, it is intended that these provisions be applicable until November 1, 1954, and may be made applicable beyond that date only to those operators of C-46 aircraft who have made a showing to the Administrator that genuine arrangements for such modifications have been initiated.

The Board has determined that any decision with respect to the disposition of the C-46 in air carrier operations must be made on an "across the board" basis applicable alike to both scheduled and irregular service. This conclusion is in accord with the Board's long standing policy of eliminating, wherever practicable and consistent with safety, differences between the various regulatory standards affecting air carrier

operations. It is recognized that safety regulations frequently have a profound effect upon the economics of air carrier operations and any rule which indefinitely permits the operation of a particular aircraft type in irregular service and denies the use of such type in scheduled service must be regarded as discriminatory. The Board sees no merit in the view that a lower standard of safety may be tolerated in irregular air carrier operations. Any characteristics of the C-46 which would cause the Board to determine that its use in scheduled air carrier operations is undesirable from a safety aspect would be sufficient cause to seek regulatory means of eliminating such characteristics in any other comparable air carrier service.

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.

Accordingly, the Civil Aeronautics Board hereby promulgates a Special Civil Air Regulation, effective July 1, 1954, to read as follows:

1. Notwithstanding the provisions of § 42.15 (b) of Part 42 of the Civil Air Regulations, C-46 airplanes may be used in passenger operations conducted under Part 42. Such airplanes shall be operated in accordance with § 42.15 (a) and the provisions of this special regulation.

2. Prior to November 1, 1954, C-46 type airplanes when used for the carriage of passengers for remuneration or hire shall not be operated at weights exceeding those which it is demonstrated to the Administrator will allow compliance with the performance requirements of Part 4b, except that in determining the maximum take-off weight, such weight shall be limited only to a value at which the airplane has a rate of climb equal to $0.035V_{S_1}^2$ in the take-off configuration at sea level with the landing gear retracted but with the propeller of the inoperative engine feathered rather than windmilling.

3. Provisionally, pending a determination by the Administrator of the weights at which C-46 aircraft will meet the standards prescribed by paragraph 2 of this regulation, the maximum take-off weight of such aircraft, when used in the manner herein referred to, shall not exceed 44,300 pounds: Provided, That in the case of such aircraft equipped with Hamilton Standard propellers with blades Model Number 6491A-9 or approved equivalent which have been clipped in accordance with specifications approved by the Administrator, such provisional maximum weight shall be increased by 1,000 pounds until such time as the Administrator shall have determined by suitable tests another value to correspond to the additional efficiency obtainable by the use of such propellers, and thereafter by such other value.

4. The Administrator of Civil Aeronautics shall authorize continued operation of C-46 aircraft in passenger service in accordance with paragraphs 2 and 3 above after November 1, 1954, but not later than April 1, 1956, if he finds that the applicant for such authorization has made and continues to make genuine efforts to arrange for and accomplish compliance with paragraph 5 below.

5. On and after October 1, 1955, all C-46 aircraft shall comply with the provisions of Part 4b as in effect on July 20, 1950, except as otherwise provided hereinafter:

a. Upon application by the air carrier filed prior to October 1, 1955, the Administrator may further authorize an air carrier to operate without full compliance with the requirements of paragraph 5 where the Administrator finds that the air carrier has made a diligent effort to meet these requirements by October 1, 1955, and that the air carrier has shown that it will comply with such requirements at the earliest possible time.

b. The provisions of §§ 4b.0 through 4b.19 of Part 4b, effective May 18, 1954, shall be complied with.

c. The provisions of §§ 4b.100 through 4b.190 need not be complied with.

d. Where literal compliance with the requirements of Subparts C, D, and E of Part 4b is extremely difficult to accomplish and would not contribute materially to the objective sought, and the Administrator finds that the experience with the C-46 type airplane justifies it, he is authorized to accept such measures of compliance as he finds will effectively accomplish the basic objective of such subparts.

e. The birdproof windshield requirements of § 4b.352 need not be complied with.

6. On and after April 1, 1956, all C-46 aircraft shall be recertificated in the transport category in accordance with paragraph 5 above, and shall comply with the provisions of §§ 4b.100 through 4b.190 with the following exception: In determining the one-engine-inoperative climb in accordance with § 4b.120 (a) and (b), the propeller of the inoperative engine may be assumed to be feathered if there is installed either an approved means for automatically indicating when the particular engine has failed or an approved means for automatically feathering the propeller of the inoperative engine.

7. On and after April 1, 1956, all C-46 aircraft shall be operated in accordance with the performance operating limitations applicable to transport category aircraft with the following exceptions: In complying with the en route limitation with one engine inoperative an air carrier may utilize a procedure whereby the airplane is operated at an altitude such that, in event of an engine failure, the airplane can clear obstacles within 10 miles on either side of the intended track by 1,000 feet, if the air carrier can demonstrate to the Administrator that such a procedure can be used without impairing the safety of operation. If such a procedure is utilized, the rate of climb for the appropriate weight and altitude shall be assumed to be, in feet per minute, $.02V_{SO}2$ less than that contained in the Airplane Flight Manual. Before approving such a procedure, the Administrator shall take into account, for the particular route, route segment, or areas concerned, the reliability of meteorological 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.

8. C-46 aircraft which comply with the provisions of paragraphs 5 and 6 above may be used in passenger operations conducted under the provisions of Parts 40 and 41 provided they are operated in accordance with paragraph 7.

9. This Special Civil Air Regulation supersedes Special Civil Air Regulations SR-379 and SR-391.

(Sec. 205 (a), 52 stat. 984; 49 U.S.C. 425 (a). Interpret or apply secs. 601, 603, 604, 52 Stat. 1007, 1009, 1010; 49 U.S.C. 551, 553, 554; (62 Stat. 1216.)

By the Civil Aeronautics Board:

/s/ M. C. Mulligan

M. C. Mulligan
Secretary

(SEAL)