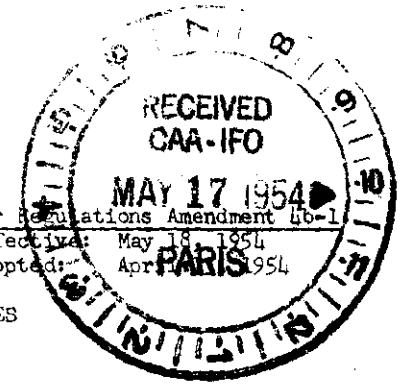
UNITED STATES OF AMERICA
CIVIL AERONAUTICS BOARD
WASHINGTON, D. C.



Civil Air Regulations Amendment 4b-1
Effective: May 18, 1954
Adopted: April [illegible], 1954

AIRPLANE AIRWORTHINESS TRANSPORT CATEGORIES

MISCELLANEOUS AMENDMENTS

A study of the administrative portions of Part 4b of the Civil Air Regulations indicates that they do not set forth in sufficient detail and clarity the scope of the part and the choice of regulations applicable to issuance of and changes in type certificates. This has caused some difficulty in the administration of the regulations with respect to these matters. This amendment is concerned mainly with setting forth clearly the scope of the part, § 4.0, and those regulations that are applicable to the issuance of and change to a type certificate. It also makes several other changes.

Although no basic change in policy from that followed in the past is contemplated, this amendment specifies in more detail the prerogatives of the applicant in choosing the regulations. It should be noted that the rules regarding the designation of applicable regulations, § 4b.11, apply not only to a new airplane type for which application for type certificate is made but also to all types irrespective of the date of original application for a type certificate. For example, the provisions which require, or which permit the ap licant to elect, compliance with newer regulations would be effective not only to new type airplanes but also to all existing types certificated under this part. This provision in no way negates the long standing rule that, except in unusual cases, the airplane need not comply with any regulations made effective subsequent to the date of application for a type certificate. A significant clarification is being made which defines those changes in an airplane type which are sufficiently extensive to warrant treating it as a new type. Another important change is the establishment of a time limitation of 5 years for the effectiveness of an application for type certification. The amendments to the other administrative provisions, §§ 4.12, 4.13, and 4.19, also include minor changes for purposes of clarification.

The presently effective regulations provide for the location of the pilot and his controls and instruments with respect to the plane of rotation of the propellers, etc. Since in certain instances the airworthiness regulations require flight crew personnel in addition to the pilot, these provisions (§§ 4b.350, 4b.351, and 4b.353) are being amended to make them applicable to the minimum flight crew which is required for safe operation of the airplane.

Part 4b does not contain specific criteria for the installation of reversible propeller control systems. This amendment adds § 4b.407 which requires the application of the principle of fail-safe design to propeller reversing systems in newly certificated transport category airplanes. The intent of the rule is to preclude unwanted reversing of the propeller during normal or emergency operation in case of a single failure or malfunction of the system. It is also intended that single failures or malfunctions be considered in conjunction with manipulation of the controls by the pilot, and that failure of primary structural parts, the occurrence of which is expected to be extremely remote, need not be considered.

A change is being made to the requirements which establish the power supply needed for operation of equipment, systems, and installations during normal and power failure conditions. The change makes clear that the essential power load requirements under power failure conditions may be reduced in conjunction with a monitoring procedure and, for the two-engine-inoperative condition, permits taking into account for power supply requirements only those loads which are necessary for controlled flight.

Several additional changes of relatively minor nature are being made with the intent of clarifying the regulations.

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.

In consideration of the foregoing, the Civil Aeronautics Board hereby amends Part 4b of the Civil Air Regulations (14 CFR, Part 4b, as amended) effective May 18, 1954:

1. By amending § 4b.0 by deleting the words "a type certificate" and inserting in lieu thereof the words "and changes to type certificates".

2. By amending § 4b.11 to read as follows:

4b.11 Designation of applicable regulations. The provisions of this section shall apply to all airplane types certificated under this part irrespective of the date of application for type certificate.

(a) Unless otherwise established by the Board, the airplane shall comply with the provisions of this part together with all amendments thereto effective on the date of application for type certificate, except that compliance with later amendments may be elected or required pursuant to paragraphs (c), (d), and (e) of this section.

(b) If the interval between the date of application for type certificate and the issuance of the corresponding type certificate exceeds five years, a new application for type certificate shall be required, except that for applications pending on May 1, 1954, such five-year period shall commence on that date. At the option of the applicant, a new application may be filed prior to the expiration of the five-year period. In either instance the applicable regulations shall be those effective on the date of the new application in accordance with paragraph (a) of this section.

(c) During the interval between filing the application and the issuance of a type certificate, the applicant may elect to show compliance with any amendment of this part which becomes effective during that interval, in which case all other amendments found by the Administrator to be directly related shall be complied with.

(d) Except as otherwise provided by the Board, or by the Administrator pursuant to § 1.24 of this subchapter, a change to the type certificate (see § 4b.13 (b)) may be accomplished, at the option of the holder of the type certificate, either in accordance with the regulations incorporated by reference in the type certificate pursuant to § 4b.13 (c), or in accordance with subsequent amendments to such regulations in effect on the date of application for approval of the change, subject to the following provisions:

(1) When the applicant elects to show compliance with an amendment to the regulations in effect on the date of application for approval of a change, he shall show compliance with all amendments which the Administrator finds are directly related to the particular amendment selected by the applicant.

(2) When the change consists of a new design or a substantially complete redesign of a component, equipment installation, or system installation of the airplane, and the Administrator finds that the regulations incorporated by reference in the type certificate pursuant to § 4b.13 (c) do not provide complete standards with respect to such change, he shall require compliance with such provisions of the regulations in effect on the date of application for approval of the change as he finds will provide a level of safety equal to that established by the regulations incorporated by reference at the time of issuance of the type certificate.

NOTE: Examples of new or redesigned components and installations which might require compliance with regulations in effect on the date of application for approval, are: New powerplant installation which is likely to introduce additional fire or operational hazards unless additional protective measures are incorporated; the installation of an auto-pilot, a pressurization system, or a new electric power system.

(e) If changes listed in subparagraphs (1) through (3) of this paragraph are made, the airplane shall be considered as a new type, in which case a new application for type certificate shall be required and the regulations together with all amendments thereto effective on the date of the new application shall be made applicable in accordance with paragraphs (a), (b), (c), and (d) of this section.

(1) A change in the number of engines;

(2) A change to engines employing different principles of operation or propulsion;

(3) A change in design, configuration, power, or weight which the Administrator finds is so extensive as to require a substantially complete investigation of compliance with the regulations.

3. By amending § 4b.12 to read as follows:

4b.12 Recording of applicable regulations. The Administrator, upon the issuance of a type certificate, shall record the applicable regulations with which compliance was demonstrated. Thereafter, the Administrator shall record the applicable regulations for each change in the type certificate which is accomplished in accordance with regulations other than those recorded at the time of issuance of the type certificate. (See § 4b.11.)

4. By amending § 4b.13 (b) by deleting the parenthetical reference "(See also § 4b.11 (a).)" at the end of the paragraph.

5. By amending § 4b.13 by adding new paragraph (c) to read as follows:

4b.13 Type certificate. * * *

(c) The applicable provisions of this part recorded by the Administrator in accordance with § 4b.12 shall be considered as incorporated in the type certificate as though set forth in full.

6. By amending § 4b.19 to read as follows:

4b.19 Changes in type design. (For requirements with regard to changes in type design and the designation of applicable regulations therefor, see § 4b.11 (d) and (e), and Part 1 of this subchapter.)

7. By amending § 4b.350 by adding the following general paragraph preceding paragraph (a):

4b.350 Pilot compartment; general. All references to flight crew in §§ 4b.350 through 4b.353 shall mean the minimum flight crew established in accordance with § 4b.720.

8. By amending § 4b.350 (a) to read as follows:

4b.350 Pilot compartment; general. * * *

(a) The arrangement of the pilot compartment and its appurtenances shall provide safety and assurance that the flight crew will be able to perform all of their duties and operate the controls in the correct manner without unreasonable concentration and fatigue.

9. By amending § 4b.350 (b) by deleting the word "pilot" and inserting in lieu thereof the words "flight crew".

10. By amending § 4b.351 (a) (2) by deleting the words "pilots' vision" and inserting in lieu thereof the words "the flight crew's normal duties".

11. By amending § 4b.353 (c) by deleting in two instances the word "pilots'" and inserting in lieu thereof the words "flight crew's".

12. By amending § 4b.362 (e) (7) by adding the word "approved" at the beginning of the phrase "means shall be provided to assist the occupants in descending to the ground".

13. By adding a new § 4b.407 to read as follows:

4b.407 Propeller reversing system. The propeller reversing system, if installed, shall be such that no single failure or malfunctioning of the system during normal or emergency operation will result in unwanted travel of the propeller blades to a position substantially below the normal flight low-pitch stop. Failure of structural elements need not be considered if occurrence of such failure is expected to be extremely remote.

14. By amending § 4b.604 (m) by deleting the words "engine cylinder displacement" and inserting in lieu thereof the words "cylinder displacement of the engine".

15. By amending § 4b.606 (c) by adding a new subparagraph (4) to read as follows:

4b.606 Equipment, systems, and installations. * * *

(c) Power supply. * * *

(4) In determining the probable operating combinations and durations of essential loads for the partial power failure conditions prescribed in subparagraphs (2) and (3) of this paragraph, it shall be permissible to assume that the power loads are reduced in accordance with a monitoring procedure which is consistent with safety in the types of operations authorized. If a particular load is not required to maintain controlled flight it need not be considered for the two-engine-inoperative condition on airplanes with four or more engines as prescribed in subparagraph (3) of this paragraph.

(Sec. 205 (a) 52 Stat. 984; 49 U.S.C. 425 (a). Interpret or apply secs. 601, 603, 52 Stat. 1007, 1009, as amended; 49 U.S.C. 551, 553)

By the Civil Aeronautics Board:

/s/ M. C. Mulligan

M. C. Mulligan
Secretary

(SEAL)

Part 4b last printed December 31, 1953.