EXECUTIVE ORDER 10096

PROVIDING FOR A UNIFORM PATENT POLICY FOR THE GOVERNMENT WITH RESPECT TO INVENTIONS MADE BY GOVERNMENT EMPLOYEES AND FOR THE ADMINISTRATION OF SUCH POLICY

WHEREAS inventive advances in scientific and technological fields frequently result from governmental activities carried on by Government employees; and

WHEREAS the Government of the United States is expending large sums of money annually for the conduct of these activities; and

WHEREAS these advances constitute a vast national resource; and

WHEREAS it is fitting and proper that the inventive product of functions of the Government, carried out by Government employees, should be available to the Government; and

WHEREAS the rights of Government employees in their inventions should be recognized in appropriate instances; and

WHEREAS the carrying out of the policy of this order requires appropriate administrative arrangements:

NOW, THEREFORE, by virtue of the authority vested in me by the Constitution and statutes, and as President of the United States and Commander in Chief of the armed forces of the United States, in the interest of the establishment and operation of a uniform patent policy for the Government with respect to inventions made by Government employees, it is hereby ordered as follows:

1. The following basic policy is established for all Government agencies with respect to inventions hereafter made by any Government employee:

(a) The Government shall obtain the entire right, title and interest in and to any invention made by any Government employee (1) during working hours, or (2) with a contribution by the Government of facilities, equipment, materials, funds, or information, or of time or services of other Government employees on official duty, or (3) which bear a direct relation to or are made in consequence of the official duties of the inventor.

(b) In any case where the contribution of the Government, as measured by any one or more of the criteria set forth in paragraph (a) last above, to the invention is insufficient equitably to justify a requirement of assignment to the Government of the entire right, title and interest to such invention, or in any case where the Government has insufficient interest in an invention to obtain entire right, title and interest therein (although the Government could obtain same under paragraph (a), above), the Government agency concerned, subject to the approval of the Chairman of the Government Patents Board (provided for in paragraph 3 of this order and hereinafter referred to as the Chairman), shall leave title to such invention in the employee, subject, however, to the reservation, in the terms thereof, to appear where practicable, in any patent, domestic or foreign, which may issue on such invention.

(c) In applying the provisions of paragraphs (a) and (b) above, to the facts and circumstances relating to the making of any particular invention, it shall be presumed that an invention made by an employee who is employed or assigned (i) to invent or improve or perfect any art, machine, manufacture, or composition of matter, (ii) to conduct or perform research, development work, or both, (iii) to supervise, direct, coordinate, or review Government financed or conducted research, development work, or both, or (iv) to act in a liaison capacity among governmental or nongovernmental agencies or individuals engaged in such work, or made by an employee included within any other category of employees specified by regulations issued pursuant to section 4 (b) hereof, falls within the provisions of paragraph (a), above, and it shall be presumed that any invention made by any other employee falls within the provisions of paragraph (b), above. Either presumption may be rebutted by the facts or circumstances attendant upon the conditions under which any particular invention is made and, notwithstanding the foregoing, shall not preclude a determination that the invention falls within the provisions of paragraph (d) next below.

(d) In any case wherein the Government neither (1) pursuant to the provisions of paragraph (a) last above, to the invention is insufficient equitably to justify a requirement of assignment to the Government of the entire right, title and interest to such invention, or in any case where the Government has insufficient interest in an invention to obtain entire right, title and interest therein (although the Government could obtain same under paragraph (a), above), the Government agency concerned, subject to the approval of the Chairman of the Government Patents Board (provided for in paragraph 3 of this order and hereinafter referred to as the Chairman), shall leave title to such invention in the employee, subject, however, to the reservation, in the terms thereof, to appear where practicable, in any patent, domestic or foreign, which may issue on such invention.

(e) In applying the provisions of paragraphs (a) and (b) above, to the facts and circumstances relating to the making of any particular invention, it shall be presumed that an invention made by an employee who is employed or assigned (i) to invent or improve or perfect any art, machine, manufacture, or composition of matter, (ii) to conduct or perform research, development work, or both, (iii) to supervise, direct, coordinate, or review Government financed or conducted research, development work, or both, or (iv) to act in a liaison capacity among governmental or nongovernmental agencies or individuals engaged in such work, or made by an employee included within any other category of employees specified by regulations issued pursuant to section 4 (b) hereof, falls within the provisions of paragraph (a), above, and it shall be presumed that any invention made by any other employee falls within the provisions of paragraph (b), above. Either presumption may be rebutted by the facts or circumstances attendant upon the conditions under which any particular invention is made and, notwithstanding the foregoing, shall not preclude a determination that the invention falls within the provisions of paragraph (d) next below.

CONTENTS

EXECUTIVE ORDER

Page

Inventions made by Government employees; providing, for uniform patent policy for Government and for administration of such policy

EXECUTIVE AGENCIES

Agriculture Department

See Commodity Credit Corporation; Forest Service; Production and Marketing Administration.

Alien Property, Office of

Notices:

Alien Property, Office of

Notices:

Child Labor Branch

See Wage and Hour Division.

Civil Aeronautics Board

Notices:

Commodity Credit Corporation

Rules and regulations:

Commodity Credit Corporation

Rules and regulations:

Federal Communications Commission

Rules and regulations:

Federal Communications Commission

Rules and regulations:

Federal Trade Commission

Rules and regulations:

Federal Trade Commission

Rules and regulations:

Forest Service

Notices:

Forest Service

Notices:

Winterthur, Inc.

Notices:

Wright, Edward

Notices:

Vestigial orders, etc.:

Vestigial orders, etc.:

Vestigial orders, etc.:

Vestigial orders, etc.:

Vestigial orders, etc.:

Vestigial orders, etc.:

Vestigial orders, etc.:
CONTENTS—Continued

Wage and Hour Division—Con.

Rules and regulations—Continued

Learners employment—Con.

Telephone industry—Con.

Independent

Minors between 14 and 16 years of age, employment; occupations and periods and conditions of employment

Student learners; conditions under which certificates will be issued

CODIFICATION GUIDE

A numerical list of the parts of the Code of Federal Regulations affected by documents published in this issue. Proposed rules, as opposed to final actions, are identified as such.

Title 3
Chapter II (Executive orders)
8865 (see EO 10906)
10906

Title 6
Chapter IV
Part 610

Title 7
Chapter IX:
Part 955

Title 14
Chapter I:
Part 4b (proposed)

Title 16
Chapter I:
Part 3

Title 24
Chapter III:
Part 340

Title 29
Chapter IV:
Part 441

Chapter V:
Part 520

Chapter VI:
Part 510

Chapter VII:
Part 521

Chapter VIII:
Part 530

Chapter IX:
Part 540

Chapter X:
Part 550

Chapter XI:
Part 560

Chapter XII:
Part 570

Chapter XIII:
Part 580

Chapter XIV:
Part 590

Chapter XV:
Part 590

Chapter XVI:
Part 580

Chapter XVII:
Part 570

Chapter XVIII:
Part 560

Chapter XIX:
Part 550

Chapter XX:
Part 540

Chapter XXI:
Part 530

Chapter XXII:
Part 520

Chapter XXIII:
Part 510

Chapter XXIV:
Part 500

Chapter XXV:
Part 490

Chapter XXVI:
Part 480

Chapter XXVII:
Part 470

Chapter XXVIII:
Part 460

Chapter XXIX:
Part 450

Chapter XXX:
Part 440

Chapter XXXI:
Part 430

Chapter XXXII:
Part 420

Chapter XXXIII:
Part 410

Chapter XXXIV:
Part 400

Chapter XXXV:
Part 390

Chapter XXXVI:
Part 380

Chapter XXXVII:
Part 370

Chapter XXXVIII:
Part 360

Chapter XXXIX:
Part 350

Chapter XL:
Part 340

Chapter XLI:
Part 330

Chapter XLII:
Part 320

Chapter XLIII:
Part 310

Chapter XLIV:
Part 300

Chapter XLV:
Part 290

Chapter XLVI:
Part 280

Chapter XLVII:
Part 270

Chapter XLVIII:
Part 260

Chapter XLIX:
Part 250

Chapter L:
Part 240

Chapter LI:
Part 230

Chapter LII:
Part 220

Chapter LIII:
Part 210

Chapter LIV:
Part 200

Chapter LV:
Part 190

Chapter LVII:
Part 180

Chapter LVIII:
Part 170

Chapter LIX:
Part 160

Chapter LX:
Part 150

Chapter LXI:
Part 140

Chapter LXII:
Part 130

Chapter LXIII:
Part 120

Chapter LXIV:
Part 110

Chapter LXV:
Part 100

Chapter LXVI:
Part 90

Chapter LXVII:
Part 80

Chapter LXVIII:
Part 70

Chapter LXIX:
Part 60

Chapter LXX:
Part 50

Chapter LXXI:
Part 40

Chapter LXXII:
Part 30

Chapter LXXIII:
Part 20

Chapter LXXIV:
Part 10

Chapter LXXV:
Part 0

visions of paragraph (a) above, obtains entire right, title and interest in and to an invention or (2) pursuant to the provisions of paragraph (b) above, reserves a non-exclusive, irrevocable, royalty-free license in the invention with power to grant licenses for all governmental purposes, the Government shall leave the entire right, title and interest in and to the invention in the Government employee, subject to law.
330

Wednesday, January 25, 1950

FEDERAL REGISTER 391

(e) Actions taken, and rights acquired, under the foregoing provisions of this section, shall be reported to the Government and the Chairman with procedures established by him.

2. Subject to considerations of national security, or public health, safety, or welfare, or the following basic policy is established for the collection, and dissemination to the public, of information concerning inventions resulting from Government research and development activities:

(a) When an invention is made under circumstances defined in paragraph 1 (a) of this order giving the United States the right to title thereto, the Government agency concerned shall either prepare and file an application for patent therefor in the United States Patent Office or make a full disclosure of the invention promptly to the Chairman, who may, if he determines the Government interest so requires, cause application for patent to be filed or cause the invention to be fully published in accordance with Executive Order 9865, and suggest modifications or improvements or rights therein, including licenses, owned or controlled by the United States or any Government agency and its employees, to any employee of that Department.

(b) Under arrangements made and policies established by the Chairman, all inventions or rights therein, including licenses, owned or controlled by the United States or any Government agency shall be disclosed, copies, summaries, analyses and abstracts thereof shall be maintained and made available to all Government agencies and to public libraries, universities, trade associations, scientists and scientific groups, industrial and commercial organizations, and all other interested groups of persons.

3. (a) A Government Patents Board is established consisting of a Chairman of the Government Patents Board, who shall be appointed by the President, and of one representative from each of the following:

Department of Agriculture
Department of Commerce
Department of the Interior
Department of Justice
Department of State
Department of Defense
Civil Service Commission
Federal Security Agency
National Advisory Committee for Aeronautics

General Services Administration

Each such representative, together with an alternate, shall be designated by the head of the agency concerned.

(b) The Government Patents Board shall advise and confer with the Chairman concerning the operation of those aspects of the Government's patent policies not otherwise specified by the terms of this order or of Executive Order No. 8985, and suggest modifications or improvements where necessary.

(c) Consonant with law, the agencies referred to in paragraph 3 (a) hereof shall as may be necessary for the purpose of effectuating this order furnish assistance to the Board in accordance with section 214 of the Independent Offices Appropriation Act, 1946, 59 Stat. 174, 31 U. S. C. 681. The Department of Commerce shall provide necessary office accommodations and facilities for the use of the Board and the Chairman.

(d) The Chairman shall establish such committees and other working groups as may be required to advise or assist him in the performance of any of his functions.

(e) The Chairman of the Government Patents Board and the Chairman of the Interagency Committee on Scientific Research and Development (pro­vided for by Executive Order No. 9912 of December 24, 1947) shall establish and maintain such mutual consultation as will effect the proper coordination of affairs of common concern.

4. With a view to obtaining uniform application of the policies set out in this order and uniform operations thereunder, the Chairman is authorized and directed:

(a) To consult and advise with Government agencies concerning the application and operation of the policies outlined herein;

(b) After consultation with the Government Patents Board, to formulate and submit to the President for approval such proposed rules and regulations as may be necessary or desirable to implement and effectuate the aforesaid policies, together with the recommendations of the Government Patents Board thereon;

(c) To submit annually a report to the President concerning the operation of such policies, and from time to time such recommendations for modification thereof as may be deemed desirable;

(d) To determine with finality any controversies or disputes between any Government agency and its employees, to the extent submitted by any party to the dispute, concerning the ownership of inventions made by such employees or rights therein; and

(e) To perform such other or further functions or duties as may from time to time be prescribed by the President or by statute.

5. The functions and duties of the Secretary of Commerce and the Department of Commerce under the provisions of Executive Order No. 9865 of June 14, 1947 are hereby transferred to the Chairman. All expenses of the Government Patents Board and the Chairman may be incurred and paid by him to any Government agency or officer: Provided, That said Executive Order No. 8985 shall not be deemed to be amended or affected by any provision of this Executive order other than this paragraph 5.

6. Each Government agency shall take all steps appropriate to effectuate this order, including the promulgation of necessary regulations which shall not be inconsistent with this order or with regulations issued pursuant to paragraph 4 (b) hereof.

(a) "Government agency" includes any executive department and any independent commission, board, office, agency, authority, or other establishment of the Executive Branch of the Government of the United States including any such independent regulatory commission or board, any such wholly-owned corporation, and the Smithsonian Institution, but excludes the Atomic Energy Commission.

(b) "Government employee" includes any officer or employee, civilian or military, of any Government agency, except such part-time consultants or employees as may be excluded by regulations promulgated pursuant to paragraph 4 (b) hereof.

(c) "Invention" includes any art, machine, manufacture, design, or composition of matter, or any new and useful improvement thereof, or any variety of plant, which is or may be patentable under the patent laws of the United States.

HARRY S. TRUMAN

THE WHITE HOUSE,

[FR Doc. 50-722; Filed, Jan. 23, 1950; 1:10 p. m.]

RULES AND REGULATIONS

TITLE 6—AGRICULTURAL CREDIT

Chapter IV—Production and Marketing Administration and Commodity Credit Corporation, Department of Agriculture

Subchapter C—Leans, Purchases, and Other Programs

PART 610—DAIRY PRODUCTS

§ 610.125 Price support program for milk and butterfat.

(a) CCC will purchase, during the period January 1, 1956, through March 31, 1951, butter, nonfat dry milk solids, Cheddar cheese, and evaporated milk, f. o. b. delivered at any point at any location in the continental United States, at the following prices: of approximately $3.67 per hundredweight for manufacturing milk of 3.95 percent butterfat (yearly average test) and approximately 60 cents per pound of evaporated milk. As a means of carrying out this program, Commodity Credit Corporation (hereinafter called CCC) has entered into such contracts with dairy products as provided herein.

§ 610.125 Price support program for milk and butterfat. (a) CCC will purchase, during the period January 1, 1956, through March 31, 1951, butter, nonfat dry milk solids, Cheddar cheese, and evaporated milk, f. o. b. offered delivery points at any location in the continental United States, at the following prices:
RULES AND REGULATIONS

U. S. Extra Grade, packed in export.

The nonfat dry milk solids shall be packed in commercial domestic containers. The evaporated milk shall meet U. S. Department of Agriculture specifications, and shall be packed in commercial domestic containers. The evaporated milk shall meet U. S. Department of Agriculture specifications, and shall be packed in commercial domestic containers.

c. The products purchased shall be produced and located in the continental United States. Purchases will be made in units of not less than tariff minimum carlots for the area where the product is located. Grades and weights shall be evidenced by inspection certificates issued by the U. S. Department of Agriculture.

d. Purchases will be made by CCC subject to the terms and conditions of purchase announcements issued by the Dairy Branch, Production and Marketing Administration, U. S. Department of Agriculture, Washington 25, D. C.

(3) Pursuant to the amended market order; and the term “U. S. No. 2” shall have the same meaning as when used in the revised United States Standards for Grapefruit (California and Arizona), 7 CFR 51.241; 14 F. R. 7369: Provided, That the tolerance for grade defects permitted for such U. S. No. 2 grade shall not include serious damage due to dryness or mushy condition; however, with respect to any lot of such grapefruit 10 percent, by count, of the grapefruit in such lot may fail to meet the requirements, of such U. S. No. 2 grade, relating to freedom from serious damage caused by dryness or mushy condition: Provided further, That included in such 10 percent there may be not more than 5 percent, by count, of the grapefruit in such lot which show dryness or mushy condition to the extent that more than 40 percent of the pulp is affected.

(3) As used in this section, “handler,” “variety,” “grapefruit,” and “ship” shall have the same meaning as when used in said amended marketing agreement and order; and the term “U. S. No. 2” shall have the same meaning as when used in the revised United States Standards for Grapefruit (California and Arizona), 7 CFR 51.241; 14 F. R. 7369: Provided, That the tolerance for grade defects permitted for such U. S. No. 2 grade shall not include serious damage due to dryness or mushy condition; however, with respect to any lot of such grapefruit 10 percent, by count, of the grapefruit in such lot may fail to meet the requirements, of such U. S. No. 2 grade, relating to freedom from serious damage caused by dryness or mushy condition: Provided further, That included in such 10 percent there may be not more than 5 percent, by count, of the grapefruit in such lot which show dryness or mushy condition to the extent that more than 40 percent of the pulp is affected.

Done at Washington, D. C., this 23rd day of January 1950.

[Seal]
ELMER F. KROUSE,
President,
Commodity Credit Corporation.

Approved.
RALPH S. TRIEG,
President,
Commodity Credit Corporation.

[60 Stat. 125.105.317 T. S. D. A. Spec. 609]

TITLE 7—AGRICULTURE

Chapter IX—Production and Marketing Administration (Marketing Agreements and Orders), Department of Agriculture

[Grapefruit Reg. 68]

PART 905—GRAPEFRUIT GROWN IN ARIZONA; IN IMPERIAL COUNTY, CALIFORNIA; AND IN THAT PART OF RIVERSIDE COUNTY, CALIFORNIA, SITUATED SOUTH AND EAST OF THE SAN GORGONIO PASS

LIMITATION OF SHIPMENTS

§ 905.329 Grapefruit Regulation 68—

(a) Findings. (1) Pursuant to the marketing agreement, as amended, and Order No. 55, as amended (7 CFR Part 905; 14 F. R. 6803), regulating the handling of grapefruit grown in the State of Arizona; in Imperial County, California; and in that part of Riverside County, California, situated south and east of the San Gorgonio Pass, effective under the applicable provisions of the Agricultural Marketing Agreement Act of 1937, as amended, and upon the basis of the recommendations of the Administrative Committee (established under the aforesaid amended marketing agreement and order), and upon other available information, it is hereby found that the limitation of shipments of grapefruit in such lot which show dryness or mushy condition, as hereinafter provided, will tend to effectuate the declared policy of the act.

(2) It is hereby further found that, it is impracticable and contrary to the public interest to give preliminary notice, in accordance with procedure in said marketing order, prior to the effective date of this section until 30 days after publication thereof in the Federal Register (60 Stat. 237; 5 U. S. C. 1901 et seq.) because the time intervening between the date when information upon which this section is based became available and the time when this section must become effective in order to effectuate the declared policy of the act is insufficient; a reasonable time is permitted, under the circumstances, for preparation for such effective time; and good cause exists for making the provisions hereof effective not later than January 25, 1950. Shipments of grapefruit, grown as aforesaid, have been subject to regulation by grades and sizes, pursuant to the amended marketing agreement and order, since October 23, 1949, and will so continue until January 25, 1950; the recommendation and supporting information for continued regulation thereto which cannot be completed by 12:01 a.m., P. S. T., February 19, 1950, no handler shall ship.

Any grapefruit of any variety grown in the State of Arizona; in Imperial County, California; or in that part of Riverside County, California, situated south and east of the San Gorgonio Pass which grade lower than U. S. No. 2 grade; Provided, That the tolerance for grade defects permitted for such U. S. No. 2 grade shall not include serious damage due to dryness or mushy condition; however, with respect to any lot of such grapefruit 10 percent, by count, of the grapefruit in such lot may fail to meet the requirements, of such U. S. No. 2 grade, relating to freedom from serious damage caused by dryness or mushy condition: Provided further, That included in such 10 percent there may be not more than 5 percent, by count, of the grapefruit in such lot which show dryness or mushy condition to the extent that more than 40 percent of the pulp is affected: or

(b) The butter shall be salted creamery butter of U. S. Grade B or higher, solid-packed in commercial containers. The nonfat dry milk solids shall be U. S. Extra Grade, packed in export containers.

The Cheddar cheese shall be U. S. Grade A or higher, packed in commercial domestic containers. The evaporated milk shall meet U. S. Department of Agriculture specifications, and shall be packed in commercial domestic containers.

(c) The products purchased shall be produced and located in the continental United States. Purchases will be made in units of not less than tariff minimum carlots for the area where the product is located. Grades and weights shall be evidenced by inspection certificates issued by the U. S. Department of Agriculture.

(d) Purchases will be made by CCC subject to the terms and conditions of purchase announcements issued by the Dairy Branch, Production and Marketing Administration, U. S. Department of Agriculture, Washington 25, D. C.

(2) As used in this section, “handler,” “variety,” “grapefruit,” and “ship” shall have the same meaning as when used in said amended marketing agreement and order; and the term “U. S. No. 2” shall have the same meaning as when used in the revised United States Standards for Grapefruit (California and Arizona), 7 CFR 51.241; 14 F. R. 7369: Provided, That the tolerance for grade defects permitted for such U. S. No. 2 grade shall not include serious damage due to dryness or mushy condition; however, with respect to any lot of such grapefruit 10 percent, by count, of the grapefruit in such lot may fail to meet the requirements, of such U. S. No. 2 grade, relating to freedom from serious damage caused by dryness or mushy condition: Provided further, That included in such 10 percent there may be not more than 5 percent, by count, of the grapefruit in such lot which show dryness or mushy condition to the extent that more than 40 percent of the pulp is affected: or

(3) As used in this section, “handler,” “variety,” “grapefruit,” and “ship” shall have the same meaning as when used in said amended marketing agreement and order; and the term “U. S. No. 2” shall have the same meaning as when used in the revised United States Standards for Grapefruit (California and Arizona), 7 CFR 51.241; 14 F. R. 7369: Provided, That the tolerance for grade defects permitted for such U. S. No. 2 grade shall not include serious damage due to dryness or mushy condition; however, with respect to any lot of such grapefruit 10 percent, by count, of the grapefruit in such lot may fail to meet the requirements, of such U. S. No. 2 grade, relating to freedom from serious damage caused by dryness or mushy condition: Provided further, That included in such 10 percent there may be not more than 5 percent, by count, of the grapefruit in such lot which show dryness or mushy condition to the extent that more than 40 percent of the pulp is affected: or

FORM

Title:

U.S. Grade A

Specifications:

Free of defects permitted for such U. S. Grade A, as set forth in section 62 (7 CFR 51.241; 14 F. R. 7369) and section 67 (7 CFR 51.238; 14 F. R. 7367) hereof, and in section 63 (7 CFR 51.237; 14 F. R. 7367) hereof, as amended.
FEDERAL REGISTER

Chapter III — Public Housing Administration, Housing and Home Finance Agency

PART 240—WAR HOUSING PROGRAM; FEDERAL REGISTER

Disposition of federally owned war housing projects.

Effective November 4, 1949, paragraphs (a), (b), and (c) of § 240.5 Disposition of federally owned war housing projects, are amended as follows:

§ 240.5 Disposition of federally owned war housing projects.

The Public Housing Administration is responsible for the disposition of war housing projects, or parts thereof, upon their termination by the Administrator of the Housing and Home Finance Agency.

Definitions.

(1) "Government agency" and "Federal agency" mean any executive department, board, bureau, commission, or other agency in the execution or enforcement of any Federal law.

(2) "State and local governments" mean any state, territory, or possession of the United States, the District of Columbia, and any political subdivision or instrumentality of any of them.

(3) "Non-profit institutions" means any scientific, literary, educational, public health, public welfare, charitable, or eleemosynary institution, or hospital or similar institution, or any volunteer fire company (1) which is supported in whole or in part through the use of funds derived from taxation by the United States, its territories or possessions, or by any State or political subdivision thereof, or (2) which is exempt from taxation under section 101 (6) of the Internal Revenue Code.

(4) "Public bodies" means educational institutions and local governments.

"Educational Institutions" means (1) any public educational institution, or (2) any private educational institution, no part of the net earnings of which shall accrue to the benefit of any private shareholder or individual. "Local public bodies" includes state and local governments and non-profit corporations which officially represent a local governing body (1) which is supported in whole or in part through the use of funds derived from taxation by the United States, its territories or possessions, or by any State or political subdivision thereof, or (2) which is exempt from taxation under section 101 (6) of the Internal Revenue Code.

"Veteran" shall include (1) a person (or his family) who has served in the military or naval forces of the United States for any period of time on or after September 16, 1940, and prior to July 26, 1944, who has been released therefrom under conditions other than dishonorable, (ii) a person (or his family) serving in the active military or naval forces of the United States who has served therein on or after September 16, 1940, and prior to July 26, 1947, and (iii) the family of a person who served in the military or naval forces of the United States.
States on or after September 16, 1940, and before January 20, 1947, and who died in service. (No right which was vested under this section prior to December 23, 1943, shall be affected by reason of the change in the definition of the term "veteran" effective on that date, and applications made prior to December 23, 1943, for any right or privilege under this section may be processed without regard to such change.)

"Military or naval forces of the U. S." means the Army, Navy, Air Force, Marine Corps, Coast Guard and, since July 29, 1945, the commissioned corps of the U.S. Public Health Service. The term military or naval forces of the United States, as described above, or by one member of his family as defined above means any dwelling structure determined to be of a temporary character, as determined by him, and constructed under the provisions of the Lanham Act (54 Stat. 1125; 42 U. S. C. 1221), as amended, Section 313 of the Lanham Act (54 Stat. 1125; 42 U. S. C. 1221) as amended, entitled, as amended,:

The Administrator shall, as soon as practicable, and in the public interest, remove all housing under his jurisdiction which is of a temporary character, as determined by him, and constructed under the provisions of the Lanham Act (54 Stat. 1125; 42 U. S. C. 1221), Public Law 781, Seventy-Sixth Congress, and Public Laws 9, 73, and 353, Seventy-Seventh Congress. Such removal shall, in any event, be accomplished not later than January 1, 1951, with the exception only of such housing as the Administrator, after consultation with local communities, finds is still needed in the interest of the orderly demobilization of the war effort: Provided, That all such exceptions shall be reexamined annually by the Administrator and if the administrative provisions or reexaminations shall be reported to the Congress. The removal provisions of the act are applicable only to the dwelling buildings.

(1) Priorities. The following order of preference shall govern the disposition of temporary dwelling buildings:

(a) Government agencies;
(b) State and local governments;
(c) Non-profit institutions.

(2) Conditions of sale or transfer—

(a) Government agencies. Dwelling structures may be sold or transferred on Government owned land or off the present project site: Provided, That when the use is to be on-site the transferee Government agency will agree to carry out the provisions of the Lanham Act concerning the removal of temporary housing. Any sale to the Reconstruction Finance Corporation for sale to veterans or to a Government agency for its use on or off the present site:

(b) State and local governments and non-profit institutions. Temporary dwelling structures may be sold to state or local governments or non-profit institutions for use off the present site. If sold to a state or local government they may be removed without demolition being required, regardless of their intended use. If sold to a non-profit institution they shall be sold for removal by demolition unless they are to be removed for non-residential or institutional use.

(c) Non-priority holders. Temporary dwelling structures sold to anyone other than a Government agency, a State or local government, or a non-profit institution, must be removed from the site by demolition within the period specified in the contract of sale.

(3) Method of offering. Temporary dwelling structures shall be offered for sale by a combined advertisement to priority and non-priority holders for a 15-day period. Before advertising, a price shall be established for priority holders, which shall be made available upon request. Priority holders who do not wish to offer the established price shall be asked to state a price, which will be considered competitively. In case of tie bids, priority holders shall have preference in the order of their priority. If PHA determines that the structures have no commercial value, the offering to priority holders at no cost shall proceed the offering to non-priority holders, and each offering shall be for a 15-day period.

Competitive bid forms should make it clear that bids may involve either a payment by the successful bidder to the Government, or a lease or rental agreement with the Government, or a sale of the dwelling to the successful bidder. When acceptable offers are not received as a result of the advertising, sales shall be made by negotiation or other means.

(3) Non-dwelling buildings. If non-dwelling buildings, including community, administration, commercial, and utility buildings are on leased land or land held under lease or by a Federal, State, or local governmental body for the purchase of non-dwelling buildings other than commercial buildings having value as such: Provided (i) Such offer has been received prior to the public competitive bidding offer and (ii) the property is required for a public purpose. In such case the property may be offered at a fixed price based on value. Under no circumstances may there be an exception to the competitive bid policy in the case of a commercial building, unless the commercial building has no value as such.

Advertising of the sale of non-dwelling buildings may be sold or transferred for use on or off the present site. When sold for use off-site, they may be removed without being demolished.

Non-dwelling structures were advanced through the Federal Works Agency and are now under the jurisdiction of the General Services Administration, consultation shall be held by the Field Office Director with that agency to determine what disposition shall be made of such facilities.

If not transferred to a landowner of leased land, or to a governmental body, non-dwelling structures shall be offered for sale by advertisement for a 15-day period. Where desirable, advertising of non-dwelling structures shall be combined with advertising of dwellings but no priorities apply to the non-dwelling buildings. If no acceptable offer is received from advertising, sales through re-advertisement, negotiation, or other means shall be made.

(3) Site improvements sold separately. Site improvements may be sold separately from structures in which case there shall be no priorities.

Site improvements may be (i) sold to the landowner in connection with the lease or use settlement (ii) sold to a private individual or corporation by (iii) left on the site either by abandonment to the
owner of land taken under lease or temporary use where the improvements have no commercial value, or for sale with owned land.

(c) Occupants shall be given preference to purchase vacant dwelling units not sold in accordance with (a) of this subdivision. Such sales shall be at the same fixed prices as in the offer to the bailee or Government agency.

(d) Occupants shall be given preference to purchase dwelling units that remain occupied after termination if it is determined that it is in the best interest of the PHA to expeditiously close down the entire project. Such sales shall be at fixed prices.

(e) The general public shall be offered vacant dwelling units not sold in accordance with (a), (b), or (c) of this subdivision. Such sales shall be at the same fixed prices as in the sale to veterans, or on a competitive bid basis. Non-dwelling units shall be offered to the general public on a competitive bid basis.

(f) Veterans, or on a competitive bid basis. Non-dwelling units shall be offered to the general public in accordance with (a) or (b) of this subdivision. Such sales shall be at the same fixed prices as in the sale to veterans, or on a competitive bid basis. Non-dwelling units shall be offered to the general public on a competitive bid basis.

5. TITLE 29—LABOR

The Fair Labor Standards Act of 1938 (Pub. L. No. 800, 50 Stat. 891; 42 U.S.C. and Sup., Title V, 1951) delineates the occupations and periods and conditions of employment. Child Labor Regulation No. 2 (15 FR. 1939, July 20, 1959) is to be amended by the addition of a new paragraph to §441.3 as follows:

441.3 Occupations. This part shall apply to all occupations other than the following:

(f) Occupations in connection with—

(1) Transportation of persons or property by rail, highway, air, water, pipeline, or other means;

(2) Warehousing and storage;

(3) Communications and public utilities;

(4) Construction (including demolition and repair);

except such office (including ticket office) work, or sales work, in connection with subparagraphs (1), (2), (3), and (4) of this paragraph, as does not involve the performance of any duties on trains,
motor vehicles, aircraft, vessels, or other media of transportation or at the actual site of construction operations.

2. Delete paragraphs (g) and (h) of § 441.3 and amend paragraph (i) of § 441.3 to read as follows:

§ 441.3 Periods and conditions of employment. Employment in any of the occupations to which this part is applicable shall be confined to the following periods:

(1) Between 7 a.m. and 7 p.m. in any one day. This period shall be measured by applicable standard time, except that it shall be limited by applicable saving time whenever such time is adopted as the official time of the community.

3. Renumber § 441.7 as § 441.6.

The above amendments shall become effective on publication in the Federal Register.

(Sec. 3 (1), 52 Stat. 1060, 1061, 29 U. S. C. 260 (4))

Signed at Washington, D.C., this 18th day of January 1950.

MAURICE J. TORBIN, Secretary of Labor.

[PK. Doc. 50-56; Filed, Jan. 24, 1950; 8:40 a.m.]

Chapter V—Wage and Hour Division, Department of Labor

PART 520—STUDENT LEARNERS

Pursuant to section 14 of the Fair Labor Standards Act, the Administrator has heretofore promulgated regulations (29 CFR, Part 520) providing terms and conditions under which certificates may be issued authorizing the employment of student learners at wages below the minimum wage established in section 6 of the act.

On January 17, 1950, a notice was published in the Federal Register (15 F. R. 285) that the Administrator proposed to revise these regulations. Interested parties were given 5 days in which to submit data, views or arguments pertaining to the proposed revision of the regulations. This period has now expired, and careful consideration has been given to all material submitted.

The revised regulations, as amended herein, are made necessary by the Fair Labor Standards Amendments of 1949 raising the minimum wage from 40 cents to 75 cents an hour, and provide, among other things, the procedure to be followed in obtaining student learner certificates, the subminimum wage rates to be paid, hours of employment—training, and temporary authorization for continuation of certain state and local programs in order to prevent curtailment of opportunities of employment. Now, therefore, pursuant to the authority vested in me by section 14 of the Fair Labor Standards Act, as amended (Section 14, 52 Stat. 1060, 29 U. S. C. 214; as amended, 63 Stat. 910), I find that it is necessary, in order to prevent curtailment of opportunities for employment, that the regulations contained in this part, revised as published in the Federal Register on January 17, 1950, be, and such regulations are, adopted as follows with the following amendments:

In § 520.3 the first paragraph is designated paragraph "(a)"; the second paragraph is designated paragraph "(b)"; and a new paragraph designated as paragraph "(c)" is added.

As revised, Part 520 reads as follows:

1. Definitions.
2. Applications.
3. Conditions under which certificates will be issued.
5. Duration of certificates.
6. Terms of certificate.
7. Proceedings on applications.
8. Revocation and cancellation.
9. Review.
10. Petition for amendment of the regulations in this part.


§ 520.1 Definitions. As used in the regulations in this part:
(a) "Student-learner" means a student who is receiving instruction in an accredited school, college or university and who is employed on a part-time basis pursuant to a bona fide training program which is under the supervision of a State board of vocational education or other recognized educational body.
(b) A "bona fide vocational training program" means a program providing for part-time employment of student-learners for a part of the working day, or for alternating weeks, or for limited periods during the year, such employment providing training which is supplemented by related instruction given in a regular part of his school course by the school, college or university.

§ 520.2 Applications. (a) Applications may be filed with the Administrator of the Wage and Hour Division, United States Department of Labor, Washington, D. C., by any officer of a school, college or university, for a special certificate authorizing the employment at wages below the minimum established in section 6 of the Fair Labor Standards Act, as amended, of a student learner engaged in a bona fide vocational training program where such action is necessary to prevent curtailment of opportunities for employment.
(b) All applications must be on official forms furnished on request by the Wage and Hour Division and must be signed by the officer of the school official, and the student learner. Applications must contain all information required by such forms, including among other things, a brief statement clearly outlining the vocational training program and showing, particularly, the nature of the processes in which the student-learner will be engaged in training on the job; a brief statement clearly outlining the related school instruction; information showing the total number of persons employed in the establishment; data relating to the age of the employee, the proposed hourly wage rate, the length of the period for which and the total weekly hours devoted to employment training and school instruction.

§ 520.3 Conditions under which certificates will be issued. (a) The Administrator or his authorized representative may issue a certificate permitting employment of a student-learner by a named employer where it is found that such employment provides training in an occupation which requires a substantial amount of skill and a significant learning period, which employment—training is performed pursuant to a definitely organized plan of instruction designed to teach technical knowledge and related industrial information given as a part of the student learner's course by an accredited school, college, or university.

(2) Where the vocational training program is operated under the Smith—Hughes and George-Barden Acts, the Administrator or his authorized representative may issue certificates permitting employment of a student-learner by a named employer where it is found that such employment provides training in an occupation which requires a substantial amount of skill and a significant learning period, which employment—training is performed pursuant to a definitely organized plan of instruction designed to teach technical knowledge and related industrial information given as a part of the student learner's course by an accredited school, college, or university.

(3) Applications for special certificates shall be filed at the earliest practicable date with the Administrator of the Wage and Hour Division by the school officials in accordance with the provisions of § 520.2.
or the orders and regulations issued by the Secretary of Labor pursuant thereto (Parts 400 to 481 of Chapter IV of this title).

§ 520.6 When the issuance of such a certificate would tend to prevent the development of apprenticeships in accordance with the regulations applicable thereto, or would create a hazard to the health or welfare of the student-learner, the certificate shall take effect only if the conditions of employment of the student-learner have changed or that the purposes for which the certificate was originally issued no longer obtain.

§ 520.7 Restrictions on applications. (a) It is desirable, when employed at subminimum wage rates will tend to depress the wages or working conditions of experienced workers in the same occupation.

§ 520.8 Revocation and cancellation. (a) An authorized representative of the student-learner may apply for cancellation of any certificate for cause. Cancellation may be effected (1) as of the date of issuance if it is found that the applicant set forth any fact or facts in the application which he knew or had reasonable cause to believe to be false; (2) as of the date of violation if it is found that any of its terms have been violated; and (3) prospectively if it is shown that the conditions of employment of the student-learner have changed or that the purposes for which the certificate was originally issued no longer obtain.

§ 520.9 Review. Any person aggrieved by the action of an authorized representative of the Administrator may within 60 days after hearing thereof, appeal to the Secretary of Labor to review such decision. If such appeal is filed, the regulations contained in this part shall be considered, facts or conduct which may warrant such action will be called to the attention of the employer and he shall be afforded an opportunity to achieve or demonstrate compliance, or to show that the conditions of employment of the student-learner have not changed or that the purpose for which the certificate was originally issued still exist.

§ 520.10 Petition for amendment of the regulations in this part. Any person wishing a revision of any of the terms of the foregoing regulations may submit in writing to the Administrator a petition setting forth the changes desired and the reasons for proposing them. If reasonable cause for amendment of the regulations is set forth, a hearing will be granted before the Administrator or his authorized representative with due notice to interested parties, or other provision will be made for affording interested parties an opportunity to present oral or written argument before the Administrator or an authorized representative who took no part in the action under review.

§ 520.11 Apprentice training of veterans. In the case of a veteran employed in an apprentice-training course which requires more than 100 hours of training, pursuant to the Servicemen's Readjustment Act of 1944 (58 Stat. 284; 38 U.S.C. 693) as amended, the regulations contained in this part are hereby amended by adding a new section, to be numbered § 521.10, to read as follows:

§ 521.10 Apprentice training of veterans. In the case of a veteran employed in an apprentice-training course which requires more than 100 hours of training, pursuant to the Servicemen's Readjustment Act of 1944 (58 Stat. 284; 38 U.S.C. 693) as amended, the regulations contained in this part are hereby amended by adding a new section, to be numbered § 521.10, to read as follows:

§ 521.10 Apprentice training of veterans. In the case of a veteran employed in an apprentice-training course which requires more than 100 hours of training, pursuant to the Servicemen's Readjustment Act of 1944 (58 Stat. 284; 38 U.S.C. 693) as amended, the regulations contained in this part are hereby amended by adding a new section, to be numbered § 521.10, to read as follows:

§ 521.10 Apprentice training of veterans. In the case of a veteran employed in an apprentice-training course which requires more than 100 hours of training, pursuant to the Servicemen's Readjustment Act of 1944 (58 Stat. 284; 38 U.S.C. 693) as amended, the regulations contained in this part are hereby amended by adding a new section, to be numbered § 521.10, to read as follows:

§ 521.10 Apprentice training of veterans. In the case of a veteran employed in an apprentice-training course which requires more than 100 hours of training, pursuant to the Servicemen's Readjustment Act of 1944 (58 Stat. 284; 38 U.S.C. 693) as amended, the regulations contained in this part are hereby amended by adding a new section, to be numbered § 521.10, to read as follows:

§ 521.10 Apprentice training of veterans. In the case of a veteran employed in an apprentice-training course which requires more than 100 hours of training, pursuant to the Servicemen's Readjustment Act of 1944 (58 Stat. 284; 38 U.S.C. 693) as amended, the regulations contained in this part are hereby amended by adding a new section, to be numbered § 521.10, to read as follows:
RULES AND REGULATIONS

tute a temporary certificate authorizing the employment of the veteran in such training course, at a wage rate of more than 49 cents but less than 78 cents an hour, for the period beginning January 25, 1950, and ending May 25, 1950: Providing, That at the earliest possible date within such period the employer of such veteran shall file with the Wage and Hour Division, United States Department of Labor, Washington 25, D. C., a true copy of the approved training program and agreement.

It is the judgment of the Administrator that the proper administration of the Fair Labor Standards Act requires that these regulations become effective simultaneously with the effective date of the Fair Labor Standards Amendment of 1949. Therefore, compliance with the requirements of paragraphs (a), (b) and (c) of section 4 of the Administrative Procedure Act is impracticable. Accordingly, the regulations contained in this chapter have been amended herein to become effective on January 25, 1950.

(Sec. 14, 52 Stat. 1068, as amended: 29 U. S. C., Supp. 2, § 2(a))

Signed at Washington, D. C., this 23d day of January 1950.

WM. R. McCOMB,
Administrator, Wage and Hour Division.

[F. R. Doc. 50-792; Filed, Jan. 24, 1950; 9:20 a. m.]

PART 522—EMPLOYMENT OF LEARNERS

MILLINERY INDUSTRY, APPAREL INDUSTRY, ARTIFICIAL FLOWER AND FEATHER INDUSTRY, AND WOOLEN INDUSTRY

Pursuant to section 14 of the Fair Labor Standards Act, as amended, the Administrator has herefore promulgated regulations setting forth terms and conditions under which special certificates may be issued to veterans for the employment of learners in the apparel (other than gloves, women's apparel, single pants, shirts and allied garments, sportswear and other odd outerwear, rainwear, robes, leather and sheep-lined clothing industry, the artificial flower and feather industry, and the woolen industry authorizing employment of learners at wages below the minimum wage established in section 6 of the act.

On January 12, 1950, a notice was published in the Federal Register (15 F. R. 176) that the Administrator proposed to revise the special regulations providing for the employment of learners in these industries. Interested persons were given seven days in which to submit data, views or arguments pertaining to the proposed revocation. This period has now expired, and careful consideration has been given to all material submitted.

Now, therefore, pursuant to the authority vested in me by section 14 of the Fair Labor Standards Act, as amended, (52 Stat. 1068, 29 U. S. C. 201; as amended 53 Stat. 910) I find that the following special industry regulations are no longer necessary in order to prevent curtail-

Pat 522—Employment of Learners

KNITTED WEAR INDUSTRY

Pursuant to section 14 of the Fair Labor Standards Act the Administrator has herefore promulgated regulations (§§ 522.68 to 522.79) setting forth terms and conditions under which special certificates may be issued in the Knitted Wear Industry for the employment of learners at wages below the minimum wage established in section 6 of the act.

On January 12, 1950, a notice was published in the Federal Register (15 F. R. 177) that the Administrator proposed to revise the regulations so as to provide, among other things, higher subminimum learner rates in the industry. Interested persons were given seven days in which to submit data, views or arguments pertaining to the proposed amendments. This period has now expired, and careful consideration has been given to all material submitted.

Now, therefore, pursuant to the authority vested in me by section 14 of the Fair Labor Standards Act, as amended, (52 Stat. 1068, 29 U. S. C. 201; as amended 53 Stat. 910) and in accordance with §522.12, I find that it is necessary, in order to prevent the curtailment of opportunities for employment, that the amendments to §§522.68 to 522.79, as published in the Federal Register on January 12, 1950, be, and such amendments to the regulations hereby are, adopted as follows:

1. Amend §522.72 to read as follows:

§522.72 Learner wage rate. Learners employed under the certificate shall be paid not less than 60 cents per hour. Where experienced operators are paid piece work rates, learners shall be paid the same piece work rate and shall re-
has hereinafter promulgated regulations (§§ 522.82 to 522.94) setting forth terms and conditions under which special certificates may be issued in the Independent Telephone Industry authorizing employment of learners at wages below the minimum wage established in section 6 of the act.

On January 12, 1950, a notice was published in the Federal Register (15 F. R. 177) that the Administrator proposed to revise the regulations so as to provide, among other things, higher subminimum learner rates in the industry. Interested persons were given seven days in which to submit data, views or arguments pertaining to the proposed amendments. This period has now expired, and careful consideration has been given to all material submitted.

Now, therefore, pursuant to the authority vested in me by section 14 of the Fair Labor Standards Act, as amended (52 Stat. 1060, 29 U. S. C. 214: as amended 63 Stat. 910) and in accordance with § 522.12, I find that it is necessary, in order to prevent the curtailment of opportunities for employment, that the amendments to §§ 522.82 to 522.94, as published in the Federal Register on January 12, 1950, be, and such amendments to the regulations hereby are, adopted as follows with the following additional amendment: In § 522.88, change "(c)" to "(b)" and change "(b)" to "(c)".

1. In § 522.83, revoke paragraph (e), replace said paragraph (b) as (c), and substitute new paragraph (b) to read as follows:

§ 522.83 Number of learners. * * *

(b) Special certificates issued to meet abnormal labor turn-over may provide:

(1) In the case of exchanges employing 8 operators, two learners may be employed at any one time within any 6-month period: Provided, That a total of no more than two learners are employed within any such period, and that each learner is employed for not more than 480 hours.

(2) In the case of exchanges employing 9 to 18 operators, four learners may be employed at any one time within any 6-month period: Provided, That a total of no more than four learners are employed within any such period, and that each learner is employed for not more than 400 hours.

2. Amend § 522.84 to read as follows:

§ 522.84 Learning period. The maximum learning period which may be provided for any learner under a special certificate issued in this industry shall not extend beyond the first 480 hours of employment in training for and in a select occupation.

3. Amend § 522.85 to read as follows:

§ 522.85 Learner hourly rates. The minimum rates of pay for learners shall be not less than 60 cents per hour for the first 320 hours, and 65 cents for the second 160 hours of the learning period.

In § 522.88, delete the words, "as no certificate had been issued," at the end of paragraph (c), and add new paragraph (d) to read as follows:

§ 522.88 Renovation of special certificates. * * *

(d) Except in cases of willfulness or those in which the public interest requires otherwise, before any contemplated action for the suspension or revocation of any special certificate for the employment of learners in the Independent Telephone Industry will be considered, facts or conduct which may warrant such action shall be called to the attention of the employer in writing and he shall be accorded an opportunity to demonstrate or achieve compliance, or to show that he is maintaining employment of the learner have not changed or that the purpose for which the certificate was originally issued still exists.

5. Amend § 522.91 to read as follows:

§ 522.91 Record to be kept. The name of each learner and occupation in which each is employed shall be entered on the payroll record of the exchange on the which the special certificate is issued and he shall be designated on the payroll as a learner.

6. Omit § 522.94.

This is the judgment of the Administrator that the effective administration of the Fair Labor Standards Act requires that these amendments become effective simultaneously with the effective date of the Fair Labor Standards Amendments of 1949. Therefore, compliance with the requirement of the Administrative Procedure Act that publication of rules be made not less than 30 days prior to the effective date thereof is not feasible. These amendments accordingly shall become effective on January 20, 1950, and shall continue in force and effect until July 25, 1950, unless modified, superseded or rescinded prior to said date of termination.

(Sec. 14, 52 Stat. 1060; 29 U. S. C. 214)

Signed at Washington, D. C., this 20th day of January 1950.

W. R. McCOMB, Administrator, Wage and Hour Division, United States Department of Labor.
(b) With respect to learners hired prior to and on the payroll of an employer on January 15, 1950, the learning period authorized in Column B of paragraph (a) of this section may be extended by 160 hours, provided such learners are paid at a rate of not less than 70 cents per hour for the additional 160 hours of the learning period, provided further that the number of such learners shall be counted in determining the number or proportion of learners provided in Column D of paragraph (a) of this section.

(c) No employer shall be employed under the terms of a special learner certificate, except as provided in Column C of paragraph (a) of this section.

(d) No learner shall be hired under a special learner certificate if an experienced worker who is capable of equaling the performance of a worker of ordinary or minimum skill is available for employment. A special learner certificate authorizing the employment of learners by new or expanding plants shall be issued for a period not longer than necessary to complete the training of the total number of additional learners.

It is the judgment of the Administrator that the effective administration of the Fair Labor Standards Act requires that these amendments become effective simultaneously with the effective date of the Fair Labor Standards Amendments of 1949. Therefore, compliance with the requirement of the Administrative Procedure Act that publication of rules be made not less than 30 days prior to the effective date thereof is not feasible. These amendments accordingly shall become effective on January 25, 1950, and shall continue in full force and effect until July 25, 1950, unless modified, superseded or rescinded prior to such date.

(29 U. S. C. 214)
Terms of special certificates. Where necessary in order to prevent the curtailment of opportunities for employment of experienced workers, the Administrator may issue special certificates permitting the employment of learners, at subminimum wages, in machine stitching operations on knit and knit wool gloves, provided that as many as 10 learners may be authorized in any one plant, unless experienced workers are found to be available.

(a) Learners employed under the certificate shall not exceed 10 percent of the total number of workers in the plant engaged in hand and machine stitching operations on leather dress gloves; and in machine stitching operations on knit fabric and work gloves; and in finger knitting and finger closing operations on knit wool gloves, provided that as many as 10 learners may be authorized in any certificate.

(b) No person shall be employed as a learner under the certificate, longer than 480 hours.

(c) Learners employed under the certificate shall not exceed 10 percent of the total number of workers in the plant engaged in hand and machine stitching operations on leather dress gloves, and in machine stitching operations on knit fabric and work gloves; and in finger knitting and finger closing operations on knit wool gloves, provided that as many as 10 learners may be authorized in any certificate.

(d) Only learners shall be employed at a subminimum wage under the certificate and no learner shall be employed under the certificate unless hired when an experienced worker was not available.

(e) No learners shall be employed at a subminimum wage under the certificate until (1) the Administrator or his authorized representative has found that the applicant set forth any fact or facts in the application which he knew or had reasonable cause to believe to be false; (2) as of the date of violation if it is found that any of its terms have been violated; and (3) prospectively if it is found that the conditions of employment shall not have been changed or that the purposes for which the certificate was originally issued no longer obtain.

§ 522.221 Cancellation of certificates. (a) The Administrator or his authorized representative may cancel any certificate for cause. Cancellation may be effected as of the date of issuance if it is found that the applicant set forth any fact or facts in the application which he knew or had reasonable cause to believe to be false; as of the date of violation if it is found that any of its terms have been violated; and prospectively if it is found that the conditions of employment shall not have been changed or that the purposes for which the certificate was originally issued no longer obtain.

(b) Except in cases of willfulness or those in which the public interest requires otherwise, before any contemplated action for cancellation or revocation of any special certificate for the reasons set forth under paragraph (a) of this section, the Administrator or his authorized representative shall give the employer and the union, if any, which represents the employees, a reasonable opportunity to appear and be heard thereon.

§ 522.222 Definitions. In §§ 522.220 to 522.224, the following terms shall have the meanings:

(a) In the leather dress branch, a person who has not been employed during the preceding three years for more than 480 hours in the aggregate in hand or machine stitching operations on leather dress gloves.

(b) In the knit fabric branch, a person who has not been employed during the preceding three years for more than 480 hours in the aggregate in machine stitching operations on leather dress or knit fabric gloves.

(c) In the work glove branch, a person who has not been employed during the preceding three years for more than 480 hours in the aggregate in machine stitching operations in any type of glove manufacturing.

(d) In the knit wool branch, a person who has not been employed during the preceding three years for more than 480 hours in the aggregate in finger knitting and finger closing operations and the term "Glove Branch of the Apparel Industry" includes leather dress gloves, knit fabric gloves, work gloves, and knit wool gloves.

It is the judgment of the Administrator that the proper administration of the Fair Labor Standards Act requires that the determination and order, as revised, become effective simultaneously with the effective date of the Fair Labor Standards Amendments of 1949. Therefore, compliance with the requirement of the Administrative Procedure Act that publication of rules be made not less than 30 days prior to the effective date thereof is not feasible. Accordingly, the determination and order, as revised herein, shall become effective on January 25, 1950.

Signed at Washington, D. C., this 22d day of January, 1950.

Wm. R. McCombs, Administrator, Wage and Hour Division.

[F. R. Doc. 52-741; Filed, Jan. 24, 1950; 8:20 a.m.]
§ 549.3 Distinction between plan and trust. As used in the regulations in this part:

(a) "Profit-sharing plan" means any such program or arrangement as qualifies hereunder which provides for the distribution of profits to his employees or a group of his employees of their respective shares of profits;

(b) "Profit-sharing trust" means any such program or arrangement as qualifies hereunder which provides for the irrevocable deposit by the employer of his employees' distributive share of profits in a trust for deferred distribution to such employees of their respective shares.

§ 549.4 Petition for amendment of regulations. Any person wishing a revision of any of the terms of the foregoing regulations may submit in writing to the Administrator written comments containing the changes desired and the reasons for proposing them. If, upon inspection of the petition, the Administrator believes that reasonable cause exists for amendment of the regulations as set forth, the Administrator will either schedule a hearing with due notice to interested parties, or will make other provision for affording interested parties an opportunity to present their views, either in support of or in opposition to the proposed changes.

Signed at Washington, D.C., this 23rd day of January 1950.

WM. R. McCOMB
Administrator,
Wage and Hour Division.

(P. R. Doc. 86-762; Filed, Jan. 30, 1950; 9:28 a.m.)

PART 550—DEFINING AND DELIMINATING THE TERM "TALENT FEES"

Section 7 (d) (3) (c) of the Fair Labor Standards Act, as amended, effective January 25, 1938, provides that talent fees paid to performers, including announcers, on radio and television programs shall be excluded from computation of the performer's regular rate of pay, and further provides that the Administrator of the Wage and Hour Division shall issue regulations defining and delimiting the term "talent fees" for purposes of this section.

In connection with the formulation of said regulations, the Administrator appointed an Advisory Committee composed of representatives of the American Federation of Radio Artists and the National Association of Broadcasters. The Advisory Committee met in Washington, D.C., on November 22, 1949 and December 21, 1949 with members of the Administrator's staff and advised and assisted in the preparation of the regulations herein referred to.

In view of the fact that section 7 (d) (3) (c) of the Fair Labor Standards Act, as amended, became effective on January 25, 1950, the Administrator decrees it to be in the public interest that the appropriate regulations thereunder should become effective simultaneously on said date. Consequently, notice and public procedure pursuant to section 4 (a) of the Administrative Procedure Act is found by the Administrator to be impracticable.

Now, therefore, pursuant to the authority vested in the Administrator by section 7 (d) (3) (c) of the Fair Labor Standards Act, as amended, the regulations set forth below are hereby adopted, effective January 25, 1950.

Interested persons are invited to submit their views or comments pertaining to these regulations to the Administrator, Wage and Hour Division, United States Department of Labor, Washington 25, D.C., within 30 days from the date of publication hereof in the Federal Register. If, upon the basis of any such data, views or comments submitted, the Administrator finds it necessary or desirable to revise the regulations, appropriate notice thereof will be published in the Federal Register.

Sec. 550.1 "Talent fees" as used in section 7 (d) (3) (c) of the Fair Labor Standards Act, as amended.

550.2 Definitions.

550.3 Petition for amendment of regulations.

AUTHORITY: §§ 550.1 to 550.3 issued under § 5 (d) of the Fair Labor Standards Act, as amended; 29 U.S.C. and Sup., 261 et seq.

§ 550.1 "Talent fees" as used in section 7 (d) (3) (c) of the Fair Labor Standards Act, as amended. The term "talent fees" in section 7 (d) (3) (c) of the act shall mean extra payments made to performers, including announcers on radio and television programs, where the payment is made:

(a) To an employee having regular duties as a staff performer (including announcers), as an extra payment for services as a performer on a particular commercial program or a particular series of commercial programs (including commercial spot announcements) or for special services as a performer on a particular sustaining program or a particular series of sustaining programs;

(b) In pursuance of an applicable employment agreement or understanding or an applicable collective bargaining agreement, in a specific amount agreed upon in advance of the performance of the services or special services for which the extra payment is made.

§ 550.2 Definitions. As used in the regulations in this part:

(a) The term "extra payment" shall mean a payment, in a specific amount, made in addition to the straight-time and overtime compensation which would be due the performer under the agreement applicable to his employment and under the act if the time spent in performance of the services referred to in paragraph (a) of § 550.1 had been devoted exclusively to duties of a staff performer; but shall not include any payment any part of which is credited or offset against any remuneration otherwise payable to the performer under any contract or statutory provision;

(b) The term "performer" shall mean a person who performs a distinctive, personalized service as a part of an actual broadcast or telecast including an actor, singer, dancer, musician, comedian, or...
any person who entertains, affords amusement to, or occupies the interest of a radio or television audience by acting, singing, dancing, reading, narrating, performing feats of skill, or announcing, or describing or relating facts, events and other matters of interest, and who actively participates in such capacity in the production or presentation of a radio or television program. It shall not include such persons as script writers, stand-ins, or directors who are neither seen nor heard by the radio or television audience; nor shall it include persons who participate in the broadcast or telecast purely as technicians such as engineers, electricians and stagehands;

(c) The term "special services" shall mean services beyond the scope of a performer's regular or ordinary duties as a staff performer under the agreement applicable to the employment.

§ 553.1 Petition for amendment of regulations. Any person wishing to make a revision of any of the terms of the foregoing regulations may submit in writing to the Administrator a petition setting forth the revisions desired and the reasons for proposing them. If, upon inspection of the petition, the Administrator believes that the regulations cause amendment of the regulations is set forth, the Administrator will schedule a hearing with due notice to interested parties, or will make other provisions for affording interested parties an opportunity to present their views in support of or in opposition to the proposed change.

Signed at Washington, D.C., this 23d day of January 1950.

WM. R. McCORM, Administrator, Wage and Hour Division.

[F. E. Doc. 50-739; Filed, Jan. 24, 1950; 8:38 a.m.]

TITLE 36—PARKS, FORESTS, AND MEMORIALS
Chapter II—Forest Service, Department of Agriculture

PART 211—Administrative

APPEALS FROM ADMINISTRATIVE ACTION

By virtue of the authority vested in the Secretary of Agriculture under the provisions of the act of March 3, 1891, as amended (16 U.S.C. 471), and the act of June 4, 1897, as amended (16 U.S.C. 551), I, Charles F. Brannan, Secretary of Agriculture, do hereby amend the first paragraph of § 211.2, Part 211, Chapter II, Title 36, Code of Federal Regulations as follows:

The first paragraph of § 211.2 is amended to read as follows:

§ 211.2 Appeals from administrative action. An appeal may be taken from any administrative decision or order by filing with the officer who rendered the decision a written request for reconsideration thereof or notice of appeal. Decisions of forest officers shall be final unless appeal is taken therefrom within a reasonable time. The decision appealed from shall be reviewed by the immediate superior of the officer by whom the decision was rendered; that is, in the following order: Superior, Regional forester, Chief of the Forest Service, Secretary of Agriculture.

Appeals from the Chief of the Forest Service to the Secretary of Agriculture shall, upon the written request of the appellant, be referred to the National Forest Advisory Board of Appeals, to consider referred to it on the merits and furnish the Secretary of Agriculture with its advice and recommendations.


Done at Washington, D.C., this 17th day of January 1950. Witness my hand and the seal of the Department of Agriculture.

[Seal] CHARLES F. BRANNAN, Secretary of Agriculture.

[F. E. Doc. 50-700; Filed, Jan. 24, 1950; 8:49 a.m.]

FEDERAL REGISTER 403

§ 46—SHIPPING

Chapter II—United States Maritime Commission

Subchapter F—Merchant Ship Sales Act of 1946

[General Order 60, Amdt. 8 to Supp. 5]

PART 259—RULES AND REGULATIONS, FORMS AND CITIZENSHIP REQUIREMENTS

FORMS; DOMESTIC TRADE ADDENDUM

Section 296.32 Uniform bareboat charter of a war-built dry-cargo vessel under the Merchant Ship Sales Act of 1946. "SHIPSALESMENSTE 303", is amended as follows:

The form of Domestic Trade Addendum, as authorized by the Commission on July 22, 1946, and published in the Federal Register of August 14, 1946 (13 F.R. 4710), is hereby superseded and revised to read as follows:

SHIPSALESMENSTE 303

(Domestic Trade Addendum)

(Rewritten)

Contract No. MCO________ Addendum No.________

Addendum to Bareboat Charter Agreement (hereinafter called the "Agreement") dated as of 

between the United States of America, acting by and through the United States Maritime Commission (hereinafter called the "Owner") and __________ (hereinafter called the "Charterer").

Whereas, separate accountings for foreign trade and domestic trade (coastwise or inter-coastal) have been prescribed by legislation (Public Law 127, 69th Congress) with respect to all voyages commencing subsequent to June 30, 1947.

Whereas, the parties have agreed upon new terms and conditions applicable to vessels chartered hereunder for operation on Charterer's certificated coastwise or inter-coastal routes, effective as of July 1, 1947.

Whereas, the parties desire to amend this Agreement.

Now, therefore, effective as of July 1, 1947, this Agreement is hereby amended as follows:

1. Separate accountings for foreign trade and domestic trade (coastwise or inter-coastal) shall be required, and unless otherwise provided in the Agreement, all voyage payments require in excess of such minimum, basic hire, the basic hire shall be increased by the amount by which the voyage payment exceeds the minimum basic hire, provided that such increase shall not operate to increase the basic hire to in excess of 15% per annum. Such increase shall be deemed to be an unconditional payment to the Owner, and that the balance of 6 1/2% shall be payable from earnings before any participation in such earnings by the Charterer.

2. It is specifically agreed that the minimum basic monthly charter hire prescribed in Part 1 of this Agreement (6 1/2% per annum of the unadjusted statutory sales price or the floor price of the vessel, whichever is higher) shall be deemed to be an unconditional payment to the Owner, and that the balance of 6 1/2% shall be payable from earnings before any participation in such earnings by the Charterer.

III. Additional charter hire. For the purpose of this agreement, the word "charter" shall mean that such payment in excess of either the unadjusted statutory sales price or the floor price of the vessel, whichever is higher.

MEMORIALS

Chapter II—Forest Service, Department of Agriculture

PART 211—ADMINISTRATION

APPEALS FROM ADMINISTRATIVE ACTION

By virtue of the authority vested in the Secretary of Agriculture under the provisions of the act of March 3, 1891, as amended (16 U.S.C. 471), and the act of June 4, 1897, as amended (16 U.S.C. 551), I, Charles F. Brannan, Secretary of Agriculture, do hereby amend the first paragraph of § 211.2, Part 211, Chapter II, Title 36, Code of Federal Regulations as follows:

§ 211.2 Appeals from administrative action. An appeal may be taken from any administrative decision or order by filing with the officer who rendered the decision a written request for reconsideration thereof or notice of appeal. Decisions of forest officers shall be final unless appeal is taken therefrom within a reasonable time. The decision appealed from shall be reviewed by the immediate superior of the officer by whom the decision was rendered; that is, in the following order: Superior, Regional forester, Chief of the Forest Service, Secretary of Agriculture.

Appeals from the Chief of the Forest Service to the Secretary of Agriculture shall, upon the written request of the appellant, be referred to the National Forest Advisory Board of Appeals, to consider referred to it on the merits and furnish the Secretary of Agriculture with its advice and recommendations.


Done at Washington, D.C., this 17th day of January 1950. Witness my hand and the seal of the Department of Agriculture.

[Seal] CHARLES F. BRANNAN, Secretary of Agriculture.

[F. E. Doc. 50-700; Filed, Jan. 24, 1950; 8:49 a.m.]

FEDERAL REGISTER 403

§ 46—SHIPPING

Chapter II—United States Maritime Commission

Subchapter F—Merchant Ship Sales Act of 1946

[General Order 60, Amdt. 8 to Supp. 5]

PART 259—RULES AND REGULATIONS, FORMS AND CITIZENSHIP REQUIREMENTS

FORMS; DOMESTIC TRADE ADDENDUM

Section 296.32 Uniform bareboat charter of a war-built dry-cargo vessel under the Merchant Ship Sales Act of 1946. "SHIPSALESMENSTE 303", is amended as follows:

The form of Domestic Trade Addendum, as authorized by the Commission on July 22, 1946, and published in the Federal Register of August 14, 1946 (13 F.R. 4710), is hereby superseded and revised to read as follows:

SHIPSALESMENSTE 303

(Domestic Trade Addendum)

(Rewritten)

Contract No. MCO________ Addendum No.________

Addendum to Bareboat Charter Agreement (hereinafter called the "Agreement") dated as of 

between the United States of America, acting by and through the United States Maritime Commission (hereinafter called the "Owner") and __________ (hereinafter called the "Charterer").

Whereas, separate accountings for foreign trade and domestic trade (coastwise or inter-coastal) have been prescribed by legislation (Public Law 127, 69th Congress) with respect to all voyages commencing subsequent to June 30, 1947.

Whereas, the parties have agreed upon new terms and conditions applicable to vessels chartered hereunder for operation on Charterer's certificated coastwise or inter-coastal routes, effective as of July 1, 1947.

Whereas, the parties desire to amend this Agreement:

Now, therefore, effective as of July 1, 1947, this Agreement is hereby amended as follows:

1. Separate accountings for foreign trade and domestic trade (coastwise or inter-coastal) shall be required, and unless otherwise provided in the Agreement, all voyage payments require in excess of such minimum basic hire, the basic hire shall be increased by the amount by which the voyage payment exceeds the minimum basic hire, provided that such increase shall not operate to increase the basic hire to in excess of 15% per annum. Such increase shall be deemed to be an unconditional payment to the Owner, and that the balance of 6 1/2% shall be payable from earnings before any participation in such earnings by the Charterer.

2. It is specifically agreed that the minimum basic monthly charter hire prescribed in Part 1 of this Agreement (6 1/2% per annum of the unadjusted statutory sales price or the floor price of the vessel, whichever is higher) shall be deemed to be an unconditional payment to the Owner, and that the balance of 6 1/2% shall be payable from earnings before any participation in such earnings by the Charterer.

3. Additional charter hire. For the purpose of this agreement, the word "charter" shall mean that such payment in excess of either the unadjusted statutory sales price or the floor price of the vessel, whichever is higher.
be deleted and the following paragraphs substituted in lieu thereof:

CLAUSE 13. Additional charter hire. If at the end of the calendar year 1947, or any subsequent year or at the termination of this Agreement, as amended, the cumulative net voyage profit (after the payment of such other charges as are basic characteristics hereinafter defined and herein and payment of the Charterer's fair and reasonable overhead expenses applicable to such voyage) shall not exceed 10 per centum per annum on the Charterer's capital necessarily employed in the business of the Vessels (all as hereinafter defined) the Charterer shall pay over to the Owner at Washington, D. C., within 30 days after the end of such year or other period, as additional charter hire for such voyage, an amount equal to one-half of such cumulative net voyage profit in excess of 10 per centum per annum on such capital (but such cumulative net profit so accounted for shall not be included in any calculation of cumulative net profit in any subsequent year or period).

The Charterer agrees to make preliminary payments on account of the charter hire, and additional charter hire at such times and in such manner and amounts as may be required by the provisions hereof. That all hire, payment of additional charter hire shall be deemed to be preliminary and subject to adjustment either at the time of the completion of preliminary statements or upon the completion of each final audit by the Owner, at which time such payments shall be made to the extent of the preliminary statement or final audit may show to be due, or such overpayments refunded to the Charterer as may be required.

V. Net voyage profit. With respect to the vessels listed on Schedule B, as supplemented and modified, an additional paragraph shall be inserted following the first paragraph of sub-paragraph (a), Clause 12, Part II, entitled: "Net Voyage Profit," reading as follows:

Upon application of the Charterer supported by adequate data based on past experience, the Owner may agree that in vessel operating expenses of such charges as the Owner determines to be fair and reasonable to provide reserves for vessel repair expenses and/or F. and L. insurance deductible average losses on all voyages terminating after December 31, 1946, provided that at the time of final accounting hereunder each of such reserves shall be adjusted to actual by distributing the balances therein to net voyage profit for the accounting periods involved in the same ratio as the reserve charges to vessel operating expenses in such period bears to the total revenue thereof for the entire period.

VI. Bills of lading or voyage charters. Notwithstanding the provisions of Clause 17, Part II, of the Addendum, Charterers engaged in coastwise or intercoastal trades will be permitted to use the standard forms of bill of lading set forth in the tariffs published by the Charterer and filed with the Interstate Commerce Commission.

VII. Period of vessel's use. As to each vessel listed on the attached schedule marked Exhibit B, as supplemented and modified, a maximum period of about twenty-four months, it being agreed that no voyage shall be commenced after June 30, 1949.

VIII. Definition. For the purposes of this Addendum, the term "domestic trade (coastwise and intercoastal)" as used in Public Law 147, 81st Cong.; 50 U. S. C. App. and Sup. 1745, 1738) shall be substituted in lieu thereof:

Net Voyage Profit, reading follows:

Upon application of the Charterer supported by adequate data based on past experience, the Owner may agree that in vessel operating expenses of such charges as the Owner determines to be fair and reasonable to provide reserves for vessel repair expenses and/or F. and L. insurance deductible average losses on all voyages terminating after December 31, 1946, provided that at the time of final accounting hereunder each of such reserves shall be adjusted to actual by distributing the balances therein to net voyage profit for the accounting periods involved in the same ratio as the reserve charges to vessel operating expenses in such period bears to the total revenue thereof for the entire period.

By:

X. Special provisions.

In witness whereof, the Owner has executed this Addendum in quadruplicate the day of , 194.

By:

Execution for Charterer:

Attest:

or if not Incorporated

In the presence of:

UNITED STATES OF AMERICA

By: United States Maritime Commission

For the Commission

Execution for Owner:

Approved as to form:

By: Assistant General Counsel

I, , duly designated, qualified, and acting Secretary of , party to this Agreement, and, as such, I am the custodian of the official records and the radial books of its governing body; that, who signed this Agreement on behalf of said corporation, was then the duly designated, qualified, and acting Secretary of said corporation, that said officer affixed his manual signature to said Agreement in his official capacity as said officer for and on behalf of said corporation by authority and direction of its governing body duly made and taken: that said Agreement is within the scope of the corporate and lawful powers of this corporation.

[CORPORATE SEAL]

Secretary

[SEAL]

A. J. Williams, Secretary.

January 12, 1950.


By order of the United States Maritime Commission.

[TITLE 47—TELECOMMUNICATIONS

Chapter I—Federal Communications Commission

PART 3—RADIO BROADCAST SERVICES

FM BROADCAST STATIONS

In the matter of amendment of Standards of Good Engineering Practice concerning FM broadcast stations to revise lists of approved equipment in sections 16, 17, and 18.

At a session of the Federal Communications Commission held at its offices in Washington, D. C., on the 18th day of January 1950.

Whereas, sections 16, 17, and 18 of the Standards of Good Engineering Practice concerning FM broadcast stations provide that lists of approved equipment will be issued from time to time for incorporation in these Standards.

Whereas, the Commission has approved certain equipment in accordance with sections 13, 14, and 15 of these Standards.

Whereas, the Commission has been advised by certain manufacturers that they do not intend to proceed with the manufacture of equipment hereafter proposed and given tentative approval, and

Whereas, the Commission has found that it will be in the public interest to amend the Standards of Good Engineering Practice concerning FM broadcast stations so as to revise these lists in accordance with changes and additions that have been made since last amended, and

Whereas, these amendments do not preclude the approval of additional equipment in accordance with these Standards, and

Whereas, the amendments are issued under the authority of sections 303 (e) and 303 (r) of the Communications Act of 1934, as amended, and
Wednesday, January 25, 1950

Whereas, in view of the foregoing, the Commission is of the opinion that it is unnecessary that the procedure for proposed rule making prescribed in section 4 of the Administrative Procedure Act be followed, and that for the same reasons the amendments may become effective immediately,

It is therefore ordered, That sections 15, 17, and 16 of the Standards of Good Engineering Practice concerning FM broadcast stations be and are hereby amended to read as set forth below.

[S. 305 (r), 50 Stat. 151; 47 U. S. C. 305 (r)]. Applies sec. 305 (e), 48 Stat. 1082; 47 U. S. C. 303 (r). The Commission is of the opinion that it is

16. A

Department of the Treasury

Bureau of Narcotics

[21 CFR, Ch. II ]

Addiction-Forming or Addiction-Sustaining Liability of Drug Nu-2206

Notice of Proposed Rule Making

Notice is hereby given, pursuant to the provisions of section 1 of the act of March 5, 1936 (60 Stat. 38; 26 U. S. C. 3228), section 4 of the Administrative Procedure Act (60 Stat. 238; 5 U. S. C. 1003), and by virtue of authority vested in me by the Secretary of the Treasury (21 CFR 203.1), that a determination is proposed to be made that the new drug Nu-2206 (3-hydroxy-N-methylmorphinan) has an addiction-forming or addiction-sustaining liability similar to morphine and is an opiate.

Consideration will be given to any written data, views, or arguments pertaining to the addiction-forming or addiction-sustaining liability of Nu-2206, which are received by the Commissioner of Narcotics prior to February 20, 1956. Any person desiring to be heard on the addiction-forming or addiction-sustaining liability of Nu-2206 will be accorded the opportunity at a hearing in the office of the Commissioner of Narcotics, 1709 E Street.

The proposed revision of Part 4b which is attached hereto is basically an editorial revision of the part in line with current regulations and will be useful in compliance with current transport category requirements and will be useful in

FEDERAL REGISTER

15. Approved Transmitters—Continued

Manufacturer's name Type No. Rated power

Collins Radio Co., Cedar Rapids, Iowa. 73A. 250 watts.4 kw. 5 kw. 10 kw.

Do. 73A. 5 kw. 10 kw.

Federal Telephone & Radio Corp., Newark, N. J. 102 A. 5 kw. 10 kw.

Do. 102 A. 10 kw.

DOOLITTLE RADIO, INC., CHICAGO, I1L

Do. 192 A, 250 watts. 1 kw. 3 kw. 10 kw. 50 kw.

[14 CFR, Part 4b ]

Civil Aeronautics Board

Airplane & Motor Vehicle Transport Categories

Notice of Proposed Rule Making

Pursuant to authority delegated by the Civil Aeronautics Board to the Bureau of Safety Regulation, notice is hereby given that the Bureau has under consideration a revision of Part 4b as hereinafter set forth.

Interested persons may participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Communications submitted in such written data, views, or arguments as they may desire. Communications should be submitted to the Civil Aeronautics Board, attention Bureau of Safety Regulation, Washington 25, D. C. All communications received within 30 days from the date of this publication will be considered by the Board before taking further action on the proposed rule.

The proposed revision of Part 4b which is attached hereto is basically an editorial revision of the part in line with current Federal Register requirements and the new transportation regulations established for the Civil Air Regulations. There has been some rearrangement of material, some clarification of language, and a few substantive modifications which have been fully discussed with the industry and with which, we believe, there is no disagreement. It is believed that the revision will aid the industry in complying with current transportation category requirements and will be useful in

Page 4

PROPOSED RULE MAKING

DEPARTMENT OF THE TREASURY

Bureau of Narcotics

[21 CFR, Ch. II ]

Addiction-Forming or Addiction-Sustaining Liability of Drug Nu-2206

Notice of Proposed Rule Making

Notice is hereby given, pursuant to the provisions of section 1 of the act of March 8, 1946 (60 Stat. 38; 26 U. S. C. 3228), and by virtue of authority vested in me by the Secretary of the Treasury (21 CFR 203.1), that a determination is proposed to be made that the new drug Nu-2206 (3-hydroxy-N-methylmorphinan) has an addiction-forming or addiction-sustaining liability similar to morphine and is an opiate.

Consideration will be given to any written data, views, or arguments pertaining to the addiction-forming or addiction-sustaining liability of Nu-2206, which are received by the Commissioner of Narcotics prior to February 20, 1956. Any person desiring to be heard on the addiction-forming or addiction-sustaining liability of Nu-2206 will be accorded the opportunity at a hearing in the office of the Commissioner of Narcotics, 1709 E Street.

The proposed revision of Part 4b which is attached hereto is basically an editorial revision of the part in line with current Federal Register requirements and the new transportation regulations established for the Civil Air Regulations. There has been some rearrangement of material, some clarification of language, and a few substantive modifications which have been fully discussed with the industry and with which, we believe, there is no disagreement. It is believed that the revision will aid the industry in complying with current transportation category requirements and will be useful in

Page 4
considering any changes in airworthiness requirements which were proposed in the annual plan for reviewing this part of the regulations.

In order to permit the revision to supersede fully, the current part and thus save the Administrator the cost of printing and distributing amendments of existing type designs in so far as such amendments or modifications affect requirements which should be explored fully before any definite change is proposed.

\[ \text{PROPOSED RULE MAKING} \]

There is also attached an explanatory statement setting forth some of the details of the changes from current Part 4b in the proposed revision.

This revision is proposed under the authority of Title VI of the Civil Aeronautics Act (Secs. 205 (a), 601-610, 32 Stat. 984, 1007, 1012; 49 U. S. C. 423 (a), 551-560).

Dated December 20, 1949, at Washington, D. C.

By the Bureau of Safety Regulation.

[SEAL]  
JOHN M. CHAMBERLAIN  
Director.

Explanatory statement. This statement will explain briefly the more important changes made in the proposed revision of Part 4b. There is included a provision permitting the issuance of a type certificate for aircraft certificated in whole or in part under the provisions of Part 4b, as hereinafter amended, received after the effective date of this part shall be subject to those provisions contained herein which are appropriate to such amendment or modification. No provision contained herein shall otherwise affect currently valid type designs of transport category aircraft or aircraft manufactured under the transport category unless it is specifically required by such provision.

\[ \text{Definitions} \]

§ 4b.1 Definitions. Unless otherwise noted, terms used in this part of the Regulations are defined as follows:

(a) Administrator.—(1) Administrator. The Administrator is the Administrator of Civil Aeronautics.

(2) Applicant. An applicant is a person or persons applying for approval of an airplane or any part thereof.

(3) Approved. Approved, when used alone or as modifying terms such as means, devices, specifications, etc., shall mean approved by the Administrator.

(4) General design.—(1) Standard atmosphere. The standard atmosphere is an atmosphere defined as follows:

(i) The air is a dry perfect gas.

(ii) The temperature at sea level is 59° F.

(iii) The pressure at sea level is 29.82 inches Hg.

(iv) The temperature gradient from sea level to the altitude at which the temperature equals —67° F. is —0.00386° F./ft. and zero thereafter.

(v) The density \( \rho \) at sea level under the above conditions is 0.002370 pounds per cubic foot.

(12) Maximum anticipated air temperature. The maximum anticipated air temperature is a temperature specified for the purpose of compliance with the powerplant cooling standards. (See § 4b.451 (b)).

(13) Airplane configuration. Airplane configuration is a term referring to the position of the various elements affecting the aerodynamic characteristics of the airplane (e. g. wing flaps, landing gear, etc.).

(4) Aerodynamic coefficients. The aerodynamic coefficients as used herein are nondimensional coefficients for forces.
and moments. They correspond with the criteria specified by the U. S. National Advisory Committee for Aeronautics.

(5) Critical engine(s). The critical engine is that engine(s) the failure of which gives the most adverse effect on the airplane flight characteristics relative to the case under consideration.

(6) Critical engine-failure speed. The critical-engine-failure speed is the airplane speed at which compliance with the requirements of this part of the Civil Air Regulations is demonstrated. (See § 4b.112.)

(7) V_{FE}: The design maneuvering speed.

(8) V_{DF}: The design diving speed.

(9) V_{T}: The design take-off speed.

(10) V_{M}: The design maximum speed.

(11) V_{M/S}: The design maximum speed with wing flaps in a prescribed extended position.

(12) V_{L}: The landing gear extended speed is the maximum speed at which the airplane can be flown safely with the landing gear extended. (See § 4b.716.)

(13) V_{L/G}: The landing gear operating speed is a maximum speed at which the landing gear can be raised or lowered safely. (See § 4b.715.)

(14) V_{M/C}: The critical-engine-failure speed.

(15) V_{M/D}: The design cruising speed.

(16) V_{M/T}: The design take-off safety speed.

(17) V_{M/S}: The minimum steady flight speed with wing flaps in the landing position. (See §§ 4b.112 and 4b.160.)

(18) V_{M}: The stalling speed or the minimum steady flight speed obtained in a specified configuration. (See § 4b.112 (b).)

(19) V_{M/C}: The critical-engine-failure speed.

(20) V_{M/D}: The design diving speed.

(21) V_{M/S}: The design maximum speed with one engine inoperative. (See § 4b.132.)

(22) V_{M}: The never-exceed speed. (See § 4b.711.)

(23) V_{M/D}: The normal operating limit speed.

(24) V_{M/S}: The stalling speed or the minimum steady flight speed with wing flaps in the landing position. (See §§ 4b.112 (a) and 4b.160.)

(25) V_{M}: The stalling speed or the minimum steady flight speed obtained in a specified configuration. (See § 4b.112 (b).)

(26) V_{M/C}: The critical-engine-failure speed.

(27) V_{M/D}: The design take-off safety speed.

(28) V_{M/S}: The minimum steady flight speed with wing flaps in the landing position. (See §§ 4b.112 (a) and 4b.160.)

(29) V_{M}: The stalling speed or the minimum steady flight speed obtained in a specified configuration. (See § 4b.112 (b).)

(30) V_{M/C}: The critical-engine-failure speed.

(31) V_{M/D}: The design take-off safety speed.

(32) V_{M/S}: The minimum steady flight speed with wing flaps in the landing position. (See §§ 4b.112 (a) and 4b.160.)

(33) V_{M}: The stalling speed or the minimum steady flight speed obtained in a specified configuration. (See § 4b.112 (b).)

(34) V_{M/C}: The critical-engine-failure speed.

(35) V_{M/D}: The design take-off safety speed.

(36) V_{M/S}: The minimum steady flight speed with wing flaps in the landing position. (See §§ 4b.112 (a) and 4b.160.)

(37) V_{M}: The stalling speed or the minimum steady flight speed obtained in a specified configuration. (See § 4b.112 (b).)

(38) V_{M/C}: The critical-engine-failure speed.

(39) V_{M/D}: The design take-off safety speed.

(40) V_{M/S}: The minimum steady flight speed with wing flaps in the landing position. (See §§ 4b.112 (a) and 4b.160.)

(41) V_{M}: The stalling speed or the minimum steady flight speed obtained in a specified configuration. (See § 4b.112 (b).)

(42) V_{M/C}: The critical-engine-failure speed.

(43) V_{M/D}: The design take-off safety speed.

(44) V_{M/S}: The minimum steady flight speed with wing flaps in the landing position. (See §§ 4b.112 (a) and 4b.160.)

(45) V_{M}: The stalling speed or the minimum steady flight speed obtained in a specified configuration. (See § 4b.112 (b).)

(46) V_{M/C}: The critical-engine-failure speed.

(47) V_{M/D}: The design take-off safety speed.

(48) V_{M/S}: The minimum steady flight speed with wing flaps in the landing position. (See §§ 4b.112 (a) and 4b.160.)

(49) V_{M}: The stalling speed or the minimum steady flight speed obtained in a specified configuration. (See § 4b.112 (b).)

(50) V_{M/C}: The critical-engine-failure speed.

(51) V_{M/D}: The design take-off safety speed.

(52) V_{M/S}: The minimum steady flight speed with wing flaps in the landing position. (See §§ 4b.112 (a) and 4b.160.)

(53) V_{M}: The stalling speed or the minimum steady flight speed obtained in a specified configuration. (See § 4b.112 (b).)
PROPOSED RULE MAKING

§ 4b.10 Eligibility for type and airworthiness certificates. An airplane shall be eligible: for type and airworthiness certification under the provisions of this part if it complies with the airworthiness provisions hereinafter established for the airplane. The Administrator finds that the provision or provisions not complied with are compensated for by other design features which provide an equivalent level of safety: Provided, That the Administrator finds no feature or characteristic of the airplane which renders it unsafe for the transport category.

§ 4b.11 Amendment. Unless otherwise specified, an amendment of this part shall be effective with respect to airplanes for which application for type certificates are filed more than 60 days after the adoption date of the amendment.

§ 4b.12 Type certificate. An applicant shall be issued a type certificate when he demonstrates the eligibility of the aircraft: by complying with the requirements of §§ 4b.13 through 4b.15 in addition to those contained in Part 2 of the Civil Air Regulations.

§ 4b.13 Data required. The applicant for a standard type certificate shall submit to the Administrator such descriptive data as are necessary to demonstrate that the airplane complies with the airworthiness requirements. The descriptive data shall be in written or printed form and shall consist of drawings and specifications disclosing the configuration of the airplane and all design features covered in the airworthiness requirements as well as sufficient information on dimensions, materials, and processes to describe the strength of the structure. The type design shall describe the airplane in sufficient detail to permit the airworthiness of subsequent airplanes of the same type to be determined by comparison with the type design.

§ 4b.14 Inspection and tests. Inspections and tests shall include all those found necessary by the Administrator to insure that the airplane complies with the applicable airworthiness requirements and conforms with the following:

(a) All materials and products are in accordance with the specifications in the type design;

(b) All parts of the airplane are constructed in accordance with the drawings in the type design;

(c) All manufacturing processes, construction, and assembly are such that the design strength and safety contemplated by the type design will be realized in service.

§ 4b.15 Flight tests. After proof of compliance with the structural requirements contained in this part and upon completion of all necessary inspections and testing on the ground, and proof of the designation of the airplane as conforming to the type design, and upon receipt from the applicant of a report of flight tests performed by him, the following shall be conducted:

(a) Such official flight tests as the Administrator finds necessary to determine compliance with the requirements of this part as may be chosen.

(b) After the conclusion of flight tests specified in paragraph (a) of this section, such additional flight tests as the Administrator finds necessary to ascertain whether the airplane's components, and equipment are reliable and function properly. The extent of such additional flight tests shall depend upon the complexity of the airplane, the number and nature of new design features and experience of the particular airplane model, its components, and equipment. If practical, these flight tests shall be conducted on the same airplane used in the flight tests specified in paragraph (a) of this section.

§ 4b.16 Airworthiness certificates. An airplane manufactured in accordance with a type certificate (see § 4b.12) and conforming to the type design shall become eligible for an airworthiness certificate under paragraphs (a) and (b) of this section when, upon inspection of the airplane, the Administrator finds that it so conforms and that it is in a condition for safe operation. For each newly manufactured airplane this finding shall include a flight check by the applicant.

(a) Standard certificate. To become eligible for a standard certificate an airplane shall comply with all of the requirements of this part which are applicable to the particular airplane, and the Administrator determines that the airplane is intended only for the purpose for which it is to be used.

(b) Restricted certificate. An airplane intended to be operated for a restricted purpose for which full compliance with the requirements of this part would be impracticable, shall be eligible for a restricted airworthiness certificate if it complies with all the requirements of this part which are not rendered inapplicable by the nature of the special purpose involved. The Administrator shall establish such operating restrictions for the airplane as he finds will provide a level of safety equivalent to that established for the transport category.

(c) Experimental certificate. An airplane shall become eligible for a type and airworthiness experimental certificate when the applicant presents evidence that the airplane is intended only for experimental purposes, and the Administrator finds that with appropriate restrictions it can be so operated without endangering the general public. The applicant shall submit data to identify the airplane together with any other pertinent information found by the Administrator necessary to safeguard the general public.

§ 4b.17 Production certificate. For requirements with regard to production certificates see Part 2 of this chapter.

§ 4b.18 Approval of materials, parts, processes, and appliances. (a) Materials, parts, processes, and appliances shall be approved upon a basis and in a manner determined by the Administrator to implement the pertinent provisions of the Civil Air Regulations. The Administrator may adopt and publish such specifications as he finds necessary to administer this section, and shall incorporate therein such portions of all applicable Federal and military specifications respecting such materials, parts, processes, and appliances as he finds appropriate.
(b) Any material, part, process, or appliance shall be deemed to have met the requirements for approval when it meets the pertinent specifications adopted by the Administrator, and the manufacturer so certifies in a manner prescribed by the Administrator.

Changes

§ 4b.20 General. When the type design is changed, the applicant or holder of the type certificate shall demonstrate that the airplane complies with all applicable airworthiness requirements. (See § 4b.21.)

§ 4b.21 Classification of changes. Changes shall be classified as minor and major. A minor change shall be one which has no appreciable effect on the weight, balance, structural strength, powerplant operation, flight characteristics, or other characteristic affecting the airworthiness of the airplane. A major change shall be one not classified as a minor change.

§ 4b.22 Approval of minor changes. Minor changes to type designs may be approved by an authorized representative of the Administrator prior to the submission to the Administrator of any revised drawings.

§ 4b.23 Approval of major changes. Major changes to type designs shall be approved only after receipt by the Administrator of substantiating data and necessary descriptive data for inclusion in the type certificate. (See § 4b.24.)

§ 4b.24 Service experience changes. (a) Where the Administrator finds, as a result of service experience, that an unsafe condition exists with respect to a design feature, part, or characteristic of any airplane certificated under this part, he shall furnish notice thereof to all operators of airplanes of that type and the airplanes shall not thereafter be operated until the unsafe condition has been corrected, unless otherwise authorized by the Administrator under specified conditions and limitations.

(1) When the Administrator finds that design changes are necessary to correct the unsafe condition of the airplane, the holder of the type certificate, upon request of the Administrator, shall submit appropriate design modifications for the approval of the Administrator.

(2) Upon approval, such changes shall be a part of the type design of the type certificate, and descriptive data covering the changes shall be made available by the holder of the type certificate to all operators of airplanes previously certificated under such type certificate.

(3) All airplanes of the same type shall be modified in accordance with such amended type certificate.

(b) Where no current unsafe condition exists but the Administrator or the holder of the type certificate finds through service experience that changes in type design will contribute to the safety of the airplane, the holder of the type certificate may submit appropriate design modifications for the approval of the Administrator. Upon approval of such modifications, the design of the type certificate shall be amended accordingly, and all airplanes manufactured thereafter shall be modified in accordance with such amended type certificate. The manufacturer shall make available to all operators of the same type of airplane information on the design modifications.

SUBPART B—FLIGHT

§ 4b.100 Proof of compliance. (a) Compliance with the requirements prescribed in this subpart shall be established by flight or other tests conducted upon an airplane of the type for which a certificate of airworthiness is sought or by calculations based on such tests, provided that the results obtained by calculations are consistent in accuracy to the results of direct testing.

(b) Compliance with each requirement shall be established at all appropriate combinations of weight and center of gravity position within the range of loading conditions for which certification is sought by systematic investigation of all these combinations, except where compliance can be inferred reasonably from those combinations which are investigated.

(c) The controllability, stability, trim, and stall characteristics of the airplane shall be established at all altitudes up to the maximum anticipated operating altitude.

(d) The applicant shall provide a person holding an appropriate pilot certificate to make the flight tests, but a designated representative of the Administrator shall pilot the airplane when it is found necessary to determine the compliance with the airworthiness requirements.

(e) Official type tests shall be discontinued until corrective measures have been taken by the applicant when either:

(1) The applicant's test pilot is unable or unwilling to conduct any of the required flight tests; or

(2) It is found necessary that requirements which have not been met are so substantial as to render additional test data meaningless or of such nature as to make further testing unreasonably hazardous.

(f) Adequate provision shall be made for emergency egress and for the use of parachutes by members of the crew during the flight tests.

(g) The applicant shall submit to the Administrator's representative a report covering all computations and tests required in connection with calibration of instruments used for test purposes and correction of test results to standard atmospheric conditions. The Administrator's representative shall conduct any flight tests which he finds necessary to check the calibration and correction report.

§ 4b.101 Weight limitations. The maximum and minimum weights at which the airplane shall be suitable for operation shall be established as follows:

(a) Maximum weights shall not exceed any of the following:

(b) The design minimum weight for which the structure has been proven;

(c) The minimum weight for which compliance with all the applicable flight requirements has been demonstrated.

§ 4b.102 Center of gravity limitations. Center of gravity limits shall be established as the most forward position permissible for each weight in accordance with § 4b.101 and the most aft position permissible for each of such weight. Limits of the center of gravity range shall not exceed any of the following:

(a) The extremes selected by the applicant;

(b) The extents for which compliance with all the applicable flight requirements has been demonstrated.

§ 4b.103 Additional limitations on weight distribution. If a weight and center of gravity combination is not permissible only within certain load distribution limits (e.g., spanwise) which could be exceeded inadvertently, such limits shall be established together with the corresponding weight and center of gravity combinations, and shall not exceed any of the following:

(a) The weight selected by the applicant;

(b) The limits for which the structure has been proven;

(c) The limits for which compliance with all the applicable flight requirements has been demonstrated.

§ 4b.104 Empty weight. (a) The empty weight, and the corresponding center of gravity position, shall be determined by weighing the airplane. This weight shall exclude the weight of the crew and payload, but shall include the weight of all fixed ballast, unusable fuel supply, undrainable oil, total quantity of engine coolant, and total quantity of all other fluids, except for the fuels, oil, coolant tanks, and the items of equipment installed.

§ 4b.105 Use of ballast. Removable ballast may be used to equalize the weight of the airplane to comply with the flight requirements. (See §§ 4b.738 and 4b.741 (c).)
PROPOSED RULE MAKING

for standard atmospheric conditions and still air.

§ 4b.111 Wing flap positions. (a) The wing flap positions denoted respectively as the take-off, en route, approach, and landing shall be selected by the applicant. (See also § 4b.323.)

(b) The flap positions may be made variable with weight and altitude.

§ 4b.112 Stall ing speeds. (a) The speed, $V_{St}$, denotes the true indicated stalling speed, or the minimum steady flight speed at which the airplane is controllable, in miles per hour, with:

1. Engines idling, throttles closed (or not more than sufficient power for zero thrust at a speed not greater than 110 percent of the stalling speed);
2. Propeller pitch controls in the position normally used for take-off;
3. Landing gear extended;
4. Wing flaps in the landing position;
5. Cowl flaps closed;
6. Center of gravity in the most unfavorable position within the allowable landing range;
7. The weight of the airplane equal to the weight in connection with which $V_{St}$ is being used as a factor to determine a required performance.

(b) The speed, $V_{St}$, denotes the true indicated stalling speed, or the minimum steady flight speed at which the airplane is controllable, in miles per hour, with:

1. Engines idling, throttles closed (or not more than sufficient power for zero thrust at a speed not greater than 110 percent of the stalling speed);
2. Propeller pitch controls in the position normally used for take-off;
3. Landing gear extended;
4. Wing flaps in the landing position;
5. Cowl flaps closed;
6. Center of gravity in the most unfavorable position within the allowable landing range;
7. The weight of the airplane equal to the weight in connection with which $V_{St}$ is being used as a factor to determine a required performance.

These speeds shall be determined by flight tests using the procedures outlined in § 4b.160 (b).

§ 4b.113 Take-off; general. (a) The take-off data in §§ 4b.114 to 4b.116, inclusive, shall be determined under the following conditions:

1. At all weights and altitudes selected by the applicant;
2. With a constant take-off flap position for the particular weight and altitude;
3. With the operating engines not exceeding their approved limitations at the particular altitude.

(b) All take-off data, when corrected, shall assume a level take-off surface, and shall be determined on a smooth, dry, hard-surfaced runway, in such a manner that the controllability under the conditions of the performance does not require exceptional skill or alertness on the part of the pilot.
(c) For temperature accountability data see § 4b.117. For wind and runway gradient corrections see appropriate operating parts of the Civil Air Regulations.

§ 4b.114 Take-off speeds. (a) The critical-engine-failure speed, $V_{c}$, in terms of true indicated air speed, shall be selected by the applicant, but shall not be less than the minimum speed at which the controllable airplane during take-off run to be adequate to permit proceeding safely with the take-off, using normal piloting skill, when the critical engine is suddenly made inoperative.

(b) The minimum take-off safety speed, $V_{t0}$, in terms of true indicated air speed shall be selected by the applicant so as to permit the rate of climb required in § 4b.126, but shall not be less than:

1. 1.50 $V_{St}$ for two-engine airplanes,
2. 1.15 $V_{St}$ for airplanes having more than two engines,
3. 1.10 times the minimum control speed, $V_{mc}$, established under § 4b.123.

(c) If $V_{c}$ is equal to or greater than $V_{t0}$, demonstration of controlability during take-off for $V_{c}$, as provided in paragraph (a) of this section, shall not be required.

§ 4b.115 Accelerate-stop distance. The accelerate-stop distance shall be the sum of the following:

1. The distance required to accelerate the airplane from a standing start to the speed $V_{S}$,
2. The distance required to arrest the airplane from the point corresponding with the speed $V_{S}$.

(b) In addition to, or in lieu of, wheel brakes, the use of other braking means shall be acceptable in determining the accelerate-stop distance, provided that such braking means shall have been proven to be safe and reliable, that the manner of their employment is such that consistent results can be expected under normal conditions of operation, and that exceptional skill is not required to control the airplane.

(c) The landing gear shall remain extended throughout the accelerate-stop distance.

§ 4b.116 Take-off path. The take-off path shall be considered to consist of the following five consecutive elements:

(a) The airplane is accelerated to the speed $V_{S}$, assuming the critical engine to fail at the speed $V_{S}$.

(b) The horizontal distance traversed and the height attained by the airplane in the time required to retract the landing gear when operating at the speed $V_{mc}$ with:

1. The critical engine inoperative, its propeller:
   (1) Windmilling with the propeller control in a position normally used during take-off until (if applicable) its rotation has been stopped (see paragraph (c) (1) of this section),
   (2) If applicable, stopped for the remainder of the gear retraction time.
2. The horizontal distance traversed and the height attained by the airplane in the time elapsed from the end of element (b) until the rotation of the inoperative propeller has been stopped when:
   (1) The operation of stopping the propeller is initiated not earlier than the instant the airplane has attained a total height of 50 feet above the take-off surface.
   (2) The airplane speed is equal to $V_{S}$.
   (3) The landing gear is retracted;
   (4) The inoperative propeller is windmilling with the propeller control in a position normally used during take-off.
3. The horizontal distance traversed and the height attained by the airplane in the time elapsed from the end of element (c) until the time limit on the use of take-off power is reached, while operating at the speed $V_{S}$, with:
   (1) The inoperative propeller stopped.
   (2) The landing gear fully retracted.
   (3) The airplane shall be capable of contending the engine cooling in the position which provides adequate cooling in the hot-day conditions.

§ 4b.117 Temperature accountability. Operating correction factors for take-off weight and take-off distance shall be determined to account for temperatures above and below standard, and when approved by the Administrator shall be included in the Airplane Flight Manual. These factors shall be obtained as follows:

(a) For any specific airplane type, the average full temperature accountability shall be computed for the range of weights of the airplane, altitudes above sea level, and ambient temperatures required by the expected operating conditions. Account shall be taken of the temperature effect on both the aerodynamic characteristics of the airplane and the engine power. The full temperature accountability shall be expressed per degree of temperature in terms of a weight correction, a take-off distance correction, and a change, if any, in the critical engine failure speed, $V_{c}$.

(b) The operating correction factors for the airplane weight and take-off distance shall be at least one-half of the full temperature accountability. The value of $V_{c}$ shall be further corrected by the average amount necessary to assure that the airplane can stop within the runway length at the ambient temperatures except that the corrected value of $V_{c}$ shall not be less than a minimum at which the airplane can be controlled with the critical engine inoperative.

§ 4b.118 Climb; general. Compliance with the climb requirements of §§ 4b.119 through 4b.121, shall be shown for standard atmospheric conditions, still air, and specified altitudes.

§ 4b.119 All engines operating; climb.—(a) General. The steady rate of climb shall be determined at any altitude at which the airplane is expected to operate and at any weight within the range of weights to be specified in the airworthiness certificate.

(b) Operating conditions. The steady rate of climb at 5,000 feet shall not be less in feet per minute than $8 V_{mc}$ with:

1. Landing gear fully retracted.
2. Wing flaps in the most favorable position.
3. Cowl flaps (or other means of controlling the engine cooling) in the position which provides adequate cooling in the hot-day conditions.
One-engine-inoperative climb—(a) Flaps in take-off position; landing gear extended. The steady rate of climb in feet per minute shall not be less than 0.07 \( V_s^2 \), at any altitude within the range for which take-off weight is to be specified in the certificate, with:

- (1) Double engine operating
- (2) Wing flaps in the take-off position
- (3) Cowl flaps in the position normally used during take-off
- (4) Center of gravity in the most unfavorable position permitted for landing
- (5) All engines operating at the take-off power available at such altitude
- (6) The weight equal to maximum landing weight for that altitude.

(b) Flaps in take-off position; landing gear retracted. The steady rate of climb in feet per minute shall not be less than 0.05 \( V_s^2 \), with all other conditions as described in paragraph (a) of this section.

(c) Flaps in en route position. The steady rate of climb in feet per minute shall not be less than 0.05 \( V_s^2 \) at any altitude within the range for which take-off weight is to be specified in the airworthiness certificate, shall be determined and shall, at a standard altitude of 5,000 feet and at the maximum take-off weight, be at least 0.02 \( V_s^2 \), for airplanes with a maximum take-off weight of 40,000 pounds, 0.04 \( V_s^2 \) for airplanes with a maximum take-off weight of 60,000 pounds or more, with a linear variation of the coefficient of \( V_s^2 \) between 40,000 pounds and 60,000 pounds.

(d) The landing gear retracted.

(e) Wing flaps in the most favorable position.

(f) Cowl flaps or other means of controlling the engine cooling air supply in the position which provides adequate cooling in the hot-day condition.

(g) Center of gravity in the most unfavorable position.

(h) The critical engine inoperative, its propeller stopped.

(i) All remaining engines operating at the maximum continuous power available at each altitude.

(j) The weight equal to maximum landing weight for that altitude.

\[ \text{Flaps in approach position.} \]

The steady rate of climb in feet per minute shall not be less than 1.1 \( V_s \), at any altitude within the range for which landing weight is to be specified in the certificate, with:

- (1) The landing gear retracted.
- (2) Wing flaps in position such that \( V_s \) does not exceed 1.1 \( V_s \).
- (3) Cowl flaps in the position normally used during an approach to a landing.
- (4) Center of gravity in the most unfavorable position permitted for landing.
- (5) The critical engine inoperative, its propeller stopped.
- (6) All remaining engines operating at the take-off power available at such altitude.

The horizontal distance required to land and to come to a complete stop (to a speed of approximately 3 m. p. h. for seaplanes or float plane) from a point 50 feet above the landing surface shall be determined for a range of weights and altitudes selected by the applicant. In making this determination the following conditions shall apply:

- (a) A steady gliding approach shall have been maintained down to the 50-foot altitude with a true indicated air speed of not less than 1.3 \( V_s \).
- (b) The nose of the airplane shall not be depressed, nor the forward thrust increased by application of power after reaching the 50-foot altitude.
- (c) At all times during and immediately prior to the landing, the flaps shall be in the landing position, except that after the airplane is on the landing surface and the true indicated air speed has been reduced to not more than 0.9 \( V_s \), the flap position may be changed.
- (d) The landing shall be made in such manner that there is no excessive vertical acceleration, no tendency to bounce, none over, ground loop, porpoise, or water loop, and in such manner that its reproduction shall not require any exceptional degree of skill on the part of the pilot, or exceptionally favorable conditions.
except that maximum continuous power shall be used.

(2) With power off, flaps retracted, and the airplane trimmed at 1.4 $V_{S1}$, take-off power shall be applied quickly while maintaining the same air speed.

(i) The maneuver of this subparagraph shall be repeated, except that the flaps shall be extended.

(3) With power off, flaps extended, and the airplane trimmed at 1.4 $V_{S1}$, air speeds within the range of 1.1 $V_{S1}$ to 1.7 $V_{S1}$, or $V_{LE}$, whichever is the lesser, shall be obtained and maintained.

(c) It shall be possible without the use of exceptional piloting skill to prevent loss of altitude when flap retraction from any position is initiated during steady horizontal flight at 1.1 $V_{S1}$ with simultaneous application of not more than maximum continuous power.

(See also § 4b.323.)

§ 4b.132 Directional and lateral control—(a) Directional control; general. It shall be possible, while holding the wings approximately level, to execute reasonably sudden changes in heading in either direction without encountering dangerous characteristics. Heading changes up to 15° shall be demonstrable, except that the heading change at which the rudder pedal force is 180 pounds need not be exceeded. The control shall be demonstrated at a speed equal to 1.4 $V_{S1}$ under the following conditions:

(1) The critical engine inoperative and its propeller in the minimum drag condition.

(2) The other engine(s) at maximum continuous power and the airplane trimmed as indicated, the characteristics of the elevator control forces and friction shall comply with the following:

(a) The other engine(s) at maximum continuous power, and the airplane trimmed as indicated, the characteristics of the elevator control forces and friction shall comply with the following:

(i) The other engine(s) at maximum continuous power, and the airplane trimmed as indicated, the characteristics of the elevator control forces and friction shall comply with the following:

(ii) The critical engine inoperative and its propeller in the minimum drag condition.

(b) The airplane trimmed at 1.4 $V_{S1}$ with the landing gear extended or with the landing gear retracted, and the corresponding trim control by the pilot or the automatic pilot, the airplane shall comply with the requirements of §§ 4b.141 through 4b.144.

(i) The other engine(s) at maximum continuous power, and the airplane trimmed as indicated, the characteristics of the elevator control forces and friction shall comply with the following:

(ii) The critical engine inoperative and its propeller in the minimum drag condition.

§ 4b.133 Minimum control speed, $V_{MC}$, (a) A minimum speed shall be determined under the conditions specified in this paragraph, so that, when one engine is suddenly made inoperative at that speed, it shall be possible to recover control of the airplane, with one engine still inoperative, and maintain it in straight flight at that speed, either with zero yaw or, at the option of the applicant, with an angle of bank not in excess of 5°. Such speed shall not exceed 1.2 $V_{S1}$ with:

(1) Take-off or maximum available power on all engines.

(2) Rearmost center of gravity.

(3) Flaps in take-off position.

(4) Landing gear retracted.

(b) In demonstrating the minimum speed of paragraph (a) of this section, the rudder force required to maintain control shall not exceed 180 pounds, nor shall it be necessary to throttle the remaining engine.

(c) During recovery of the maneuver of paragraph (a) of this section, the airplane shall not assume any dangerous attitude, nor shall it require exceptional skill, strength, or alertness on the part of the pilot to prevent a change of heading in excess of 20° before recovery is complete.

§ 4b.140 General. The means used for trimming the airplane shall be such that after being trimmed and without further pressure upon, or movement of, either the primary control or its corresponding trim control by the pilot or the automatic pilot, the airplane shall comply with the trim requirements of §§ 4b.141 through 4b.144.

§ 4b.141 Lateral and directional trim. The airplane shall maintain lateral and directional trim under the most adverse conditions of center of gravity relative to the elevator control forces and friction depending upon the airplane's center of gravity position, and at the weight at which the two-engine-inoperative climb is equal to at least 0.01 $V_{LE}$, at an altitude of 8,000 feet.

§ 4b.142 Longitudinal trim. The airplane shall maintain longitudinal trim at any speed which can be obtained with throttles closed.

§ 4b.143 Longitudinal and directional trim. The airplane shall maintain longitudinal and directional trim at a speed equal to 1.4 $V_{S1}$, during climbing flight with the critical engine inoperative, with:

(a) The other engine(s) at maximum continuous power.

(b) The landing gear retracted.

(c) Wings flaps retracted.

§ 4b.144 Trim for airplanes with four or more engines. The airplane shall maintain trim in rectilinear flight at the climb speed, configuration, and power used in establishing the rates of climb in §§ 4b.121, with the most unfavorable center of gravity position, and at the weight at which the two-engine-inoperative climb is equal to at least 0.01 $V_{LE}$, at an altitude of 8,000 feet.

§ 4b.150 General. The airplane shall be longitudinally, directionally, and laterally stable in accordance with §§ 4b.151 through 4b.157. Suitable stability and control "feel" (static stability) shall be required in other conditions normally encountered in service if flight tests show such stability to be necessary for safe operation.

§ 4b.151 Static longitudinal stability. In the configurations outlined in §§ 4b.153 through 4b.155, and with the airplane trimmed as indicated, the characteristics of the elevator control forces and friction shall comply with the following:

(a) A pull shall be required to obtain and maintain speeds below the specified trim speed, and a push shall be required to obtain and maintain speeds above the specified trim speed. This criterion shall apply at any speed which can be obtained without excessive control force, except that such speeds need not be greater than the appropriate operating limit speed or need not be less than the minimum speed in steady unloaded flight.

(b) The airspeed shall return to within 10 percent of the original trim speed when the control force is slowly released from any speed within the limits defined in paragraph (a) of this section.

(c) The stable slope of stick force curve versus speed of §§ 4b.152 through 4b.155 shall be such that any substantial change in speed is clearly perceptible to the pilot through a resulting change in stick force.

§ 4b.152 Stability during landing. The stick force curve shall have a stable slope, and the stick force shall not exceed 80 pounds at any speed between 1.1 $V_{S1}$ and 1.8 $V_{S1}$,

(a) Wing flaps in the landing position.

(b) The landing gear extended.

(c) Maximum landing weight.

(d) Throttles closed on all engines.

(e) The airplane trimmed at 1.4 $V_{S1}$ with throttles closed.

§ 4b.153 Stability during approach. The stick force curve shall have a stable slope at all speeds between 1.1 $V_{S1}$ and 1.8 $V_{S1}$,

(a) Wing flaps in sea level approach position.
§ 4b.180 Stalling; symmetrical power.
(a) Stalls shall be demonstrated with:
(1) Power off,
(2) The power necessary to maintain level flight at a speed of 1.6 $V_s$, with flaps extended, at the speed at which the airplane is trimmed, and at maximum landing weight,
(3) The wings and flaps extended in any likelihood of combination of positions,
(4) All appropriate airplane weights,
(5) The center of gravity in the most adverse position for recovery,
(6) The airplane in straight flight and in turns with bank up to 30°.
(b) With trim controls adjusted for straight flight at a speed of 1.4 $V_s$, the speed shall be reduced by means of the elevator control until it is steady at slightly above stalling speed; then the elevator control shall be pulled back at a rate such that the airplane speed reduction does not exceed one mile per hour per second until a stall is produced thereon.
(c) In conditions of paragraphs (a) and (b) of this section it shall be possible to produce and correct roll and yaw by unreversed use of the aileron and rudder controls up to the moment when the airplane pitches.
(d) In straight flight stalls, the average roll occurring between the initiation of the pitching motion and the completion of the recovery shall not exceed 30°.
(e) No short period oscillation occurring between stalling speed and maximum permissible speed shall be heavily damped with the primary controls free and in a fixed position.

§ 4b.181 Stalling; asymmetrical power.
(a) The airplane shall be safely recoverable without applying power to the inoperative engine when stalled with:
(1) The critical engine inoperative,
(2) Flaps and landing gear retracted,
(3) The remaining engines operating up to 75 percent of maximum continuous power, except that the power need not be greater than that at which the use of maximum control travel does not hold the wings level laterally.
(b) The operating engines may be throttled back during the recovery from the stall.

§ 4b.182 Stall warning. Clear and distinctive stall warning shall be apparent to the pilot at a speed at least 5 percent above the stall speed, with flaps and landing gear in all possible positions, both in straight and turning flight. The warning may be furnished either through the inherent aerodynamic qualities of the airplane, by a speedo-meter, or by other means which will give clearly distinguishable indications under all conditions of flight which are to be expected in airline operations.

Ground Handling Characteristics
§ 4b.175 Directional stability and control. (a) There shall be no uncontrollable tendency for landplanes to nose over in any reasonably expected operating condition, or when bound occurs during landing or take-off.
(b) Wheel brakes shall operate smoothly and shall exhibit no undue tendency to induce nosing over.

Longitudinal stability and control
§ 4b.177 Directional stability and control. (a) There shall be no uncontrollable ground-looping tendency in 90° cross winds of velocity up to 0.2 $V_s$, at any ground speed at which the airplane is expected to operate.
(b) All landplanes shall be demonstrated to be satisfactorily controllable with no exceptional degree of skill or alertness on the part of the pilot in power-off landings, at normal landing speed, during which brakes or engine power are not used to maintain a straight path.
(c) Satisfactory means shall be provided for directional control of the airplane during taxiing.

Shock absorption. The shock absorbing mechanism shall not produce any component of wind velocity will have been demonstrated to be safe to take off or land.

Water Handling Characteristics
§ 4b.180 Stability and control. (a) The airplane shall not be so violent or extreme as to make it difficult, with normal piloting skill, to make a prompt recovery and regain control of the airplane.
(b) The airplane shall exhibit no uncontrollable porpoising at any speed at which the airplane is normally operated on the water.
(c) There shall be no uncontrollable looping tendency in 90° cross winds of velocity up to 0.2 $V_s$, at any ground speed at which the airplane is expected to operate on water.
(d) Satisfactory means shall be provided for directional control of the airplane during taxiing on water.

§ 4b.181 Spray characteristics. Spray during taxiing, take-off, or landing shall at no time dangerously obscure the vision of the pilots or produce damage to the propeller or other parts of the airplane.

§ 4b.182 Demonstrated cross winds. There shall be established a cross component of wind velocity which
PROPOSED RULE MAKING

miscellaneous flight requirements

§ 4b.190 flutter and vibration. (a) All parts of the airplane shall be demonstrated in flight to be free from flutter and land.
(b) There shall be no buffeting condition in normal flight severe enough to interfere with satisfactory control of the airplane, to cause excessive fatigue to the crew, or to cause structural damage.3

§ 4b.200 loads. Strength requirements of this subpart are specified in terms of limit and ultimate loads. Unless otherwise stated, the specified loads shall be considered as limit loads. In determining compliance with these requirements the following factors shall be applicable:
(a) The factor of safety shall be 1.5 unless otherwise specified.
(b) Unless otherwise provided, the specified air, ground, and water loads shall be placed in equilibrium with inertia forces, considering all items of mass in the airplane.
(c) All loads shall be distributed in a manner closely approximating or conservatively representing actual conditions.
(d) If deflections under load significantly change the distribution of external or internal loads, such redistribution shall be taken into account.

§ 4b.201 strength and deformation.
(a) The structure shall be capable of supporting limit loads without suffering detrimental permanent deformations.
(b) At all loads up to limit loads the deformation shall be such as not to interfere with safe operation of the airplane.
(c) The structure shall be capable of supporting ultimate loads without failure. It shall support the load for at least 3 seconds, unless proof of strength is demonstrated by dynamic tests simulating actual conditions of load application.

§ 4b.202 proof of structure. (a) Proof of compliance of the structure with the strength and deformation requirements of § 4b.201 shall be made for all critical loading conditions.
(b) Proof of compliance by means of structural analysis shall be acceptable only when the structure conforms to types for which experience has shown such methods to be reliable. In all other cases substantiating tests shall be required.

It is not the intent of this requirement to discourage such stall warning buffeting as does not contradict these provisions.

§ 4b.210 general. Flight load requirements shall be complied with at critical altitudes within the range for which certification is desired, as weight from the design minimum weight to the design maximum weight, the latter not being less than the design take-off weight, with any practicable distribution of available load within the prescribed operating limitations stated in the airplane flight manual. (See § 4b.740.) At all speeds in excess of these corresponding with a Mach number of 0.55, compressibility effects shall be taken into account.

(a) Flight load factor. The flight load factors specified in this subpart shall represent the component of acceleration in terms of the gravitational constant. The flight load factor shall be assumed to act normal to the longitudinal axis of the airplane, being equal in magnitude and shall be opposite in direction to the airplane inertia load factor at the center of gravity.
(b) Design air speeds. The design air speeds shall be “equivalent air speeds” and shall be chosen by the applicant, except that they shall not be less than the speeds defined in subparagraphs (1) through (5) of this paragraph. Where estimated values of the speeds $V_n$ and $V_c$ are used, such estimates shall be conservative.

(1) Design flap speed, $V_F$. The minimum value of the design flap speed shall be equal to 1.4 $V_s$ or 1.8 $V_c$, whichever is greater, where $V_s$ is the stalling speed with flaps retracted at the design landing weight, and $V_c$ is the stalling speed with flaps in the landing position at the design landing weight. (See § 4b.211 (a), and $V_s$ is the stalling speed with flaps retracted at the design take-off weight. (See fig. 4b-2.)
(2) Design maneuvering speed, $V_M$. The design maneuvering speed $V_M$ shall be equal to $V_n / \sqrt{n}$ where $n$ is the limit maneuvering load factor used (see § 4b.211 (a), and $V_s$ is the stalling speed with flaps retracted at the design take-off weight. (See fig. 4b-2.)

(3) Design speed for maximum gust intensity, $V_g$. $V_g$ shall be the speed at which the 40 foot per second gust line intersects the positive $C_{max}$ curve on the gust $V_n$ envelope (see § 4b.211 (b) and fig. 4b-3).
(4) Design cruising speed, $V_C$. The minimum design cruising speed $V_C$ shall be sufficiently greater than $V_D$ to provide for inadvertent speed increases likely to occur as a result of severe atmospheric turbulence. In the absence of a rational investigation substantiating the use of other values, $V_p$ shall not be less than $V_D + 50$ (m. p. h.), except that it need not exceed the maximum speed in level flight at maximum continuous power for the corresponding altitude. At altitudes where $V_p$ is limited by Mach number, $V_D$ need not exceed 0.8 $V_D$ such as shown in figure 4b-1, except that it shall not be less than 1.3 $V_p$, with the flaps retracted at the maximum altitude for which certification is desired.
(5) Design dive speed, $V_D$. The minimum design dive speed $V_D$ shall be sufficiently greater than $V_D$ to provide for...
safe recovery from inadvertent upsets occurring at \( V_p \). In the absence of a rational investigation the minimum value of \( V_p \), in the altitude range between sea level and an altitude selected by the applicant, shall not be less than 1.25 \( V_e \) or \( 1.40 \) (m. p. h.), whichever is greater. The altitude range chosen shall be adequate for the safe operation of the airplane. At higher altitudes than that selected by the applicant \( V_p \) may be employed only if it is shown that lower values of maneuvering load factor may be used in determining the airplane structural operating limitations as specified in § 4b.710.

(a) Maneuvering load factors. (See fig. 4b-2.) The airplane shall be assumed to be subjected to symmetrical maneuvers resulting in the limit load factors prescribed in subparagraphs (1) and (2) of this paragraph, except where limited by maximum (static) lift coefficients. Lower values of maneuvering load factor may be employed only if it is shown that the airplane embodies features of design which make it impossible to exceed such values in flight.

(1) The positive maneuvering load factor \( n \) for any flight speed up to \( V_p \) shall be limited to a Mach number selected in flight.

(2) The negative maneuvering load factor \( n \) shall have a minimum value of 1.0 at all speeds up to \( V_p \) and shall vary linearly with speed from the value at \( V_p \) to zero at \( V_e \).

(b) Gust load factors. The airplane shall be assumed to be subjected to symmetrical vertical gusts while in level flight. The resulting limit load factors shall correspond with the following conditions:

(1) Positive (up) and negative (down) gusts of 40 f. p. s. nominal intensity at a speed \( V_p \) shall be applicable where the positive \( \frac{40}{V_p} \) f. p. s. gust line intersects the positive \( C_{n_{\text{max}}} \) curve. If this gust intensity produces load factors greater than those obtained in condition (2), it may be modified at altitudes above 20,000 feet in such a manner as to produce a load factor not less than that obtained in condition (2).

(2) Positive and negative gusts of 30 f. p. s. at \( V_p \).

(3) Positive and negative gusts of 15 f. p. s. at \( V_p \).

(4) Gust load factors shall be assumed to vary linearly between the specified conditions as shown on the gust envelope of figure 4b-3.

### Figure 4b-2: Maneuvering envelope maneuvering load factor vs. speed, \((V-n)\) diagram.

departure from use at the relatively low air speeds of approach, landing, and take-off are installed, the airplane shall be assumed to be subjected to symmetrical maneuvers and gusts with the flaps in landing position at the design flap speed \( V_p \) resulting in limit load factors within the range determined by the following conditions:

(a) Maneuvering to a positive limit load factor of 2.6.

(b) Positive and negative 15 fps nominal intensity gusts acting normal to the flight path in level flight.

(c) In designing the flaps and supporting structures, slipstream effects shall be taken into account as specified in § 4b.323.

(d) When automatic flap operation is provided, the airplane shall be designed for the speeds and the corresponding flap positions which the mechanism permits. (See § 4b.323.)

### § 4b.212 Effect of high lift devices.

When flaps or similar high lift devices intended for use at the relatively low air speeds of approach, landing, and take-off are installed, the airplane shall be assumed to be subjected to symmetrical maneuvers and gusts with the flaps in landing position at the design flap speed \( V_p \) resulting in limit load factors within the range determined by the following conditions:

(a) Maneuvering to a positive limit load factor of 2.6.

(b) Positive and negative 15 fps nominal intensity gusts acting normal to the flight path in level flight.

(c) In designing the flaps and supporting structures, slipstream effects shall be taken into account as specified in § 4b.323.

(d) When automatic flap operation is provided, the airplane shall be designed for the speeds and the corresponding flap positions which the mechanism permits. (See § 4b.323.)

### § 4b.213 Symmetrical flight conditions—(a) Procedure of analysis. In the analysis of symmetrical flight conditions at least those specified in paragraphs (b), (c), and (d) of this section shall be considered. The following procedure of analysis shall be applicable.

(1) A sufficient number of points on the maneuvering and gust envelopes shall be investigated to insure that the maximum load for each part of the airplane structure is obtained. A conservative combined envelope may be used for this purpose.

(2) All significant forces acting on the airplane shall be placed in equilibrium in a rational or a conservative manner. The linear inertia forces shall be considered in equilibrium with wing and horizontal tail surface loads, while the angular (pitching) inertia forces shall be considered in equilibrium with wing and fuselage aerodynamic moments and horizontal tail surface loads.

(3) Where sudden displacement of a control is specified, the assumed rate of displacement need not exceed that which actually would be applied by the pilot.
(4) In determining elevator angles and chordwise load distribution in the maneuvering conditions of paragraphs (b) and (c) of this section in turns and pull-ups, account shall be taken of the effect of corresponding pitching velocities.

(b) Maneuvering balanced conditions. The maneuvering conditions A through I on the maneuvering envelope (fig. 4b-2) shall be investigated, assuming the airplane to be in equilibrium with zero pitching acceleration.

(c) Maneuvering unbalanced conditions. The following conditions on figure 4b-2 involving pitching acceleration shall be investigated.

(1) A. Unchecked pull-up at speed \( V_A \). The airplane shall be assumed to be flying in steady unaccelerated flight (point \( A \), on figure 4b-2) and the pitching control suddenly moved to obtain extreme positive pitching (nose up), flying in steady unaccelerated flight (point \( A \), on figure 4b-2) to be maneuvered to the positive maneuvering load factor (point \( A_1 \), on Fig. 4b-2), unless it is shown that a lesser value could not be exceeded:

\[
W \leq \frac{C_D}{S} \leq 10 \%.
\]

(2) A. Checked maneuver at speed \( V_A \). (i) The airplane shall be assumed to be maneuvered to the positive maneuvering load factor by a checked maneuver from an initial condition of steady unaccelerated flight (point \( A \), on fig. 4b-2). The initial positive pitching portion of this maneuver may be considered covered by subparagraph (1) of this paragraph.

(ii) A negative pitching acceleration (nose down) of at least the following value shall be assumed to be attained concurrently (nose up) with the airplane maneuvering load factor (point \( A_1 \), on Fig. 4b-2), unless it is shown that a lesser value could not be exceeded:

\[
\frac{-V_n^2}{2g} \leq (n - 1.5) (\text{radians/sec})^2
\]

where \( n \) is equal to the value of the positive maneuvering load factor as defined by point \( D_1 \), on figure 4b-2.

(3) D. and D. checked maneuver at \( V_D \). The airplane shall be assumed to be subjected to a checked maneuver from steady unaccelerated flight (point \( D \), on fig. 4b-2) to the positive maneuvering load factor (point \( D_2 \), on Fig. 4b-2) as follows:

(i) A positive pitching acceleration (nose up), equal to at least the following value, shall be assumed to be attained concurrently with the airplane load factor of unity, unless it is shown that lesser values could not be exceeded:

\[
\frac{-V_n^2}{2g} \leq (n - 1.5) (\text{radians/sec})^2
\]

where \( n \) is equal to the value of the positive maneuvering load factor as defined by point \( D_1 \), on figure 4b-2.

(4) G. Maneuvering. The gust conditions. The gust conditions \( B' \) through \( J' \) on figure 4b-3 shall be investigated.

(1) The load increment due to a specified gust shall be added to the initial balancing tail load corresponding with steady unaccelerated flight.

(2) The alleviating effect of wing down-wash and of the airplane's motion in response to the gust may be included in computing the tail gust load increment.

The gust factor \( K \) (§ 4b.211 (b) ) may be applied to the specified gust intensity for the horizontal tail, in lieu of a rational investigation of the airplane response.

\[ § 4b.214 \text{ Rolling conditions. The airplane shall be designed for rolling loads resulting from the conditions specified in paragraphs (a) and (b) of this section.} \]

(2) A. Positive pitching acceleration (nose down) of at least the following values shall be assumed in condition (2) of this paragraph, in the absence of a rational investigation of the airplane's response to a true gust, the gust loading on the vertical tail surfaces may be computed by the following formulas:

\[
W = \frac{K}{U} V_n \left( \frac{W}{V_A} \right) \left( \frac{S}{S_1} \right) \leq 10 \%
\]

where \( W \) = average limit unit pressure in pounds per square foot,

\( U \) = nominal gust intensity in feet per second,

\( V_A \) = design cruising speed in miles per hour,

\( C_D \) = design take-off weight, pounds,

\( S \) = vertical surface area sq. ft.

\[ § 4b.216 \text{ Supplementary flight conditions} \]

(a) Engine torque effects. Engine mounts and their supporting structures shall be designed for engine torque effects combined with basic flight loadings specified in paragraphs (1) and (2) of this paragraph. The limit torque shall be obtained by multiplying the mean torque by a factor of 1.5 in the case of engines having 3 or more cylinders.

(1) The limit load corresponding with maximum continuous power and propeller speed acting simultaneously with 75 percent of the limit loads from flight condition A (see fig. 4b-2).

(2) The limit load corresponding with maximum continuous power and propeller speed acting simultaneously with the limit loads from flight condition A (see fig. 4b-2).

(b) Side load on engine mount. The limit load factor in a lateral direction for this condition shall be equal to the maximum obtained in the yawing condition, but shall not be less than either 1.33 or one-third the limit load factor for flight condition A (see fig. 4b-2).

Engine
mounds and their supporting structure shall be designed for this condition which may be assumed independent of other conditions of operation.

(c) Pressure cabin loads. When pressurized compartments are provided for the occupants of the airplane, the following requirements shall be met. (See §§ 4b.213 through 4b.215, taking into account the effects of sudden release of pressure in any compartment having external doors or windows.

The condition of the airplane in a pressurized cabin loads condition shall be designed for the maximum horizontal surface load in combination with the critical vertical surface loading (load per unit area) and by bulkheads or floor, the primary control surface hinge moments are based on test data.

§ 4b.220 Control surface and system loads.

§ 4b.220 Control surface loads: general. The control surfaces shall be designed for the limit loads resulting from the flight conditions prescribed in §§ 4b.213 through 4b.215, taking into account the following provisions:

(a) Effect of pilot effort. (1) In the control surface flight loading conditions, the air loads on the movable surfaces and the corresponding deflections must be such that the limits of control can be obtained in flight by employing the maximum pilot control forces specified in figure 4b-5, except that two-thirds of the maximum values specified for the aileron and elevator shall be acceptable when control surface hinge moments are based on reliable data. In applying this criterion, proper consideration shall be given to the effects of servo mechanisms, tabs, and automatic pilot systems in assisting the pilot.

(b) Effect of trim tab. The effects of trim tabs on the control surface design conditions need be taken into account only in cases where the surface loads are limited on the basis of maximum pilot effort in accordance with the provisions of this section, and the deflections shall be those specified in § 4b.222.

§ 4b.221 Wing flaps. (a) Wing flaps, their operating mechanism, and control systems and their supporting structures shall be designed for the maximum horizontal surface load in combination with the critical vertical surface loading (load per unit area) and by bulkheads or floor, the primary control surface hinge moments are based on test data.

§ 4b.222 Tabs. (a) At all speeds up to 200 mph, elevator trim tabs shall be designed for the deflections required to trim the airplane at any point within the positive portion of the maneuvering V-n diagram of figure 4b-21, except as limited by the stops.

(b) Aileron and rudder trim tabs shall be designed for deflections required to trim airplane in appropriate unsymmetrical loadings and rigging, and symmetrical and unsymmetrical power conditions.

(c) Balancing and serve tabs shall be designed for deflections consistent with the primary control surface loading conditions.

§ 4b.229 Special devices. The loading for special devices employing aerodynamic surfaces, such as slots and spoilers, shall be based on test data.

§ 4b.244 Primary flight control systems. Elevator, aileron, and rudder control systems and their supporting structures shall be designed for loads corresponding with 125 percent of the computed hinge moments of the movable control surfaces in the conditions prescribed in §§ 4b.220, subject to the following provisions:

(a) The system limit loads, except the loads resulting from ground gusts, §§ 4b.224, need not exceed those which can be produced by the pilot or pilots and automatic devices operating the controls.
PROPOSED RULE MAKING

LIMIT PILOT LOADS (ONE PILOT)

<table>
<thead>
<tr>
<th>Control</th>
<th>Maximum load</th>
<th>Minimum load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ailerons</td>
<td>100 pounds</td>
<td>40 pounds</td>
</tr>
<tr>
<td>Stick</td>
<td>80 pounds</td>
<td>40 pounds</td>
</tr>
<tr>
<td>Elevator</td>
<td>300 pounds</td>
<td>100 pounds</td>
</tr>
<tr>
<td>Rudder</td>
<td>300 pounds</td>
<td>100 pounds</td>
</tr>
</tbody>
</table>

1 The critical portions of the aileron control system shall be designed for a single tangential force having a limit value equal to 1.25 times the couple force determined from these criteria.
2 D = wheel diameter.

FIGURE 4b-5—Pilot control force limits (Primary controls).

<table>
<thead>
<tr>
<th>Control</th>
<th>Limit pilot loads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscellaneous</td>
<td>[ \frac{1}{3} \text{H} \times \text{B}, \text{ but not less than 30} \text{ lb}, \text{ nor more than 30 lb.} \times \text{R} \text{ = radius}. \text{ Applicable to any angle within} \pm 20^\circ \text{ of phase of control.} \text{PELLS or levers.} \text{ Tack.-pounds.} \text{ PULLS or levers.} \text{ Force units.} \text{ PULLS or levers.} \text{ Trou-pounds.} \text{ PULLS or levers.}</td>
</tr>
</tbody>
</table>

1 Limited to fin, tip, stabiliser, spoiler, and landing gear operating controls.

FIGURE 4b-6—Pilot control force limits (Secondary controls).

§ 4b.230 General. The limit loads obtained in the conditions specified by §§ 4b.231 through 4b.236 shall be considered as external forces applied to the airplane structure and shall be placed in equilibrium by linear and angular inertia forces in a rational or conservative manner. In applying the specified conditions the provisions of paragraph (a) of this section shall be complied with. In addition, for the landing conditions of §§ 4b.231 through 4b.234 the airplane shall be assumed to be subjected to forces and descent velocities prescribed in paragraph (b) of this section. (The basic landing gear dimensional data are given in fig. 4b-7.)

(a) Center of gravity positions. The critical center of gravity positions within the certification limits shall be selected so that the maximum design loads in each of the landing gear elements are obtained in the landing and the ground handling conditions.

(b) Load factor for landing conditions. (See § 4b.322 for requirements on energy absorption tests which determine the minimum limit inertia load factors corresponding with the required limit descent velocities.)

(1) In the landing conditions the limit vertical inertia load factor at the center of gravity of the airplane shall be chosen by the applicant, except that it shall not be less than the value which would be obtained when landing the airplane with a limit descent velocity of either 10 fps at the design landing weight or 6 fps at the design take-off weight.

(2) It shall be acceptable to assume a wing lift not exceeding two-thirds of the airplane weight to exist throughout the landing impact and at the center of gravity of the airplane.

(3) The provisions of subparagraph (1) and (2) of this paragraph shall be predicated on conventional arrangements of main and nose gears, or main and tail gears, and on normal operating techniques. It shall be acceptable to modify the prescribed descent velocities if it is shown that the airplane embodies features of design which make it impossible to develop these velocities.

§ 4b.231 Level landing conditions—
(a) General. In the level attitude, the airplane shall be assumed to contact the ground with the nose wheel type just clear of the ground. The landing conditions specified in paragraphs (a) (1) and (a) (2) of this section shall be investigated. (See fig. 4b-8.)

(b) Level landing; nose-wheel type. The airplane horizontal reference line shall be assumed horizontal. The conditions specified in paragraphs (a) (1) and (a) (2) of this section shall be investigated. (See fig. 4b-9.)

(c) Level landing; tail-wheel type. The following airplane attitudes shall be considered: (See fig. 4b-9.)

(1) Main wheels contacting the ground with the nose wheel just clear of the ground. The landing conditions specified in paragraphs (a) (1) and (a) (2) of this section shall be investigated.

(2) Nose and main wheels contacting the ground simultaneously. Conditions in this attitude need not be investigated if this attitude cannot reasonably be attained at the specified descent and forward velocities. The two conditions

TAIL WHEEL TYPE

NOSE WHEEL TYPE

FIGURE 4b-7—Basic landing gear dimension data.
specified in paragraphs (a) (1) and (a) (2) of this section shall be investigated, except that in condition (a) (1) it shall be acceptable to investigate the nose and main gear separately neglecting the pitching moments due to wheel spin-up loads, while in condition (a) (2) the pitching moment shall be assumed to be resisted by the nose gear.

§ 4b.232 Tail-down landing conditions. The following conditions shall be investigated for the load factor obtained in § 4b.230 with the vertical ground reactions applied to the landing gear axes.

(a) Tail-wheel type. The main and tail wheels shall be assumed contacting the ground simultaneously. (See fig. 4b-8.) Two conditions of ground reaction on the tail wheel shall be assumed to act in the following directions:

(1) Vertical.
(2) Up and aft through the axle at 45° to the ground line.

(b) Nose-wheel type. The airplane shall be at an attitude corresponding with either the stalling angle or the maximum angle permitting clearance with the ground by all parts of the airplane other than the main wheels, whichever is the lesser. (See fig. 4b-8.)

§ 4b.233 One-wheel landing condition. The main landing gear on one side of the airplane center line shall contact the ground in the level attitude. (See fig. 4b-10.) The ground reactions on this side shall be the same as those obtained in § 4b.231 (a) (2). The unbalanced external loads shall be resisted by inertia of the airplane in a rational or conservative manner.

§ 4b.234 Lateral drift landing condition. (a) The airplane shall be in the level attitude with only the main wheels contacting the ground. (See fig. 4b-11.)

(b) Side loads of 0.8 of the vertical reaction (on one side) acting inward and 0.6 of the vertical reaction (on the other side) acting outward shall be combined with one-half of the maximum vertical ground reactions obtained in the level landing conditions. These loads shall be assumed to be applied at the ground contact point and to be resisted by the inertia of the airplane. It shall be allowed to assume the drag loads as zero.

§ 4b.235 Ground handling conditions.

The landing gear and airplane structure shall be investigated for the conditions of this section with the airplane at the design take-off weight, unless otherwise prescribed. No wing lift shall be considered. It shall be allowed to assume the shock absorbers and tires to be deflected to their static position.

(a) Take-off run. The landing gear and airplane structure shall be designed for loads not less than those resulting from the condition specified in § 4b.172.

(b) Braked roll—(1) Tail-wheel type. The airplane shall be assumed in the level attitude with all load on the main wheels. The limit vertical load factor shall be 1.0 for the airplane at the design landing weight, and 1.0 for the airplane at the design take-off weight. A drag reaction equal to the vertical reaction multiplied by a coefficient of friction of 0.8 shall be combined with the vertical ground reaction and applied at the ground contact point. (See fig. 4b-12.)

(2) Nose-wheel type. The limit vertical load factor shall be 1.2 for the airplane at the design landing weight, and 1.0 for the airplane at the design take-off weight. A drag reaction equal to the vertical reaction multiplied by a coefficient of friction of 0.8 shall be combined with the vertical reaction and applied at the ground contact point of each wheel having brakes. The following two airplane attitudes shall be considered. (See fig. 4b-12.)

(1) The airplane in the level attitude with all wheels contacting the ground and the loads distributed between the main and nose gear. Zero pitching acceleration shall be assumed.

(2) The airplane in the level attitude with only the main gear contacting the ground and the pitching moment resisted by angular acceleration.

(ii) Turning. The airplane in the static position shall be assumed to execute a steady turn by nose gear steering or differential power such that the limit load factors applied at the center of gravity are 1.0 vertically and 0.5 laterally. (See fig. 4b-13.) The side ground reaction of each wheel shall be 0.5 of the vertical reaction.

(c) Piching. The airplane shall be assumed to pivot about one side of the main gear, the brakes on that side being locked. The limit vertical load factor...
shall be 1.0 and the coefficient of friction 0.8. The airplane shall be assumed to be in static equilibrium, the loads being applied at the ground contact points. (See fig. 4b-14.)

(e) Nose-wheel yawing. (1) A vertical load factor of 1.0 at the airplane c.g. and a side component at the nose wheel ground contact equal to 0.8 of the vertical ground reaction at that point shall be assumed.

(2) The airplane shall be placed in static equilibrium with the loads resulting from the application of the brakes on one side of the main gear. The vertical load factor at the c.g. shall be 1.0. The forward acting load at the airplane c.g. shall be 0.8 times the vertical load on one main gear. The side vertical loads at the ground contact point on the nose gear shall be those required for static equilibrium. The side load factor at the airplane c.g. shall be assumed zero.

(f) Tail-wheel yawing. (1) A vertical ground reaction equal to the static load on the tail wheel, in combination with a side component of equal magnitude shall be assumed.

(2) When a swivel is provided, the tail wheel shall be assumed swiveled 90° to the airplane longitudinal axis with the resultant load passing through the axle. When a lock, steering device, or shimmy-damper is provided, the tail wheel shall also be assumed in the trailing position with side load acting at the ground contact point.

§ 4b.236 Unsymmetrical loads on dual-wheel units. In dual-wheel units, 60 percent of the total ground reaction for the unit shall be applied to one wheel and 40 percent to the other. To provide for the case of one tire flat, either wheel...
shall be capable of withstanding 60 percent of the load which would be assigned to the unit in the specified conditions, except that the vertical ground reaction shall not be less than the full static value.

**Water Loads**

§ 4b.250 General. The water load requirements shall apply to the entire airplane. At least the hull structure, the wing, the nacelles, and any float supporting structure shall be investigated.

§ 4b.251 Design weight. The design weight used in the water landing conditions shall not be less than the design landing weight, except that local bottom pressure conditions shall be investigated at the design take-off weight.

§ 4b.252 Boat seaplane bottom pressures—(a) Maximum local pressure. The maximum value of the limit local pressure shall be determined from the following equation:

\[
P_{\text{max}} = 0.04 V_s^n \]

where:

- \(P\) = pressure, pounds per square inch,
- \(V_s\) = stalling speed with flaps fully retracted at the design take-off weight.

(b) Variation in local pressure. The local pressures to be applied to the hull bottom shall vary in accordance with figure 4b-15. No variation from keel to chine (beamwise) shall be assumed, except when the chine flare indicates the advisability of higher pressures at the chine.

(c) Application of local pressure. The local pressures determined in paragraphs (a) and (b) of this section shall be applied over a local area in such a manner as to cause the maximum local loads in the hull bottom structure.

(d) Distributed bottom symmetrical pressures. For the purpose of designing frames, keels, and chine structure, a maximum limit pressure shall be computed according to paragraph (a) of this section, except that the stalling speed used in the computation shall be based upon the design landing weight, and the resulting pressure value shall be reduced to one-half. The pressure shall be applied simultaneously over the entire hull bottom according to the distribution of figure 4b-15. The resulting loads shall be carried into the side-wall structure of the hull proper, but need not be transmitted in a fore-and-aft direction as shear and bending.

(e) Distributed bottom unsymmetrical pressures. Each floor member or frame shall be designed for a load on one side of the hull center line equal to the most critical symmetrical loading as obtained in paragraph (d), combined with a load on the other side of the hull center line equal to one-half the most critical symmetrical loading.

§ 4b.253 Boat seaplane loading conditions—(a) Step loading condition—(1) Application of load. The resultant water load shall be applied vertically in the plane of symmetry so as to pass through the center of gravity of the airplane.

(2) Magnitude of load. The limit acceleration shall be 4.0, unless a lower value is shown by tests to be applicable.

(3) Hull shear and bending loads. The hull shear and bending loads shall be computed from the inertia loads produced by the vertical water load. To avoid excessive local shear loads and bending moments near the point of water load application, it shall be acceptable to distribute the water load over the hull bottom using pressures not less than those specified in § 4b.252 (d).

(b) Bow loading condition—(1) Application of load. The resultant water load shall be applied in the plane of symmetry at a point one-tenth of the distance from the bow to the step and shall be directed upward and rearward at an angle of 30° from the vertical.

(2) Magnitude of load. The magnitude of the limit resultant water load shall be determined from the following equation:

\[
P_b = \frac{1}{2} n_s W_e\]

where:

- \(P_b\) = the load in pounds,
- \(n_s\) = the step landing load factor,
- \(W_e\) = an effective weight assumed to be equal to one-half the design landing weight of the airplane.

(3) Hull shear and bending loads. The hull shear and bending loads shall be determined by appropriate consideration of the inertia loads which resist the linear and angular accelerations involved. To avoid excessive local shear...
loads, it shall be acceptable to distribute the water reaction over the hull bottom using pressures not less than those specified in § 4b.252 (d).

(c) Stern loading condition—(1) Application of load. The resultant water load shall be applied vertically in the plane of symmetry and shall be distributed over the hull bottom from the second step forward with an intensity equal to the pressures specified in § 4b.252 (c).

(2) Magnitude of load. The limit resultant load shall equal three-fourths of the design landing weight of the airplane.

(3) Hull shear and bending loads. The hull shear and bending loads shall be determined by assuming the hull structure to be supported at the wing attachment fittings and by neglecting internal inertia loads. This condition need not be applied to the fittings or to the portion of the hull ahead of the rear attachment fittings.

(d) Side loading condition—(1) Application of load. The resultant water load shall be applied in a vertical plane through the center of gravity. The vertical component shall be assumed to act in the plane of symmetry and the horizontal component at a point half-way between the bottom of the keel and the load water line at design landing weight (at rest).

(2) Magnitude of load. The limit vertical component of acceleration shall be 3.25, and the side component shall be equal to 15 percent of the vertical component.

(3) Hull shear and bending loads. The hull shear and bending loads shall be determined by appropriate consideration of the inertia loads or by introducing couples at the wing attachment points. To avoid excessive local shear loads, it shall be acceptable to distribute the water reaction over the hull bottom using pressures not less than those specified by § 4b.252 (d).

§ 4b.254 Float seaplane bottom pressures. (a) Main float seaplane bottoms shall be designed for the following:

(a) Maximum local pressure. The maximum value of the limit local pressure shall be as determined by the equations in § 4b.252 (a).

(b) Variation in local pressure. The local pressures to be applied to the float bottom shall vary in accordance with the following:

(1) A pressure of the value prescribed by paragraph (a) of this section shall be applied over the portion of the bottom lying between the main step and a section at 25 percent of the distance from the step to the bow.

(2) A pressure equal to one-half the value prescribed by paragraph (a) of this section shall be applied over the portion of the bottom lying between the section at 25 percent of the distance from the main step to the bow and a section at 75 percent of the distance from the main step to the bow.

(3) A pressure equal to 0.3 times the value prescribed by paragraph (a) of this section shall be applied over the portion of the bottom aft of the main step.

(c) Application of local pressure. The local pressures determined in paragraphs (a) and (b) of this section shall be applied over a local area in such a manner as to cause the maximum local loads in the float bottom structure.

(d) Distributed bottom pressures. For the purpose of designing frames, keels, and chine structure, distributed pressures equal to one-half of the values specified in paragraphs (a) and (b) of this section shall be applied simultaneously over the entire affected float bottom.

§ 4b.255 Float seaplane landing conditions—(a) Landing with inclined reactions. The vertical component of the limit load factor shall be 4.0, unless a lower value is shown by tests to be more applicable. The propeller axis (or equivalent reference line) shall be assumed horizontal. The resultant water reaction shall be assumed to act in the plane of symmetry and to pass through the center of gravity of the airplane inclined so that its horizontal component is equal to one-fourth of its vertical component. Inertia forces shall be assumed to act in a direction parallel to the water reaction.

(b) Landing with vertical reactions. The limit load factor shall be 4.0 acting vertically, unless a lower value is shown by tests to be more applicable. The propeller axis (or equivalent reference line) shall be assumed horizontal. The resultant water reaction shall be assumed to act vertically and to pass through the center of gravity of the airplane.

(c) Landing with side load. The vertical component of the limit load factor
§ 4.256 Seaplane float loads. Each float of a seaplane shall be capable of carrying the following loads when supported at the attachment fittings as installed on the airplane:

(a) A limit load acting upward at the bow of the float equal to 0.8 times that portion of the airplane's weight which is normally supported by the float.

(b) A limit load acting upward at the stern of the float equal to 1.5 times that portion of the airplane's weight which is normally supported by the float.

(c) A limit load acting upward at the stop of the float equal to 1.5 times that portion of the airplane's weight which is normally supported by the float.

§ 4.257 Wing tip float loads. Each wing tip float shall be capable of carrying the following loads:

(a) A limit load acting upward through the completely submerged center of buoyancy of the float equal to three times the completely submerged displacement.

(b) A limit load inclined upward at 45° to the rear acting through the completely submerged center of buoyancy of the float equal to three times the completely submerged displacement.

(c) A limit load acting parallel to the water surface (laterally) applied at the center of area of the side view equal to 1.5 times the completely submerged displacement.

(b) The primary wing structure shall incorporate a sufficient strength margin to insure that failure of wing tip float attachment members occurs before the wing structure is damaged.

§ 4.258 Seawing loads. Seawing design loads shall be based on appropriate test data.

Emergency Landing Conditions

§ 4.280 General. The following requirements deal with emergency conditions of landing on land or water in which the safety of the occupants shall be considered although it is accepted that parts of the airplane may be damaged.

(a) The structure shall be designed to give every reasonable probability that all of the occupants, if they make proper use of the seats, belts, and other provisions made in the design (see § 4.258), will escape serious injury in the event of a minor crash landing (with wheels up if the airplane is equipped with retractable landing gear) in which the occupants experience unloading inertia forces relative to the surrounding structure.

(1) Upward .......... 2.0g (Downward ... 4.5g)

(2) Forward .......... 6.0g

(3) Sideward .... 1.5g

(b) The use of a lesser value of the downward inertia force specified in paragraph (a) of this section shall be allowed if it is shown that the airplane structure could absorb the landing shock without a minor crash landing and an ultimate descent velocity of 5 f. p. s. without exceeding the value chosen.

§ 4.261 Ditching provisions. At the request of the applicant, the type certificate may include certification that adequate provision has been made for emergency landings during overwater flights.

(a) In order that landplanes may qualify for such a certification, satisfactory evidence must be submitted that all practicable measures compatible with the general characteristics of the type which have been taken to minimize the change in inertia forces relative to the surrounding water which would be likely to cause immediate injury to the occupants or make it impossible for them to escape from the airplane.

(b) In demonstrating compliance with the provisions of this section, the probable behavior of the airplane in a water landing shall be established by model tests or by comparison with airplanes of similar configuration for which the ditching characteristics are known.

(1) In making such tests or comparison, propulsive power shall be given to scoops, flaps, projections, and all other factors likely to affect the hydrodynamic characteristics of the actual airplane.

(2) External doors and windows shall be designed to withstand the probable maximum local pressures, unless the effects of the collapse of such parts are taken into account in the model tests or airplane comparison.

(c) Airplanes which are to receive such certification shall also comply with provisions of § 4.361.

(d) When an airplane is certificated to include the ditching provisions specified in this section, the ditching procedures shall be set forth in the Airplane Flight Manual.
PROPOSED RULE MAKING

(d) The structure shall be designed in so far as practicable, to avoid points of stress concentration where variable stresses above the fatigue limit are likely to occur in normal service.

§ 4b.307 Design factors; general. The following requirements shall be considered in structural design.

(a) Special factors. Where there may be uncertainty concerning the actual strength of particular parts of the structure, or where the strength is likely to deteriorate prior to normal replacement, or where strength is subject to appreciable variability due to uncertainties in manufacturing processes and inspection methods, the factor of safety prescribed in § 4b.200 (a) shall be multiplied by a special factor to make the probability of any part being under-strength from these causes extremely remote.

(b) Casting factors. (1) Where visual inspection only is to be employed, the casting factor shall be 2.0, except that it need not exceed 1.25 for bearing stresses in castings are tested to show compliance with an approved inspection specification.

(2) Other inspection procedures and casting factors shall be acceptable if approved by the Administrator.

(c) Bearing factors. Bearing strength shall be provided for the following conditions: (Bearing factors need not be applied when covered by other special factors): (1) Relative motion in operation. (Control surface and system joints are covered in §§ 4b.314, 4b.321, and 4b.322 (b).)

(2) Joints with clearance (free fit) subject to pounding or vibration.

(3) Special factors. A casting factor of at least 1.15 shall be used in the analysis of all fittings whose strength is not proven by limit and ultimate load tests in which the residual stresses arising from machining are simulated in the fitting and the surrounding structure. This factor applies to all portions of the fittings, the means of attachment, and bearing on the members joined.

(2) In the case of integral fittings, the part shall be treated as a fitting up to the point where the tension properties become typical of the member.

(2) The fitting factor need not be applied where a type of joint design based on comprehensive test data is used. The following are examples: continuous joints in metal plating, welded joints, and tie rods or bolts made in accordance with approved practices.

§ 4b.308 Flutter and vibration prevention measures. In all conditions of operation within the limit V-n envelope, the wings, tail surfaces, control surfaces, control systems, and other structural parts shall be free from flutter and dangerous vibration, including that resulting from gust impulses. In showing compliance with this requirement the following shall apply:

(a) Satisfactory analytical and/or experimental evidence shall be submitted to show that dangerous flutter conditions will not develop when any speed up to 1.2 Vn, selected in accordance with § 4b.210 (b) (5), except that the speed need not exceed the terminal velocity in a 30° dive.

(b) The airplane shall comply with the flight demonstration requirements specified in § 4b.106.

(c) The natural frequencies of all main structural components, control surfaces, and systems shall be determined by vibration tests or other reliable methods, and shall be shown to be within the range of values appropriate for the prevention of flutter.

(d) The mass balance of movable control surfaces shall be shown to preclude flutter.

§ 4b.309 Stiffness. Wings and tail surfaces shall be shown to be free from aero-elastic divergence, and control surfaces to be free from reversal of effect, at all speeds up to 1.2 Vn, selected in accordance with § 4b.210 (b) (5), except that the speed need not exceed the terminal velocity in a 30° dive. In showing compliance with this requirement, the torsional rigidity of wings and tail surfaces shall be determined by tests or other acceptable methods.

Control Surfaces

§ 4b.310 General. The requirements of §§ 4b.311 through 4b.313 shall apply to the design of the control surfaces.

§ 4b.311 Proof of strength. (a) Limit load tests shall be required to prove compliance with limit load requirements.

(b) Control surface tests shall include the horn or fitting to which the control system is attached.

(c) Analysis or individual load tests shall be conducted to demonstrate compliance with the multiplying factor requirements for control surface hinges as provided in § 4b.313 (a).

(d) Rigging loads due to wire braiding shall be taken into account in a rational or conservative manner.

(e) The end connections of brace wires shall be such as to minimize restraint against bending or vibration.

§ 4b.312 Installation. (a) Movable tab surfaces shall be so installed that there is no interference between the surfaces when each is held in its extreme position and all others are operated through their full angular movement.

(b) When the stabilizer is used, stops shall be provided which will limit its travel, in the event of failure of the adjusting mechanism, to a range equal to the maximum required to trim the airplane and its loadings, as prescribed in § 4b.140. (c) Hinges. (a) Control surface hinges, excepting ball and roller bearings, shall incorporate a multiplying factor of not less than 6.67 with respect to the ultimate bearing strength of the strongest material used as a bearing.

(b) For hinges incorporating ball or roller bearings, the approved rating of the bearing shall not be exceeded.

(c) Hinges shall provide sufficient strength and rigidity for loads parallel to the hinge line.

Control Systems

§ 4b.320 General. All controls shall operate with sufficient ease, smoothness, and positiveness to permit proper performance of their function. All controls shall be arranged and identified to provide convenience in operation and in a manner tending to prevent inadvertent operation.

§ 4b.321 Two-control airplanes. Two-control airplanes shall be capable of continuing safely in flight and landing in the event of failure of any one connecting element in the directional-lateral flight control system.

§ 4b.322 Trimming controls. (a) The trimming controls shall be conveniently located and each shall operate in the plane and with the sense of the motion of the airplane with which it is intended to provide, as specified in § 4b.353.

(b) Proper precautions shall be taken against the possible loss of inadvertent or abrupt tab operation.

(c) Means shall be provided to indicate the position of the trim device with respect to the range of adjustment. The indicating device shall be clearly visible to the pilots and located to preclude the possibility of confusion.

(d) Trimming devices shall be capable of continued normal operation in the event of failure of any one connecting element or transmitting element of the primary flight control system.

(e) Tab controls shall be irreversible, until the tab is properly balanced and shown to be free from flutter.

(f) Irreversible tab systems shall provide rigidity and reliability in the portion of the system from the tab to the attachment of the irreversible unit to the airplane structure.

§ 4b.323 Wing flap controls. (a) The controls shall operate in a manner to permit the flight crew to place the flaps in any of the take-off, en route, approach, or landing positions established under § 4b.111, and to maintain these positions thereafter, without further attention on the part of the crew, except for flap movement produced by an automatic flap operation system.

(b) The flap control shall be located and designed to render improbable its inadvertent operation.

(c) The rate of operation of the flap in response to the operation of the pilot's control and the characteristics of the automatic flap positioning or load limiting device shall be such as to obviate satisfactory flight and performance characteristics under steady or changing con-
§ 4b.324 Flap interconnection. (a) The motion of flaps on opposite sides of the plane of symmetry shall be synchronized by a mechanical interconnection unless the airplane is demonstrated to have safe flight characteristics while the flaps are retracted on one side and extended on the other. Where interconnection is used, it shall be designated to account for appropriate asymmetrical loads, including those resulting from flight with the engines on one side of the plane of symmetry inoperative and the remaining engines at take-off power.

§ 4b.325 Stops. (a) All control systems shall be provided with stops which positively limit the range of motion of the control surfaces.

(b) Stops shall be so located in the system that wear, slackness, or take-up adjustments will not seriously affect the range of surface travel.

(c) Stops shall be capable of withstanding the loads corresponding with design conditions for the control system.

§ 4b.326 Control system locks. If a device is provided for locking a control surface while the airplane is on the ground or water:

(a) The locking device shall provide unmistakable warning to the pilot when it is engaged.

(b) Means shall be provided to preclude the possibility of the lock becoming engaged during flight.

(c) Locks shall be designed for the ground gust conditions prescribed in § 4b.226.

§ 4b.327 Static tests. Tests shall be conducted on control systems to show compliance with limit load requirements in accordance with the following provisions:

(a) The direction of the test loads shall be such as to produce the most severe loading of the control system structure.

(b) The tests shall include all fittings, pulleys, and brackets used in attaching the control system to the main structure.

(c) Analyses or individual load tests shall be provided to demonstrate compliance with the multiplying factor requirements specified for control system joints subjected to angular motion. (See § 4b.329 (b).)

§ 4b.328 Operation tests. An operation test shall be conducted for each control system by operating the controls from the pilot compartment with the entire system loaded to correspond with 80 percent of the limit load specified for the control system. In this test there shall be no jamming, excessive friction, or excessive deflection.

§ 4b.329 Control system details; general. All details of control systems shall be designed and installed to prevent jamming, chafing, and interference from cargo, passengers, and loose objects. Precautionary means shall be provided in the cockpit to prevent the entry of foreign objects into places where they might jam the control system. Provisions shall be made to prevent the slapping of cables or tubes against other parts of the airplane.

(a) Cable systems. (1) Cables, cable fittings, turnbuckles, splices, and pulleys shall be of an approved type.

(2) Cables smaller than 1/8-inch diameter shall not be used in the aileron, elevator, or rudder systems.

(b) The design of control cables shall be such that the presence of a hazardous change in cable tension throughout the range of travel under operating conditions and temperature variations.

(c) Pulley types and sizes shall correspond with the cables used.

(d) Pulleys shall be provided with satisfactory guards which shall be closely fitted to prevent the cables being misplaced or fouled.

(e) The pulleys shall be in the plane passing through the cable within such limits that the cable does not rub against the pulley flange.

(f) Fairleads shall be so installed that they do not cause a change in cable direction of more than 3°.

(g) Clevis pins (excluding those not subject to load or motion) retained only by cotter pins shall not be used in the control system.

(h) Turnbuckles shall be attached to parts having angular motion in a manner to prevent any binding throughout the range of travel.

(i) Provision for visual inspection shall be made at all fairleads, pulleys, terminals, and clearances.

(j) Joints. (1) Control system joints subjected to angular motion in push-pull systems, excepting ball and roller bearing systems, shall incorporate a multiplying factor of not less than 3.33 with respect to the ultimate bearing strength of the softest material used as a bearing.

(2) The factor specified in subparagraph (1) of this paragraph may be reduced to a value of 2.0 for joints in cable control systems.

(k) The approved rating of ball and roller bearings shall not be exceeded.

§ 4b.330 General. The requirements of §§ 4b.331 through 4b.338 shall apply to the complete landing gear.

§ 4b.331 Shock absorbers. (a) The shock absorbing elements for the main, nose, and tail units shall be substantiated by the tests specified in §§ 4b.332 and 4b.333.

(b) The shock absorbing ability of the landing gear in taxiing shall be demonstrated by operational tests prescribed in § 4b.172.

§ 4b.332 Landing gear tests. The landing gear shall withstand the following tests.

(a) Shock absorption tests. (1) It shall be demonstrated by energy absorption tests that the limit load factors selected for design in accordance with §§ 4b.330 and 4b.332 for take-off and landing weights, respectively, will not be exceeded.

(2) In addition to the provisions of subparagraph (1) of this paragraph, a reserve of energy absorption shall be demonstrated by a test simulating an airplane descent velocity of 120 ft. p. s. at design landing weight, assuming wing lift not greater than the airplane weight acting during the landing impact. In this test the landing gear shall not fail. (See paragraph (c) of this section.)

(3) If compliance with the limit landing conditions specified in paragraph (a) (1) of this section is demonstrated by free drop tests, these shall be conducted on the complete airplane, consisting of airplane, landing gear, and shock absorber in their proper relation. The free drop heights shall not be less than the following:

(i) 18.7 inches for the design landing weight conditions.

(ii) 6.7 inches for the design take-off weight conditions.

(b) Limit drop tests. (1) If compliance with the limit landing conditions specified in paragraph (a) (1) of this section is demonstrated by free drop tests, these shall be conducted on the complete airplane, consisting of airplane, landing gear, and shock absorber in their proper relation. The free drop heights shall not be less than the following:

(i) 18.7 inches for the design landing weight conditions.

(ii) 6.7 inches for the design take-off weight conditions.

(2) If wing lift is simulated in free drop tests the landing gear shall be dropped with an effective mass equal to:

\[ W_f = W \left( \frac{h+1-L}{h} \right) \]

where:

- \( W_f \) = the effective weight to be used in the drop test.
- \( h \) = specified height of drop in inches.
- \( L \) = deflection under impact of the tire (at the approved inflation pressure) plus the vertical component of the axle travel of the drop mass (the value of \( d \) used in the computation of \( W_f \) shall not exceed the value actually obtained in the drop test).

\[ W_f = W_m \text{ for main gear units, equal to the static weight on the particular unit with the airplane in the level attitude (with the nose wheel clear in the case of nose wheel type airplanes).} \]

\[ W_f = W_t \text{ for tail gear units, equal to the static weight on the tail unit with the airplane in the tail-down attitude.} \]

\[ W_f = W_n \text{ for nose wheel units, equal to the vertical component of the static reaction which would exist at the nose wheel, assuming the mass of the airplane acting at the center of gravity and exerting a force of 1.0g downward and 0.5g forward.} \]

\( L \) = the ratio of the assumed wing lift to the airplane weight, not in excess of 0.667.

(3) The attitude in which a landing gear unit is drop tested shall simulate the attitude in the landing condition critical for the unit.

(c) Reserve energy absorption drop tests. (1) If compliance with the reserve energy absorption condition specified in § 4b.332 (a) (2) is demonstrated:
by free drop tests, the landing gear units shall be dropped from a free drop height of not less than 27 inches.

(2) If wing lift equal to the airplane weight is simulated, the units shall be dropped with an effective mass equal to:

\[ m = \frac{W - \frac{W}{g} + L}{n} \]

where the symbols and other details are the same as in § 4b.332.

§ 4b.333 Limit load factor determination.

(a) In determining the limit airplane inertial load factor \( n \) from the free drop tests specified in § 4b.332, the following formula shall be used:

\[ n = \frac{W}{W + L} \]

where \( n \) is the load factor during impact developed on the mass used in the drop test (i.e., the acceleration due to the landing). In any case the results in the drop test must be in line with the results obtained in the test plus \( L \) (see § 4b.332 (b) (1) for definition of \( W \), \( n \), and \( L \)).

(b) The value of \( n \) so determined shall not be greater than the limit load factor used in the landing conditions, § 4b.320 (b).

§ 4b.334 Retracting mechanism—(a) General.

(1) The landing gear retracting mechanism and supporting structure shall be designed for the loads occurring in the flight conditions when the gear is in the retracted position, and for the combination of friction, inertia, brake torque, and air loads occurring during retraction. 

(2) The landing gear shall be designed for airspeeds up to 1.6 \( V_{E} \), (flaps in the approach position at design landing weight) and any load factor up to those specified for the flaps extended condition, § 4b.322.

(3) The landing gear, the retracting mechanism, and the airplane structure including wheel well doors shall be designed to withstand the flight loads occurring with the landing gear in the extended position at any speed up to 0.67 \( V_{E} \), unless other means are provided to decelerate the airplane in flight at this speed.

(b) Landing gear lock. A positive means shall be provided for the purpose of maintaining the landing gear in the extended position.

(c) Emergency operation. Emergency means of extending the landing gear shall be provided, so that the landing gear can be extended in the event of any reasonably probable failure in the normal retraction system. In any case the emergency system shall provide for the failure of any single source of hydraulic, electric, or equivalent energy supply.

(d) Operation test. Proper functioning of the landing gear retracting mechanism shall be demonstrated by operation tests.

(1) Positron indicator and warning device. When a retractable landing gear is used, means shall be provided for indicating to the pilot when the gear is secured in the extended and in the retracted position.

(2) In addition to the requirement of subparagraph (1) of this paragraph, landplanes shall be provided with an aural warning device which will function continuously when all throttles are closed if the gear is not fully extended and locked.

(3) If a manual shut off for the warning device prescribed in subparagraph (2) of this paragraph, it shall be installed so that the mechanisms will reset the warning mechanism.

(4) Control. The location and operation of the landing gear retraction control shall be according to the provisions of § 4b.335.

(b) The rated static load of each main wheel shall not be less than the design take-off weight of the airplane divided by the number of main wheels.

(c) Nose wheels shall be tested in accordance with Part 15 of this chapter and the maximum nose wheel load shall be obtained in the ground loads requirements and for the corresponding side and burst loads.

§ 4b.335 Wheels. (a) Main landing gear wheels (1.e., those nearest the airplane center of gravity) shall be of a type approved in accordance with Part 15 of this chapter.

(b) The rated static load of each main wheel shall not be less than the design take-off weight divided by the number of main wheels.

(c) Nose wheels shall be tested in accordance with Part 15 of this chapter and the maximum nose wheel load shall be obtained in the ground loads requirements and for the corresponding side and burst loads.

§ 4b.336 Tires. (a) Landing gear tires shall be of a proper fit on the rim of the wheel, and their approved rating shall be such that \( n \) is not exceeded under the following conditions:

(1) Airplane weight equal to the design take-off weight.

(2) Load on main wheel tires equal to the airplane weight divided by the number of main wheels.

(3) Load on nose wheel tires (to be compared with the dynamic rating established for such tires) equal to the reaction obtained at the nose wheel, assuming the mass of the airplane concentrated at the center of gravity and exerting a force of 0.67g downward and 0.31g forward, the reactions being distributed to the nose and main wheels by the principles of statics with the crag reaction at the ground applied only at those wheels having brakes.

(b) When specially constructed tires are used, the wheels shall be plainly and conspicuously marked to that effect.

(c) The brake system shall be so designed and constructed that in the event of a single failure in any connection or transmitting element in the brake system (excluding the operating pedal or handle), no one failure of any single source of hydraulic or other brake operating energy supply, it shall be possible to bring the airplane to rest under conditions specified in § 4b.322 with a mean deceleration of the landing roll of at least 50 percent of that obtained in determining the landing distance as prescribed in that section.

(d) In applying the requirement of subparagraph (2) of this paragraph to hydraulic brakes, the brake drum, shoes, and actuators (or their equivalents) shall be considered as connecting or transmitting elements, unless it is shown that the leakage of hydraulic fluid resulting from failure of the sealing elements in these units would not reduce the braking effectiveness below that specified in subparagraph (2) of this paragraph.

§ 4b.337 Brakes—(a) General.

(1) All airplanes shall be equipped with approved brakes.

(2) The brake system shall be so designed and constructed that in the event of a single failure in any connection or transmitting element in the brake system (excluding the operating pedal or handle), no single source of hydraulic or other brake operating energy supply, it shall be possible to bring the airplane to rest under conditions specified in § 4b.322 with a mean deceleration of the landing roll of at least 50 percent of that obtained in determining the landing distance as prescribed in that section.

(b) The primary flight controls listed on figure 4b-16, excluding cables and control rods, shall be so located with respect to the propellers that no portion of the pilot or the controls lies in the region between the plane of rotation of any inboard propeller and the surface generated by a line passing through the center of the propeller hub and making

PROPOSED RULE MAKING
an angle of 5° forward or aft of the
plane of rotation of the propeller.

<table>
<thead>
<tr>
<th>Controls</th>
<th>Movement and action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td></td>
</tr>
<tr>
<td>Aileron</td>
<td>Right (clockwise) for right wing</td>
</tr>
<tr>
<td>Elevator</td>
<td>Rearward for nose up</td>
</tr>
<tr>
<td>Rudder</td>
<td>Right pedal forward for noseright</td>
</tr>
<tr>
<td>Secondary</td>
<td></td>
</tr>
<tr>
<td>Flaps (or auxiliary)</td>
<td>Down to extend.</td>
</tr>
<tr>
<td>Trim tabs</td>
<td>Rotate to produce similar rotation of the ailerons, elevator, and rudder.</td>
</tr>
<tr>
<td>(or equivalent)</td>
<td></td>
</tr>
</tbody>
</table>

![Figure 4b-16—Aerodynamic controls.](image)

(c) When a second pilot is required for particular operations by the operating parts of the Civil Air Regulations, the airplane shall be controllable with equal safety from both seats.

(d) The pilot compartment shall be constructed to prevent fluid leakage likely to be distracting to the crew or harmful to the structure when flying in rain or snow.

(e) A door shall be provided between the pilot compartment and the passenger compartment.

(f) The door prescribed in paragraph (e) of this section shall be equipped with a locking means to prevent passengers from opening the door without the pilot's permission.

(g) Vibration and noise characteristics of cockpit appurtenances shall not interfere with the safe operation of the airplane.

§ 4b.351 Pilot compartment vision—

(a) Nonprecipitation conditions. (1) The pilot compartment shall be arranged to afford the pilots a sufficiently extensive, clear, and undistorted view for performing all maneuvers within the operating limitations of the airplane, including taxing, take-off, approach, and landing.

(2) It shall be demonstrated by day and night flight tests that the pilot compartment is free of glare and reflections which would tend to interfere with the pilots' vision.

(b) Precipitation conditions. (1) Means shall be provided for maintaining a sufficient portion of the windshield clear so that at least the first pilot is afforded a sufficiently extensive view along the flight path in all normal flight attitudes of the airplane. Such means shall be designed to function under the following conditions without continuous attention on the part of the crew:

(i) In heavy rain at speeds up to 1.6

(ii) Flap retracted.

(iii) In the most severe icing conditions for which approval of the airplane is desired.

(2) In addition to the means prescribed in subparagraph (1) of this paragraph at least the first pilot shall be provided with a window which, when the cabin is not pressurized, is operable under the conditions prescribed in subparagraph (1), and which provides the view specified in subparagraph (1).

The design shall be such that when the window is opened sufficient protection from the elements will be provided against the impairment of the pilot's vision.

§ 4b.352 Pilot windshield and windows—

(a) All integral glass panels shall be of a nontippling safety type.

(b) The windshield, its supporting structure, and other structure in front of the pilots shall have sufficient strength to withstand without penetration the impact of a four-pound bird when the relative velocity of the bird to the airplane along the flight path of the latter is equal to the value of V _∞ at sea level selected in accordance with § 4b.210 (b) (4).

§ 4b.353 Controls. (a) All cockpit controls shall be located and identified (except those the function of which is obvious) to provide convenience in operation, and in a manner tending to prevent inadvertent operation. The direction of movement of aerodynamic and certain powerplant, accessories, and auxiliary controls shall be such that accidental operation shall not exceed distances shown in figures 4b-16 and 4b-17. Wherever practicable the sense of motion involved in the operation of other controls shall correspond with the sense of the effect of the operation upon the airplane or upon the part operated.

§ 4b.354 Instrument arrangement. (See § 4b.611.)

§ 4b.355 Instrument marking. (The operational markings, instructions, and placards required for the instruments, controls, etc., are specified in §§ 4b.730 through 4b.738.)

§ 4b.356 Doors. (a) Airplane cabins shall be provided with at least one easily accessible external main door.

(b) It shall be possible to open external doors from either inside or outside by the operation of only one handle inside or one handle outside even though persons may be seated against the door from the inside. The means of opening shall be simple and obvious and shall be so arranged and marked that it can be readily located and operated, even in darkness.

(c) Reasonable provisions shall be made to prevent the jamming of any external door as a result of fuselage deformation in a minor crash.

(d) External doors shall be so located that persons using them will not be endangered by the propellers, when appropriate operating procedures are employed.

§ 4b.357 Door louvers. Where internal doors are equipped with louvers or other ventilating means, provision convenient to the crew shall be made for stopping the flow of air through the door when such action is found necessary.

§ 4b.358 Seats, berths, and safety belts—(a) Arrangement. At all stations designated as occupiable during take-off and landing, the seats, berths, belts, harnesses, and adjacent parts of the airplane shall be arranged so that a person making proper use of these facilities will not suffer serious injury in the emergency landing conditions of § 4b.260 (a):

(i) Passengers and crew shall be afforded protection from head injuries by one of the following or equivalent means:

(1) Safety belt and shoulder harness which will prevent the head from contacting any injurious object.

(2) Safety belt and the elimination of all injurious objects within striking radius of the head in a fore and aft direction.

(3) Safety belt and a cushioned rest which will support the arms, shoulders, head, and spine.

(ii) All seats, berths, and supporting structure shall be designed for an occupant weighing at least 176 lbs. and for critical loads resulting from all specified flight load conditions.

(iii) All seats and berths designated as occupiable during landing and take-off, and their supporting structure, shall be designed for the loads resulting from all specified ground load conditions including the emergency landing conditions of § 4b.260. Reactions from safety belts and harnesses shall be taken into account in design of the airplane.

(b) Pilots' seats shall be designed for the reactions resulting from application of the pilot forces to the flight controls as prescribed in § 4b.224.

§ 4b.359 Cargo and baggage compartments. (a) Each cargo and baggage compartment shall be designed for the specified maximum weight of contents and critical load distributions at the appropriate maximum load factors corresponding with all specified flight and ground load conditions, excluding the emergency landing conditions of § 4b.260.

(b) Provisions shall be made to prevent the contents in the compartments
from becoming a hazard by shifting under the loads specified in paragraph (a) of this section.

(c) Provisions shall be made to protect the passengers and crew from injury by the contents of any compartment when the ultimate inertia force acting forward is 8g.

Emergency Provisions

§ 4b.360 General. The requirements of §§ 4b.361 and 4b.362 shall apply to the emergency provisions.

§ 4b.361 Flotation. (a) When certification of ditching provisions is desired by the applicant under the provisions of § 4b.361, evidence shall be submitted to prove that there is every reasonable probability that the airplane, after landing in the water, will remain afloat, as follows:

1. In the case of airplanes equipped with life rafts having capacity for all persons aboard the airplane, the flotation time and trim will permit all occupants to leave their ditching stations and occupy the rafts.

2. In the case of airplanes not equipped with life rafts having capacity for all persons aboard the airplane, the airplane will float indefinitely without sufficient compartments above the water line to accommodate all persons aboard the airplane.

(b) Compliance with the requirements of paragraph (a) of this section may be demonstrated by buoyancy and trim computations in which suitable allowances are made for probable structural damage and leakage. For airplanes equipped with fuel dump valves, the volume of fuel which could be dumped may be considered as buoyancy volume.

§ 4b.362 Emergency exists. Passenger and crew compartments designated as occupiable during take-off and landing shall be provided with emergency exits as prescribed in the following paragraphs. Individual compartments shall be so designed as those closed spaces to which normal access is by a door, passageway, or stair, any of which might restrict rapid evacuation of the airplane.

(a) Evacuation. In case of question concerning the adequacy of emergency exits, it shall be demonstrated that the airplane can be completely evacuated in 30 seconds, or in a time equal to one second per occupant, whichever is greater, under conditions simulating a forced landing. The following shall be observed during the demonstration:

1. The maximum number of passengers for whom seats are provided shall participate in the demonstration.

2. The persons designing the evacuation procedure shall not be briefed more than once prior to the official demonstration.

(b) Number of exits. (1) The minimum number of exits per compartment shall be as follows:

<table>
<thead>
<tr>
<th>Minimum Number of Persons</th>
<th>Minimum Number of Exits</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 or less</td>
<td>1</td>
</tr>
<tr>
<td>More than 5, but not more than 19</td>
<td>2</td>
</tr>
<tr>
<td>More than 16, but not more than 29</td>
<td>3</td>
</tr>
<tr>
<td>More than 22, but not more than 29</td>
<td>4</td>
</tr>
<tr>
<td>More than 29, but not more than 36</td>
<td>5</td>
</tr>
</tbody>
</table>

(2) Where the number of persons for whom seats are provided exceeds 36, 1 exit per 8 persons shall be the minimum required.

(3) The external main door specified in § 4b.357 shall be considered as one emergency exit if it meets the design requirements of paragraph (c).

(4) The number of exits in any one compartment need not exceed 4 if an adjacent compartment can be reached through a passageway without a door and if the total number of exits in the 2 compartments equals 1 exit per 6 passengers. Deviation from these numbers shall be allowed if it is demonstrated that the airplane can be evacuated within the time specified in paragraph (a) of this section.

(c) Exit arrangement. (1) Emergency exits shall be located to give the maximum likelihood that they will be usable in an emergency landing with wheels up.

(2) When certification of ditching provisions is desired by the applicant, it shall be shown that at least one emergency exit for every 16 passengers is located above the water line.

(3) In airplanes for which two or more emergency exits are required, the ratio of the number of exits on either side of the airplane to the total number required shall be not less than 1/3. At least one exit on the opposite side from the external main door shall be operable from the outside and shall be marked accordingly for the guidance of rescue personal.

(4) The emergency exits shall be readily accessible, shall not require exceptional agility of a person using them, and shall be distributed so as to facilitate evacuation without crowding.

(5) Each emergency exit shall provide a clear and unobstructed opening to the outside, the minimum dimensions of which shall be such that a 19 by 26 inch ellipse can be inscribed therein.

(6) Reasonable provisions shall be made against the jamming of emergency exits as a result of fuselage deformation.

(7) The method of opening of emergency exits shall be simple and obvious. (See § 4b.736 (e).)

(b) The proper functioning of emergency exits shall be demonstrated by test.

(d) For all landplane emergency exits which are more than 10 feet from the ground with the airplane on the ground and wheels retracted, suitable means shall be provided by which the occupants can safely descend to the ground.

Ventilation, Heating, and Pressurization

§ 4b.370 General. The requirements of §§ 4b.371 through 4b.376 shall apply to the ventilation, heating, and pressurization of the airplane.

§ 4b.371 Ventilation. (a) All passenger and crew compartments shall be suitably ventilated.

(b) Provision shall be made to prevent carbon monoxide concentration in excess of one part in 20,200 parts of air.

(c) Provision shall be made to exclude fuel fumes.

(d) Where partitions between compartments are equipped with louvers or other means allowing air to flow between such compartments, provision convenient to the crew shall be made for stopping the flow of air through the louvres or other means when such action is found necessary.

§ 4b.372 Combustion heaters. Gasoline and combustion heaters installations shall comply with applicable parts of the powerplant installation requirements pertaining to fire prevention. All pertinent requirements concerning fuel tanks, Provisions, and exhaust systems shall be applicable.

§ 4b.373 Pressure cabins—general. The design of the pressure cabins shall comply with the requirements of §§ 4b.374 through 4b.376. (See § 4b.316 (e) for strength requirements.)

§ 4b.374 Pressure supply. If cabin pressurization is to be used, the pressure supply shall be capable of maintaining a cabin pressure corresponding with an altitude of not more than 10,000 feet in standard atmospheric conditions. Airplane’s flight altitude is the maximum for which certification is desired.

§ 4b.375 Pressure control. Pressure cabins shall be provided with at least the following valves, controls, and indicators for controlling cabin pressure:

(a) At least two pressure relief valves, one or both of which may be the normal regulating valve, shall be installed to limit automatically the positive pressure differential to a predetermined and safe value at the maximum rate of flow delivered by the pressure source. The combined capacity of the relief valves shall be such that the failure of any one valve would not cause an appreciable rise in the pressure differential. The pressure differential shall be considered positive when the internal pressure is greater than the external pressure.

(b) At least one reverse pressure differential relief valve (or equivalent) shall be installed to prevent automatically a negative pressure differential which would damage the structure.

(c) Means shall be provided by which the pressure differential can be rapidly equalized.

(d) An automatic or manual regulator for controlling the intake and/or exhaust air flow shall be installed so that the required internal pressures and air flow rates can be maintained.

(e) Instruments shall be provided at an appropriate crew station showing the pressure differential, the absolute pressure in the cabin, and the rate of change of the absolute pressure.

(f) Warning indication shall be provided at an appropriate crew station to indicate when the safe or preset limits on pressure differential and absolute cabin pressure are exceeded.

(g) If the structure is not designed for pressure differentials up to the maximum relief valve setting in combination with landing loads (see § 4b.216 (c)), a sufficient warning placard shall be placed at an appropriate crew station.

§ 4b.376 Tests. The complete pressurized cabin, including doors, windows, and all valves, shall be tested as a pressure vessel for the pressure differential specified in § 4b.216 (c). The following
functional tests shall be performed up to the working pressures.

Functional and capacity tests of the positive pressure and negative pressure differential relief valves and the emergency release valve, simulating the condition of regulator valves closed.

Tests showing that all parts of the pressurization system will function properly under all possible conditions of pressure, temperature, and moisture up to the maximum altitude for which certification is desired;

(c) Flight tests demonstrating the performance of the pressure supply, pressure and flow regulators, indicators, and warning signals in steady and stepped climbs and descents at rates corresponding with the maximum attainable without exceeding the operating limitations of the airplane, up to the maximum altitude for which certification is desired;

(d) Tests showing that all doors and emergency exits operate properly after being subjected to the tests specified in paragraph (c) of this section.

Fire Prevention

§ 4b.380 General. Compliance shall be shown with the fire prevention requirements of §§ 4b.381 through 4b.384.

§ 4b.381 Cabin interiors. All compartments occupied or used by the crew or passengers shall comply with the following provisions.

(a) The materials in no case shall 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) Each compartment for used towels, papers, and waste shall be of fire-resistant material, and shall incorporate covers or other provisions for containing possible fires.

§ 4b.382 Cargo and baggage compartments. (a) Cargo and baggage compartments 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 items are adequately shielded, isolated, or otherwise protected so that they cannot be damaged by movement of cargo in the compartment, and so that any breakage or failure of such item will not create a hazard.

(b) Provision shall be made to prevent cargo or baggage from interfering with the functioning of the fire-protective features of the compartment.

(c) All materials used in the construction of cargo or baggage compartments, including tie-down equipment, shall be flame-resistant.

§ 4b.383 Cargo compartment classification. All cargo and baggage compartments shall be classified in the “A” category. Cargo and baggage compartments shall be classified in the “B” category if the presence of a possible fire therein would be easily discernible to a member of the crew while standing and if all parts of the compartment are easily accessible in flight. A hand fire extinguisher shall be available for each compartment.

(b) “B” category. 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 of a compartment to reach effectively all parts of the compartment with a hand fire extinguisher. Compliance shall be shown with the following:

(1) 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.

(2) Each compartment shall be equipped with a separate system of an approved type smoke detector or fire detector other than a heat detector to give warning at the pilot or flight engineer station.

(3) Hand fire extinguishers shall be readily available for use in each compartment.

(4) The compartment shall be completely lined with fire-resistant material, except that additional service lining of flame-resistant material may be employed.

(c) “C” category. Cargo and baggage compartments shall be classified in the “C” category, if they do not conform to the prerequisites for the “A” or “B” categories. Compliance shall be shown with the following:

(1) Each compartment shall be equipped with:

(a) A separate system of an approved type smoke detector or fire detector other than heat detector to give warning at the pilot or flight engineer station;

(b) An automatic fire-extinguishing system controlled from the pilot or flight engineer station.

(2) 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.

(3) Ventilation and drafts shall be controlled within each compartment so that the extinguishing agent provided can control any fire which may start within the compartment.

(4) The compartment shall be completely lined with fire-resistant material, except that additional service lining of flame-resistant material may be employed.

§ 4b.384 Proof of compliance. (a) Compliance with these provisions of paragraphs (a) and (b) of § 4b.383 which refer to the compartmental classification, the entry of hazardous quantities of smoke or extinguishing agent into compartments occupied by the crew or passengers, and the operation of the extinguishing agent in category “C” compartments shall be demonstrated by tests in flight.

(b) It shall also be demonstrated during the tests prescribed in paragraph (a) of this section that no inadvertent operation of smoke or fire detectors in adjacent or other compartments within the airplane would occur as a result of fire or smoke contained in an adjacent compartment, either during or after extinguishment, unless the extinguishing system floods such compartments simultaneously.

Miscellaneous

§ 4b.390 Reinforcement near propellers. Surfaces near propeller this shall have sufficient strength and stiffness to withstand the effects of the induced vibration and of ice thrown from the propeller. Windows shall not be located in this area unless shown capable of withstanding the most severe ice impact likely to occur.

§ 4b.391 Leveling marks. Reference marks shall be provided for use in leveling the airplane when making weight and balance determinations on the ground.

SUBPART E—POWERPLANT INSTALLATION (RECIPROCATING ENGINES)

General

§ 4b.400 Scope. (a) The powerplant installation shall be such that all components of the airplane are necessary for its propulsion. It shall also be considered to include all components which affect the control of the major propulsive units which affect their safety of operation between normal inspections or overhaul periods. (See §§ 4b.404 and 4b.613 for instrument installation and marking.)

(b) All components of the powerplant installation shall be constructed, arranged, and installed in such a manner as will assure their continued safe operation between normal inspections or overhaul periods.

(c) Accessibility shall be provided to permit such inspection and maintenance as is necessary to assure continued airworthiness.

(d) Electrical interconnections shall be provided to prevent the existence of differences of potential between major components of the powerplant installation and other portions of the airplane.

§ 4b.401 Engines—(a) Type certification. All engines shall be type certified in accordance with the provisions of Part 13 of the Civil Air Regulations.

(b) Engine isolation. The engines shall be so isolated, each from the other, that the failure or malfunctioning of any one engine, or any part of the powerplant installation serving any one engine, will not prevent the safe operation of the remaining engine or engines.

(c) Control of engine rotation. Means shall be provided for stopping and restarting the rotation of any engine individually in flight. All components which affect the engine rotation shall be located on the engine side of the firewall and which might be exposed to fire, shall be of fire-resistant construction. (See also §§ 4b.443 and 4b.444.)

§ 4b.402 Propellers. Propellers shall be type certificated in accordance with the provisions of Part 14 of the Civil Air Regulations. The maximum propeller shaft rotational speed and the engine power permissible for use in the airplane
shall not exceed the corresponding limits for which the propeller has been certificated.

§ 4b.403 Propeller vibration. The magnitude of the propeller blade vibration stresses under all normal conditions of operation shall be determined by actual measurement or by comparison with similar installations for which such measurements have been made. The vibration stresses thus determined shall not exceed values which have been demonstrated to be safe for continuous operation.

§ 4b.404 Propeller pitch and speed limitations. (a) The propeller pitch and speed shall be limited to values which will assure safe operation under all normal conditions and which will assure compliance with the performance requirements specified in §§ 4b.116 through 4b.125.

(b) A propeller speed limiting means shall be provided at the governor. Such means shall be set to limit the maximum possible governed engine speed to a value not exceeding the maximum permissible r. p. m.

(c) The low pitch blade stop in the propeller, or other means used to limit the low pitch position, shall be set so that the propeller speed does not exceed 103 percent of the maximum permissible engine r. p. m. under the following conditions:

(1) Propeller blades at the low pitch limit and governor inoperative;

(2) Engine operating at take-off manifold pressure with the airplane stationary under standard atmospheric conditions.

§ 4b.405 Propeller clearance. With the airplane loaded to the maximum weight and at the most adverse center of gravity position and the propellers in the most adverse pitch position, the propeller clearances shall not be less than the following, unless smaller clearances are substantiated for the particular design involved:

(a) Ground. Seven inches of clearance for airplanes equipped with nose-wheel type landing gears) or 9 inches of clearance (for airplanes equipped with tail-wheel type landing gears) shall be provided with the landing gear statically deflected and the airplane in the level, normal take-off, or taxiing attitude, whichever is most critical. In addition, there shall be positive clearance between the propeller and the ground when, with the airplane in the level take-off attitude, the critical tire is completely deflated and the corresponding landing gear strut is completely bottomed.

(b) Water. A minimum clearance of 13 inches shall be provided unless compliance with § 4b.151 can be demonstrated with less clearance.

(c) Structure. (1) One inch radial clearance shall be provided between the blade tips and the structure: The structure or whatever additional radial clearance is necessary to preclude harmful vibration of the propeller or airplane.

(2) One-half inch longitudinal clearance shall be provided between the propeller blades or cuffs and stationary portions of the airplane.

(3) Positive clearance shall be provided between other rotating portions of the propeller and Oscillating and stationary portions of the airplane.

§ 4b.406 Propeller de-icing provisions. (a) Airplanes intended for operation under atmospheric conditions conducive to the formation of propeller ice shall be provided with means for the prevention and removal of ice accretions.

(b) If combustible fluid is used for propeller de-icing, the provisions of §§ 4b.480 through 4b.483, inclusive, shall be complied with.

Fuel System Operation and Arrangement

§ 4b.410 General. (a) The fuel system shall be constructed and arranged in such a manner as to assure a flow of fuel to each engine at a rate and pressure which have been established for proper engine functioning under all normal conditions, including all maneuvers for which the airplane is intended. (For fuel system instruments see § 4b.604.)

(b) The fuel system shall be so arranged that no one fuel pump can draw fuel from more than one tank at a time unless means are provided to prevent introducing air into the system.

§ 4b.411 Fuel system independence. The fuel system shall be arranged to permit operation in such a manner that the failure of any one component will not result in the irrecoverable loss of power of more than one engine.

§ 4b.412 Pressure cross-feed arrangements. (a) Pressure cross-feed lines shall not pass through portions of the airplane intended to carry personnel or cargo, unless means are provided to prevent the flight personnel to shut off the supply of fuel to these lines, or unless the lines are enclosed in a fuelproof and fumeproof shroud which is ventilated and drained to the exterior of the airplane.

(b) The shrudings specified in paragraph (a) of this section need not be used if the lines are deflected within the personnel or cargo areas and if they are suitably routed or protected to safeguard against accidental damage.

(c) 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 excess pressures which may result from exposure of the isolated line to high ambient temperatures.

§ 4b.413 Fuel flow rate. (a) The ability of the fuel system to provide the required fuel flow rate shall be demonstrated when the airplane is in the attitude which represents the most adverse condition from the standpoint of fuel feed which the airplane is designed to attain. The following shall be considered in this respect:

(1) The normal ground attitude.

(2) Climb with take-off flaps, landing gear up, using take-off power, at speed \( V_{1c} \) as determined in § 4b.114 (b) at landing weight.

(3) Level flight at maximum continuous power or the power required for level flight at \( V_{C} \) whichever is less.

(4) The attitude of glide at a speed of \( 1.3 \ V_{1c} \) at landing weight.

§ 4b.414 Pump systems. (a) The fuel flow rate for pump systems (main and reserve supply) shall be 0.9 pound per hour for each take-off horsepower or 125 percent of the actual take-off fuel consumption of the engine, whichever is greater.

(b) The fuel flow rate specified in paragraph (a) of this section shall be applicable to both the primary engine-driven pump and to emergency pumps.

It shall be available when the pump is running at the speed at which it would normally be operating during take-off. In the case of hand operated pumps, the fuel shall be considered to be not more than 60 complete cycles (120 single strokes) per minute.

§ 4b.415 Transfer systems. The provisions of § 4b.414 shall also apply to transfer systems, except the required fuel flow rate for the engine or engines involved shall be established upon the basis of maximum continuous power and its corresponding speed instead of take-off power and its corresponding speed.

§ 4b.416 Determination of unusable fuel supply and fuel system operation on low fuel. (a) Upon presentation of the airplane for test, the applicant shall select the quantity of fuel with which to demonstrate compliance with this provision. He shall indicate which of the conditions specified in paragraph (b) of this section are most likely to be critical from the standpoint of establishing the unusable fuel supply and the order in which the other conditions may be critical.

(b) The unusable fuel supply for each tank to be tested for take-off and landing shall be established as not less than the quantity at which the first evidence of malfunctioning occurs under the following conditions: (See § 4b.420.)

(1) Level flight at maximum continuous power or at the power required for level flight at \( V_{C} \) whichever is less.

(2) Climb with take-off flaps and landing gear up, using take-off power, at speed \( V_{1c} \) as determined in § 4b.114 (b) at landing weight;
Wednesday, January 25, 1950

(3) Rapid application of maximum continuous power and subsequent transition to climb at speed \( V_{c} \), with retraction of flaps and landing gear, from a point not less than 1,000 ft above the altitude to which the airplane is to be operated, and positioning the airplane for take-off and landing shall be established as not less than the quantity at which the first evidence of malfunctioning occurs under the conditions specified in paragraph (b) of § 4b.120 (c).

(4) The unusable fuel supply for all tanks other than those used for take-off and landing shall be established as not less than the quantity at which the first evidence of malfunctioning occurs under the conditions specified in paragraph (b) of § 4b.120 (c). It shall be acceptable to demonstrate compliance with this requirement by a ground test.

§ 4b.417 Fuel system hot weather operation. (a) To prove satisfactory hot weather operation the airplane shall be operated at the critical altitude, with the altitude of the airplane chosen by the applicant, to the altitude corresponding with that at which the one-engine-inoperative best rate of climb is not less than the appropriate engine climb specified in § 4b.120 (c). There shall be no evidence of vapor lock or other malfunctioning. The climb test shall be conducted under the following conditions:

(1) All engines shall operate at maximum continuous power, except that take-off power shall be used for the altitude range extending from 1,000 ft below the critical altitude through the critical altitude. The time interval during which take-off power is used shall not exceed the take-off time limitation.

(2) The test shall be conducted with the fuel tanks, minimum crew, and ballast required, except that support of the airplane structure to which the airplane is connected shall be nonabsorbent or shall be treated to prevent the absorption of fluids.

§ 4b.418 Flow between interconnected tanks. In fuel systems with tanks the outlets of which are interconnected, it shall not be possible for fuel to flow between tanks in quantities sufficient to cause malfunctioning. Flexibility shall be provided in fuel tanks so that the tank will not cause an overflow of fuel from the tank when the airplane is operated as specified in § 4b.416 (b) and the tanks are full.

Fuel System Construction and Installation

§ 4b.420 General. (a) Fuel tanks shall be capable of withstanding without failure all vibration, inertia, fluid, and structural loads to which they may be subjected in operation.

(1) Integral tank liners shall be of an acceptable type or shall be proven suitable for the particular application.

(2) Where flexible fuel tank liners are installed, they shall be designed to withstand a minimum internal pressure of 3.5 p.s.i.

(3) Integral type fuel tanks shall be provided with facilities for the inspection and repair of the tank interior.

(4) The total usable capacity of the fuel tanks shall not be less than 0.15 gallon for each maximum continuous horsepower for which the airplane is certified.

(5) The unusable fuel capacity shall be the minimum quantity of fuel which will permit compliance with the provisions of § 4b.416.

(g) The fuel quantity gage shall be adjusted to account for the unusable fuel supply as specified in § 4b.613 (c).

(1) The unusable fuel supply shall be included in the empty weight of the airplane.

§ 4b.421 Fuel tank tests. (a) Fuel tanks shall be capable of withstanding the following pressure tests without failure or leakage. The pressures may be applied in a manner simulating the actual pressure distribution in service.

(1) Conventional metal tanks and nonmetallic tanks the walls of which are not supported by the airplane structure shall be submitted to a pressure of 3.5 p.s.i., or the pressure developed during the maximum ultimate acceleration of the airplane with a full tank, whichever is greater.

(2) Integral tanks shall be submitted to a minimum pressure of 3.5 p.s.i. unless the tank is in a sealed compartment, in which case a hydrostatic head, or equivalent test, shall be applied to duplicate the hydrostatic head to the maximum limit acceleration of the airplane with a full tank exceeds this value, in which case a hydrostatic head, or equivalent test, shall be applied to duplicate the hydrostatic head to the maximum limit acceleration of the airplane with a full tank exceeds this value, in which case a hydrostatic head, or equivalent test, shall be applied to duplicate the hydrostatic head to the maximum limit acceleration of the airplane with a full tank exceeds this value, in which case a hydrostatic head, or equivalent test, shall be applied to duplicate the hydrostatic head to the maximum limit acceleration of the airplane with a full tank.

(3) Nonmetallic tanks the walls of which are supported by the airplane structure shall be submitted to a pressure of 3.5 p.s.i. when mounted in the airplane structure.

(b) It shall not be possible to fill the fuel tank sump capacity of a gallon, whichever is greater.

(1) The tank sump capacity of a gallon, whichever is greater.

(2) The fuel tank sump capacity shall be subject to a vibration test when mounted in a manner simulating the actual installation.

(3) The tank assembly shall be vibrated for 25 hours at an amplitude of not less than 0.5° female inch or 25 inches three times full of water.

(1) The center of gravity within allowable limits.

(2) The fuel tank sump capacity shall be subject to a vibration test when mounted in a manner simulating the actual installation.

(3) The tank assembly shall be vibrated for 25 hours at an amplitude of not less than 0.5° female inch or 25 inches three times full of water.

(4) The fuel tank sump capacity shall be subject to a vibration test when mounted in a manner simulating the actual installation.

(5) The tank assembly shall be vibrated for 25 hours at an amplitude of not less than 0.5° female inch or 25 inches three times full of water.

(6) The fuel tank sump capacity shall be subject to a vibration test when mounted in a manner simulating the actual installation.

(7) The tank assembly shall be vibrated for 25 hours at an amplitude of not less than 0.5° female inch or 25 inches three times full of water.

§ 4b.422 Fuel tank installation. (a) The method of support for fuel tanks shall not be such as to concentrate loads, resulting from the weight of the fuel in the tank, on unsupported tank surfaces. The following shall be applicable.

(1) Pads shall be provided to prevent chafing between the tank and its supports.

(2) Materials employed for padding shall be nonabsorbent or shall be treated to prevent the absorption of fluids.

(3) If flexible tank liners are employed, they shall be so supported that the liner is not required to withstand fluid loads.

§ 4b.423 Fuel tank expansion space. (a) Fuel tanks shall be provided with an expansion space of not less than 2 percent of the tank capacity.

§ 4b.424 Fuel tank sump. (a) Each fuel tank shall be provided with a sump having a capacity of not less than 0.025 percent of the tank capacity or 0.16 of a gallon, whichever is greater.

(b) The fuel tank sump capacity specified in paragraph (a) of this section
shall be effective with the airplane in the normal ground attitude. The fuel tank shall be constructed to permit drainage of any hazardous quantity of water from all portions of the tank to the sump when the airplane is in the ground attitude.

(5) Drains shall be provided with a drain to permit complete drainage of the sump on the ground. The drain shall discharge clear of all portions of the airplane other than the tank itself.

(6) Recessed fuel filler connections which retain any appreciable quantity of fuel shall incorporate a drain, and the drain shall discharge clear of all portions of the airplane.

(7) The filler cap shall provide a fuel-tight seal.

§ 4b.426 Fuel tank vents and carburetor vapor vents. (a) Fuel tanks shall be vented from the top portion of the expansion space in such a manner that the venting is not obstructed under all normal flight conditions. The following shall be applicable.

(1) Vent outlets shall be so located and protected as to prevent the possibility of being obstructed by ice or other foreign matter.

(2) The vent shall be constructed to preclude the possibility of siphoning fuel during normal operation.

(3) The vent shall be of sufficient size to permit the rapid relief of excessive differences of pressure between the interior of the fuel tank and the atmosphere.

(4) Air spaces of tanks the outlets of which are interconnected shall also be interconnected.

(5) There shall be no points in the vapor or fuel line which may accumulate with the airplane in either the ground or the level flight attitudes unless drainage is provided.

(b) Vents and drainage shall not terminate at points where the discharge of fuel from the vent outlet will constitute a fire hazard or from which fumes may enter personnel compartments.

(2) Carburetors which are provided with vapor elimination connections shall be provided with a vent line which will lead vapors back to one of the fuel tanks. The vents shall comply with the following:

(1) Satisfactory provisions shall be incorporated in the vent system to avoid stoppage by ice.

(2) If more than one fuel tank is provided and it is necessary to use the tanks in a definite sequence, the vapor vent return line shall lead back to the fuel tank used for take-off and landing.

§ 4b.427 Fuel tank outlet. A fuel strainer, of 15 to 16 meshes per inch, shall be provided either for the fuel tank outlet or for the booster pump. Strainers shall comply with the following:

(a) The clear area of the fuel tank outlet strainer shall not be less than 5 square inches per linear foot of the area of the fuel tank outlet line.

(b) The diameter of the strainer shall not be less than the diameter of the fuel tank outlet.

(c) Finger strainers shall be accessible for inspection and cleaning.

Fuel System Components

§ 4b.430 Fuel pumps. (a) If the engine fuel supply is maintained by means of pumps, one fuel pump for each engine shall be engine driven.

(b) Fuel pumps shall meet the pertinent flow requirements of § 4b.413.

(c) Unless equivalent provisions are available for the continuous supply of fuel to all engines in case of the failure of any positive displacement fuel system pump, the pump itself shall incorporate an integral bypass. Engine fuel injection pumps which are certified as an integral part of the engine need not incorporate a bypass.

(d) Emergency fuel pumps shall be provided to permit supplying all engines with fuel in case of the failure of any one fuel system. If the engine-driven pump has been approved with the engine and suitable precautions are taken to avoid vapor lock and pump cavitation. If the only pump used in the system is an engine fuel-injection pump which has been certified as an integral part of the engine, an emergency pump need not be provided.

(e) Emergency pumps shall be capable of complying with the same flow requirements as are prescribed for the main pumps.

(f) Hand emergency pumps shall not require excess effort for their continued operation at the rate of 60 complete cycles (120 single strokes) per minute.

(g) Emergency pumps shall be available for immediate use in case of failure of any other pump.

(h) If engine-driven pumps are capable of maintaining flight up to 6,000 feet altitude and with fuel in case of the failure of any other pump, auxiliary fuel pumps shall be provided to support the auxiliary pumps in the event of the failure of any other pump.

§ 4b.431 Fuel pump installation.

(a) Provision shall be made to maintain the fuel pressure at the inlet to the carburetor within the range of limits established for proper engine operation.

(b) When necessary for the maintenance of the proper fuel delivery pressure, a connection shall be provided to transmit the carburetor air intake static pressure to the proper fuel pump relief valve connection. In such cases, to avoid erroneous fuel pressure reading, the gauge shall be independent of the vacuum pump air pressure. The gauge shall be independent of the carburetor inlet pressure.

§ 4b.432 Fuel system lines and fittings. (a) Fuel lines shall be installed and supported to prevent excessive vibration and to withstand loads due to fuel pressure and accelerated flight conditions.

(b) Lines which are connected to components of the airplane between which relative motion may exist shall incorporate provisions for flexibility.

(c) Flexible connections in lines which may be under pressure and subjected to axial loading shall employ flexible hose assemblies rather than hose clamp connections.

(d) Flexible hose shall be of an acceptable type or shall be shown to be suitable for the particular application.

§ 4b.433 Lines and fittings in designated fire zones.

Fuel lines and fittings in all designated fire zones (see § 4b.400) shall comply with the provisions of § 4b.433.

§ 4b.434 Fuel valves. In addition to the requirements of § 4b.482 for shut-off means, all fuel valves shall be provided with positive stops or suitable index provisions in the "on" and "off" positions and shall be supported so that leads resulting from their operation or from accelerated flight conditions are not transmitted to the lines attached to the valve.

§ 4b.435 Fuel strainer. A fuel strainer complying with the following paragraphs shall be provided between the fuel tank outlet and the carburetor inlet.

(a) If an engine-driven fuel pump is provided, the strainer shall be located between the tank outlet and the engine-driven pump inlet.

(b) The strainer shall be accessible for drainage and cleaning, and the strainer screen shall be easily removable.

(c) The strainer shall be mounted in a manner not to cause its weight to be supported by the connecting lines or by the inlet or outlet connections of the strainer itself.

§ 4b.436 Fuel system drains. Drainage of the system shall be accomplished by strainer drains and other drains as provided in § 4b.424. The following shall apply.

(a) Drains shall discharge clear of all portions of the airplane and shall incorporate means for positive locking of the drain in the closed position.

(b) All fuel system drains shall be accessible.

(c) If drainage of the strainer permits compliance with paragraphs (a) and (b) of this section, no additional drains need be provided unless it is possible for a hazardous quantity of water or sediment to be trapped therein. (See also § 4b.433(c)).

§ 4b.437 Fuel jettisoning system. (a) If the maximum take-off weight for which the airplane is certificated exceeds 105 percent of its maximum landing weight, provisions shall be made to permit the jettisoning of fuel from the maximum take-off to the maximum landing weight at an average rate of 1 percent of the maximum take-off weight per minute, except that the time required to jettison the fuel need not in any case be less than 10 minutes when the airplane is flown in the following conditions. The fuel jettisoning system shall permit the discharge of fuel from all portions of the airplane under the following conditions at the maximum take-
off weight and with flaps and landing gear up:
(1) Power-off glide at a speed of 1.4 \( V_{as} \).
(2) Climb at the one-engine-inoperative speed with the critical engine Inoperative, the other engines at maximum continuous power.
(3) Level flight at a speed of 1.4 \( V_{as} \), if found critical as a result of tests specified in subparagraphs (1) and (2) of this paragraph.
(b) Unless it is demonstrated that the flap position does not adversely affect fuel jettisoning, a placard shall be provided adjacent to the jettisoning control to warn flight personnel against jettisoning while the flaps are lowered. A notation to this effect shall also be included in the Airplane Flight Manual (§ 4b.740).
(c) The fuel jettisoning system and its operation shall be free of fire hazard.
(d) Neither fumes nor fuel shall enter any portion of the airplane from the jettisoning operation shall not adversely affect the controllability of the airplane.
(i) Compliance with the provisions of § 4b.432 shall be demonstrated.
(g) It shall not be possible to jettison fuel in the tanks used for take-off and landing below the level providing 45 minutes flight at 75 percent maximum continuous power, except that all fuel may be jettisoned where an auxiliary control is provided independent of the main jettisoning control.
(h) The fuel jettisoning valve shall permit the flight personnel to close the valve during any portion of the jettisoning operation. (See § 4b.475 for fuel jettisoning system controls.)

Oil System
§ 4b.440 General. (a) Each engine shall be provided with an independent oil system capable of supplying the engine with an appropriate quantity of oil at a temperature not exceeding the maximum which has been established as safe for continuous operation. (For oil system instruments see §§ 4b.604 and 4b.735.)
(b) The oil capacity of the system shall not be less than one gallon for every 33 gallons of fuel capacity, unless provisions are made for transferring oil between tanks in flight or unless a reserve oil supply which can be fed to any tank during flight is provided.
(i) If a reserve oil system is not provided, the total oil capacity need not exceed one gallon for each 40 gallons of fuel capacity.
(j) Oil-fuel ratios lower than those prescribed in paragraphs (b) and (c) of this section shall be acceptable if substantiated by data indicating unusually low oil consumption of the engine.
(k) Any screen or other guard which may impede the flow of oil. (See also § 4b.483 (c).)
(l) The fuel jettisoning system shall be demonstrated under ground and flight operation.

Oil tank expansion space. (1) Oil tanks shall have an expansion space of not less than either 10 percent of the tank capacity or 0.5 gallon, whichever is greater.
(2) Reserve oil tanks which have no direct connection to any engine shall have an expansion space which is not less than 2 percent of the tank capacity.
(3) It shall not be possible to fill the oil tank expansion space inadvertently when the airplane is in the normal ground attitude.

Oil tank filler connections. (1) Oil tank filler connections shall be as prescribed in § 4b.785 (b).
(2) Recessed oil filler connections which retain any appreciable quantity of oil shall incorporate a drain, and the drain shall discharge clear of all portions of the airplane.
(3) The filler cap shall provide an oil-tight seal.
(c) Oil tank vent. (1) Oil tanks shall be vented from the top portion of the expansion space in such a manner that the tank is vented under all normal flight conditions.
(2) Oil tank vents shall be arranged so that condensation of water vapor which may freeze and obstruct the line cannot accumulate at any point. (See also § 4b.483 (c).)
(d) Oil tank outlet. The oil tank outlet shall not be enclosed or covered by any screen or other guard which may impede the flow of oil. (See also § 4b.449.)
(2) Breathers shall discharge in a location which will not constitute a fire hazard in case offoaming occurs and so accumulate at any point.
(e) Flexible oil tank liners. Flexible oil tank liners shall be of an acceptable type or shall be shown to be suitable for the particular application.
§ 4b.442 Oil tank tests. (a) Oil tanks shall be capable of withstanding without failure all vibration, inertia, and fluid loads to which they may be subjected in operation.
(1) Oil tank tests shall be the same as fuel tank tests (see § 4b.421), except as follows:
(1) The test pressure specified in § 4b.421 (a) shall be 5 p.s.i.
(2) The test fluid specified in § 4b.421 (c) shall be oil at a temperature of 250° F.
§ 4b.443 Oil tank installation. Oil tank installation shall comply with the provisions of § 4b.422, except that oil tanks may be located on the engine side of the firewall.
§ 4b.444 Oil lines and fittings—(a) General. Oil lines shall comply with the provisions of § 4b.432.
(b) Lines and fittings in designated fire zones. Oil lines and fittings in all designated fire zones (see § 4b.450) shall comply with the provisions of § 4b.433.
(c) Engine breather lines. (1) Engine breather lines shall be arranged so that condensation of water vapor which may freeze and obstruct the line cannot accumulate at any point.
(2) Breather lines shall discharge in a location which will not constitute a fire hazard in case offoaming occurs and so that the emitted oil will not impair upon the pilot windshield.

Oil filters. If the airplane is equipped with an oil filter, the filter shall be constructed or installed in such a manner that complete blocking of the flow through the filter element will not prevent the safe operation of the engine oil supply system.

Oil radiators. If the airplane is equipped with an oil filter, the filter shall be constructed or installed in such a manner that complete blocking of the flow through the filter element will not prevent the safe operation of the engine oil supply system.

Oil lines shall comply with the provisions of § 4b.422, except that oil tanks may be located on the engine side of the firewall.

Cooling System
§ 4b.450 General. The powerplant cooling provisions shall be capable of maintaining the temperatures of major powerplant components, engine fluids, and the carburetor intake air within the established safe values under all conditions of ground and flight operation. (For cooling system instruments see §§ 4b.604 and 4b.734.)
§ 4b.451 Cooling tests—(a) General. Compliance with the provisions of § 4b.450 shall be demonstrated under critical ground, water, and flight operating conditions. If the tests are conducted under conditions which deviate from the maximum anticipated air temperature (see paragraph (b) of this section), the results of the tests and the temperature shall be corrected in accordance with the provisions of paragraphs (b) and (c) of this section. The corrected
temperatures determined in this manner shall not exceed the maximum established safe values. The fuel used during the cooling test shall be of the minimum octane number approved for the engines involved, and the mixture settings shall be the same as normal operation. The test procedures shall be as outlined in § 4b.452 through 4b.454.

(b) Maximum anticipated air temperature. The fuel used during the cooling test shall be of the minimum octane number approved for the engines involved, and the mixture settings shall be the same as normal operation. The test procedures shall be as outlined in § 4b.452 through 4b.454.

(c) Maximum cylinder barrel temperature. Cylinder barrel temperature shall be corrected by adding 0.7 of the difference between the maximum anticipated air temperature and the temperature of the ambient air at the time of the first occurrence of maximum air, oil, or coolant temperature. Cylinder barrel temperatures shall be corrected by adding 0.7 of the difference between the maximum anticipated air temperature and the temperature of the ambient air at the time of the first occurrence of maximum air, oil, or coolant temperature during the cooling test, unless a more rational correction is shown to be applicable.

(d) Correction factors for cylinder barrel temperatures. Cylinder barrel temperatures shall be corrected by adding 0.7 of the difference between the maximum anticipated air temperature and the temperature of the ambient air at the time of the first occurrence of maximum air, oil, or coolant temperature. Cylinder barrel temperatures shall be corrected by adding 0.7 of the difference between the maximum anticipated air temperature and the temperature of the ambient air at the time of the first occurrence of maximum air, oil, or coolant temperature during the cooling test, unless a more rational correction is shown to be applicable.

§ 4b.452 Climb cooling test procedure.

(a) The climb cooling test shall be conducted with the critical engine inoperative and its propeller feathered.

(b) All remaining engines shall be operated at maximum continuous power or at full throttle when above the critical altitude.

(c) After stabilizing temperatures in flight, the climb shall be started at or below the height during the two following conditions and shall be continued until at least 5 minutes after the occurrence of the highest temperature recorded, or until the maximum altitude is reached for which certification is desired:

1. 1,000 feet below the engine critical altitude.
2. 1,000 feet below the maximum altitude at which the rate of climb is equal to that established in accordance with § 4b.120 (c).

(d) The climb shall be conducted at an air speed which does not exceed the speed used in establishing the rate of climb required in § 4b.120 (c). It shall be acceptable to conduct the climb cooling test in conjunction with the take-off cooling test specified in § 4b.455.

§ 4b.453 Take-off cooling test procedure. If the time for which take-off power is used in establishing the take-off path of the airplane exceeds two minutes, a take-off cooling test shall be conducted to demonstrate cooling take-off and during subsequent climb with one engine inoperative. The following procedure shall be applicable.

(a) The take-off cooling test shall be commenced by stabilizing temperatures during level flight at 75 percent of maximum continuous power (all engines operating) with the appropriate cowl flap and shutter setting.

(b) After all temperatures have stabilized, the climb shall be started at the lowest practicable altitude and shall be conducted with one engine inoperative and its propeller feathered.

(c) The engine shall be operated at take-off rpm and power (or full throttle when above the take-off critical altitude) for the same time interval as take-off power is used during determination of the take-off flight path (see § 4b.114).

(d) At the end of the time interval prescribed in paragraph (c) of this section the power shall be reduced to the maximum continuous power and the climb continued until at least 5 minutes after the occurrence of the highest temperature recorded during the cooling test, unless a more rational correction is shown to be applicable.

§ 4b.454 Cooling test procedure for flying boat operation.

(a) The take-off cooling test shall be conducted during taxiing down wind for 10 minutes at 5 m.p.h. above the speed at which the airplane is inoperative.

(b) The climb cooling test shall be conducted with one engine inoperative.

(c) The cooling test shall be conducted at an air speed which does not exceed the speed used in establishing the rate of climb required in § 4b.120 (c). It shall be acceptable to conduct the climb cooling test of § 4b.453.

(d) The climb shall be conducted at an air speed which does not exceed the speed used in establishing the rate of climb required in § 4b.120 (c). It shall be acceptable to conduct the climb cooling test of § 4b.453.

§ 4b.455 Liquid cooling systems. Each liquid-cooled engine shall be provided with an independent cooling system. The coolant system shall be so arranged that no air or vapor can be trapped in any portion of the system other than the expansion tank, either during filling or during operation. No flammable coolant shall be used.

§ 4b.456 Coolant tank—(a) General. The tank shall have a usable coolant capacity of not less than one gallon and shall be capable of withstanding without failure all vibration, inertia, and fluid loads to which it may be subjected during operation.

(b) Coolant tank tests. Coolant tank tests shall be the same as fuel tank tests (see § 4b.421, except as follows:

1. The 3.5 p.s.i. pressure test of § 4b.421 (a) shall be replaced by either the sum of the pressure developed during the maximum ultimate acceleration with a full tank plus the maximum working pressure of the system, or 1.25 times the maximum ultimate acceleration of the system, whichever is greater.

2. In the case of tanks with non-metallic liners, the test fluid shall be a coolant at operating temperature rather than fuel as specified in § 4b.421 (c).

(c) Cooling systems. Coolant tanks shall be supported in a manner which will permit expansion due to operating temperatures and which will prevent the transmission of harmful vibrations to the radiator.

(d) The air intake duct to the coolant radiator shall be so located that in case of fire, flames issuing from normal openings of the engine nacelle cannot ignite the flammable coolant, or establish a path for the spread of fire to the cockpit.

(e) Coolant system drains. (1) One or more drains shall be provided to permit drainage of the coolant system, including the coolant tank, radiator, and the engine, when the airplane is in the normal ground attitude.

2. Drains shall discharge clear of all portions of the airplane and shall incorporate means for positive locking of the drain in the closed position.

3. Coolant system drains shall be accessible.

Induction and Exhaust Systems

§ 4b.460 General. (a) The engine air induction system shall permit supplying an adequate quantity of air to the engine under all conditions of operation.

(b) The induction system shall provide air to permit acceptable fuel metering and mixture distribution with the induction system valves in any position.

(c) Each engine shall be provided with an alternate air source unless equivalent safety is demonstrated by other means.

(d) Air intakes shall not open into the cowling, unless that portion of the cowling is separated from the engine accessory section by means of a firewall, or unless provision is made to prevent the emergence of fire in the vicinity of the engine.

(e) Alternate air intakes shall be located in a sheltered position.

§ 4b.461 Induction system de-icing and anti-icing provisions. The engine air induction system shall incorporate means for the prevention and elimination of ice accumulation in accordance with the following provisions, unless it is demonstrated that equivalent safety can be obtained by a lower heat rise or by other
means. It shall be demonstrated that compliance with the following provisions can be accomplished when the airplane is operating in air at a temperature of 30°F. F. and at an altitude of 10,000 feet above sea level.

(a) Airplanes equipped with balanced power-plant controls shall be provided with a preheater capable of providing a heat rise of 100°F when the engine is operating at 60 percent of its maximum continuous power.

(b) Airplanes equipped with altitude engines employing carburetors which embody features tending to reduce the possibility of ice formation shall be provided with a preheater capable of providing a heat rise of 129°F when the engine is operating at 60 percent of its maximum continuous power.

§ 4b.462 Carburetor preheater design. (a) Means shall be provided to assure ventilation of the carburetor air preheater when the engine is being operated at idle speed.

(b) The preheater shall be constructed to permit inspection of exhaust manifold parts which it surrounds and also to permit inspection of critical portions of the preheater itself.

§ 4b.463 Induction system ducts. (a) Induction system ducts ahead of the first stage of the supercharger shall be provided with drains to prevent the hazards of accumulation of fuel and moisture in the ground attitude.

(b) Sufficient strength shall be incorporated in the ducts to prevent induction system failures resulting from normal backfire conditions.

(c) Drains shall not discharge in locations which might cause a fire hazard.

(d) Ducts which are connected to components of the airplane between which relative motion may exist shall incorporate provisions for flexibility.

§ 4b.464 Induction system screens. (a) If induction system screens are employed, they shall be located upstream from the carburetor.

(b) Except as may be possible for fuel to impinge upon induction system screens.

(c) Screens shall not be located in portions of the induction system which constitute the only passage through which air may reach the engine, unless the screen is so located that it can be deiced by heated air.

(d) De-icing of induction system screens by means of alcohol alone shall not be acceptable.

§ 4b.465 Carburetor air cooling. (a) Installations employing two-stage superchargers shall be provided with means to maintain the air temperature at the inlet to the carburetor at or below the maximum established value.

(b) Demonstration of compliance with the provision of paragraph (a) shall be accomplished in accordance with § 4b.466.

§ 4b.466 Intercoolers and aftercoolers. Intercoolers and aftercoolers shall be capable of withstanding without failure all vibration, inertia, and air pressure loads to which they may be subjected in operation.

§ 4b.467 Exhaust system and installation components—(a) General. (1) The exhaust system shall be constructed and arranged to assure the safe disposal of exhaust gases without the presence of a fire hazard or carbon monoxide contamination of air in personnel compartments.

(2) Unless suitable precautions are taken, exhaust system parts shall not be located in hazardous proximity to portions of any systems carrying flammable fluids or vapors nor shall they be located in such portions of such systems where the latter may be subject to leakage.

(3) All airplane components upon which hot exhaust gases may impinge, or which may be subjected to high temperatures due to proximity to exhaust system parts, shall be constructed of fireproof material. All exhaust system components shall be separated by means of fireproof barriers from adjacent portions of the airplane which are outside the engine compartment.

(4) Exhaust gases shall not discharge within dangerous proximity of any fuel or oil system drains.

(5) Exhaust gases shall not discharge at a location which will cause a glare seriously affecting pilot visibility at night.

(b) Exhaust piping. (1) Exhaust piping shall be constructed of material suitably resistant to heat and corrosion, and shall incorporate provisions to prevent failure due to expansion when heated to operating temperatures.

(2) Exhaust pipes shall be supported to withstand all vibration and inertia loads to which they may be subjected in operation.

(3) Portions of the exhaust piping which are connected to components between which relative motion may exist shall incorporate provisions for flexibility.

(c) Exhaust heat exchangers. (1) Exhaust heat exchangers shall be constructed and installed to assure their ability to withstand all vibration, inertia, and other loads to which they may be subjected in operation.

(2) Heat exchangers shall be constructed of materials which are suitable for continued operation at high temperatures and which are resistant to corrosion due to products contained in exhaust gases.

(3) Provision shall be made for the inspection of all critical portions of exhaust heat exchangers.

(4) Heat exchangers shall be cooled whenever they are subject to contact with exhaust gases.

(d) Exhaust heating of ventilating air. If an exhaust heat exchanger is used for heating other air, a secondary heat exchanger shall be provided between the primary exhaust gas heat exchanger and the ventilating air system, unless it is demonstrated that sufficient safety can be obtained by other means.

(e) Exhaust driven turbo-superchargers. (1) Exhaust driven turbines shall be of an approved type or shall be proven suitable for the particular application. They shall be installed and supported to assure their safe operation between normal inspection and overhaul periods.

(2) Provision for expansion and flexibility shall be made between exhaust conduits and the turbine.

(3) Provision shall be made for lubrication of the turbine and for cooling of these turbine parts where the temperatures are critical.

(4) Means shall be provided for automatic limitation of turbine speed to its maximum allowable overspeed value.

Power-Plant Controls and Accessories

§ 4b.470 Power-plant controls. All power-plant controls shall comply with the provisions of § 4b.353 with respect to location, grouping, and direction of motion, and shall comply with the provisions of § 4b.477 with respect to marking. In addition they shall comply with the following:

(a) Controls shall be so located that they cannot be inadvertently operated by personnel entering or leaving the airplane, or while flight personnel are making normal movements in the cockpit.

(b) Controls shall maintain any set position without constant attention by flight personnel. They shall not tend to creep due to control loads or vibration.

(c) Flexible controls shall be of an approved type or shall be proven suitable for the particular application.

(d) Controls shall have strength and rigidity to withstand operating loads without failure and without excessive deflection.

§ 4b.472 Ignition switches. (a) Ignition switches shall be so arranged that they cannot be inadvertently operated by personnel entering or leaving the airplane.

(b) Means shall be provided for quickly shutting off all ignition by the grouping of switches or by providing a master ignition control.

(c) If a master ignition control is provided, a guard shall be incorporated to prevent inadvertent operation of the control.

§ 4b.473 Mixture controls. (a) If mixture controls are provided, a separate control shall be provided for each engine.

(b) The mixture controls shall be grouped and arranged to permit separate control of each engine and also simultaneous control of all engines.

§ 4b.474 Propeller controls. (a) Propeller speed and pitch controls. The propeller speed and pitch controls shall be grouped and arranged to permit control of the propellers separately and together. The controls shall provide for synchronization of all propellers.
§ 4b.476 Propeller feathering controls. If the propeller blades can be placed in a pitch position which produces negative thrust, propeller reversing controls shall be arranged to prevent inadvertent operation.

§ 4b.478 Engine ignition systems. (a) The design of the engine ignition system shall take into consideration the condition of an inoperative generator and the condition of a completely depeated battery when the generator is running at its normal operating speed.

(c) Means shall be provided to warn flight personnel if malfunctioning of any part of the electrical system is causing the continuous discharging of a battery which is necessary for engine ignition. (See § 4b.472 for ignition switches.)

§ 4b.480 Designated fire zones. (a) Designated fire zones shall comprise the following regions:

(1) Engine power section;

(2) Engine accessory section;

(3) Complete powerplant compartments in which no isolation is provided between the engine power section and the engine accessory section;

(4) Auxiliary power unit compartments;

(5) Fuel-burning heaters, regions surrounding them, and other combustion equipment installations.

§ 4b.481 Flammable fluids. (a) No tanks or reservoirs which are a part of a system containing flammable fluids or gases shall be located in designated fire zones.

§ 4b.482 Shut-off means. (a) Means for each individual engine and for each individual fire zone specified under subparagragh (1) and (3) 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 any designated fire zone, except that means need not be provided to shut off flow in lines forming an integral part of an engine.

(b) In order to facilitate rapid and effective control of fires, shut-off means shall permit automatic and manual operation, and shall utilize the provisions made on the engine for mounting.

§ 4b.483 Lines and fittings. (a) All lines and fittings located in designated fire zones which carry flammable fluids or gases shall be constructed of fire-resistant materials.

(b) Lines and fittings which are not subject to pressure or to relative motion between components shall be of fire-resistant materials.
§ 4b.485 Fire detector systems. (a) 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 in such zones.

(b) Fire detectors shall be constructed and installed to ensure their ability to resist without failure all vibration, inertia, and other loads to which they may be subjected in operation.

(c) Detectors shall be unaffected by exposure to oil, water, or other fluids or fumes which may be present.

§ 4b.486 Fire walls. All engines, auxiliary power units, fuel-burning heaters, and other combustion equipment shall be protected against fire, which are intended for operation in flight. All components of fire extinguishing systems located in designated fire zones shall be constructed of fire-proof material, 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 and so located as to minimize the possibility of failure.

§ 4b.488 Engine accessory section discharge. This diaphragm shall comply with the provisions of § 4b.486.

§ 4b.489 Protection of other airplane components against fire. All components of fire extinguishing systems located in designated fire zones shall be constructed of fire-proof material, 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 and so located as to minimize the possibility of failure.

§ 4b.600 Scope. The required equipment as prescribed in this subpart is the minimum which shall be installed in the airplane for certification. Such additional equipment as is necessary for a specific type of operation is prescribed in the operating parts of the Civil Air Regulations.

§ 4b.601 Functional and installational requirements. Each item of equipment shall be:

(a) Of a type and design satisfactory to perform its intended function,

(b) Adequately labeled as to its identification, function, or operational limitations, or any combination of these, whichever is applicable,

(c) Properly installed in accordance with specified limitations of the equipment,

(d) Demonstrated to function satisfactorily in the airplane.

§ 4b.602 Required basic equipment. The basic equipment listed in §§ 4b.603 through 4b.608 shall be required for certification of the airplane.

§ 4b.603 Flight navigation instruments. (a) Air-speed indicating system with heated pilot tube or equivalent means of preventing malfunction due to icing (see paragraphs 4b.612 (a) and (b)).

(b) Altimeter (sensitive) (see § 4b.512 (b)).

(c) Clock (sweep-second).

(d) Free air temperature indicator.

(e) GYROscopic bank and pitch indicator (see § 4b.612 (e)).

(f) GYROscopic rate-of-turn indicator (with bank indicator) (see § 4b.612 (e)).

(g) GYROscopic direction indicator (see § 4b.612 (e)).

(h) Magnetic direction indicator (see § 4b.612 (e)).

(i) Rate-of-climb indicator (vertical speed) (see § 4b.612 (b)).

§ 4b.604 Powerplant instruments. (a) Carburetor air temperature indicator for each engine.

(b) Coolant indicator for each liquid-cooled engine.

(c) Cylinder head temperature indicator for each air-cooled engine (see § 4b.613 (f)).

(d) Fuel pressure indicator for each pump-fed engine.

(e) For each engine not equipped with an automatic altitude mixture control:

(f) Fuel quantity indicator for each fuel tank (see § 4b.613 (d)), or

(g) Fuel mixture indicator,

(h) Oil pressure indicator for each engine.

(i) Oil quantity indicator for each oil tank when a transfer or oil reserve supply system is used (see § 4b.613 (e)).

(j) Oil temperature indicator for each engine.

(k) Tachometer for each engine.

(l) Fire warning indicators (see § 4b.489).

§ 4b.605 Miscellaneous equipment. (a) Approved seats for all occupants (see § 4b.358).

(b) Approved safety belts for all occupants (see § 4b.643).

(c) A master switch arrangement for electrical circuits other than ignition,

(d) Adequate source(s) of electrical energy,

(e) Electrical protective devices,

(f) Radio communication system (two-way).

(g) Radio navigation system.

(h) Windshield wiper or equivalent for each pilot.

(i) Ignition switch for each and all engines (see § 4b.472).

(j) Approved portable fire extinguisher (see § 4b.641).

SUBPART F—EQUIPMENT

§ 4b.610 General. The provisions of §§ 4b.611 through 4b.619 shall establish the installation requirements for aircraft and powerplant instruments.

§ 4b.611 Arrangement and visibility of instrument installations. (a) Flight, navigation, and powerplant instruments for use by each pilot shall be easily visible to him from his station with the minimum practicable deviation from his normal position and line of vision when he is looking out and forward along the flight path.

(b) All of the required flight instrument indications shall be conveniently grouped and as nearly as practicable centered about the vertical plane of the pilot's forward vision.

(c) All the required powerplant instruments shall be closely grouped on the instrument panel.

(d) Identical powerplant instruments for the several engines shall be located so as to prevent any misleading impression as to the engines to which they relate.

(e) Important powerplant instruments shall be easily visible to the appropriate crew members.

(f) The vibration characteristics of the instrument panel shall be such as to not to impair seriously the accuracy of the instruments or to damage them.

§ 4b.612 Flight and navigation instruments. (a) Air-speed indicating instruments shall be calibrated to indicate true air speed at sea level in the standard atmosphere with a minimum practicable instrument calibration error when the airspeed indicating and static pressures are applied to the instrument.

(b) The air-speed indicating system shall be calibrated in flight to determine the system error, i.e., the relation between TAS and CAS.
(2) The air-speed error of the installation, excluding the air-speed indicator instrument calibration error, shall not exceed 5 p. h. on the manifold gauge, any error from the manifold gauge to the static pressure tube or equivalent means of ice protection.

(3) The air-speed indicating system shall be arranged in so far as practicable and at 1.3 \( \sqrt{V} \) with flaps in landing position.

(4) The air-speed indicating system shall be provided with a heated pitot tube or equivalent means of ice protection.

(5) Static air vent system. All instruments provided with static air case connections shall be vented to the outside atmosphere through a suitable piping system.

(6) The vent(s) shall be so located on the airplane that its orifice will be least affected by air flow variation, moisture, or other foreign matter.

(7) The installation shall be such that the system will be air-tight, except for the vent into the atmosphere.

(e) Magnetic direction indicator. (1) The magnetic direction indicator shall be installed so that its accuracy will not be excessively affected by the airplane's vibration or magnetic fields of a permanent or transient nature.

(2) After the magnetic direction indicator's calibration, the calibration shall be such that the derivative in level flight does not exceed \( \pm 10 \) on any heading.

(3) A calibration placard shall be provided as specified in § 4b.733.

(d) Automatic pilot system. If an automatic pilot system is installed, the following shall be applicable:

(1) The actuating (servo) devices shall be of such design that they can, when necessary, either be disengaged positively or be overpowered by the pilot to enable him to regain satisfactory control of the airplane.

(2) A satisfactory means shall be provided to indicate readiness to the pilot the alignment of the actuating device in relation to the control system which operates, except when automatic synchronization is provided.

(3) The manually operated control(s) for the system's operation shall be readily accessible to the pilot.

(4) The automatic pilot system shall be of such design and so adjusted that, within the range of adjustment available to the human pilot, it cannot produce overloads in the control system and surfaces greater than those for which the system and surfaces were designed.

(e) Gyroscopic indicators (air-driven type). All air-driven gyroscopic instruments shall derive their energy from a suction air pump driven either by an engine or by an auxiliary power unit. The following shall be applicable:

(1) Two suction air pumps actuated by separate power means shall be provided, either one of which shall be of sufficient capacity to operate all of the air-driven gyroscopic instruments and the service ceilings of the airplane in normal cruising condition.

(2) A suitable means shall be provided in the suction air pump installation, where the lines from the individual pumps connect into the manifold line, to select either pump in case of failure of one pump source.

(3) When an automatic system is provided to permit simultaneous air flow is provided in the system, a means shall be provided for indicating any interrupted air flow in the suction air pump lines shall be incorporated in the system. In order to indicate which source has failed, a visual means shall be provided to indicate this condition to the flight crew.

(4) A suction gauge shall be installed to indicate ready to the flight crew while in flight the suction in inches of mercury which is being applied to the air-driven types of gyroscopic instruments.

(4b.613) Power plant instruments—(a) Operational markings. Instruments shall be marked as specified in §§ 4b.724 through 4b.738.

(b) Instrument lines. (1) Instrument lines carrying flammable fluids or gases under pressure shall be provided with restricted orifices or equivalent safety devices at the source of the pressure to prevent escape of excessive fluid or gas in case of line failure.

(2) Power plant instrument lines shall comply with the provisions of § 4b.432. (For fire-resistant power plant instrument lines see § 4b.453.)

(c) Fuel gage indicator. Means shall be provided to indicate to the flight crew the quantity in gallons or equivalent units of usable fuel in each tank during flight. The following shall apply:

(1) Tanks, the outlets and air spaces of which are interconnected, shall be considered as one tank for the purpose of providing separate indicators.

(2) Exposed sight gauges shall be protected against erosion.

(3) Fuel quantity indicators shall be calibrated to read zero during level flight when the quantity of fuel remaining in the tank is equal to the usable fuel supply as defined by § 4b.416 (see § 4b.740).

(d) Fuel flowmeter system. When a flowmeter system is installed, the metering component shall include a suitable means for bypassing the fuel supply in the event that malfunctioning of the metering component results in a severe restriction to fuel flow.

(e) Oil quantity indicator. (1) A stick gauge or other equivalent means shall be provided to indicate the quantity of oil in each tank (see § 4b.735).

(2) If an oil transfer system or a reserve oil supply system is installed, means shall be provided to indicate to the crew during flight the quantity of oil in each tank.

(f) Cylinder head temperature indicating system for air-cooled engines. A cylinder head temperature indicating system shall be provided for each air-cooled engine on airplanes equipped with cowl flaps. In the case of airplanes without cowl flaps, an indicator shall be provided or the provisions of § 4b.450 is demonstrated at a speed in excess of the speed of best rate of climb.

Electrical Systems and Equipment

§ 4b.620 Installation. (a) Electrical systems and equipment shall be free from hazards in themselves, in their method of operation, and in their effect on other parts of the airplane.

(b) They shall be protected from fuel, oil, water, other detrimental substances, and from mechanical damage.

(c) For substantiation of the electrical system the data required under § 4b.13 shall include:

(1) Wiring diagrams, including a schematic power supply diagram.

(2) Installation data, including the manufacturer's name, type of all electrical items, and reference to pertinent specifications.

(3) An electrical load analysis.

§ 4b.621 Batteries. (a) The battery capacity shall be determined necessary from an electrical load analysis.

(b) Means shall be provided to prevent corrosive battery substance from coming in contact with any part of the airplane during servicing or in flight.

(c) Batteries shall be completely enclosed in a container or compartment and shall be easily accessible for servicing and inspection of each other.

(d) The battery container or compartment shall be vented so that gases released by the battery are carried outside the airplane.

(e) Battery cooling shall be provided if found necessary to keep the battery temperature within the limits specified by the battery manufacturer.

§ 4b.622 Generator system—(a) Generator capacity. The generator capacity necessary shall be determined initially from an electrical load analysis, and its adequacy shall be demonstrated during flight test. A switch shall be provided for each generator to permit its output to be interrupted. Individual generators shall be capable of delivering their continuous rated power.

(b) Generator control. Generator voltage control equipment shall be capable of regulating the generator output within rated limits.

(c) Reverse current cutout. A generator reverse current cutout shall disconnect the generator from the battery and from other generators when the generator is developing a voltage of such value that current sufficient to cause malfunctioning can flow into the generator.

§ 4b.623 Master switch. A master switch arrangement shall be provided which will disconnect all sources of electrical power from the main distribution system as a point adjacent to the power sources.

§ 4b.624 Master switch installation. The master switch and its controls shall be so installed that it is easily discernible and accessible to a member of the crew in flight.

§ 4b.625 Protective devices. Protective devices (fuses or circuit breakers) shall be installed in the circuits to all electrical equipment, except this shall be determined not to be necessary in the main circuits of starter motors or in other circuits where no hazard is presented by
their omission. If fuses are used, one spare of each rating or 50 percent spare fuses of each rating, whichever is greater, shall be provided.

§ 4b.629 Protective devices installation. Protective devices in circuits used in flight shall be located conveniently and properly to facilitate replacement of fuses or resetting of circuit breakers in flight.

§ 4b.627 Electric cables. The electric cables used shall be in accordance with approved standards for aircraft electric cables of a slow-burning type. They shall have current-carrying capacity sufficient to deliver the necessary power to the items of equipment to which they are connected.

§ 4b.623 Switches. Switches shall be capable of carrying their rated current. They shall be accessible to the crew and shall be labeled as to operation and the circuit controlled.

Lights

§ 4b.631 Landing lights—(a) Illumination. Landing lights shall provide sufficient light to make all instruments, switches, etc., easily readable.

(b) Instrument light installation. Instrument lights shall be installed in a manner so that their direct rays are shielded from the pilot's eyes and so that no objectionable reflections are visible to him.

(c) Light dimming. A means of controlling the intensity of illumination shall be provided, unless it is shown that nondimmed instrument lights are satisfactory under all expected conditions of flight.

§ 4b.630 Instrument lights—(a) Illumination. Instrument lights shall provide sufficient light for night illuminating to make all instruments, switches, etc., easily readable.

(b) Instrument light installation. Instrument lights shall be installed in a manner so that their direct rays are shielded from the pilot's eyes and so that no objectionable reflections are visible to him.

(c) Light dimming. A means of controlling the intensity of illumination shall be provided, unless it is shown that nondimmed instrument lights are satisfactory under all expected conditions of flight.

§ 4b.632 Position lights—(a) Type. Forward and rear position lights shall be of a type certificated in accordance with Part 15.

(b) Forward position light installation. (1) Forward position lights shall be installed so that, with the airplane in normal flying position, the red light is displayed on the left side and the green light on the right side, each showing unbroken light.

(2) The intersection of the two planes forming the gimbal angle A prescribed in Part 15 shall be vertical.

(c) Rear position light installation. (1) The red and white position lights shall be mounted as far apart as practicable and installed so that unbroken light is directed symmetrically aft from each light with the axis of the maximum cone of illumination parallel to the flight path.

(2) The intersection of the two planes forming the gimbal angle A prescribed in Part 15 shall be vertical.

(d) Top and bottom fuselage lights. (1) The top and bottom fuselage lights shall provide a means for night landing.

(2) The bottom fuselage lights shall be installed in a manner so that they are visible from all directions.

(e) Position light flasher. (1) The position light flasher shall incorporate two flashing circuits which are energized alternately, the flashing of the position and fuselage lights in the manner indicated in paragraph (f).

(2) The flasher shall be of an approved type.

(f) Flashing light sequence. (1) The forward position lights and the rear white position light shall be on one of the flasher circuits, and the top and bottom fuselage lights and the rear red position light shall be on the other circuit.

(2) The flashing sequence shall be repeated automatically when the position light switch is in the "flash" position.

(g) Flashing light cutoff switch. A switch shall be provided to eliminate the flasher from the position light circuit so that continuous light may be provided by the forward position lights and the rear white position light, while the top and bottom fuselage lights are not lighted.

§ 4b.633 Riding light. When a riding (anchor) light is required for a seaplane, flying boat, or amphibian, it shall be capable of showing a white light for at least two miles at night under clear atmospheric conditions.

§ 4b.634 Riding light—installation. The riding light specified in § 4b.633 shall be installed to show the maximum unbroken light practicable when the airplane is moored or drifting on the water. Externally hung lights shall be acceptable.

Safety Equipment

§ 4b.639 Ex-icers. When an ice protection system is installed, it shall be of an approved type. The pneumatic boots are used, at least two independent sources of power and a positive means for the deflation of the boots shall be provided.

§ 4b.641 Fire extinguishers; number and installation. (a) The approved portable fire extinguisher required in Chapter 2 of this part shall be installed on the airplane.

(b) When the operating rules require additional fire-extinguishing equipment, the installation of such equipment shall depend upon the size and compartmentation of the airplane and the number and distribution of the crew and passengers. Such fire extinguishers shall be installed in approved locations.

§ 4b.642 Flare installation. (a) Parachute flares shall be reissuable from the pilot compartment and shall be of a type certificated in accordance with Part 15. It shall be demonstrated in flight that the flare is acceptable in accordance with § 4b.18. In no case shall the rated strength of the safety belt be less than that corresponding to the ultimate load factors specified in § 4b.260 (a), taking due account of the dimensional characteristics of the safety belt installation for the specific seat or berth arrangement. Safety belts shall be attached so that no part of the anchorage will fail at a load lower than that corresponding to the ultimate load factors specified in § 4b.260 (a).

§ 4b.644 Safety belt signal. When a means is provided to indicate to the passengers when seat belts should be fastened, the device shall be so installed that it can be operated from the seat of either pilot or copilot.

§ 4b.645 Emergency flotation and signaling equipment. (a) Rafts and life preservers shall be installed so as to be readily available to the crew and passengers.

(b) Rafts released automatically or released by the pilot shall be attached to the airplane by means of line to keep them adjacent to the airplane.

(c) Signaling devices shall be accessible, shall function satisfactorily, and shall be free from any hazard in their operation.

Miscellaneous Equipment

§ 4b.650 Radio installation. Radio equipment installations in the airplane shall be free from hazards in themselves, in their method of operation, and in their effects on other components of the airplane.

§ 4b.651 Oxygen equipment and supply. When required by the operating rules of the Civil Air Regulations, the supplemental and protective breathing equipment and its installation shall meet the following requirements.

(a) General. The oxygen system in the airplane shall be free from hazards in itself, in its method of operation, in its effect on other components of the airplane. A means shall be provided to enable the crew to determine the quantity of oxygen available in each source of supply.

Wednesday, January 25, 1950

FEDERAL REGISTER

439
(b) Required minimum mass flow supplemental oxygen. The minimum mass flow of supplemental oxygen required per person at various cabin pressure altitudes shall be at least that indicated by figure 4b-18.

c) Equipment standards for distribution system. Where oxygen is to be supplied to both crew and passengers, the distribution system shall be designed to provide either:

1. A source of supply for the flight crew on duty and a separate source for the passengers and other crew members, or

2. A common source of supply with means provided so that the minimum supply required by the flight crew on duty can be separately reserved.

d) Equipment standards for dispensing units. An individual dispensing unit shall be provided for each crew member and passenger for whom supplemental oxygen is required to be furnished. All units shall be designed to cover the nose, and at least 25 percent of the units required to be furnished shall, in addition, cover the mouth. (For crew masks to be used for protective breathing purposes see the pertinent air carrier operating rules.)

e) Means for determining use of oxygen. A means shall be provided to enable the crew to determine whether oxygen is being delivered to each user.

§ 4b.653 Engine-driven accessories. Engine-driven accessories essential to safe operation of the airplane shall be so distributed among two or more engines that the failure of any one engine will not impair the safe operation of the airplane.

§ 4b.655 Hydraulic systems—(a) Design. Hydraulic systems and elements shall withstand, without exceeding the yield point, all structural loads which may be imposed in addition to the hydraulic loads.

(b) Tests. Hydraulic systems shall be substantiated by proof pressure tests. When proof tested, no part of the hydraulic systems shall fail, malfunction, or experience a permanent set. The proof load of any system shall be 1.5 times the maximum operating pressure of that system.

c) Lines and fittings. Hydraulic lines and fittings in all designated fire zones (see § 4b.460) shall comply with the provisions of § 4b.483.

d) Reservoirs and accumulators. Location of hydraulic reservoirs and accumulators shall comply with the provisions of § 4b.481, except when they are an integral part of the engine or propeller.

SUBPART C—OPERATING LIMITATIONS AND INFORMATION

General

§ 4b.700 Scope. (a) The operating limitations listed in §§ 4b.710 through 4b.723 shall be established as prescribed in this part.

(b) The operating limitations, together with any other information concerning the airplane found necessary for safe operation during operation shall be made available to appropriate members of the flight crew by means of the Airplane Flight Manual, as prescribed in § 4b.740, by means of the markings and placards as prescribed in § 4b.720, and by such additional means as may be found necessary to accomplish this purpose.

Operating Limitations

§ 4b.710 Air-speed limitations; general. (a) The values of air-speed limitations are a function of weight, weight distribution, altitude, or Mach number, the values corresponding with any desired combination of these values shall be established.

These air speeds shall be expressed in IAS.

§ 4b.711 Never-exceed speed, $V_{NE}$. (a) To allow for possible variations in the airplane characteristics and to minimize the possibility of inadvertency exceeding safe speeds, the never-exceed speed $V_{NE}$ shall be a speed established sufficiently below the lesser of:

1. The design dive speed $V_d$ chosen in accordance with § 4b.210 (b) (5), or

2. The maximum speed demonstrated in flight in accordance with § 4b.190.

(b) In the absence of a rational investigation, the value of $V_{NE}$ shall not exceed 0.9 times the lesser of the two speeds referred to in paragraph (a).

§ 4b.712 Normal operating limit speed, $V_{NO}$. (a) The normal operating limit speed $V_{NO}$ shall be established not to exceed the design cruising speed $V_{c}$ chosen in accordance with § 4b.210 (b) (4) and sufficiently below the never-exceed speed $V_{NE}$ to make it unlikely that $V_{NO}$ would be exceeded in a moderate upset occurring at $V_{NO}$.

(b) In the absence of a rational investigation, the value of $V_{NO}$ shall not exceed 0.9 times $V_{NE}$.

§ 4b.713 Maneuvering speed. The maneuvering speed shall not exceed the design maneuvering speed $V_m$ determined in accordance with § 4b.210 (2).

§ 4b.714 Flaps extended speed, $V_{FE}$. (a) The flaps extended speed $V_{FE}$ shall be established not to exceed the lesser of:

1. The design speed for slats in the landing position, chosen in accordance with § 4b.210 (1), or

2. The design speed for slats extended speed $V_{FE}$, determined in accordance with § 4b.231 (b) (2).

(b) The value of $V_{FE}$ shall be established in accordance with paragraph (a) shall not exceed 1.05 times the lesser of $V_{NO}$ or $V_{FE}$.

Notes

1. Data based on:
   a. System 100 percent efficient.
   b. Respiratory minute volume equals 15 liters (915 cubic inches) per minute.
   c. 100 percent oxygen above 20,000 feet.

2. For diluter-demand regulators use flow characteristics supplied by manufacturer to calculate required supply. Such flows must not be less than those indicated on this graph of delivery rate of 15 liters per minute.

Figure 4b-18—Minimum flow of oxygen for operation at various altitudes.
§ 4b.715 Landing gear operating speed, $V_{LO}$. The landing gear operating speed $V_{LO}$ shall be established not to exceed the speed at which it is safe to extend or retract the landing gear as limited by design in accordance with § 4b.734 or by flight characteristics.

§ 4b.716 Landing gear extended speed, $V_{LE}$. The landing gear extended speed $V_{LE}$ shall be established not to exceed a speed at which the airplane can be safely flown with the landing gear secured in the fully extended position, and for which the structure has been proven in accordance with § 4b.734.

§ 4b.717 Minimum control speed, $V_{MC}$. (See § 4b.123.)

§ 4b.718 Powerplant limitations. The following powerplant limitations shall be those established by the manufacturer for the airplane. They shall not exceed the corresponding limits established as a part of the type certification of the engine and propeller installed in accordance with § 4b.718.

(a) Take-off operation. (1) Maximum rotational speed (rpm).

(b) Maximum permissible manifold pressure.

(c) The time limit for use of the power which corresponds with the values established in subparagraphs (1) and (2) of this paragraph.

(d) Maximum continuous operation. (1) Maximum rotational speed (rpm).

(e) Maximum permissible manifold pressure.

(f) Maximum allowable cylinder head or coolant outlet, and oil temperatures.

(g) Maximum continuous operation. (1) Maximum rotational speed (rpm).

(h) Maximum permissible manifold pressure.

(i) Maximum allowable cylinder head or coolant outlet, and oil temperatures.

(j) Fuel octane rating. The minimum octane rating of fuel required for satisfactory operation of the powerplant at the limits specified in paragraphs (a) and (b) of this section.

§ 4b.719 Airplane weight and center of gravity limitations. The airplane weight and center of gravity limitations shall be those determined in accordance with §§ 4b.101 and 4b.102. Where the airplane is certificated for more than one center of gravity range, the appropriate limitations with regard to weight and loading procedures shall be set forth in the Airplane Flight Manual for each separate center of gravity range.

§ 4b.720 Minimum flight crew. The minimum flight crew shall be established by the Administrator as that number of persons which he finds necessary for safe and efficient operation of the airplane; the operations authorized under § 4b.721 shall be determined upon the load imposed upon individual crew members with due consideration given to the accessibility and the ease of operation of all necessary controls by the appropriate crew members.

§ 4b.721 Types of operation. The types of operation to which the airplane is limited shall be established by the category in which it has been found eligible for certification and by the equipment installed. (See the operating parts of the Civil Air Regulations.)

§ 4b.722 Maximum operating altitude. The maximum altitude shall be established up to which operation is permitted, as limited by flight, structural, powerplant, functional, or equipment characteristics.

§ 4b.723 Maneuvering flight load factors. Load factor limitations shall be established not to exceed the limit positive load factors determined from the maneuvering diagram, figure 4-2. (See § 4b.211 (a).)

Markings and placards

§ 4b.730 General. (a) Markings and placards shall be displayed in a conspicuous place and shall be such that they cannot be easily erased, defaced, or obscured.

(b) Additional information, placards, and instrument markings having a direct and important bearing on safe operation shall be provided when unusual design, operating, or handling characteristics so warrant.

§ 4b.731 Instrument markings; general. (a) When markings are placed on the cover glass of the instrument, provision shall be made to maintain the correct alignment of the glass cover with the face of the dial.

(b) All arcs and lines shall be of sufficient width and so located that they are clearly visible to the pilot.

§ 4b.732 Air-speed indicator. The following markings shall be placed on the air-speed indicator. If speeds vary with altitude, means shall be provided to indicate the appropriate limitation to the pilot throughout the operating altitude range.

(a) A radial red line shall indicate the never-exceed speed $V_{NE}$ (see § 4b.711).

(b) A yellow arc extending from the red line specified in paragraph (a) of this section to the upper limit of the green arc specified in paragraph (c) of this section shall indicate the caution range.

(c) A green arc with the lower limit at $V_{S}$ as determined in § 4b.112 (b) with maximum take-off weight, landing gear and wing flaps extended, and the upper limit at the normal operating limit speed $V_{NO}$ established in § 4b.712 shall indicate the normal operating range.

(d) A white arc with the lower limit at $V_{S}$ as determined in § 4b.112 (a) at the maximum landing weight, and the upper limit at the maximum speed $V_{NO}$ as established in § 4b.714 shall indicate the flap operating range.

§ 4b.733 Magnetic direction indicator. (a) A placard shall be installed on or in close proximity to the magnetic direction indicator which shall indicate the calibration of the instrument in a level flight attitude with engine(s) operating. The placard shall state whether the calibration was made with radio receiver(s) on or off.

(b) The calibration readings shall be in terms of magnetic headings in not greater than 45° increments.

§ 4b.734 Powerplant instruments; general. All required powerplant instruments shall be marked as follows:

(a) The maximum and the minimum (if applicable) safe operational limits shall be marked with red radial lines.

(b) The normal operating ranges shall be marked with a green arc not extending beyond the maximum and minimum safe operational limits.

(c) The take-off and precautionary ranges shall be marked with a yellow arc.

§ 4b.735 Oil quantity indicators. Indicators shall be marked in sufficient increments so that they will indicate readily and accurately the quantity of oil.

§ 4b.736 Fuel quantity indicator. When the unusable fuel supply for any tank exceeds 1 gallon or 5 percent of the tank capacity, whichever is greater, a red arc shall be marked on the indicator extending from the fuel quantity indicator to the lowest reading obtainable in the level flight attitude. A suitable notation in the Airplane Flight Manual shall be made to indicate that the fuel quantity indicator reaches zero is not usable in flight. (See § 4b.613 (c).)

§ 4b.737 Control markings; general. All cockpit controls, with the exception of the primary flight controls and other controls the function of which is obvious, shall be plainly marked and/or identified as to their function and method of operation.

(a) Aerodynamic controls. The secondary controls shall be marked to comply with §§ 4b.322 and 4b.323.

(b) Powerplant fuel controls. (1) Controls for fuel tank selector valves shall be marked to indicate the position corresponding with each tank and with all possible cross-feed positions.

(2) When more than one fuel tank is provided, and if safe operation depends upon the use of the fuel supply in sequence, the fuel tank selector controls shall be marked adjacent to or on the control itself to indicate the order in which the tanks should be used.

(c) Controls for engine selector valves shall be marked to indicate the position corresponding with each engine.

(d) Accessory and auxiliary controls. (1) When a retractable landing gear is used, the visual indicator required in § 4b.334 (e) shall be marked so that the pilot can ascertain at all times when the wheels are locked in either extreme position.

(2) Emergency controls shall be colored red and shall be marked to indicate their method of operation.

§ 4b.738 Miscellaneous markings and placards;—(a) Baggage compartments and ballast location. Each baggage and cargo compartment as well as the ballast location shall bear a placard stating the maximum allowable weight of contents and, if applicable, any other limitation on contents found necessary due to loading requirements.
(b) Fuel, oil, and coolant filler openings. The following information shall be marked on or adjacent to the appropriate filler cover:
(1) The word "fuel", the minimum permissible fuel octane number for the engines installed, and the usable fuel tank capacity (see § 4b.419);
(2) The word "oil" and the oil tank capacity;
(3) The name of the proper coolant fluid and the capacity of the coolant system.

(c) Emergency exit placards. (1) Emergency exits shall be marked as such with luminous paint in letters not less than ¾ inch high. The markings shall be located either on or immediately adjacent to the exit and shall be conspicuous to the passengers.
(2) The location and method of operation of the emergency exit handles shall be marked with luminous paint. (See § 4b.362 (c)).

(d) Operating limitation placard. A placard shall be provided in front of and in clear view of the pilot stating: "This airplane must be operated in compliance with the operating limitations specified in CAA approved Airplane Flight Manual."

(e) Safety equipment. (1) Safety equipment controls which the crew is expected to operate in time of emergency such as flares, automatic life raft release, etc., shall be easily accessible and plainly marked as to their method of operation.
(2) When fire extinguishers and signaling and other life-saving equipment are carried in lockers, compartments, etc., these locations shall be marked accordingly.

Airplane Flight Manual
§ 4b.740 General. (a) An Airplane Flight Manual shall be furnished with each airplane.

(b) The portions of the manual listed in §§ 4b.741 through 4b.743 as are appropriate to the airplane shall be verified and approved and shall be segregated, identified, and clearly distinguished from portions not so approved.

(c) Additional items of information having a direct and important bearing on safe operation shall be required when unusual design, operating, or handling characteristics so warrant.

§ 4b.741 Operating limitations.—(a) Air-speed limitations. The following air-speed limitations shall be included together with sufficient information to permit marking the air-speed indicator in accordance with § 4b.723:
(1) The never-exceed speed (see § 4b.711);
(2) The normal operating limit speed (see § 4b.712) together with a statement to the effect that normal flight operations should be confined to speeds below this value, and a further statement to the effect that the range of speeds between the normal operating limit speed and the never-exceed speed should be entered with caution and with due regard to the prevailing flight and atmospheric conditions;
(3) When an air-speed limitation is based upon compressibility effects, a statement to this effect, together with information as to any symptoms, the probable behavior of the airplane, and recommended recovery procedures;
(4) The maneuvering speed (see § 4b.310 (b) (2)), together with a statement to the effect that full application of rudder and aileron controls as well as those maneuvers which involve angles of attack near the stall should be confined to speeds below this value;
(5) The flaps extended speed (see § 4b.714), together with a description of the pertinent flap positions and engine powers;
(6) The landing gear operating speed (see § 4b.719), together with a statement to the effect that this is the maximum speed at which it is safe to extend or retract the landing gear;
(7) The landing gear extended speed (see § 4b.716), if greater than the landing gear operating speed, together with a statement to the effect that this is the maximum speed at which the airplane can be flown safely with the landing gear in the extended position.

(b) Powerplant limitations. Information shall be included to outline and to explain all powerplant limitations (see § 4b.718) and to permit marking the instruments as required in §§ 4b.734 through 4b.736.

(c) Weight and loading distribution. The airplane weights and e. g. limits required by §§ 4b.101 and 4b.102, shall be included together with the items of equipment on which the empty weight is based. Where the variety of possible loading conditions warrants, instructions shall be included to facilitate observation of the limitations.

(d) Flight load acceleration limits. The positive maneuvering limit load factors for which the airplane structure has been proven shall be described in terms of accelerations, together with a statement to the effect that these accelerations limit the angle of bank in turns and limit the severity of pull-up maneuver.

(e) Flight crew. The number and functions of the minimum flight crew determined in accordance with § 4b.720 shall be described.

(1) Type of operation. The type(s) of operation(s) shall be listed for which the airplane and its equipment installations have been approved.

(e) Maximum operating altitude. The altitude established under § 4b.722 shall be included, together with an explanation of the limiting factors.

§ 4b.742 Operating procedures.—(a) Normal. Information and instructions shall be included regarding the use and recommended procedure shall be described to be followed in the event of engine failure, including minimum speeds, trim, operation of remaining engine(s), operation of flaps, etc.

(b) Emergency. The recommended procedure shall be described to be followed in stopping the rotation of propellers in flight.

(d) Other emergency procedures. Recommended procedures shall be described to be followed in the event of fire, decompression, etc.

§ 4b.743 Performance information—
(a) Performance data. A summary of all pertinent performance data shall be given, including the performance data necessary for the application of the operating rules of the Civil Air Regulations, together with descriptions of the conditions, air speeds, etc., under which these data were determined.

(b) Flap controls. Instructions shall be included describing the use and adjustment of the flap controls necessary to obtain the performance listed according to paragraph (a) of this section.

(c) Air speeds. The indicated air speeds corresponding with those determined for take-off shall be listed together with the procedures to be followed in the event the critical engine becomes inoperative during take-off (see § 4b.742 (c)).

(d) Stall characteristics. An explanation shall be included of any significant or unusual flight or ground handling characteristics.

Airplane Identification Data
§ 4b.750 Identification plate. A fireproof identification plate shall be securely attached to the structure in an accessible location where it will not likely be defaced during normal service. The identification plate shall not be placed in a location where it might be expected to be destroyed or lost in the event of an accident. The identification plate shall contain the identification data required by § 2.36 of this chapter.

[F. R. Doc. 50-728. Filed, Jan. 34, 1950, 8:59 a.m.]
NOTICES

DEPARTMENT OF THE TREASURY

Fiscal Service, Bureau of the Public Debt

[1950 Dept. Circular 856]

1 1/4 PERCENT TREASURY NOTES OF SERIES A-1951

OFFERING OF NOTES

JANUARY 29, 1950.

I. OFFERING OF NOTES. 1. The Secretary of the Treasury, pursuant to the authority of the Second Liberty Bond Act, as amended, invites subscriptions, at par, from the people of the United States for notes of the United States, designated 1 1/4 Percent Treasury Notes of Series A-1951, in exchange for Treasury Certificates of Indebtedness of Series B-1950, maturing February 1, 1950, which will be accepted at par, and should accompany the subscription.

2. The notes will be dated February 1, 1950, and will mature February 1, 1950. Maturing February 1, 1950, notes will be subject to estate, inheritance, gift or duty tax, and shall be subject to all taxes, now or hereafter prescribed, governing United States notes.

3. The notes will be acceptable to the Federal Reserve Banks and are authorized and requested to receive subscriptions, to make allotments on the basis and up to the amounts indicated by the Secretary of the Treasury to the Federal Reserve Banks of the respective Districts, to issue allotment notices, to receive payment for notes allotted, to make delivery of notes on full-paid subscriptions allotted, and they may issue interim receipts pending delivery of the definitive notes.

4. The Secretary of the Treasury may at any time, or from time to time, prescribe supplemental or amendatory rules and regulations governing the offering, which will be communicated promptly to the Federal Reserve Banks.

[SEAL] JOHN W. SNYDER Secretary of the Treasury.

[F. R. Doc. 50-660; Filed, Jan. 24, 1950; 8:50 a. m.]

DEPARTMENT OF AGRICULTURE

Forest Service

[Memorandum No. 1249]

NATIONAL FOREST ADVISORY BOARD OF APPEALS

There is hereby established the National Forest Advisory Board of Appeals to advise the Secretary on any appeals to him from the decisions of the Chief of the Forest Service involving any public use of the national forests and other lands under the administration of the Forest Service. A majority of the members of the Board shall constitute a quorum. Upon receipt of a written request to the Secretary from the appellant, the Secretary shall request the Board to consider the appeal. The Board shall consider the appeal on its merits and furnish its advice and recommendations to the Secretary.

Done at Washington, D.C., this 17th day of January 1950. Witness my hand and the seal of the Department of Agriculture.

[SEAL] CHARLES F. BRANNAN Secretary of Agriculture.

[F. R. Doc. 50-690; Filed, Jan. 24, 1950; 8:46 a. m.]

*See Title 36, Chapter II, Part 211, supra.

CIVIL AERONAUTICS BOARD

[Docket No. 4150]

GOLDEN NORTH AIRWAYS, INC.

NOTICE OF HEARING

In the matter of the suspension and revocation of Letter of Registration No. 666 issued to Golden North Airways, Inc. Notice is hereby given that hearing in the above-entitled proceeding postponed from January 19, 1950, to a time and place to be fixed, is assigned to be held on February 2, 1950, at 10.00 a. m., in Room 116, Wing "C", Temporary Building No. 5, Sixteenth Street and Constitution Avenue NW., Washington, D.C., before Examiner Curtis C. Henderson.


By the Civil Aeronautics Board.

[SEAL] M. C. MULLEN, Secretary.

[F. R. Doc. 50-673; Filed, Jan. 24, 1950; 8:46 a. m.]

FEDERAL COMMUNICATIONS COMMISSION

DELEGATIONS OF AUTHORITY

In the matter of amendment of section 0.145 of the Commission's statement of delegations of authority.

At a meeting of the Federal Communications Commission held at its offices in Washington, D.C. on the 18th day of January 1950, the Commission having under consideration a delegation to the Secretary of the Commission upon securing the approval of the Bureau of Law, Engineering and Accounting to act on applications for construction permits for noncommercial educational FM broadcast stations; and

It appearing, that such delegation would expedite Commission action on the above authorizations and would be in the public interest; and

It further appearing, that the amendment of the Commission's rules and regulations to effectuate the above proposals is procedural in nature and that the public notice and procedure provided for in section 4 of the Administrative Procedure Act is not required herein;

It is ordered, That, effective immediately, section 0.145 of the Commission's rules and regulations is amended by the addition of new paragraph (g), reading as follows:

(g) Applications for construction permits for new noncommercial educational FM broadcast stations;

Released: January 18, 1950.

FEDERAL COMMUNICATIONS COMMISSION

[SEAL] T. J. BOWIE, Secretary.

[F. R. Doc. 50-685; Filed, Jan. 24, 1950; 8:46 a. m.]
NOTICES

INTERSTATE COMMERCE COMMISSION
[Rev. S.O. 562, King's Rev. I.C.C. Order 9]

REROUTING OR DIVERSION OF TRAFFIC

In the opinion of Homer C. King, Agent, the railroads, because of high waters of the Ohio and the Wabash rivers and their tributaries in the states of Illinois, Indiana, and Kentucky, are unable to transport traffic routed over their lines that portion of the railroads' lines is ordered, that:
(a) Reouting traffic. Railroads unable to transport traffic to or through points in the states of Illinois, Indiana, and Kentucky because of high waters of the Ohio and the Wabash rivers and their tributaries, are hereby authorized and directed to reroute or divert such traffic over any available route to expedite the movement; the billing covering all such cars rerouted shall carry a reference to this order as authority for the rerouting.
(b) Concordence of rerouting roads to be obtained. The railroad desiring to reroute or divert traffic under this order shall confer with the proper transportation officer of the railroad or railroads to which such traffic is to be diverted or rerouted, and shall receive the concurrence of such other railroads before the rerouting or diversion is ordered.
(c) Notification to shippers. The carrier rerouting cars in accordance with this order shall notify each shipper at the time each car is rerouted or diverted and shall furnish to such shipper the new routing provided under this order.
(d) Effective date. This order shall become effective 12:01 a.m., January 18, 1950.
(e) Expiration date. This order shall expire at 11:59 p.m., January 31, 1950, unless otherwise modified, changed, suspended or annulled.

It is further ordered, that this order shall be served upon the Association of American Railroads, Car Service Division, as agent of all railroads subscribing to the car service and per diem agreement under the terms of that agreement.


HOMER C. KING.
Agent.

[Rev. S.O. 24810]

MOTOR-RAIL RATES: NEW YORK, NEW HAVEN AND HARTFORD RAILROAD CO.
APPLICATION FOR RELIEF

JANUARY 20, 1950.

The Commission is in receipt of the above-entitled and numbered application for relief from the long-and-short-haul provision of section 4 (1) of the Interstate Commerce Act.

Filed by: The New York, New Haven and Hartford Railroad Company and Rand Express Freight Lines, Inc.

Commodities involved: Grain, grain products and related articles, and feed for animals.

The Commission, in its discretion, may proceed to investigate and determine the matters involved in such application without further or formal hearing. If because of an emergency a grant of temporary relief is found to be necessary before the expiration of the 15-day period, a hearing, upon a request filed within that period, may be held subsequently.

By the Commission, Division 2.
W. P. BARTZEL.
Secretary.

[Rev. S.O. 24812]

GRAIN FROM TEXAS TO ST. LOUIS, MO., AND EAST ST. LOUIS, ILL.
APPLICATION FOR RELIEF

JANUARY 20, 1950.

The Commission is in receipt of the above-entitled and numbered application for relief from the long-and-short-haul provision of section 4 (1) of the Interstate Commerce Act.

Filed by: D. Q. Marsh, Agent, for and on behalf of carriers parties to a tariff I. C. C. No. 3831.

Commodities involved: Grain, grain products and related articles, and feed for animals.

From: Points in Texas.
To: St. Louis, Mo., and East St. Louis, Ill.

The Commission, in its discretion, may proceed to investigate and determine the matters involved in such application without further or formal hearing. If because of an emergency a grant of temporary relief is found to be necessary before the expiration of the 15-day period, a hearing, upon a request filed within that period, may be held subsequently.

By the Commission, Division 2.
W. P. BARTZEL.
Secretary.
Appropriate documents and papers effectuating this order will issue.


For the Attorney General.

[SEAL] HAROLD I. HAYTON, Acting Director, Office of Alien Property.

[Return Order 532]

UNTITA BALDUCCI

Having considered the claim set forth below and having issued a determination allowing the claim, which is incorporated by reference herein and filed herewith,

It is ordered, That the claimed property described below, in the determination, be returned, subject to any increase or decrease resulting from the administration thereof prior to return, and after adequate provision for taxes and conservatory expenses:

Claimant, Claim No., Notice of Intention To Return Published, and Property

UNTITA BALDUCCI, Vicopisano, Pisa, Italy;
Claim No.: 7:38; December 2, 1949 (14 F. R. 7261); $4,602.07 in the Treasury of the United States and an undivided one-half interest in each of two pieces of real property, described as follows:

All other provisions of said Vesting Order 14049 and all actions taken by or on behalf of the Attorney General of the United States in reliance thereon, pursuant to and under the authority thereof are hereby ratified and confirmed.

Executed at Washington, D. C., on January 6, 1950.

For the Attorney General.

[SEAL] HAROLD I. HAYTON, Acting Director, Office of Alien Property.

[Return Order 526]

GISELA BOSGL

Having considered the claim set forth below and having issued a determination allowing the claim, which is incorporated by reference herein and filed herewith,

It is ordered, That the claimed property, described below and in the determination, be returned, subject to any increase or decrease resulting from the administration thereof prior to return, and after adequate provision for taxes and conservatory expenses:

Claimant, Claim No., Notice of Intention To Return Published, and Property

GISELA BOSGL, Vienna, Austria; Claim No.: 39918; December 2, 1949 (14 F. R. 7261); $990.51 in the Treasury of the United States.

Appropriate documents and papers effectuating this order will issue.


For the Attorney General.

[SEAL] HAROLD I. HAYTON, Acting Director, Office of Alien Property.

FEDERAL REGISTER

445

Wednesday, January 25, 1950

FEDERAL REGISTER

445

Wednesday, January 25, 1950

The companies concerned have been engaged in negotiations looking toward the sale of the gas properties; and

It appearing to the Commission that it is appropriate to grant the application in view of all the circumstances of this case:

It is ordered, That the period for American Gas and Indiana & Michigan to dispose of the gas properties of Indiana & Michigan be, and the same hereby is, extended to June 30, 1950.

By the Commission.

[SEAL] OWAL L. DEBOIS, Secretary.
BERtha GRUMBACH

Having considered the claim set forth below and having issued a determination allowing the claim, which is incorporated by reference herein and filed herewith,

It is ordered, That the claimed property, consisting of shares of the common and third preferred capital stock of the De Nobili Cigar Company, Long Island

446

by reference herein and filed herewith, below and having issued a determination and conservatory expenses:

Claimant, Claim No. Notice of Intention To Return Published, and Property

Bertha Grumbach, Freiburg, Germany; Claim No. 20483; December 14, 1949 (14 F. R. 7695); $4,192.45 in the Treasury of the United States. All right, title and interest of Bertha Grumbach in and to the trusts created

It is ordered, That the claimed property, consisting of shares of the common and third preferred capital stock of the De Nobili Cigar Company, Long Island

Appropriate documents and papers effectuating this order will issue.

Executed at Washington, D. C., on January 18, 1950.

For the Attorney General.

DUSEINE MAIRE FRIMER

NOTICE OF INTENTION TO RETURN VESTED PROPERTY

Pursuant to section 33 (f) of the Trading With the Enemy Act, as amended, notice is hereby given of intention to return, on or after 90 days from the date of the publication herof, the following property, subject to any increase or decrease resulting from the administration thereof prior to return, and after adequate provision for taxes and conservatory expenses:

Claimant, Claim No. Property, and Location

Duseine Marie Frimer, Venlo, Denmark; Claim No. 4704; $1,122.65 in the Treasury of the United States.


For the Attorney General.

[ Seal ] HAROLD I. BAYNTON, Acting Director, Office of Alien Property.

[ F. R. Doc. 50-694; Filed, Jan. 24, 1950; 8:52 a. m. ]

FELIX GRABCEWSKI

NOTICE OF INTENTION TO RETURN VESTED PROPERTY

Pursuant to section 33 (f) of the Trading With the Enemy Act, as amended, notice of return, on or after 90 days from the date of publication hereof, the following property located in Washington, D. C., including all royalties accrued thereunder and all damages and profits recoverable for past infringement thereof, after adequate provision for taxes and conservatory expenses:

Claimant and Property

Felix Grabcewski; d/b/a of F. Grabcewski; Lodz, Cegielniana 82/3, Warsaw, Poland;...
Hans Strauss, New York, N. Y.; Claim No. 7778; Dec. 2, 1949 (14 F. R. 7261); all right, title, interest and claim of any kind or character whatsoever of Bertha Lion Strauss in and to the trust estate of Meier Katten, deceased; $3,881.46 in the Treasury of the United States.

Appropriate documents and papers effectuating this order will issue.

Executed at Washington, D. C., on January 17, 1950.

For the Attorney General.

HANS STRAUSS

Having considered the claim set forth below and having issued a determination allowing the claim, which is incorporated by reference herein and filed herewith,

[F. R. Doc. 50-666; Filed, Jan. 23, 1950; 8:50 a.m.]