

HISTORICAL AND REVISION NOTES

Revised Section	Source (U.S. Code)	Source (Statutes at Large)
44503	49 App.:1704.	July 12, 1976, Pub. L. 94-353, § 25, 90 Stat. 885.

The words “in accordance with this section” and “due” are omitted as surplus. The word “personnel” is substituted for “manpower” for consistency in the revised title.

§ 44504. Improved aircraft, aircraft engines, propellers, and appliances

(a) DEVELOPMENTAL WORK AND SERVICE TESTING.—The Administrator of the Federal Aviation Administration may conduct or supervise developmental work and service testing to improve aircraft, aircraft engines, propellers, and appliances.

(b) RESEARCH.—The Administrator shall conduct or supervise research—

(1) to develop technologies and analyze information to predict the effects of aircraft design, maintenance, testing, wear, and fatigue on the life of aircraft, including nonstructural aircraft systems, and air safety;

(2) to develop methods of analyzing and improving aircraft maintenance technology and practices, including nondestructive evaluation of aircraft structures;

(3) to assess the fire and smoke resistance of aircraft material;

(4) to develop improved fire and smoke resistant material for aircraft interiors;

(5) to develop and improve fire and smoke containment systems for inflight aircraft fires;

(6) to develop advanced aircraft fuels with low flammability and technologies that will contain aircraft fuels to minimize post-crash fire hazards;

(7) to develop technologies and methods to assess the risk of and prevent defects, failures, and malfunctions of products, parts, processes, and articles manufactured for use in aircraft, aircraft engines, propellers, and appliances that could result in a catastrophic failure of an aircraft; and

(8) in conjunction with other Federal agencies, as appropriate, to develop technologies and methods to assess the risk of and prevent defects, failures, and malfunctions of products, parts, and processes for use in all classes of unmanned aircraft systems that could result in a catastrophic failure of the unmanned aircraft that would endanger other aircraft in the national airspace system.

(c) AUTHORITY TO BUY ITEMS OFFERING SPECIAL ADVANTAGES.—In carrying out this section, the Administrator, by negotiation or otherwise, may buy or exchange experimental aircraft, aircraft engines, propellers, and appliances that the Administrator decides may offer special advantages to aeronautics.

(Pub. L. 103-272, §1(e), July 5, 1994, 108 Stat. 1176; Pub. L. 106-181, title IX, §904, Apr. 5, 2000, 114 Stat. 196; Pub. L. 112-95, title IX, §903(a), Feb. 14, 2012, 126 Stat. 138.)

HISTORICAL AND REVISION NOTES

Revised Section	Source (U.S. Code)	Source (Statutes at Large)
44504(a)	49 App.:1353(b) (1st sentence). 49 App.:1655(c)(1).	Aug. 23, 1958, Pub. L. 85-726, §312(b) (1st, last sentences), 72 Stat. 752. Oct. 15, 1966, Pub. L. 89-670, §6(c)(1), 80 Stat. 938; Jan. 12, 1983, Pub. L. 97-449, §7(b), 96 Stat. 2444.
44504(b)	49 App.:1353(b) (2d sentence).	Aug. 23, 1958, Pub. L. 85-726, 72 Stat. 731, §312(b) (2d sentence); added Nov. 3, 1988, Pub. L. 100-591, §2, 102 Stat. 3011; Nov. 5, 1990, Pub. L. 101-508, §9208(a), 104 Stat. 1388-376.
44504(c)	49 App.:1353(b) (last sentence) 49 App.:1655(c)(1).	

In this section, the word “Administrator” in section 312(b) of the Federal Aviation Act of 1958 (Public Law 85-726, 72 Stat. 752) is retained on authority of 49:106(g).

In subsection (a), the words “to improve” are substituted for “such . . . as tends to the creation of improved” to eliminate unnecessary words.

Editorial Notes

AMENDMENTS

2012—Subsec. (b)(8). Pub. L. 112-95 added par. (8).

2000—Subsec. (b)(1). Pub. L. 106-181 inserted “, including nonstructural aircraft systems,” after “life of aircraft”.

Statutory Notes and Related Subsidiaries

EFFECTIVE DATE OF 2000 AMENDMENT

Amendment by Pub. L. 106-181 applicable only to fiscal years beginning after Sept. 30, 1999, see section 3 of Pub. L. 106-181, set out as a note under section 106 of this title.

ALTERNATIVE FUEL AND LOW-EMISSION AVIATION TECHNOLOGY PROGRAM

Pub. L. 117-169, title IV, §40007, Aug. 16, 2022, 136 Stat. 2030, provided that:

“(a) APPROPRIATION AND ESTABLISHMENT.—For purposes of establishing a competitive grant program for eligible entities to carry out projects located in the United States that produce, transport, blend, or store sustainable aviation fuel, or develop, demonstrate, or apply low-emission aviation technologies, in addition to amounts otherwise available, there are appropriated to the Secretary for fiscal year 2022, out of any money in the Treasury not otherwise appropriated, to remain available until September 30, 2026—

“(1) \$244,530,000 for projects relating to the production, transportation, blending, or storage of sustainable aviation fuel;

“(2) \$46,530,000 for projects relating to low-emission aviation technologies; and

“(3) \$5,940,000 to fund the award of grants under this section, and oversight of the program, by the Secretary.

“(b) CONSIDERATIONS.—In carrying out subsection (a), the Secretary shall consider, with respect to a proposed project—

“(1) the capacity for the eligible entity to increase the domestic production and deployment of sustainable aviation fuel or the use of low-emission aviation technologies among the United States commercial aviation and aerospace industry;

“(2) the projected greenhouse gas emissions from such project, including emissions resulting from the development of the project, and the potential the project has to reduce or displace, on a lifecycle basis, United States greenhouse gas emissions associated with air travel;

“(3) the capacity to create new jobs and develop supply chain partnerships in the United States;

“(4) for projects related to the production of sustainable aviation fuel, the projected lifecycle greenhouse gas emissions benefits from the proposed project, which shall include feedstock and fuel production and potential direct and indirect greenhouse gas emissions (including resulting from changes in land use); and

“(5) the benefits of ensuring a diversity of feedstocks for sustainable aviation fuel, including the use of waste carbon oxides and direct air capture.

“(c) COST SHARE.—The Federal share of the cost of a project carried out using grant funds under subsection (a) shall be 75 percent of the total proposed cost of the project, except that such Federal share shall increase to 90 percent of the total proposed cost of the project if the eligible entity is a small hub airport or nonhub airport, as such terms are defined in section 47102 of title 49, United States Code.

“(d) FUEL EMISSIONS REDUCTION TEST.—For purposes of clause (ii) of subsection (e)(7)(E), the Secretary shall, not later than 2 years after the date of enactment of this section [Aug. 16, 2022], adopt at least 1 methodology for testing lifecycle greenhouse gas emissions that meets the requirements of such clause.

“(e) DEFINITIONS.—In this section:

“(1) ELIGIBLE ENTITY.—The term ‘eligible entity’ means—

“(A) a State or local government, including the District of Columbia, other than an airport sponsor;

“(B) an air carrier;

“(C) an airport sponsor;

“(D) an accredited institution of higher education;

“(E) a research institution;

“(F) a person or entity engaged in the production, transportation, blending, or storage of sustainable aviation fuel in the United States or feedstocks in the United States that could be used to produce sustainable aviation fuel;

“(G) a person or entity engaged in the development, demonstration, or application of low-emission aviation technologies; or

“(H) nonprofit entities or nonprofit consortia with experience in sustainable aviation fuels, low-emission aviation technologies, or other clean transportation research programs.

“(2) FEEDSTOCK.—The term ‘feedstock’ means sources of hydrogen and carbon not originating from unrefined or refined petrochemicals.

“(3) INDUCED LAND-USE CHANGE VALUES.—The term ‘induced land-use change values’ means the greenhouse gas emissions resulting from the conversion of land to the production of feedstocks and from the conversion of other land due to the displacement of crops or animals for which the original land was previously used.

“(4) LIFECYCLE GREENHOUSE GAS EMISSIONS.—The term ‘lifecycle greenhouse gas emissions’ means the combined greenhouse gas emissions from feedstock production, collection of feedstock, transportation of feedstock to fuel production facilities, conversion of feedstock to fuel, transportation and distribution of fuel, and fuel combustion in an aircraft engine, as well as from induced land-use change values.

“(5) LOW-EMISSION AVIATION TECHNOLOGIES.—The term ‘low-emission aviation technologies’ means technologies, produced in the United States, that significantly—

“(A) improve aircraft fuel efficiency;

“(B) increase utilization of sustainable aviation fuel; or

“(C) reduce greenhouse gas emissions produced during operation of civil aircraft.

“(6) SECRETARY.—The term ‘Secretary’ means the Secretary of Transportation.

“(7) SUSTAINABLE AVIATION FUEL.—The term ‘sustainable aviation fuel’ means liquid fuel, produced in the United States, that—

“(A) consists of synthesized hydrocarbons;

“(B) meets the requirements of—

“(i) ASTM International Standard D7566; or

“(ii) the co-processing provisions of ASTM International Standard D1655, Annex A1 (or such successor standard);

“(C) is derived from biomass (in a similar manner as such term is defined in section 45K(c)(3) of the Internal Revenue Code of 1986 [26 U.S.C. 45K(c)(3)]), waste streams, renewable energy sources, or gaseous carbon oxides;

“(D) is not derived from palm fatty acid distillates; and

“(E) achieves at least a 50 percent lifecycle greenhouse gas emissions reduction in comparison with petroleum-based jet fuel, as determined by a test that shows—

“(i) the fuel production pathway achieves at least a 50 percent reduction of the aggregate attributional core lifecycle emissions and the induced land-use change values under a lifecycle methodology for sustainable aviation fuels similar to that adopted by the International Civil Aviation Organization with the agreement of the United States; or

“(ii) the fuel production pathway achieves at least a 50 percent reduction of the aggregate attributional core lifecycle greenhouse gas emissions values and the induced land-use change values under another methodology that the Secretary determines is—

“(I) reflective of the latest scientific understanding of lifecycle greenhouse gas emissions; and

“(II) as stringent as the requirement under clause (i).”

CRASH-RESISTANT FUEL SYSTEMS

Pub. L. 114–190, title II, §2105, July 15, 2016, 130 Stat. 620, provided that: “Not later than 1 year after the date of enactment of this Act [July 15, 2016], the Administrator of the Federal Aviation Administration shall evaluate and update, as necessary, standards for crash-resistant fuel systems for civilian rotorcraft.”

AVIATION FUEL RESEARCH AND DEVELOPMENT PROGRAM

Pub. L. 112–95, title IX, §910, Feb. 14, 2012, 126 Stat. 141, provided that:

“(a) IN GENERAL.—Using amounts made available under section 48102(a) of title 49, United States Code, the Administrator [of the Federal Aviation Administration], in coordination with the Administrator of NASA [National Aeronautics and Space Administration], shall continue research and development activities into the qualification of an unleaded aviation fuel and safe transition to this fuel for the fleet of piston engine aircraft.

“(b) REQUIREMENTS.—In carrying out the program under subsection (a), the Administrator shall, at a minimum—

“(1) not later than 120 days after the date of enactment of this Act [Feb. 14, 2012], develop a research and development plan containing the specific research and development objectives, including consideration of aviation safety, technical feasibility, and other relevant factors, and the anticipated timetable for achieving the objectives;

“(2) assess the methods and processes by which the FAA and industry may expeditiously certify and approve new aircraft and recertify existing aircraft with respect to unleaded aviation fuel;

“(3) assess technologies that modify existing piston engine aircraft to enable safe operation of the aircraft using unleaded aviation fuel and determine the resources necessary to certify those technologies; and

“(4) develop recommendations for appropriate policies and guidelines to facilitate a transition to unleaded aviation fuel for piston engine aircraft.

“(c) COLLABORATION.—In carrying out the program under subsection (a), the Administrator shall collaborate with—

“(1) industry groups representing aviation consumers, manufacturers, and fuel producers and distributors; and

“(2) other appropriate Federal agencies.

“(d) REPORT.—Not later than 270 days after the date of enactment of this Act [Feb. 14, 2012], the Administrator shall provide to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report on the plan, information obtained, and policies and guidelines developed pursuant to subsection (b).”

RESEARCH PROGRAM ON ALTERNATIVE JET FUEL
TECHNOLOGY FOR CIVIL AIRCRAFT

Pub. L. 112-95, title IX, §911, Feb. 14, 2012, 126 Stat. 142, provided that:

“(a) IN GENERAL.—Using amounts made available under section 48102(a) of title 49, United States Code, the Administrator [of the Federal Aviation Administration (FAA)] shall establish a research program to assist in the development and qualification of jet fuel from alternative sources (such as natural gas, biomass, ethanol, butanol, and hydrogen) and other renewable sources.

“(b) AUTHORITY TO MAKE GRANTS.—The Administrator shall carry out the program through the use of grants or other measures authorized under section 106(l)(6) of such title, including reimbursable agreements with other Federal agencies.

“(c) PARTICIPATION IN PROGRAM.—

“(1) PARTICIPATION OF EDUCATIONAL AND RESEARCH INSTITUTIONS.—In carrying out the program, the Administrator shall include participation by—

“(A) educational and research institutions that have existing facilities and leverage private sector partnerships; and

“(B) consortia with experience across the supply chain, including with research, feedstock development and production, small-scale development, testing, and technology evaluation related to the creation, processing, production, and transportation of alternative aviation fuel.

“(2) USE OF NASA FACILITIES.—In carrying out the program, the Administrator shall consider utilizing the existing capacity in aeronautics research at Langley Research Center, Glenn Research Center [renamed NASA John H. Glenn Research Center at the Neil A. Armstrong Test Facility by Pub. L. 116-263, 134 Stat. 3316], and other appropriate facilities of NASA [National Aeronautics and Space Administration].

“(d) DESIGNATION OF INSTITUTION AS A CENTER OF EXCELLENCE.—

“(1) IN GENERAL.—Not later than 180 days after the date of enactment of this Act [Feb. 14, 2012], the Administrator may designate an institution described in subsection (c)(1)(A) as a Center of Excellence for Alternative Jet-Fuel Research in Civil Aircraft.

“(2) EFFECT OF DESIGNATION.—The center designated under paragraph (1) shall become, upon its designation—

“(A) a member of the Consortium for Continuous Low Energy, Emissions, and Noise of the FAA; and

“(B) part of a Joint Center of Excellence with the Partnership for Air Transportation Noise and Emission Reduction FAA Center of Excellence.”

PRODUCTION OF CLEAN COAL FUEL TECHNOLOGY FOR
CIVILIAN AIRCRAFT

Pub. L. 112-95, title IX, §914, Feb. 14, 2012, 126 Stat. 144, provided that:

“(a) ESTABLISHMENT OF RESEARCH PROGRAM.—Using amounts made available under section 48102(a) of title 49, United States Code, the Administrator [of the Federal Aviation Administration] shall establish a research program related to developing jet fuel from clean coal.

“(b) AUTHORITY TO MAKE GRANTS.—The Administrator shall carry out the program through grants or

other measures authorized under section 106(l)(6) of such title, including reimbursable agreements with other Federal agencies.

“(c) PARTICIPATION IN PROGRAM.—In carrying out the program, the Administrator shall include participation by educational and research institutions that have existing facilities and experience in the development and deployment of technology that processes coal into aviation fuel.

“(d) DESIGNATION OF INSTITUTION AS A CENTER OF EXCELLENCE.—Not later than 180 days after the date of enactment of this Act [Feb. 14, 2012], the Administrator may designate an institution described in subsection (c) as a Center of Excellence for Coal-to-Jet-Fuel Research.”

RESEARCH AND DEVELOPMENT OF EQUIPMENT TO CLEAN
AND MONITOR THE ENGINE AND APU BLEED AIR SUPPLIED
ON PRESSURIZED AIRCRAFT

Pub. L. 112-95, title IX, §917, Feb. 14, 2012, 126 Stat. 145, provided that:

“(a) IN GENERAL.—Not later than 60 days after the date of enactment of this Act [Feb. 14, 2012], the Administrator [of the Federal Aviation Administration], to the extent practicable, shall implement a research program for the identification or development of appropriate and effective air cleaning technology and sensor technology for the engine and auxiliary power unit bleed air supplied to the passenger cabin and flight deck of a pressurized aircraft.

“(b) TECHNOLOGY REQUIREMENTS.—The technology referred to in subsection (a) shall have the capacity, at a minimum—

“(1) to remove oil-based contaminants from the bleed air supplied to the passenger cabin and flight deck; and

“(2) to detect and record oil-based contaminants in the portion of the total air supplied to the passenger cabin and flight deck from bleed air.

“(c) REPORT.—Not later than 1 year after the date of enactment of this Act [Feb. 14, 2012], the Administrator shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Transportation and Infrastructure and the Committee on Science, Space, and Technology of the House of Representatives a report on the results of the research and development work carried out under this section.”

FAA CENTER FOR EXCELLENCE FOR APPLIED RESEARCH
AND TRAINING IN THE USE OF ADVANCED MATERIALS
IN TRANSPORT AIRCRAFT

Pub. L. 108-176, title VII, §708, Dec. 12, 2003, 117 Stat. 2582, as amended by Pub. L. 112-95, title IX, §916, Feb. 14, 2012, 126 Stat. 145, provided that:

“(a) IN GENERAL.—The Administrator of the Federal Aviation Administration shall develop a Center for Excellence focused on applied research and training on the durability and maintainability of advanced materials in transport airframe structures. The Center shall—

“(1) promote and facilitate collaboration among academia, the Federal Aviation Administration's Transportation Division, and the commercial aircraft industry, including manufacturers, commercial air carriers, and suppliers; and

“(2) establish goals set to advance technology, improve engineering practices, and facilitate continuing education in relevant areas of study.

“(b) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to the Administrator \$500,000 for each of fiscal years 2012 through 2015 to carry out this section.”

ROTORCRAFT RESEARCH AND DEVELOPMENT INITIATIVE

Pub. L. 108-176, title VII, §711, Dec. 12, 2003, 117 Stat. 2585, provided that:

“(a) OBJECTIVE.—The Administrator of the Federal Aviation Administration shall establish a rotorcraft

initiative with the objective of developing, and demonstrating in a relevant environment, within 10 years after the date of the enactment of this Act [Dec. 12, 2003], technologies to enable rotorcraft with the following improvements relative to rotorcraft existing as of the date of the enactment of this Act:

“(1) 80 percent reduction in noise levels on takeoff and on approach and landing as perceived by a human observer.

“(2) Factor of 10 reduction in vibration.

“(3) 30 percent reduction in empty weight.

“(4) Predicted accident rate equivalent to that of fixed-wing aircraft in commercial service within 10 years after the date of the enactment of this Act.

“(5) Capability for zero-ceiling, zero-visibility operations.

“(b) IMPLEMENTATION.—Within 180 days after the date of the enactment of this Act [Dec. 12, 2003], the Administrator of the Federal Aviation Administration, in cooperation with the Administrator of the National Aeronautics and Space Administration, shall provide a plan to the Committee on Science [now Committee on Science, Space, and Technology] of the House of Representatives and to the Committee on Commerce, Science, and Transportation of the Senate for the implementation of the initiative described in subsection (a).”

SPECIALTY METALS CONSORTIUM

Pub. L. 106-181, title VII, §742, Apr. 5, 2000, 114 Stat. 175, provided that:

“(a) IN GENERAL.—The Administrator [of the Federal Aviation Administration] may work with a consortium of domestic metal producers and aircraft engine manufacturers to improve the quality of turbine engine materials and to address melting technology enhancements.

“(b) REPORT.—Not later than 6 months after entering into an agreement with a consortium described in subsection (a), the Administrator shall transmit to Congress a report on the goals and efforts of the consortium.”

§ 44505. Systems, procedures, facilities, and devices

(a) GENERAL REQUIREMENTS.—(1) The Administrator of the Federal Aviation Administration shall—

(A) develop, alter, test, and evaluate systems, procedures, facilities, and devices, and define their performance characteristics, to meet the needs for safe and efficient navigation and traffic control of civil and military aviation, except for needs of the armed forces that are peculiar to air warfare and primarily of military concern; and

(B) select systems, procedures, facilities, and devices that will best serve those needs and promote maximum coordination of air traffic control and air defense systems.

(2) The Administrator may make contracts to carry out this subsection without regard to section 3324(a) and (b) of title 31.

(3) When a substantial question exists under paragraph (1) of this subsection about whether a matter is of primary concern to the armed forces, the Administrator shall decide whether the Administrator or the Secretary of the appropriate military department has responsibility. The Administrator shall be given technical information related to each research and development project of the armed forces that potentially applies to, or potentially conflicts with, the common system to ensure that potential application to the common system is considered

properly and that potential conflicts with the system are eliminated.

(b) RESEARCH ON HUMAN FACTORS AND SIMULATION MODELS.—The Administrator shall conduct or supervise research—

(1) to develop a better understanding of the relationship between human factors and aviation accidents and between human factors and air safety;

(2) to enhance air traffic controller, mechanic, and flight crew performance;

(3) to develop a human-factor analysis of the hazards associated with new technologies to be used by air traffic controllers, mechanics, and flight crews;

(4) to identify innovative and effective corrective measures for human errors that adversely affect air safety;

(5) to develop dynamic simulation models of the air traffic control system and airport design and operating procedures that will provide analytical technology—

(A) to predict airport and air traffic control safety and capacity problems;

(B) to evaluate planned research projects; and

(C) to test proposed revisions in airport and air traffic control operations programs;

(6) to develop a better understanding of the relationship between human factors and unmanned aircraft system safety; and

(7) to develop dynamic simulation models for integrating all classes of unmanned aircraft systems into the national airspace system without any degradation of existing levels of safety for all national airspace system users.

(c) RESEARCH ON DEVELOPING AND MAINTAINING A SAFE AND EFFICIENT SYSTEM.—The Administrator shall conduct or supervise research on—

(1) airspace and airport planning and design;

(2) airport capacity enhancement techniques;

(3) human performance in the air transportation environment;

(4) aviation safety and security;

(5) the supply of trained air transportation personnel, including pilots and mechanics; and

(6) other aviation issues related to developing and maintaining a safe and efficient air transportation system.

(d) RESEARCH ON DESIGN FOR CERTIFICATION.—

(1) RESEARCH.—Not later than 1 year after the date of enactment of the FAA Modernization and Reform Act of 2012, the Administrator shall conduct research on methods and procedures to improve both confidence in and the timeliness of certification of new technologies for their introduction into the national airspace system.

(2) RESEARCH PLAN.—Not later than 6 months after the date of enactment of the FAA Modernization and Reform Act of 2012, the Administrator shall develop a plan for the research under paragraph (1) that contains objectives, proposed tasks, milestones, and a 5-year budgetary profile.

(3) REVIEW.—The Administrator shall enter into an arrangement with the National Research Council to conduct an independent review of the plan developed under paragraph (2)