

Public Law 100-591
100th Congress

An Act

To amend the Federal Aviation Act of 1958 relating to aviation research.

Nov. 3, 1988

[H.R. 4686]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Aviation Safety
Research Act of
1988.

49 USC app.
1301 note.

SECTION 1. SHORT TITLE.

This Act may be cited as the "Aviation Safety Research Act of 1988".

SEC. 2. AVIATION MAINTENANCE AND FIRE SAFETY RESEARCH.

Section 312(b) of the Federal Aviation Act of 1958 (49 U.S.C. App. 1353(b)) is amended by inserting after the first sentence the following: "The Administrator shall undertake or supervise research to develop technologies and to conduct data analyses for predicting the effects of aircraft design, maintenance, testing, wear, and fatigue on the life of aircraft and on air safety, to develop methods of analyzing and improving aircraft maintenance technology and practices (including nondestructive evaluation of aircraft structures), to assess the fire and smoke resistance of aircraft materials, to develop improved fire and smoke resistant materials for aircraft interiors, to develop and improve fire and smoke containment systems for in-flight aircraft fires, and to develop advanced aircraft fuels with low flammability and technologies for containment of aircraft fuels for the purpose of minimizing post-crash fire hazards."

SEC. 3. RESEARCH ON RELATIONSHIP BETWEEN HUMAN FACTORS AND AIR SAFETY AND ON DYNAMIC SIMULATION MODELING.

Section 312(c) of the Federal Aviation Act of 1958 (49 U.S.C. App. 1353(c)) is amended by inserting after the first sentence the following: "The Administrator shall undertake or supervise research to develop a better understanding of the relationship between human factors and aviation accidents and between human factors and air safety, to enhance air traffic controller and mechanic and flight crew performance, to develop a human-factor analysis of the hazards associated with new technologies to be used by air traffic controllers, mechanics, and flight crews, and to identify innovative and effective corrective measures for human errors which adversely affect air safety. The Administrator shall undertake or supervise a research program to develop dynamic simulation models of the air traffic control system and airport design and operating procedures which will provide analytical technology for predicting airport and air traffic control safety and capacity problems, for evaluating planned research projects, and for testing proposed revisions in airport and air traffic control operations programs."

SEC. 4. RESEARCH PLAN AND REPORTS.

(a) **IN GENERAL.**—Section 312 of the Federal Aviation Act of 1958 (49 U.S.C. App. 1353) is amended by adding at the end the following new subsection:

"RESEARCH PLAN AND REPORTS

"(d)(1) The Administrator shall prepare, review, revise, publish, and transmit a national aviation research plan to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives not later than the date of the submission to Congress of the President's budget for fiscal year 1990, and for each fiscal year thereafter. The plan shall describe, for a 15-year period, the research, engineering, and development considered by the Administrator necessary to ensure the continued capacity, safety, and efficiency of aviation in the United States, considering emerging technologies and forecasted needs of civil aeronautics, and provide the highest degree of safety in air travel. The plan shall cover all research conducted under this section and section 316 of this Act and shall identify complementary and coordinated research efforts conducted by the National Aeronautics and Space Administration with funds specifically appropriated to such Administration. In addition, for projects for which the Administrator anticipates requesting funding, such plan shall set forth—

"(A) for the first 2 years the plan, detailed annual estimates of the schedule, cost, and manpower levels for each research project, including a description of the scope and content of each major contract, grant, or interagency agreement;

"(B) for the 3d, 4th, and 5th years of the plan, estimates of the total cost of each major project for such years and any additional major research projects which may be required to meet long-term objectives and which may have significant impact on future funding requirements;

"(C) for the 6th and subsequent years of the plan, the long-term objectives which the Administrator considers to be necessary to ensure that aviation safety will be given the highest priority; and

"(D) details of a program to disseminate to the private sector the results of aviation research conducted by the Administrator, including any new technologies developed.

"(2) Subject to section 316(d)(2) of this Act and the regulations prescribed to carry out such section, the Administrator shall report annually, beginning with the date of transmission of the first aviation research plan as required by paragraph (1), to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives on the accomplishments of the research completed during the preceding fiscal year. The report shall be transmitted together with each plan transmittal required under paragraph (1) and shall be organized so as to allow comparison with the plan in effect for such year under this subsection."

(b) CONFORMING AMENDMENT.—That portion of the table of contents contained in the first section of such Act which appears under the heading:

"Sec. 312. Development planning."

is amended by adding at the end the following:

"(d) Research plan and reports.

"(e) Civil aeromedical research.

"(f) Research advisory committee."

SEC. 5. CIVIL AEROMEDICAL RESEARCH.

(a) **ESTABLISHMENT OF CIVIL AEROMEDICAL INSTITUTE.**—Section 106 of title 49, United States Code, relating to the Federal Aviation Administration, is amended by adding at the end thereof the following new subsection:

“(j) There is established within the Federal Aviation Administration an institute to conduct civil aeromedical research under section 312(e) of the Federal Aviation Act of 1958. Such institute shall be known as the ‘Civil Aeromedical Institute’. Research conducted by the institute should take appropriate advantage of capabilities of other government agencies, universities, or the private sector.”.

(b) **CIVIL AEROMEDICAL RESEARCH.**—Section 312 of the Federal Aviation Act of 1958 (49 U.S.C. App. 1353), as amended by this Act, is further amended by adding at the end the following new subsection:

“**CIVIL AEROMEDICAL RESEARCH**

“(e) The Civil Aeromedical Institute established by section 106(j) of title 49, United States Code, is authorized—

“(1) to conduct civil aeromedical research, including, but not limited to, research related to—

“(A) protection and survival of aircraft occupants;

“(B) medical accident investigation and airman medical certification;

“(C) toxicology and the effects of drugs on human performance;

“(D) the impact of disease and disability on human performance;

“(E) vision and its relationship to human performance and equipment design;

“(F) human factors of flight crews, air traffic controllers, mechanics, inspectors, airway facility technicians, and other persons involved in the operation and maintenance of aircraft and air traffic control equipment; and

“(G) agency work force optimization, including training, equipment design, reduction of errors, and identification of candidate tasks for automation;

“(2) to make comments to the Administrator on human factors aspects of proposed air safety rules;

“(3) to make comments to the Administrator on human factors aspects of proposed training programs, equipment requirements, standards, and procedures for aviation personnel;

“(4) to advise, assist, and represent the Federal Aviation Administration in the human factors aspects of joint projects between such Administration and the National Aeronautics and Space Administration, other Government agencies, industry, and foreign governments; and

“(5) to provide medical consultation services to the Administrator with respect to medical certification of airmen.”.

SEC. 6. ADVISORY COMMITTEE.

Section 312 of the Federal Aviation Act of 1958 (49 U.S.C. App. 1353), as amended by this Act, is further amended by adding at the end the following new subsection:

"RESEARCH ADVISORY COMMITTEE

"(f)(1) Not later than 180 days after the date of the enactment of this subsection, the Administrator shall establish in the Federal Aviation Administration a research advisory committee.

"(2) The advisory committee shall provide advice and recommendations to the Administrator regarding needs, objectives, plans, approaches, content, and accomplishments with respect to the aviation research program carried out under this section and section 316. The committee shall also assist in assuring that such research is coordinated with similar research being conducted outside of the Federal Aviation Administration.

"(3) The advisory committee shall be composed of not more than 20 members appointed by the Administrator from among persons who are not employees of the Federal Aviation Administration and who are specially qualified to serve on the committee by virtue of their education, training, or experience. The Administrator in appointing the members of the committee shall ensure that universities, corporations, associations, consumers, and other government agencies are represented.

"(4) The chairman of the advisory committee shall be designated by the Administrator.

"(5) Members of the advisory committee shall serve without pay; except that the Administrator may allow any member, while attending meetings of the advisory committee or a subordinate committee, travel or transportation expenses in accordance with section 5703 of title 5, United States Code.

"(6) The Administrator shall provide support staff for the advisory committee. The Administrator may establish subordinate committees to the advisory committee to provide advice on specific areas of research conducted under this section and section 316.

"(7) Upon request of the advisory committee, the Administrator shall provide such information, administrative services, and supplies as the Administrator determines are necessary for the advisory committee to carry out its functions.

"(8) Section 14 of the Federal Advisory Committee Act shall not apply to the advisory committee established under this subsection.

"(9)(A) Not more than one-tenth of 1 percent of the funds made available to carry out research under this section and section 316 for fiscal years beginning after September 30, 1988, may be used by the Administrator to carry out this subsection.

"(B) No limitation on the amount of funds available for obligation by or for the advisory committee shall be applicable with respect to the funds made available to carry out this subsection."

SEC. 7. FUNDING.

(a) FISCAL YEAR 1989.—Section 506(b)(2)(B) of the Airport and Airway Improvement Act of 1982 (49 U.S.C. App. 2205(b)(2)(B)) is amended—

(1) in clause (vii), by striking "; and" and inserting in lieu thereof a comma; and

(2) by adding at the end, flush with the margin, the following: "except that not less than 15 percent of the amount appropriated pursuant to this subparagraph shall be for long-term research projects; and".

(b) FISCAL YEAR 1990.—Section 506(b)(2)(C) of the Airport and Airway Improvement Act of 1982 (49 U.S.C. App. 2205(b)(2)(C)) is amended to read as follows:

“(C) for fiscal year 1990—

“(i) \$25,000,000 solely for human factors research projects and activities; and

“(ii) \$221,530,000 for all other research projects and activities,

except that not less than 15 percent of the amount appropriated pursuant to this subparagraph shall be for long-term research projects.”.

(c) DEFINITION.—Section 506(b)(2) of the Airport and Airway Improvement Act of 1982 (49 U.S.C. App. 2205(b)(2)) is amended by adding at the end the following:

“As used in this paragraph, the term ‘long-term research project’ means a research project which is identified as a discrete project in the aviation research plan required by section 312(d)(1) of the Federal Aviation Act of 1958 and which is unlikely to result in a final rulemaking action within 5 years, or in initial installation of operational equipment within 10 years, after the date of the commencement of such project.”.

SEC. 8. AIR TRAFFIC CONTROLLER PERFORMANCE RESEARCH.

49 USC app.
1353 note.

(a) FINDINGS.—The Congress finds as follows:

(1) Research is needed to establish a more scientific approach for—

(A) identifying future staffing requirements for the air traffic control system; and

(B) developing tools needed for meeting those requirements.

(2) The Federal Aviation Administration and the National Aeronautics and Space Administration each have unique expertise and facilities for conducting research into the man-machine interface problems associated with a highly automated air traffic control system.

(b) STUDY ON INCREASED AUTOMATION.—

(1) IN GENERAL.—In order to develop the tools necessary for establishing appropriate selection criteria and training methodologies for the next generation of air traffic controllers, the Administrator of the Federal Aviation Administration shall conduct research to study the effect of automation on the performance of the next generation of air traffic controllers and the air traffic control system.

(2) CONTENT.—Research conducted under paragraph (1) shall include investigation of the following:

(A) Methods for improving and accelerating future air traffic controller training through the application of advanced training techniques, including use of simulation technology.

(B) The role of future automation in the air traffic control system and its physical and psychological effects on air traffic controllers.

(C) The attributes and aptitudes needed to function well in a highly automated air traffic control system, and development of appropriate testing methods for identifying individuals possessing those attributes and aptitudes.

(D) Innovative methods for training potential air traffic controllers to enhance the benefits of automation and maximize the effectiveness of the air traffic control system.

(E) New technologies and procedures for exploiting automated communication systems, including Mode S Transponders, to improve information transfers between air traffic controllers and aircraft pilots.

(3) **REPORT.**—Not later than 6 months after the date of the enactment of this Act, the Administrator of the Federal Aviation Administration shall report to the Congress the Administrator's plans for conducting research under this section.

(c) AGREEMENT WITH ADMINISTRATOR OF NASA.—

(1) **IN GENERAL.**—The Administrator of the Federal Aviation Administration may enter into an agreement with the Administrator of the National Aeronautics and Space Administration for use of their unique human factor facilities and expertise in conducting research activities to study the human factor aspects of the highly automated environment for the next generation of air traffic controllers.

(2) **CONTENT.**—Research under this section shall include investigation of the following:

(A) Human perceptual capabilities and the effect of computer-aided decisionmaking on the workload and performance of air traffic controllers.

(B) Information management techniques for advanced air traffic control display systems.

(C) Air traffic controller workload and performance measures, including development of predictive models.

(d) **AUTHORIZATION OF APPROPRIATIONS.**—For conducting research under this section there are authorized to be appropriated, from amounts in the Airport and Airway Trust Fund which are available for research and development, such sums as may be necessary.

SEC. 9. CRASHWORTHY FUSELAGE FUEL TANKS AND FUEL LINES.

(a) **ADVANCE NOTICE OF PROPOSED RULEMAKING.**—In order to ensure greater air safety to passengers of air carriers and reduce the incidence of post-crash fires, the Administrator of the Federal Aviation Administration shall, within 90 days following the date of enactment of this Act, issue an advance notice of proposed rulemaking to determine the feasibility of installing in all air carrier aircraft crashworthy fuselage fuel tanks and fuselage fuel lines which are rupture resistant and which disconnect and seal in the event of an accident.

(b) **RESEARCH.**—Within 60 days following the date of enactment of this Act, the Administrator shall undertake or supervise research to

develop technologies which will prevent the spraying or free flow or significant quantities of fuel after an air crash or develop fuels and fuel additives which can reduce rapid fuel dispersal and combustibility, or both.

Approved November 3, 1988.

LEGISLATIVE HISTORY—H.R. 4686 (S. 2746):

HOUSE REPORTS: No. 100-894 (Comm. on Science, Space, and Technology).

SENATE REPORTS: No. 100-584 accompanying S. 2746 (Comm. on Commerce, Science, and Transportation).

CONGRESSIONAL RECORD, Vol. 134 (1988):

Sept. 20, considered and passed House.

Oct. 20, considered and passed Senate, amended.

Oct. 21, House concurred in Senate amendment.