I

108TH CONGRESS
1ST SESSION

H. R. 2271

To enable the United States to maintain its leadership in aeronautics and aviation.

IN THE HOUSE OF REPRESENTATIVES

MAY 22, 2003

Mr. TIAHRT (for himself and Mr. BOSWELL) introduced the following bill; which was referred to the Committee on Science, and in addition to the Committee on Transportation and Infrastructure, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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A BILL

To enable the United States to maintain its leadership in aeronautics and aviation.

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

SECTION 1. SHORT TITLE; TABLE OF SECTIONS.

(a) SHORT TITLE.—This Act may be cited as the ''Second Century of Flight Act''.

(b) TABLE OF SECTIONS.—The table of sections for this Act is as follows:

Sec. 1. Short title; table of sections.
Sec. 2. Findings.

TITLE I—THE OFFICE OF AEROSPACE AND AVIATION LIAISON

Sec. 101. Office of Aerospace and Aviation Liaison.
Sec. 102. National Air Traffic Management System Development Office.
Sec. 103. Report on certain market developments and government policies.

TITLE II—TECHNICAL PROGRAMS

Sec. 201. Aerospace workforce initiative.
Sec. 202. Scholarships for service.

TITLE III—FAA RESEARCH, ENGINEERING, AND DEVELOPMENT

Sec. 301. Authorization of appropriations.
Sec. 302. Research program to improve airfield pavements.
Sec. 303. Ensuring appropriate standards for airfield pavements.
Sec. 304. Assessment of wake turbulence research and development program.
Sec. 305. Cabin air quality research program.
Sec. 306. International role of the FAA.
Sec. 307. FAA report on other nations' safety and technological advancements.
Sec. 308. Development of analytical tools and certification methods.
Sec. 309. Pilot program to provide incentives for development of new technologies.
Sec. 310. FAA center for excellence for applied research and training in the use of advanced materials in transport aircraft.
Sec. 311. FAA certification of design organizations.
Sec. 312. Report on long term environmental improvements.

TITLE IV—NASA RESEARCH, EDUCATION, AND DEVELOPMENT

Sec. 401. NASA aeronautics research plan.
Sec. 402. Assessment of NASA research plan.
Sec. 403. Study of markets enabled by environmental technologies for future aircraft.
Sec. 404. Vehicle-enabling technology program.
Sec. 405. Aviation software initiatives.
Sec. 406. Weather sensors and prediction.
Sec. 407. Advisory committees.
Sec. 408. National Center for Advanced Materials Performance.
Sec. 409. Unified budget report.
Sec. 410. Cost-sharing.

SEC. 2. FINDINGS.

The Congress finds the following:

(1) Since 1990, the United States has lost more than 600,000 aerospace jobs.

(2) Over the last year, approximately 100,000 airline workers and aerospace workers have lost their jobs as a result of the terrorist attacks in the

United States on September 11, 2001, and the slowdown in the world economy.

(3) The United States has revolutionized the way people travel, developing new technologies and aircraft to move people more efficiently and more safely.

(4) Past Federal investment in aeronautics research and development have benefited the economy and national security of the United States and the quality of life of its citizens.

(5) The total impact of civil aviation on the United States economy exceeds $900 billion annually—9 percent of the gross national product—and 11 million jobs in the national workforce. Civil aviation products and services generate a significant surplus for United States trade accounts, and amount to significant numbers of America's highly skilled, technologically qualified work force.

(6) Aerospace technologies, products and services underpin the advanced capabilities of our men and women in uniform and those charged with homeland security.

(7) Future growth in civil aviation increasingly will be constrained by concerns related to aviation

system safety and security, aviation system capabilities, aircraft noise, emissions, and fuel consumption.

(8) The United States is in danger of losing its aerospace leadership to international competitors aided by persistent government intervention. Many governments take their funding beyond basic technology development, choosing to fund product development and often bring the product to market, even if the products are not fully commercially viable. Moreover, international competitors have recognized the importance of noise, emission, fuel consumption, and constraints of the aviation system and have established aggressive agendas for addressing each of these concerns.

(9) Efforts by the European Union, through a variety of means, will challenge the United States leadership position in aerospace. A recent report outlined the European Union's goal of becoming the world's leader in aviation and aeronautics by the end of 2020, utilizing better coordination among research programs, planning, and funding to accomplish this goal.

(10) Revitalization and coordination of the United States efforts to maintain its leadership in

aviation and aeronautics are critical and must begin now.

(11) A recent report by the Commission on the Future of the United States Aerospace Industry outlined the scope of the problems confronting the aerospace and aviation industries in the United States and found that—

(A) Aerospace will be at the core of America's leadership and strength throughout the 21st century;

(B) Aerospace will play an integral role in our economy, our security, and our mobility; and

(C) global leadership in aerospace is a national imperative.

(12) Despite the downturn in the global economy, Federal Aviation Administration projections indicate that upwards of 1 billion people will fly annually by 2013. Efforts must begin now to prepare for future growth in the number of airline passengers.

(13) The United States must increase its investment in research and development to revitalize the aviation and aerospace industries, to create jobs, and to provide educational assistance and training to prepare workers in those industries for the future.

(14) Current and projected levels of Federal investment in aeronautics research and development are not sufficient to address concerns related to the growth of aviation.

TITLE I—THE OFFICE OF AEROSPACE AND AVIATION LIAISON

SEC. 101. OFFICE OF AEROSPACE AND AVIATION LIAISON.

(a) ESTABLISHMENT.—There is established within the Department of Transportation an Office of Aerospace and Aviation Liaison.

(b) FUNCTION.—The Office shall—

(1) coordinate aviation and aeronautics research programs to achieve the goal of more effective and directed programs that will result in applicable research;

(2) coordinate goals and priorities and coordinate research activities within the Federal Government with United States aviation and aeronautical firms;

(3) coordinate the development and utilization of new technologies to ensure that when available, they may be used to their fullest potential in aircraft and in the air traffic control system;

(4) facilitate the transfer of technology from research programs such as the National Aeronautics and Space Administration program established under section 401 and the Department of Defense Advanced Research Projects Agency program to Federal agencies with operational responsibilities and to the private sector;

(5) review activities relating to noise, emissions, fuel consumption, and safety conducted by Federal agencies, including the Federal Aviation Administration, the National Aeronautics and Space Administration, the Department of Commerce, and the Department of Defense;

(6) review aircraft operating procedures intended to reduce noise and emissions, identify and coordinate research efforts on aircraft noise and emissions reduction, and ensure that aircraft noise and emissions reduction regulatory measures are coordinated; and

(7) work with the National Air Traffic Management System Development Office to coordinate research needs and applications for the next generation air traffic management system.

(c) PUBLIC-PRIVATE PARTICIPATION.—In carrying out its functions under this section, the Office shall con-

sult with, and ensure participation by, the private sector (including representatives of general aviation, commercial aviation, and the space industry), members of the public, and other interested parties.

(d) REPORTING REQUIREMENTS.—

(1) INITIAL STATUS REPORT.—Not later than 90 days after the date of enactment of this Act, the Secretary of Transportation shall submit a report to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Transportation and Infrastructure on the status of the establishment of the Office of Aerospace and Aviation Liaison, including the name of the program manager, the list of staff from each participating department or agency, names of the national team participants, and the schedule for future actions.

(2) PLAN.—The Office shall submit to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science a plan for implementing paragraphs (1) and (2) of subsection (b) and a proposed budget for implementing the plan.

(3) ANNUAL REPORT.—The Office shall submit to the Senate Committee on Commerce, Science, and

Transportation, the House of Representatives Committee on Transportation and Infrastructure, and the House of Representatives Committee on Science an annual report that—

(A) contains a unified budget that combines the budgets of each program coordinated by the Office; and

(B) describes the coordination activities of the Office during the preceding year.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Transportation $2,000,000 for fiscal years 2004 and 2005 to carry out this section, such sums to remain available until expended.

SEC. 102. NATIONAL AIR TRAFFIC MANAGEMENT SYSTEM DEVELOPMENT OFFICE.

(a) ESTABLISHMENT.—There is established within the Federal Aviation Administration a National Air Traffic Management System Development Office, the head of which shall report directly to the Administrator.

(b) DEVELOPMENT OF NEXT GENERATION AIR TRAFFIC MANAGEMENT SYSTEM.—

(1) IN GENERAL.—The Office shall develop a next generation air traffic management system plan for the United States that will—

(A) transform the national airspace system to meet air transportation mobility, efficiency, and capacity needs beyond those currently included in the Federal Aviation Administration's operational evolution plan;

(B) result in a national airspace system that can safely and efficiently accommodate the needs of all users;

(C) build upon current air traffic management and infrastructure initiatives;

(D) improve the security, safety, quality, and affordability of aviation services;

(E) utilize a system-of-systems, multi-agency approach to leverage investments in civil aviation, homeland security, and national security;

(F) develop a highly integrated, secure architecture to enable common situational awareness for all appropriate system users; and

(G) ensure seamless global operations for system users, to the maximum extent possible.

(2) MULTI-AGENCY AND STAKEHOLDER INVOLVEMENT.—In developing the system, the Office shall—

(A) include staff from the Federal Aviation Administration, the National Aeronautics and Space Administration, the Department of Homeland Security, the Department of Defense, the Department of Commerce, and other Federal agencies and departments determined by the Secretary of Transportation to have an important interest in, or responsibility for, other aspects of the system; and

(B) consult with, and ensure participation by, the private sector (including representatives of general aviation, commercial aviation, and the space industry), members of the public, and other interested parties.

(3) DEVELOPMENT CRITERIA AND REQUIREMENTS.—In developing the next generation air traffic management system plan under paragraph (1), the Office shall—

(A) develop system performance requirements;

(B) select an operational concept to meet system performance requirements for all system users;

(C) ensure integration of civil and military system requirements, balancing safety, security,

and efficiency, in order to leverage Federal funding;

(D) utilize modeling, simulation, and analytical tools to quantify and validate system performance and benefits;

(E) develop a transition plan, including necessary regulatory aspects, that ensures operational achievability for system operators;

(F) develop transition requirements for ongoing modernization programs, if necessary;

(G) develop a schedule for aircraft equipment implementation and appropriate benefits and incentives to make that schedule achievable; and

(H) assess, as part of its function within the Office of Aeronautical and Aviation Liaison, the technical readiness of appropriate research technological advances for integration of such research and advances into the plan.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Administrator of the Federal Aviation Administration $300,000,000 for the period beginning with fiscal year 2004 and ending with fiscal year 2010 to carry out this section.

SEC. 103. REPORT ON CERTAIN MARKET DEVELOPMENTS AND GOVERNMENT POLICIES.

Within 6 months after the date of enactment of this Act, the Department of Transportation's Office of Aerospace and Aviation liaison, in cooperation with appropriate Federal agencies, shall submit to the Senate Committee on Commerce, Science, and Transportation, the House of Representatives Committee on Science, and the House of Representatives Committee on Transportation and Infrastructure a report about market developments and government policies influencing the competitiveness of the United States jet transport aircraft industry that—

(1) describes the structural characteristics of the United States and the European Union jet transport industries, and the markets for these industries;

(2) examines the global market factors affecting the jet transport industries in the United States and the European Union, such as passenger and freight airline purchasing patterns, the rise of low-cost carriers and point-to-point service, the evolution of new market niches, and direct and indirect operating cost trends;

(3) reviews government regulations in the United States and the European Union that have altered the competitive landscape for jet transport air-

craft, such as airline deregulation, certification and safety regulations, noise and emissions regulations, government research and development programs, advances in air traffic control and other infrastructure issues, corporate and air travel tax issues, and industry consolidation strategies;

(4) analyzes how changes in the global market and government regulations have affected the competitive position of the United States aerospace and aviation industry vis-à-vis the European Union aerospace and aviation industry; and

(5) describes any other significant developments that affect the market for jet transport aircraft.

TITLE II—TECHNICAL PROGRAMS

SEC. 201. AEROSPACE WORKFORCE INITIATIVE.

(a) IN GENERAL.—The Administrator of the National Aeronautics and Space Administration and the Administrator of the Federal Aviation Administration shall establish a joint program of competitive, merit-based, multi-year grants for eligible applicants to increase the number of students studying toward and completing technical training programs, certificate programs, and associate's, bachelor's, master's, or doctorate degrees in fields related to aerospace.

(b) INCREASED PARTICIPATION GOAL.—In selecting projects under this paragraph, the Director shall strive to increase the number of students studying toward and completing technical training and apprenticeship programs, certificate programs, and associate's or bachelor's degrees in fields related to aerospace who are individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b).

(c) SUPPORTABLE PROJECTS.—The types of projects the Administrators may support under this paragraph include those that promote high quality—

(1) interdisciplinary teaching;

(2) undergraduate-conducted research;

(3) mentor relationships for students;

(4) graduate programs;

(5) bridge programs that enable students at community colleges to matriculate directly into baccalaureate aerospace related programs;

(6) internships, including mentoring programs, carried out in partnership with the aerospace and aviation industry;

(7) technical training and apprenticeship that prepares students for careers in aerospace manufacturing or operations; and

(8) innovative uses of digital technologies, particularly at institutions of higher education that serve high numbers or percentages of economically disadvantaged students.

(d) 50 PERCENT FEDERAL SHARE.—Not less than 50 percent of the publicly financed costs associated with eligible activities shall come from non-Federal sources. Matching contributions may not be derived, directly or indirectly, from Federal funds. The Administrators shall endeavor to minimize the Federal share, taking into account the differences in fiscal capacity of eligible applicants.

(e) GRANTEE REQUIREMENTS.—

(1) TARGETS.—In order to receive a grant under this section, an eligible applicant shall establish targets to increase the number of students studying toward and completing technical training and apprenticeship programs, certificate programs, and associate's or bachelor's degrees in fields related to aerospace.

(2) GRANT PERIOD.—A grant under this section shall be awarded for a period of 5 years, with the final 2 years of funding contingent on the Director's determination that satisfactory progress has been made by the grantee toward meeting the targets established under paragraph (1).

(3) COMMUNITY COLLEGE RULE.—In the case of community colleges, a student who transfers to a baccalaureate program, or receives a certificate under an established certificate program, in science, mathematics, engineering, or technology shall be counted toward meeting a target established under paragraph (1).

(f) DEFINITIONS.—In this section:

(1) ELIGIBLE APPLICANT DEFINED.—The term ''eligible applicant'' means—

(A) an institution of higher education;

(B) a consortium of institutions of higher education; or

(C) a partnership between—

(i) an institution of higher education or a consortium of such institutions; and

(ii) a nonprofit organization, a State or local government, or a private company, with demonstrated experience and effectiveness in aerospace education.

(2) INSTITUTION OF HIGHER EDUCATION.—The term ''institution of higher education'' has the meaning given that term by subsection (a) of section 101 of the Higher Education Act of 1965 (20

U.S.C. 1001(a)), and includes an institution described in subsection (b) of that section.

(g) AUTHORIZATION OF APPROPRIATIONS.—

(1) NASA.—There are authorized to be appropriated to the Administrator of the National Aeronautics and Space Administration $5,000,000 for fiscal year 2004 and $7,000,000 for fiscal year 2005 to carry out this section, such sums to remain available until expended.

(2) FAA.—There are authorized to be appropriated to the Administrator of the Federal Aviation Administration $5,000,000 for fiscal year 2004 and $7,000,000 for fiscal year 2005 to carry out this section, such sums to remain available until expended.

SEC. 202. SCHOLARSHIPS FOR SERVICE.

(a) IN GENERAL.—The Administrator of the National Aeronautics and Space Administration and the Administrator of the Federal Aviation Administration may provide loans of up to $5,000 per year to fulltime students enrolled in an undergraduate or post-graduate program leading to an advanced degree in an aerospace related field of endeavor.

(b) LIMITATION.—An individual may not receive a loan under subsection (a) for more than 5 different years of study.

(c) FORGIVENESS FOR SERVICE.—The Administrators may forgive the repayment of principal and interest on any loan made under subsection (a) to an individual at the rate of 1 year's loan forgiveness for each 12-month period of service by that individual as a United States government employee in an aerospace related field of employment commencing after that individual completes the graduate program for which the loan was made.

(d) INTERNSHIPS.—The Administrators may provide temporary internships to recipients of loans under subsection (a), but any period of service as such an intern shall not be taken into account for purposes of subsection (c).

(e) AUTHORIZATION OF APPROPRIATIONS.—

(1) NASA.—There are authorized to be appropriated to the Administrator of the National Aeronautics and Space Administration $7,000,000 for fiscal year 2004 and $10,000,000 for fiscal year 2005 to carry out this section, such sums to remain available until expended.

(2) FAA.—There are authorized to be appropriated to the Administrator of the Federal Aviation

Administration $7,000,000 for fiscal year 2004 and $10,000,000 for fiscal year 2005 to carry out this section, such sums to remain available until expended.

TITLE III—FAA RESEARCH, ENGINEERING, AND DEVELOPMENT

SEC. 301. AUTHORIZATION OF APPROPRIATIONS.

(a) AMOUNTS AUTHORIZED.—Section 48102(a) of title 49, United States Code, is amended—

(1) by striking ''and'' at the end of paragraph (7);

(2) by striking the period at the end of paragraph (8) and inserting a semicolon; and

(3) by adding at the end the following:

''(9) for fiscal year 2004, $289,000,000, including—

''(A) $200,000,000 to improve aviation safety, including icing, crashworthiness, and aging aircraft;

''(B) $18,000,000 to improve the efficiency of the air traffic control system;

''(C) $27,000,000 to reduce the environmental impact of aviation;

"(D) $16,000,000 to improve the efficiency of mission support; and

"(E) $28,000,000 to improve the durability and maintainability of advanced material structures in transport airframe structures;

"(10) for fiscal year 2005, $304,000,000, including—

"(A) $211,000,000 to improve aviation safety;

"(B) $19,000,000 to improve the efficiency of the air traffic control system;

"(C) $28,000,000 to reduce the environmental impact of aviation;

"(D) $17,000,000 to improve the efficiency of mission support; and

"(E) $29,000,000 to improve the durability and maintainability of advanced material structures in transport airframe structures; and

"(11) for fiscal year 2006, $317,000,000, including—

"(A) $220,000,000 to improve aviation safety;

"(B) $20,000,000 to improve the efficiency of the air traffic control system;

''(C) $29,000,000 to reduce the environmental impact of aviation;

''(D) $18,000,000 to improve the efficiency of mission support; and

''(E) $30,000,000 to improve the durability and maintainability of advanced material structures in transport airframe structures.''.

SEC. 302. RESEARCH PROGRAM TO IMPROVE AIRFIELD PAVEMENTS.

The Administrator of the Federal Aviation Administration shall continue the program to consider awards to nonprofit concrete and asphalt pavement research foundations to improve the design, construction, rehabilitation, and repair of rigid concrete airfield pavements to aid in the development of safer, more cost-effective, and more durable airfield pavements. The Administrator may use grants or cooperative agreements in carrying out this section. Nothing in this section requires the Administrator to prioritize an airfield pavement research program above safety, security, Flight 21, environment, or energy research programs.

SEC. 303. ENSURING APPROPRIATE STANDARDS FOR AIRFIELD PAVEMENTS.

(a) IN GENERAL.—The Administrator of the Federal Aviation Administration shall review and determine

whether the Federal Aviation Administration's standards used to determine the appropriate thickness for asphalt and concrete airfield pavements are in accordance with the Federal Aviation Administration's standard 20-year-life requirement using the most up-to-date available information on the life of airfield pavements. If the Administrator determines that such standards are not in accordance with that requirement, the Administrator shall make appropriate adjustments to the Federal Aviation Administration's standards for airfield pavements.

(b) REPORT.—Within 1 year after the date of enactment of this Act, the Administrator shall report the results of the review conducted under subsection (a) and the adjustments, if any, made on the basis of that review to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Transportation and Infrastructure.

SEC. 304. ASSESSMENT OF WAKE TURBULENCE RESEARCH AND DEVELOPMENT PROGRAM.

(a) ASSESSMENT.—The Administrator of the Federal Aviation Administration shall enter into an arrangement with the National Research Council for an assessment of the Federal Aviation Administration's proposed wake turbulence research and development program. The assessment shall include—

(1) an evaluation of the research and development goals and objectives of the program;

(2) a listing of any additional research and development objectives that should be included in the program;

(3) any modifications that will be necessary for the program to achieve the program's goals and objectives on schedule and within the proposed level of resources; and

(4) an evaluation of the roles, if any, that should be played by other Federal agencies, such as the National Aeronautics and Space Administration and the National Oceanic and Atmospheric Administration, in wake turbulence research and development, and how those efforts could be coordinated.

(b) REPORT.—A report containing the results of the assessment shall be provided to the Committee on Science of the House of Representatives and to the Committee on Commerce, Science, and Transportation of the Senate not later than 1 year after the date of enactment of this Act.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Administrator of the Federal Aviation Administration $500,000 for fiscal year 2004 to carry out this section.

SEC. 305. CABIN AIR QUALITY RESEARCH PROGRAM.

In accordance with the recommendation of the National Academy of Sciences in its report entitled ''The Airliner Cabin Environment and the Health of Passengers and Crew'', the Federal Aviation Administration shall establish a research program to address questions about improving cabin air quality of aircraft, including methods to limit airborne diseases.

SEC. 306. INTERNATIONAL ROLE OF THE FAA.

Section 40101(d) of title 49, United States Code, is amended by adding at the end the following:

''(8) Exercising leadership with the Administrator's foreign counterparts, in the International Civil Aviation Organization and its subsidiary organizations, and other international organizations and fora, and with the private sector to promote and achieve global improvements in the safety, efficiency, and environmental effect of air travel.''.

SEC. 307. FAA REPORT ON OTHER NATIONS' SAFETY AND TECHNOLOGICAL ADVANCEMENTS.

The Administrator of the Federal Aviation Administration shall review aviation and aeronautical safety, and research funding and technological actions in other countries. The Administrator shall submit a report to the Committee on Science of the House of Representatives and to the Committee on Commerce, Science, and Transportation

of the Senate, together with any recommendations as to how such activities might be utilized in the United States.

SEC. 308. DEVELOPMENT OF ANALYTICAL TOOLS AND CERTIFICATION METHODS.

The Federal Aviation Administration shall conduct research to promote the development of analytical tools to improve existing certification methods and to reduce the overall costs for the certification of new products.

SEC. 309. PILOT PROGRAM TO PROVIDE INCENTIVES FOR DEVELOPMENT OF NEW TECHNOLOGIES.

(a) IN GENERAL.—The Administrator of the Federal Aviation Administration may conduct a limited pilot program to provide operating incentives to users of the airspace for the deployment of new technologies, including technologies to facilitate expedited flight routing and sequencing of take-offs and landings.

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Administrator $500,000 for fiscal year 2004.

SEC. 310. FAA CENTER FOR EXCELLENCE FOR APPLIED RESEARCH AND TRAINING IN THE USE OF ADVANCED MATERIALS IN TRANSPORT AIRCRAFT.

(a) IN GENERAL.—The Administrator of the Federal Aviation Administration shall develop a Center for Excel-

lence focused on applied research and training on the durability and maintainability of advanced materials in transport airframe structures, including the use of polymeric composites in large transport aircraft. 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 are authorized to be appropriated to the Administrator $500,000 for fiscal year 2004 to carry out this section.

SEC. 311. FAA CERTIFICATION OF DESIGN ORGANIZATIONS.

(a) GENERAL AUTHORITY TO ISSUE CERTIFICATES.—Section 44702(a) is amended by inserting ''design organization certificates,'' after ''airman certificates,''.

(b) DESIGN ORGANIZATION CERTIFICATES.—

(1) IN GENERAL.—Section 44704 is amended—

(A) by striking the section heading and inserting the following:

"§ 44704. Design organization certificates, type certificates, production certificate, and airworthiness certificates";

(B) by redesignating subsections (a) through (d) as subsections (b) through (e);

(C) by inserting before subsection (b) the following:

''(a) DESIGN ORGANIZATION CERTIFICATES.—

''(1) PLAN.—Within 1 year after the date of enactment of the Second Century of Flight Act, the Administrator of the Federal Aviation Administration shall submit a plan to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Transportation and Infrastructure for the development and oversight of a system for certification of design organizations under paragraph (2).

''(2) IMPLEMENTATION OF PLAN.—Within 5 years after the date of enactment of the Second Century of Flight Act, the Administrator of the Federal Aviation Administration may commence the issuance of design organization certificates under paragraph (3) to authorize design organizations to certify compliance with the requirements and minimum standards prescribed under section 44701(a) for the type

certification of aircraft, aircraft engines, propellers, or appliances.

''(3) ISSUANCE OF CERTIFICATES.—On receiving an application for a design organization certificate, the Administrator shall examine and rate the design organization in accordance with the regulations prescribed by the Administrator to determine that the design organization has adequate engineering, design, and testing capabilities, standards, and safeguards to ensure that the product being certificated is properly designed and manufactured, performs properly, and meets the regulations and minimum standards prescribed under that section. The Administrator shall include in a design organization certificate terms required in the interest of safety.'';

(D) by striking subsection (b), as redesignated, and inserting the following:

''(b) TYPE CERTIFICATES.—

''(1) IN GENERAL.—The Administrator may issue a type certificate for an aircraft, aircraft engine, or propeller, or for an appliance specified under paragraph (2)(A) of this subsection—

''(A) when the Administrator finds that the aircraft, aircraft engine, or propeller, or appliance is properly designed and manufactured,

performs properly, and meets the regulations and minimum standards prescribed under section 44701(a) of this title; or

''(B) based on a certification of compliance made by a design organization certificated under subsection (a).

''(2) INVESTIGATION AND HEARING.—On receiving an application for a type certificate not accompanied by a certification of compliance made by a design organization certificated under subsection (a), the Administrator shall investigate the application and may conduct a hearing. The Administrator shall make, or require the applicant to make, tests the Administrator considers necessary in the interest of safety.''.

(c) REINSPECTION AND REEXAMINATION.—Section 44709(a) is amended by inserting ''design organization, production certificate holder,'' after ''appliance,''.

(d) PROHIBITIONS.—Section 44711(a)(7) is amended by striking ''agency'' and inserting ''agency, design organization certificate,''.

(e) CONFORMING AMENDMENTS.—

(1) CHAPTER ANALYSIS.—The chapter analysis for chapter 447 is amended by striking the item relating to section 44704 and inserting the following:

''44704. Design organization certificates, type certificates, production certificate, and airworthiness certificates.''.

(2) CROSS REFERENCE.—Section 44715(a)(3) is amended by striking ''44704(a)'' and inserting ''44704(b)''.

SEC. 312. REPORT ON LONG TERM ENVIRONMENTAL IMPROVEMENTS.

(a) IN GENERAL.—The Administrator of the Federal Aviation Administration, in consultation with the Administrator of the National Aeronautics and Space Administration and the head of the Department of Transportation's Office of Aerospace and Aviation Liaison, shall conduct a study of ways to reduce aircraft noise and emissions and to increase aircraft fuel efficiency. The study shall—

(1) explore new operational procedures for aircraft to achieve those goals;

(2) identify both near term and long term options to achieve those goals;

(3) identify infrastructure changes that would contribute to attainment of those goals;

(4) identify emerging technologies that might contribute to attainment of those goals;

(5) develop a research plan for application of such emerging technologies, including new combuster and engine design concepts and methodologies for designing high bypass ratio turbofan

engines so as to minimize the effects on climate change per unit of production of thrust and flight speed; and

(6) develop an implementation plan for exploiting such emerging technologies to attain those goals.

(b) REPORT.—The Administrator shall transmit a report on the study to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Transportation and Infrastructure within 1 year after the date of enactment of this Act.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Administrator of the Federal Aviation Administration $500,000 for fiscal year 2004 to carry out this section.

TITLE IV—NASA RESEARCH, EDUCATION, AND DEVELOPMENT

SEC. 401. NASA AERONAUTICS RESEARCH PLAN.

(a) IN GENERAL.—Within 6 months after the date of enactment of this Act, the Administrator of the National Aeronautics and Space Administration shall transmit an aeronautics research and development plan to the Committee of Commerce, Science, and Transportation of the Senate and the Committee on Science of the House of Representatives setting forth the research goals and

funding needs over the next 10 years that will allow the United States to continue its lead in commercial aviation.

(b) SPECIFIC AREAS OF RESEARCH REQUIRED.—The plan shall include research on—

(1) enabling commercial aircraft to achieve noise levels on takeoff and on airport approach and landing that do not exceed ambient noise levels in the absence of flight operations in the vicinity of airports from which such commercial aircraft would normally operate;

(2) enabling commercial aircraft to achieve significant improvement in fuel efficiency, including specific fuel consumption, lift-to-drag ratio, and structural weight fraction, compared to aircraft in commercial service as of the date of enactment of this Act;

(3) enabling commercial aircraft to reduce emissions for nitrogen oxides to less than 5 grams per kilogram of fuel burned and to significantly reduce carbon dioxide emissions;

(4) technologies that will result in rotorcraft that, when compared to rotorcraft operating as of the date of enactment of this Act, will exhibit—

(A) an 80 percent reduction in noise levels on takeoff and on approach and landing as perceived by a human observer;

(B) a 10 percent reduction in vibration;

(C) a 30 percent reduction in empty weight;

(D) a predicted accident rate equivalent to that of fixed-wing aircraft in commercial service;

(E) the capability for zero-ceiling, zero-visibility operations; and

(F) operating noise levels that meet the conditions and noise limitations imposed by the Administrator of the Federal Aviation Administration under section 40128 of title 49, United States Code, for overflights of national parks;

(5) the development of a supersonic civil transport with—

(A) an operating speed of at least Mach 1.6;

(B) a range of at least 4,000 nautical miles;

(C) a payload of at least 150 passengers;

(D) a lift-to-drag ratio of at least 9.0;

(E) noise levels on takeoff and on airport approach and landing that meet community noise standards in place at airports from which such commercial supersonic aircraft would normally operate at the time the aircraft would enter commercial service;

(F) an N-shaped signature sonic boom peak overpressure of less than 1.0 pounds per square foot;

(G) nitrogen oxide emissions of less than 15 grams per kilogram of fuel burned; and

(H) water vapor emissions for stratospheric flight of no greater than 1,400 grams per kilogram of fuel burned; and

(6) other technologies which would improve United States aeronautics, including powered lift.

(c) PUBLIC-PRIVATE PARTICIPATION; COORDINATION.—In developing the plan, the Administrator shall consult with representatives of the United States aviation and aerospace industry and with the Office of Aerospace and Aviation Liaison of the Department of Transportation.

(d) DOT TO COORDINATE RESEARCH.—Any research undertaken pursuant to the plan shall be coordi-

nated with the Office of Aerospace and Aviation Liaison of the Department of Transportation.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Transportation $500,000 for each of fiscal years 2004 and 2005 to carry out this section.

SEC. 402. ASSESSMENT OF NASA RESEARCH PLAN.

(a) ASSESSMENT.—In order to ensure that the United States retains needed capabilities in fundamental aerodynamics and other areas of fundamental aeronautics research, the Administrator of the National Aeronautics and Space Administration shall enter into an arrangement with the National Research Council for an assessment of the Aeronautics Research Plan developed under section 401 and the United States future requirements for fundamental aeronautics research and needs for a skilled research workforce and research facilities commensurate with those requirements. The assessment shall include—

(1) an identification of any projected gaps; and

(2) recommendations for what steps should be taken by the United States to eliminate those gaps.

(b) REPORT.—The Administrator shall transmit the assessment described in subsection (a), along with the Administration's response to the assessment, to the Committee on Commerce, Science, and Transportation of the

Senate and to the Committee on Science of the House of Representatives not later than 1 year after the date of enactment of this Act.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Administrator $500,000 for fiscal year 2004 to carry out this section.

SEC. 403. STUDY OF MARKETS ENABLED BY ENVIRONMENTAL TECHNOLOGIES FOR FUTURE AIRCRAFT.

(a) OBJECTIVE.—The Administrator of the National Aeronautics and Space Administration shall conduct a study to identify and quantify new markets that would be created, as well as existing markets that would be expanded, by the incorporation of the technologies developed pursuant to section 401 into future commercial aircraft. As part of the study, the Administrator shall identify whether any of the performance characteristics specified in section 401(a) would need to be made more stringent in order to create new markets or expand existing markets. The Administrator shall seek input from at least the aircraft manufacturing industry, academia, and the airlines in carrying out the study.

(b) REPORT.—A report containing the results of the study shall be provided to the Committee on Science of the House of Representatives and to the Committee on

Commerce, Science, and Transportation of the Senate within 18 months after the date of enactment of this Act.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Administrator of the National Aeronautics and Space Administration $500,000 to carry out this section.

SEC. 404. VEHICLE-ENABLING TECHNOLOGY PROGRAM.

(a) IN GENERAL.—The Administrator of the National Aeronautics and Space Administration shall—

(1) redesignate the Administration's vehicle systems program as the vehicle-enabling technologies program; and

(2) broaden the scope of the program—

(A) to include cooperative efforts with aviation airframe, engine, avionics, and aircraft systems manufacturers to develop technologies that—

(i) will enable manufacturers to design, produce, and gain Federal Aviation Administration certification of innovative technologies that bring new capabilities to aircraft types currently being produced; and

(ii) will foster innovative capabilities and designs for future air vehicles and systems; and

(B) to include a thorough assessment of the full range of technology needs, from general aviation aircraft through supersonic vehicles, that might be adopted by airlines or corporate aviation.

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Administrator $5,000,000,000 for the period beginning with fiscal year 2004 and ending with fiscal year 2010 to carry out this section.

SEC. 405. AVIATION SOFTWARE INITIATIVES.

(a) IN GENERAL.—The Administrator of the National Aeronautics and Space Administration shall undertake the development of innovative software-validation technologies—

(1) to assist avionics and airframe manufacturers in demonstrating to the Federal Aviation Administration that their software-related products meet the accuracy, integrity, and reliability goals established by the Federal Aviation Administration for certification; and

(2) for software employed in the air traffic management system.

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Administrator $350,000,000 for the period beginning with fiscal year 2004 and ending with fiscal year 2010 to carry out this section.

SEC. 406. WEATHER SENSORS AND PREDICTION.

(a) IN GENERAL.—In order to enhance the accuracy of weather predictions for the surface and the atmosphere up to 18,000 feet, especially in rural areas, the Administrator of the National Aeronautics and Space Administration, in conjunction with the Administrator of the National Oceanic and Atmospheric Administration, shall increase research by the National Aeronautics and Space Administration into satellite sensors of wind speed, wind direction, temperature, dew point, and other low and middle-altitude weather phenomena.

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Administrator $100,000,000 for the period beginning with fiscal year 2004 and ending with fiscal year 2010 to carry out this section.

SEC. 407. ADVISORY COMMITTEES.

It is the sense of the Congress that, in continuing to assess the applicability of its programs to aerospace industry needs, the Administrator of the National Aeronautics and Space Administration should—

(1) make full use of the Administration's advisory committees, especially the Aerospace Technology Advisory Committee; and

(2) through that committee ensure that the Administration has aligned advisory committee subcommittees to reflect the focus of each of its programs and strategic goals.

SEC. 408. NATIONAL CENTER FOR ADVANCED MATERIALS PERFORMANCE.

(a) IN GENERAL.—The Administrator of the National Aeronautics and Space Administration shall develop a National Center for Advanced Materials Performance focused on shared-database methodologies addressing material, structural, manufacturing, and repair processes for use of advanced materials in commercial and military applications. The Center shall—

(1) be established on the basis of previous experience in advanced materials research and the provision of materials data and information to the aviation industry;

(2) promote and facilitate coordination between the Federal Aviation Administration and the aerospace and aviation industry which includes airframe manufacturers and material suppliers;

(3) establish goals to promote data sharing among multiple aerospace users and reduce testing via increased capability and use of numerical and analytical simulation tools; and

(4) enable the latest advanced material forms to be used cost-effectively on past and future aircraft.

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Administrator $35,000,000 for the period beginning with fiscal year 2004 and ending with fiscal year 2010 to carry out this section.

SEC. 409. UNIFIED BUDGET REPORT.

The Administrator of the National Aeronautics and Space Administration shall submit to the Senate Committee on Commerce, Science, and Transportation, the House of Representatives Committee on Transportation and Infrastructure, and the House of Representatives Committee on Science an annual report that contains a unified budget that combines the budgets of each program coordinated by the Administrator of the National Aeronautics and Space Administration.

SEC. 410. COST-SHARING.

The Administrator of the National Aeronautics and Space Administration shall prescribe guidelines to provide for consideration of the fair market value of background technologies as in-kind contributions by non-Federal Government participants in cost-shared projects administered by the Administrator. The Administrator shall use the authority of the Administration to the fullest to implement the guidelines in a manner that reduces program costs and increases the flow of innovative technology between the private sector and the Administration's programs and projects.

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