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110TH CONGRESS
1ST SESSION

H. R. 2698

To authorize appropriations for the civil aviation research and development projects and activities of the Federal Aviation Administration, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JUNE 13, 2007

Mr. UDALL of Colorado (for himself and Mr. GORDON of Tennessee) introduced the following bill; which was referred to the Committee on Science and Technology

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A BILL

To authorize appropriations for the civil aviation research and development projects and activities of the Federal Aviation Administration, and for other purposes.

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

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Federal Aviation Research and Development Reauthorization Act of 2007''.

SEC. 2. DEFINITIONS.

As used in this Act—

(1) the term ''Administrator'' means the Administrator of the Federal Aviation Administration;

(2) the term ''Director'' means the Director of the Joint Planning and Development Office;

(3) the term ''FAA'' means the Federal Aviation Administration;

(4) the term ''NASA'' means the National Aeronautics and Space Administration;

(5) the term ''National Research Council'' means the National Research Council of the National Academies of Science and Engineering;

(6) the term ''NOAA'' means the National Oceanic and Atmospheric Administration;

(7) the term ''NSF'' means the National Science Foundation;

(8) the term ''Office'' means the Next Generation Air Transportation System Joint Planning and Development Office; and

(9) the term ''Secretary'' means the Secretary of Transportation.

SEC. 3. AUTHORIZATION OF APPROPRIATIONS.

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

(1) in paragraph (11)(L), by striking ''and'';

(2) in paragraph (12)(L), by striking the period and inserting a semicolon; and

(3) by adding at the end the following new paragraphs:

''(13) for fiscal year 2008, $335,191,000, including—

''(A) $7,350,000 for fire research and safety;

''(B) $4,086,000 for propulsion and fuel systems;

''(C) $2,713,000 for advanced materials and structural safety;

''(D) $3,574,000 for atmospheric hazards and digital system safety;

''(E) $14,931,000 for aging aircraft;

''(F) $2,202,000 for aircraft catastrophic failure prevention research;

''(G) $14,651,000 for flightdeck maintenance, system integration, and human factors;

''(H) $9,517,000 for aviation safety risk analysis;

''(I) $15,254,000 for air traffic control, technical operations, and human factors;

''(J) $6,780,000 for aeromedical research;

''(K) $19,888,000 for weather programs;

''(L) $6,310,000 for unmanned aircraft systems research;

"(M) $18,100,000 for the Next Generation Air Transportation System Joint Planning and Development Office;

"(N) $13,755,000 for wake turbulence;

"(O) $20,469,000 for environment and energy;

"(P) $1,184,000 for system planning and resource management;

"(Q) $3,415,000 for the William J. Hughes Technical Center Laboratory Facility;

"(R) $74,200,000 for the Center for Advanced Aviation System Development;

"(S) $2,000,000 for the Airport Cooperative Research Program—capacity;

"(T) $3,000,000 for the Airport Cooperative Research Program—environment;

"(U) $5,000,000 for the Airport Cooperative Research Program—safety;

"(V) $3,600,000 for GPS civil requirements;

"(W) $5,000,000 for runway incursion reduction;

"(X) $6,500,000 for system capacity, planning, and improvement;

''(Y) $3,000,000 for operations concept validation;

''(Z) $1,000,000 for NAS weather requirements;

''(AA) $4,000,000 for the Airspace Management Lab;

''(BB) $5,000,000 for airspace redesign;

''(CC) $4,000,000 for wind profiling and weather research, Juneau;

''(DD) $1,000,000 for the Local Area Augmentation System (LAAS);

''(EE) $15,000,000 for Safe Flight 21, Alaska Capstone;

''(FF) $20,000,000 for NextGen demonstration;

''(GG) $8,907,000 for airports technology research—capacity;

''(HH) $9,805,000 for airports technology research—safety; and

''(14) for fiscal year 2009, $481,554,000, including—

''(A) $8,457,000 for fire research and safety;

''(B) $4,050,000 for propulsion and fuel systems;

"(C) $2,686,000 for advanced materials and structural safety;

"(D) $3,568,000 for atmospheric hazards and digital system safety;

"(E) $14,683,000 for aging aircraft;

"(F) $2,158,000 for aircraft catastrophic failure prevention research;

"(G) $37,499,000 for flightdeck maintenance, system integration, and human factors;

"(H) $8,349,000 for aviation safety risk analysis;

"(I) $15,323,000 for air traffic control, technical operations, and human factors;

"(J) $6,932,000 for aeromedical research;

"(K) $22,336,000 for weather program;

"(L) $6,738,000 for unmanned aircraft systems research;

"(M) $18,100,000 for the Next Generation Air Transportation System Joint Planning and Development Office;

"(N) $11,560,000 for wake turbulence;

"(O) $35,039,000 for environment and energy;

"(P) $1,847,000 for system planning and resource management;

''(Q) $3,548,000 for the William J. Hughes Technical Center Laboratory Facility;

''(R) $85,000,000 for Center for Advanced Aviation System Development;

''(S) $5,000,000 for the Airport Cooperative Research Program—capacity;

''(T) $5,000,000 for the Airport Cooperative Research Program—environment;

''(U) $5,000,000 for the Airport Cooperative Research Program—safety;

''(V) $3,469,000 for GPS civil requirements;

''(W) $5,000,000 for runway incursion reduction;

''(X) $6,500,000 for system capacity, planning and improvement;

''(Y) $3,000,000 for Operations Concept Validation;

''(Z) $1,000,000 for NAS weather requirements;

''(AA) $4,000,000 for the Airspace Management Lab;

''(BB) $3,000,000 for airspace redesign;

''(CC) $20,000,000 for Safe Flight 21, Alaska Capstone;

''(DD) $12,000,000 for NextGen demonstration;

''(EE) $102,000,000 for NextGen system development;

''(FF) $8,907,000 for airports technology research—capacity;

''(GG) $9,805,000 for airports technology research—safety; and

''(15) for fiscal year 2010, $486,502,000, including—

''(A) $8,546,000 for fire research and safety;

''(B) $4,075,000 for propulsion and fuel systems;

''(C) $2,700,000 for advanced materials and structural safety;

''(D) $3,608,000 for atmospheric hazards and digital system safety;

''(E) $14,688,000 for aging aircraft;

''(F) $2,153,000 for aircraft catastrophic failure prevention research;

''(G) $36,967,000 for flightdeck maintenance, system integration, and human factors;

''(H) $8,334,000 for aviation safety risk analysis;

"(I) $15,471,000 for air traffic control, technical operations, and human factors;

"(J) $7,149,000 for aeromedical research;

"(K) $23,286,000 for weather program;

"(L) $6,236,000 for unmanned aircraft systems research;

"(M) $18,100,000 for the Next Generation Air Transportation System Joint Planning and Development Office;

"(N) $11,412,000 for wake turbulence;

"(O) $34,678,000 for environment and energy;

"(P) $1,827,000 for system planning and resource management;

"(Q) $3,644,000 for William J. Hughes Technical Center Laboratory Facility;

"(R) $90,000,000 for the Center for Advanced Aviation System Development;

"(S) $5,000,000 for the Airport Cooperative Research Program—capacity;

"(T) $5,000,000 for the Airport Cooperative Research Program—environment;

"(U) $5,000,000 for the Airport Cooperative Research Program—safety;

"(V) $3,416,000 for GPS civil requirements;

"(W) $5,000,000 for runway incursion reduction;

"(X) $6,500,000 for system capacity, planning and improvement;

"(Y) $3,000,000 for operations concept validation;

"(Z) $1,000,000 for NAS weather requirements;

"(AA) $4,000,000 for the Airspace Management Lab;

"(BB) $3,000,000 for airspace redesign;

"(CC) $20,000,000 for Safe Flight 21, Alaska Capstone;

"(DD) $12,000,000 for NextGen demonstration;

"(EE) $102,000,000 for NextGen system development;

"(FF) $8,907,000 for airports technology research—capacity;

"(GG) $9,805,000 for airports technology research—safety; and

"(16) for fiscal year 2011, $514,832,000, including—

"(A) $8,815,000 for fire research and safety;

"(B) $4,150,000 for propulsion and fuel systems;

"(C) $2,747,000 for advanced materials and structural safety;

"(D) $3,687,000 for atmospheric hazards and digital system safety;

"(E) $14,903,000 for aging aircraft;

"(F) $2,181,000 for aircraft catastrophic failure prevention research;

"(G) $39,245,000 for flightdeck maintenance, system integration and human factors;

"(H) $8,446,000 for aviation safety risk analysis;

"(I) $15,715,000 for air traffic control, technical operations, and human factors;

"(J) $7,390,000 for aeromedical research;

"(K) $23,638,000 for weather program;

"(L) $6,295,000 for unmanned aircraft systems research;

"(M) $18,100,000 for the Next Generation Air Transportation System Joint Planning and Development Office;

"(N) $11,471,000 for wake turbulence;

"(O) $34,811,000 for environment and energy;

"(P) $1,836,000 for system planning and resource management;

"(Q) $3,758,000 for William J. Hughes Technical Center Laboratory Facility;

"(R) $114,000,000 for Center for Advanced Aviation System Development;

"(S) $5,000,000 for the Airport Cooperative Research Program—capacity;

"(T) $5,000,000 for the Airport Cooperative Research Program—environment;

"(U) $5,000,000 for the Airport Cooperative Research Program—safety;

"(V) $3,432,000 for GPS civil requirements;

"(W) $2,000,000 for runway incursion reduction;

"(X) $6,500,000 for system capacity, planning and improvement;

"(Y) $3,000,000 for operations concept validation;

"(Z) $1,000,000 for NAS weather requirements;

''(AA) $4,000,000 for the Airspace Management Lab;

''(BB) $3,000,000 for airspace redesign;

''(CC) $20,000,000 for Safe Flight 21, Alaska Capstone;

''(DD) $12,000,000 for NextGen demonstration;

''(EE) $105,000,000 for NextGen system development;

''(FF) $8,907,000 for airports technology research—capacity;

''(GG) $9,805,000 for airports technology research—safety; and''.

SEC. 4. NEXT GENERATION AIR TRANSPORTATION SYSTEM JOINT PLANNING AND DEVELOPMENT OFFICE.

(a) STATUS OF DIRECTOR AND RESPONSIBILITIES OF OFFICE.—Section 709 of the Vision 100— Century of Aviation Reauthorization Act (49 U.S.C. 40101 note) is amended—

(1) in subsection (a)—

(A) in paragraph (1), by adding at the end the following: ''The head of the Office shall be the Director. The Director shall report to the Administrator of the Federal Aviation Adminis-

tration and shall serve as Associate Administrator for the Next Generation Air Transportation System, and shall be a voting member and co-chair of the Joint Resources Council.'';

(B) by amending paragraph (2)(C) to read:

''(C) creating a transition plan for the implementation of that system that includes date-specific milestones for the implementation of new capabilities into the national airspace system;'';

(C) in paragraph (2)(G), by striking ''; and'' and inserting a semicolon;

(D) in paragraph (2)(H), by striking the period at the end and inserting ''; and'';

(E) by adding at the end of paragraph (2) the following:

''(I) establishing specific quantitative goals for the safety, capacity, efficiency, performance, and environmental impacts of each phase of Next Generation Air Transportation System implementation activities and measuring actual operational experience against those goals;

''(J) working to ensure global interoperability of the Next Generation Air Transportation System;

''(K) integrating aviation weather information and space weather information into the Next Generation Air Transportation System as soon as possible;

''(L) overseeing, with the Administrator, the selection of products or outcomes of research and development activities that would be moved to the next stage of a demonstration project through the Joint Resources Council;

''(M) maintaining a baseline modeling and simulation environment for testing and evaluating alternative concepts to satisfy Next Generation Air Transportation enterprise architecture requirements; and

''(N) pursuing the integration of unmanned aircraft systems into the national airspace system through research and demonstration programs under the auspices of a public and private partnership.''; and

(2) in subsection (e), by striking ''2010'' and inserting ''2011''.

(b) ACCOUNTABILITY.—Such section is further amended—

(1) in paragraph (3), by inserting ''(A)'' after the paragraph designation; and

(2) by adding at the end of paragraph (3) the following:

''(B) The Administrator, the Secretary of Defense, the Administrator of NASA, the Secretary of Commerce, the Secretary of Homeland Security, and the head of any other Department or Federal agency from which the Secretary of Transportation requests assistance under paragraph (A) shall designate a senior official in the department or agency to be responsible for—

''(i) implementing the department's or agency's Next Generation Air Transportation System activities with the Office, including the execution of all aspects of the department's or agency's work on developing and implementing the integrated plan described in section 709(2)(A); and

''(ii) ensuring that the department or agency meets its obligations as set forth in the memorandum of understanding executed by or

on behalf of the department or agency under subparagraph (D).

''(C) The head of any such department or agency shall—

''(i) establish an office within the department or agency to carry out its responsibilities under the memorandum of understanding under the supervision of the designated official; and

''(ii) ensure that the designated official has sufficient budgetary authority and staff resources to carry out the department's or agency's Next Generation Air Transportation System responsibilities as set forth in the integrated plan under section 709(b).

''(D) Not later than 6 months after the date of enactment of the Federal Aviation Research and Development Reauthorization Act of 2007, the head of each department or agency that has responsibility for carrying out any activity under the integrated plan under section 709(b) shall execute a memorandum of understanding with the Office obligating that department or agency to carry out those activities.''.

(c) INTEGRATED PLAN.—Section 709(b) of the Vision 100—Century of Aviation Reauthorization Act (49 U.S.C. 40101 note) is amended—

(1) by striking the first sentence and inserting ''The integrated plan shall be designed to ensure that the Next Generation Air Transportation System meets anticipated future air transportation safety, security, mobility, efficiency, and capacity needs and accomplishes the goals under subsection (c).'';

(2) in paragraph (3)(C), by striking ''; and'' and inserting a semicolon;

(3) by adding at the end the following:

''(5) Date-specific timetables for the partial and complete implementation of planned Next Generation Air Transportation System capabilities, including but not limited to Automated Dependent Surveillance-Broadcast, Unmanned Aircraft Systems operations, Next Generation Enabled Weather system, Next Generation Data Communications, NAS Voice Switch, System Wide Information Management system, and space weather information, and including any necessary certification activities, and including an evaluation of the costs and benefits of accelerating any of the implementation and certification timetables;

''(6) Identification of planned demonstration projects and date-specific timetables for the conduct of the demonstration projects and subsequent certification activities and an evaluation of the costs and benefits of accelerating any of the demonstration projects and certification activities;

''(7) Date-specific timetables for meeting the environmental requirements identified in subsection (I); and

''(8) Identification, on an annual basis, of each entity that will be responsible for each component of any research, development, or implementation activity.''.

(d) ANNUAL REPORT.—Section 709(d) of the Vision 100—Century of Aviation Reauthorization Act (49 U.S.C. 40101 note) is amended to read as follows:

''(d) ANNUAL REPORTS.—The Director of the Office shall transmit a report annually to the Committee on Science and Technology and the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate at the time of the President's budget request describing the progress in carrying out the plan required under subsection (b) and any changes to that plan. The annual report shall include—

''(1) the updated integrated plan developed under subsection (b);

''(2) a detailed description of the progress made in carrying out the integrated plan and any changes made to that plan since the previous annual report, and identifying any changes resulting from funding shortfalls or limitations set by the Office of Management and Budget;

''(3) any deviation from previously established development and implementation milestones, the reasons for the deviation, and the impact of the deviation;

''(4) the relevant programs and activities for the previous fiscal year and the proposed programs and activities under the President's budget request, of each participating Federal agency and department; and

''(5) the levels of funding for each participating Federal agency and department devoted to the programs and activities in paragraph (4) for the previous fiscal year and under the President's budget request.''.

(e) SENIOR POLICY COMMITTEE.—Section 710 of the Vision 100—Century of Aviation Reauthorization Act (49 U.S.C. 40101 note) is amended in the last sentence by

inserting ", and shall meet at least four times each year" before the period.

(f) BUDGET PREPARATION.—

(1) Each Federal agency and department participating in the office shall, as part of its annual request for appropriations to the Office of Management and Budget, submit a report to the Office of Management and Budget which—

(A) identifies each element of its work program which contributes directly to Next Generation Air Transportation System initiative; and

(B) states the portion of its request for appropriations that is allocated to each such element.

(2) The Office of Management and Budget shall review each such report in light of the goals, priorities, and agency and departmental responsibilities set forth in the annual report submitted under the amendment made by subsection (d), and shall include, in the President's annual budget estimate, a statement of the portion of each appropriate agency's or department's annual budget estimate relating to its activities undertaken pursuant to the Next Generation Air Transportation System initiative.

(g) CONTINGENCY PLANNING.—The Director shall, as part of the design of the Next Generation Air Transportation System, develop contingency plans for dealing with the degradation of the Next Generation Air Transportation System in the event of a natural disaster, major equipment failure, or act of terrorism.

(h) ENVIRONMENTAL RESEARCH.—The Director shall establish environmental requirements for noise, emissions, and energy consumption to be satisfied in the Next Generation Air Transportation System through a combination of technologies and operational procedures. The Director shall assign primary responsibility for the research, development, and demonstration of the applicable technologies in a relevant environment to NASA and primary responsibility for demonstration of optimized operational procedures to the FAA.

(i) GOVERNMENT ACCOUNTABILITY OFFICE ASSESSMENT AND REPORT.—

(1) SCOPE.—The Comptroller General shall assess compliance with the requirements of section 709 of the Vision 100—Century of Aviation Reauthorization Act (49 U.S.C. 40101 note) to determine—

(A) the effectiveness of the Next Generation Air Transportation System Joint Planning and Development Office in meeting the dead-

lines and milestones of the integrated plan under that section; and

(B) the adequacy and effectiveness of the memoranda of understanding executed by Federal departments and agencies under that section.

(2) REPORT.—Not later than 270 days after the date of enactment of this Act, and annually thereafter until the Next Generation Air Transportation System is fully operational, the Comptroller General shall transmit a report to the Committee on Science and Technology and the Committee on Transportation and Infrsatructure of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate containing the Comptroller General's findings, conclusions and recommendations related to the assessment in paragraph (1).

(j) UNMANNED AIRCRAFT SYSTEMS.—

(1) RESEARCH INITIATIVE.—

(A) IMPROVED MANNED AND UNMANNED AIRCRAFT.—Section 44504 of title 49, United States Code, is amended—

(i) in subsection (a), by inserting ''unmanned and manned'' after ''improve'';

(ii) in subsection (b)(6), by striking ''and'' after the semicolon;

(iii) in subsection (b)(7) by striking the period and inserting ''; and''; and

(iv) by adding at the end of subsection (b) the following:

''(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 aerial systems that could result in a catastrophic failure.''.

(B) SYSTEMS, PROCEDURES, FACILITIES, AND DEVICES.—Section 44505(b) of such title is amended—

(i) in paragraph (4), by striking ''and'' after the semicolon;

(ii) in paragraph (5)(C), by striking the period and inserting a semicolon; and

(iii) by adding at the end of subsection (b) the following:

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

''(7) to develop dynamic simulation models for integrating all classes of unmanned aircraft systems into the national airspace system.''.

(2) ROADMAP.—Not later than 90 days after the date of enactment of this Act, the Administrator shall develop and transmit an unmanned aircraft systems research, development, demonstration and implementation ''roadmap'' to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate.

(3) INDEPENDENT ASSESSMENT.—

(A) IN GENERAL.—Not later than 3 months after the date of enactment of this Act, the Administrator shall enter into an arrangement with the National Research Council for an assessment of the status of unmanned aircraft systems that shall include consideration of—

(i) human factors regarding unmanned aircraft systems operation;

(ii) ''detect, sense and avoid technologies'' with respect to both cooperative and non-cooperative aircraft;

(iii) spectrum issues and bandwidth requirements;

(iv) operation in suboptimal winds and adverse weather conditions;

(v) mechanisms for communicating unmanned aircraft system location;

(vi) airworthiness and system redundancy;

(vii) flight termination systems for safety and security;

(viii) technologies for unmanned aircraft systems flight control;

(ix) technologies for unmanned aircraft systems propulsion;

(x) unmanned aircraft systems operator qualifications, medical standards, and training requirements;

(xi) unmanned aircraft systems maintenance requirements and training requirements;

(xii) any other unmanned aircraft systems-related issue the Administrator believes should be addressed; and

(xiii) recommendations for integrating unmanned aircraft systems into the national airspace system in a timely manner.

(B) REPORT.—Not later than 12 months after initiating the study, the National Academy shall submit its report to the Administrator, the Senate Committee on Commerce, Science, and Transportation, and the House of Representatives Committee on Science and Technology containing its finding and recommendations.

(4) PILOT PROJECTS FOR TRANSITIONING RESEARCH AND DEVELOPMENT RESULTS.—

(A) IN GENERAL.—The Administrator shall establish pilot projects in sparsely populated, low-density Class G air traffic airspace to conduct experiments and collect data in order to accelerate the safe integration of unmanned aircraft systems into the national airspace system.

(B) USE OF PUBLIC-PRIVATE PARTNERSHIP.—In conducting the pilot projects, the Administrator shall encourage the formation of a public-private partnership.

(C) REPORT.—Not later than 90 days after completing the pilot projects, the Administrator shall transmit a report to the Committee on Science and Technology of the House of Representatives and the Committee on Com-

merce, Science, and Transportation of the Senate, setting forth the Administrator's findings and conclusions concerning the projects.

(D) AUTHORIZATION OF APPROPRIATIONS.—In addition to amounts authorized to be appropriated by the amendments made by this Act, there is authorized to be appropriated to the Administrator for fiscal years 2008 and 2009 such sums as may be necessary to carry out the pilot projects under this paragraph.

SEC. 5. INTERAGENCY RESEARCH INITIATIVE ON THE IMPACT OF AVIATION ON THE CLIMATE.

(a) IN GENERAL.—The Administrator, in coordination with NASA and the United States Climate Change Science Program, shall establish a research initiative to assess the impact of aviation on the climate and to evaluate approaches to mitigate that impact.

(b) RESEARCH PLAN.—Not later than 1 year after the date of enactment of this Act, the participating Federal entities shall jointly develop a plan for the research program that contains the objectives, proposed tasks, milestones, and 5-year budgetary profile.

(c) REVIEW.—The Administrator shall have the National Research Council conduct an independent review of the interagency research program plan and provide the re-

sults of that review to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate not later than 18 months after the date of enactment of this Act.

(d) AUTHORIZATION OF APPROPRIATIONS.—In addition to amounts authorized to be appropriated by the amendments made by this Act, there is authorized to be appropriated $2,000,000 for fiscal year 2008, and $5,000,000 in each of the fiscal years 2009 through 2011, for the interagency research program established under this section.

SEC. 6. RESEARCH PROGRAM ON RUNWAYS.

(a) ESTABLISHMENT OF RESEARCH PROGRAM.—The Administrator shall establish a program of research grants to universities and non-profit research foundations for research and technology demonstrations related to—

(1) improved runway surfaces; and

(2) engineered material restraining systems for runways at both general aviation airports and airports with commercial air carrier operations.

(b) AUTHORIZATION OF APPROPRIATIONS.—In addition to amounts authorized to be appropriated by the amendments made by this Act, there is authorized to be

appropriated $5,000,000 for each of the fiscal years 2008 through 2011 to carry out this section.

SEC. 7. RESEARCH ON DESIGN FOR CERTIFICATION.

(a) JOINT PROGRAM.—Not later than 6 months after the date of enactment of this Act, the FAA and NASA shall establish a joint research program on methods to improve both confidence in and the timeliness of certification of new technologies for their introduction into the national airspace system.

(b) RESEARCH PLAN.—Not later than 1 year after the date of enactment of this Act, as part of the activity described in subsection (a), the FAA and NASA shall jointly develop a plan for the research program that contains the objectives, proposed tasks, milestones, and five-year budgetary profile.

(c) REVIEW.—The Administrator shall have the National Research Council conduct an independent review of the joint research program plan and provide the results of that review to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate not later than 18 months after the date of enactment of this Act.

SEC. 8. CENTERS OF EXCELLENCE.

(a) AMENDMENT.—Section 44513(f) of title 49, United States Code, is amended to read as follows:

''(f) GOVERNMENT'S SHARE OF COSTS.—The United States Government's share of establishing and operating the center and all related research activities that grant recipients carry out shall not exceed 75 percent of the costs. The United States Government's share of an individual grant under this section shall not exceed 90 percent of the costs.''.

(b) ANNUAL REPORT.—The Administrator shall transmit a report annually to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate at the time of the President's budget request that lists—

(1) the research projects that have been initiated by each Center of Excellence in the preceding year;

(2) the amount of funding for each research project and the funding source;

(3) the institutions participating in each project and their shares of the overall funding for each research project; and

(4) the level of cost-sharing for each research project.

SEC. 9. AIRPORT COOPERATIVE RESEARCH PROGRAM.

Section 44511(f) of title 49, United States Code, is amended—

(1) in paragraph (1), by striking ''establish a 4-year pilot'' in paragraph (1) and inserting ''maintain an''; and

(2) in paragraph (4)—

(A) by striking ''expiration of the program'' and inserting ''expiration of the pilot program''; and

(B) by striking ''program, including recommendations as to the need for establishing a permanent airport cooperative research program'' and inserting ''program''.

SEC. 10. RESEARCH GRANTS PROGRAM INVOLVING UNDERGRADUATE STUDENTS.

(a) IN GENERAL.—The Administrator shall establish a program to utilize colleges and universities, including Historically Black Colleges and Universities, Hispanic Serving Institutions, tribally controlled colleges and universities, and Alaska Native and Native Hawaiian serving institutions in conducting research by undergraduate students on subjects of relevance to the FAA. Grants may be awarded under this section for—

(1) research projects to be carried out primarily by undergraduate students;

(2) research projects that combine undergraduate research with other research supported by the FAA;

(3) research on future training requirements related to projected changes in regulatory requirements for aircraft maintenance and power plant licensees; and

(4) research on the impact of new technologies and procedures, particularly those related to aircraft flight deck and air traffic management functions, and on training requirements for pilots and air traffic controllers.

(b) AUTHORIZATION OF APPROPRIATIONS.—In addition to amounts authorized to be appropriated by the amendments made by this Act, there is authorized to be appropriated $5,000,000 for each of the fiscal years 2008 through 2011, for research grants under this section.

SEC. 11. BUDGET FORMULATION.

Section 48102 of title 49, United States Code, is amended by inserting after subsection (f) the following new subsection:

''(g) BUDGET FORMULATION.—(1) The Department of Transportation's annual budget request for the Federal Aviation Administration shall identify all of the activities carried out by the Administration within the categories of

basic research, applied research, and development, as classified by the Office of Management and Budget Circular A–11. Each activity in the categories of basic research, applied research, and development shall be identified regardless of the budget category in which it appears in the budget request.

''(2) The budget request specified in paragraph (1) shall be submitted to the Committee on Science and Technology and the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate at the same time as the President's Budget Request is submitted to the Congress.''.

SEC. 12. RESEARCH PROGRAM ON SPACE WEATHER AND AVIATION.

(a) ESTABLISHMENT.—From amounts made available under section 48102(a) of title 49, United States Code, the Administrator of the Federal Aviation Administration shall, in coordination with the National Science Foundation, National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, and other relevant agencies, initiate a research program to—

(1) conduct or supervise research projects on impacts of space weather to aviation, including com-

munication, navigation, avionic systems, and on airline passengers and personnel; and

(2) facilitate the transfer of technology from space weather research programs to Federal agencies with operational responsibilities and to the private sector.

(b) USE OF GRANTS OR COOPERATIVE AGREEMENTS.—The Administrator may use grants or cooperative agreements in carrying out this section.

(c) AUTHORIZATION OF APPROPRIATIONS.—In addition to amounts authorized to be appropriated by the amendments made by this Act, there is authorized to be appropriated $1,000,000 for each of the fiscal years 2008 through 2011 to carry out this section.

SEC. 13. AVIATION GAS RESEARCH AND DEVELOPMENT PROGRAM.

(a) CONTINUATION OF PROGRAM.—The Administrator, in coordination with the NASA Administrator, shall continue research and development activities into technologies for modification of existing general aviation piston engines to enable their safe operation using unleaded aviation fuel.

(b) ROADMAP.—Not later than 120 days of the enactment of this Act, the Administrator shall develop a research and development roadmap for the program contin-

ued in subsection (a), containing the specific research and development objectives and anticipated timetable for achieving the objectives.

(c) REPORT.—Not later than 130 days of the enactment of this Act, the Administrator shall provide the roadmap specified in subsection (b) to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate.

(d) AUTHORIZATION OF APPROPRIATIONS.—In addition to amounts authorized to be appropriated by the amendments made by this Act, there is authorized to be appropriated $750,000 for each of the fiscal years 2008 through 2010, to carry out this section.

SEC. 14. RESEARCH REVIEWS AND ASSESSMENTS.

(a) REVIEW OF FAA'S ENERGY- AND ENVIRONMENT-RELATED RESEARCH PROGRAMS.—

(1) STUDY.—The Administrator shall enter into an arrangement with the National Research Council for a review of the FAA's energy- and environment-related research program. The review shall assess whether—

(A) the programs have well-defined, prioritized, and appropriate research objectives;

(B) the program are properly coordinated with the energy- and environment-related research programs of NASA, NOAA, and other relevant agencies;

(C) the program have allocated appropriate resources to each of the research objectives; and

(D) there exist suitable mechanisms for transitioning the research results into the FAA's operational technologies and procedures and certification activities.

(2) REPORT.—A report containing the results of the review shall be provided to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate within eighteen months of the enactment of this Act.

(b) ASSESSMENT OF THE IMPACT OF SPACE WEATHER ON AVIATION.—

(1) STUDY.—The Administrator shall enter into an arrangement with the National Research Council for a study of the impacts of space weather on the current and future United States aviation industry, and in particular, to examine the risks for Over-The-Pole (OTP) and Ultra-Long-Range (ULR) operations. The study shall—

(A) examine space weather impacts on at least the following areas: communications, navigation, avionics, and human health in flight;

(B) assess the benefits of space weather information and services to reduce aviation costs and maintain safety;

(C) provide recommendations on how NASA, NOAA, and the NSF can most effectively carry out research and monitoring activities related to space weather and aviation; and

(D) provide recommendations on how to integrate space weather information into the Next Generation Air Transportation System.

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

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