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1ST SESSION

S. 309

To enable the United States to maintain its leadership in aeronautics and aviation by instituting an initiative to develop technologies that will significantly lower noise, emissions, and fuel consumption, to reinvigorate basic and applied research in aeronautics and aviation, and for other purposes.

IN THE SENATE OF THE UNITED STATES

FEBRUARY 5, 2003

Mr. ALLEN (for himself and Mr. DODD) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

A BILL

To enable the United States to maintain its leadership in aeronautics and aviation by instituting an initiative to develop technologies that will significantly lower noise, emissions, and fuel consumption, to reinvigorate basic and applied research in aeronautics and aviation, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Aeronautics Research
5 and Development Revitalization Act of 2003”.

1 **SEC. 2. FINDINGS.**

2 Congress finds the following:

3 (1) It is in the national interest to maintain
4 leadership in aeronautics and aviation.

5 (2) The United States is in danger of losing its
6 leadership in aeronautics and aviation to inter-
7 national competitors.

8 (3) Past Federal investments in aeronautics re-
9 search and development have benefited the economy
10 and national security of the United States and the
11 quality of life of its citizens.

12 (4) Future growth in aviation increasingly will
13 be constrained by concerns related to aircraft noise,
14 emissions, fuel consumption, and air transportation
15 system congestion.

16 (5) Current and projected levels of Federal in-
17 vestment in aeronautics research and development
18 are not sufficient to address concerns related to the
19 growth of aviation.

20 (6) International competitors have recognized
21 the importance of noise, emissions, fuel consump-
22 tion, and air transportation system congestion in
23 limiting the future growth of aviation and have es-
24 tablished aggressive agendas for addressing each of
25 these concerns.

1 (7) An aggressive initiative by the Federal Gov-
2 ernment to develop technologies that would signifi-
3 cantly reduce aircraft noise, harmful emissions, and
4 fuel consumption would benefit the United States
5 by—

6 (A) improving the competitiveness of the
7 United States aviation industry through the de-
8 velopment of new markets for aviation services
9 and the development of superior aircraft for ex-
10 isting markets;

11 (B) improving the quality of life for our
12 citizens by drastically reducing the level of noise
13 due to aircraft operations;

14 (C) reducing the congestion of the air
15 transportation system by allowing departures
16 and arrivals at currently under utilized airports
17 through the use of environmentally compatible
18 aircraft;

19 (D) reducing the rate at which fossil fuels
20 are consumed;

21 (E) reducing the rate at which greenhouse
22 gases and other harmful gases and particulates
23 are added to the atmosphere by aircraft; and

24 (F) reinvigorating the human capital need-
25 ed to maintain international leadership in aero-

1 nautics and aviation by providing a set of ex-
2 tremely challenging and socially beneficial goals
3 to the next generation of engineers and sci-
4 entists.

5 (8) Long-term progress in aeronautics and avia-
6 tion will require continued Federal investment in
7 fundamental aeronautical research.

8 (9) The European competitors of United States
9 aircraft companies have invested heavily in new wind
10 tunnels. These new tunnels are better than their
11 older United States counterparts and give European
12 aircraft manufacturers an advantage over United
13 States aircraft manufacturers in the highly competi-
14 tive civil aircraft sales business. As a result, United
15 States aircraft companies are forced to perform tests
16 in Europe's superior wind tunnels. The security of
17 United States data obtained in these and other for-
18 eign test facilities can easily be compromised. New
19 and upgraded United States aeronautical test facili-
20 ties are needed to support a revitalized aeronautics
21 research and development program, and should be a
22 high national priority.

23 (10) Continued research is needed into the
24 flight crew and controller training needed to accom-

1 modate new aircraft and air transportation system
2 technologies and procedures.

3 (11) It is in the interest of the United States
4 to maintain a vigorous capability in basic and ap-
5 plied research and development of technologies re-
6 lated to rotorcraft.

7 (12) Maintenance of United States leadership
8 in aeronautics and aviation will require the produc-
9 tive collaboration of NASA, the Department of De-
10 fense, the FAA, the aviation industry, and the Na-
11 tion's universities.

12 (13) Improvements to our understanding of
13 convective weather phenomena and of aircraft wake
14 turbulence would significantly improve the perform-
15 ance of the Nation's air transportation system.

16 (14) The terrorist attacks of September 11,
17 2001, have imposed new requirements for research
18 on aviation security. NASA's aviation safety re-
19 search must be expanded to include methods that
20 provide for an air transportation system that is both
21 safe and secure from terrorist attacks.

22 (15) It is important for NASA to continue at
23 a healthy level its cooperative research efforts with
24 the Department of Defense regarding military avia-
25 tion technologies. These efforts have been all but

1 eliminated in recent years and must be restored. The
2 Nation must take advantage of the synergy between
3 civil and military aviation research.

4 (16) The report entitled “The NASA Aero-
5 nautics Blueprint—Toward a Bold New Era of
6 Aviation” provides an excellent statement of the
7 problems facing aviation today, and presents an ex-
8 citing vision of what can be achieved by investments
9 in aeronautics research and technology. It does not,
10 however, provide a program plan to actually achieve
11 the vision, nor does it address the huge mismatch
12 between current NASA aeronautics funding and
13 what is required to realize the vision.

14 **SEC. 3. DEFINITIONS.**

15 In this Act:

16 (1) FAA.—The term “FAA” means the Fed-
17 eral Aviation Administration.

18 (2) FAA ADMINISTRATOR.—The term “FAA
19 Administrator” means the Administrator of the
20 FAA.

21 (3) INSTITUTION OF HIGHER EDUCATION.—The
22 term “institution of higher education” has the
23 meaning given that term by section 101 of the High-
24 er Education Act of 1965 (20 U.S.C. 1001).

1 (4) NASA.—The term “NASA” means the Na-
2 tional Aeronautics and Space Administration.

3 (5) NASA ADMINISTRATOR.—The term “NASA
4 Administrator” means the Administrator of NASA.

5 **TITLE I—NASA AERONAUTICS**
6 **RESEARCH AND DEVELOPMENT**

7 **SEC. 101. ENVIRONMENTAL AIRCRAFT RESEARCH AND DE-**
8 **VELOPMENT INITIATIVE.**

9 (a) OBJECTIVE.—Not later than 10 years after the
10 date of enactment of this Act, the NASA Administrator
11 shall develop and demonstrate, in a relevant environment,
12 technologies that result in the following commercial air-
13 craft performance characteristics:

14 (1) NOISE.—Noise levels on takeoff and on air-
15 port approach and landing that do not exceed ambi-
16 ent noise levels in the absence of flight operations in
17 the vicinity of airports from which such commercial
18 aircraft would normally operate.

19 (2) FUEL EFFICIENCY.—A 10 percent improve-
20 ment in fuel efficiency, compared to aircraft in com-
21 mercial service as of the date of enactment of this
22 Act, in each of the following:

23 (A) Specific fuel consumption.

24 (B) Lift to drag ratio.

25 (C) Structural weight fraction.

1 (3) EMISSIONS.—Nitrogen oxides at less than 5
2 grams per kilogram of fuel burned.

3 (b) IMPLEMENTATION.—Not later than 180 days
4 after the date of enactment of this Act, the NASA Admin-
5 istrator shall provide to the Committee on Science of the
6 House of Representatives and the Committee on Com-
7 merce, Science, and Transportation of the Senate a plan
8 for the implementation of the initiative described in sub-
9 section (a). Such implementation plan shall include—

10 (1) technological roadmaps for achieving each
11 of the performance characteristics specified in sub-
12 section (a);

13 (2) an estimate of the 10-year funding profile
14 required to achieve the objective specified in sub-
15 section (a);

16 (3) a plan for carrying out a formal quantifica-
17 tion of the estimated costs and benefits of each tech-
18 nological option selected for development beyond the
19 initial concept definition phase; and

20 (4) a plan for transferring the technologies to
21 industry, including the identification of requirements
22 for prototype demonstrations, as appropriate.

23 (c) REVIEW.—Not later than 1 year after the date
24 of enactment of this Act, the NASA Administrator shall
25 enter into an arrangement with the National Research

1 Council to review the adequacy of the implementation plan
2 provided under subsection (b) to achieve the objective de-
3 scribed in subsection (a). In addition, the NASA Adminis-
4 trator shall enter into an arrangement with the National
5 Research Council for the review, every 3 years after the
6 initial review under this subsection, of NASA's progress
7 in achieving the objective described in subsection (a), in-
8 cluding recommendations for changes to NASA's research
9 and development program. The results of each review shall
10 be provided to the Committee on Science of the House
11 of Representatives and the Committee on Commerce,
12 Science, and Transportation of the Senate within 30 days
13 after the review is completed.

14 (d) AUTHORIZATION OF APPROPRIATIONS.—

15 (1) IN GENERAL.—Of the amounts authorized
16 to be appropriated under section 107, there are au-
17 thorized to be appropriated to the NASA Adminis-
18 trator to carry out this section—

19 (A) \$125,000,000 for fiscal year 2004;

20 (B) \$150,000,000 for fiscal year 2005;

21 (C) \$175,000,000 for fiscal year 2006;

22 (D) \$200,000,000 for fiscal year 2007;

23 and

24 (E) \$225,000,000 for fiscal year 2008.

1 (2) AMOUNTS TO CERTAIN ENTITIES.—Of the
2 amounts authorized to be appropriated in paragraph
3 (1), the percentage of the annual appropriation that
4 shall be used to fund research and development con-
5 ducted at universities, industrial research entities,
6 and not-for-profit research consortia is—

7 (A) 20 percent for fiscal year 2004;

8 (B) 30 percent for fiscal year 2005;

9 (C) 40 percent for fiscal year 2006; and

10 (D) 50 percent for fiscal years 2007 and

11 2008.

12 **SEC. 102. ROTORCRAFT RESEARCH AND DEVELOPMENT**
13 **INITIATIVE.**

14 (a) OBJECTIVE.—Not later than 10 years after the
15 date of enactment of this Act, the NASA Administrator
16 shall develop and demonstrate, in a relevant environment,
17 technologies that result in rotorcraft with the following im-
18 provements compared to rotorcraft operating on the date
19 of enactment of this Act:

20 (1) 80 percent reduction in noise levels on take-
21 off and on approach and landing as perceived by a
22 human observer.

23 (2) Factor of 10 percent reduction in vibration.

24 (3) 30 percent reduction in empty weight.

1 (4) Predicted accident rate equivalent to that of
2 fixed-wing aircraft in commercial service.

3 (5) Capability for zero-ceiling, zero-visibility op-
4 erations.

5 (b) IMPLEMENTATION.—Not later than 180 days
6 after the date of enactment of this Act, the NASA Admin-
7 istrator shall provide a plan to the Committee on Science
8 of the House of Representatives and to the Committee on
9 Commerce, Science, and Transportation of the Senate for
10 the implementation of the initiative described in sub-
11 section (a). The implementation plan shall include—

12 (1) technological roadmaps for achieving each
13 of the improvements specified in subsection (a);

14 (2) an estimate of the 10-year funding profile
15 required to achieve the objective specified in sub-
16 section (a);

17 (3) a plan for carrying out a formal quantifica-
18 tion of the estimated costs and benefits of each tech-
19 nological option selected for development beyond the
20 initial concept definition phase; and

21 (4) a plan for transferring the technologies to
22 industry, including the identification of requirements
23 for prototype demonstrations, as appropriate.

24 (c) AUTHORIZATION OF APPROPRIATIONS.—Of the
25 amounts authorized to be appropriated under section 107,

1 there are authorized to be appropriated to the NASA Ad-
2 ministrator to carry out this section—

- 3 (1) \$40,000,000 for fiscal year 2004;
- 4 (2) \$40,000,000 for fiscal year 2005;
- 5 (3) \$40,000,000 for fiscal year 2006;
- 6 (4) \$50,000,000 for fiscal year 2007; and
- 7 (5) \$70,000,000 for fiscal year 2008.

8 **SEC. 103. CIVIL SUPERSONIC TRANSPORT RESEARCH AND**
9 **DEVELOPMENT INITIATIVE.**

10 (a) **OBJECTIVE.**—Not later than 20 years after the
11 date of enactment of this Act, the NASA Administrator
12 shall develop and demonstrate, in a relevant environment,
13 technologies to enable overland flight of supersonic civil
14 transport aircraft with at least the following performance
15 characteristics:

- 16 (1) Mach number of at least 1.6.
- 17 (2) Range of at least 4,000 nautical miles.
- 18 (3) Payload of at least 150 passengers.
- 19 (4) Lift to drag ratio of at least 9.0.
- 20 (5) Noise levels on takeoff and on airport ap-
21 proach and landing that meet community noise
22 standards in place at airports from which such com-
23 mercial supersonic aircraft would normally operate
24 at the time the aircraft would enter commercial serv-
25 ice.

1 (6) Shaped signature sonic boom overpressure
2 of less than 1.0 pounds per square foot.

3 (7) Nitrogen oxide emissions of less than 15
4 grams per kilogram of fuel burned.

5 (8) Water vapor emissions for stratospheric
6 flight of no greater than 1,400 grams per kilogram
7 of fuel burned.

8 (b) IMPLEMENTATION.—Not later than 180 days
9 after the date of enactment of this Act, the NASA Admin-
10 istrator shall provide to the Committee on Science of the
11 House of Representatives and to the Committee on Com-
12 merce, Science, and Transportation of the Senate a plan
13 for the implementation of the initiative described in sub-
14 section (a). Such implementation plan shall include—

15 (1) technological roadmaps for achieving each
16 of the performance characteristics specified in sub-
17 section (a);

18 (2) an estimate of the 10-year funding profile
19 required to achieve the objective specified in sub-
20 section (a);

21 (3) a plan for carrying out a formal quantifica-
22 tion of the estimated costs and benefits of each tech-
23 nological option selected for development beyond the
24 initial concept definition phase;

1 (4) a plan for transferring the technologies to
2 industry, including the identification of requirements
3 for prototype demonstrations, as appropriate;

4 (5) a plan for research to quantify, within 3
5 years after the date of enactment of this Act, the
6 limits on sonic boom parameters, such as over-
7 pressure and rise time, that would be acceptable to
8 the general public; and

9 (6) a plan for adjusting the noise reduction re-
10 search and development activities as needed to ac-
11 commodate changes in community noise standards
12 that may occur over the lifetime of the initiative.

13 (c) **AUTHORIZATION OF APPROPRIATIONS.**—Of the
14 amounts authorized to be appropriated under section 107,
15 there are authorized to be appropriated to the NASA Ad-
16 ministrator to carry out this section—

17 (1) \$15,000,000 for fiscal year 2004;

18 (2) \$20,000,000 for fiscal year 2005;

19 (3) \$30,000,000 for fiscal year 2006;

20 (4) \$30,000,000 for fiscal year 2007; and

21 (5) \$30,000,000 for fiscal year 2008.

22 **SEC. 104. NASA AERONAUTICS SCHOLARSHIPS.**

23 (a) **OBJECTIVE.**—The NASA Administrator shall es-
24 tablish a program of scholarships for full-time graduate
25 students who are United States citizens and are enrolled

1 in, or have been accepted by and have indicated their in-
2 tention to enroll in, accredited Masters degree programs
3 in aeronautical engineering at institutions of higher edu-
4 cation. Each such scholarship shall cover the costs of
5 room, board, tuition, and fees, and may be provided for
6 a maximum of 2 years.

7 (b) IMPLEMENTATION.—Not later than 180 days
8 after the date of enactment of this Act, the NASA Admin-
9 istrator shall publish regulations governing the scholarship
10 program.

11 (c) COOPERATIVE TRAINING OPPORTUNITIES.—Stu-
12 dents who have been awarded a scholarship under this sec-
13 tion shall have the opportunity for paid employment at
14 one of the NASA Centers engaged in aeronautics research
15 and development during the summer prior to the first year
16 of the student's Masters program, and between the first
17 and second year, if applicable.

18 (d) AUTHORIZATION OF APPROPRIATIONS.—Of the
19 amounts authorized to be appropriated under section 107,
20 there are authorized to be appropriated to the NASA Ad-
21 ministrator to carry out this section—

22 (1) \$500,000 for fiscal year 2004;

23 (2) \$750,000 for fiscal year 2005;

24 (3) \$1,000,000 for fiscal year 2006;

25 (4) \$1,000,000 for fiscal year 2007; and

1 (5) \$1,000,000 for fiscal year 2008.

2 **SEC. 105. AVIATION WEATHER RESEARCH.**

3 There are authorized to be appropriated to the NASA
4 Administrator \$10,000,000 for each of the fiscal years
5 2004 through 2008 for collaborative research with the Na-
6 tional Oceanic and Atmospheric Administration on convec-
7 tive weather events, with the goal of improving the reli-
8 ability of 2- to 6-hour aviation weather forecasts to a level
9 of at least 0.75.

10 **SEC. 106. AIR TRAFFIC MANAGEMENT RESEARCH AND DE-**
11 **VELOPMENT INITIATIVE.**

12 (a) OBJECTIVE.—The FAA Administrator and the
13 NASA Administrator shall participate in a national initia-
14 tive with the objective of defining and developing an air
15 traffic management system designed to meet national
16 long-term aviation security, safety, and capacity needs.
17 The initiative should result in a multiagency blueprint for
18 acquisition and implementation of an air traffic manage-
19 ment system that would—

20 (1) build upon current air traffic management
21 and infrastructure initiatives;

22 (2) improve the security, safety, quality, and af-
23 fordability of aviation services;

24 (3) utilize a system of systems approach;

1 (4) develop a highly integrated, secure common
2 information network to enable common situational
3 awareness for all appropriate system users; and

4 (5) ensure seamless global operations for sys-
5 tem users.

6 (b) IMPLEMENTATION.—In implementing subsection
7 (a), the FAA Administrator and the NASA Administrator
8 shall work with other appropriate Government agencies
9 and industry to—

10 (1) develop system performance requirements;

11 (2) determine an optimal operational concept
12 and system architecture to meet such requirements;

13 (3) utilize new modeling, simulation, and anal-
14 ysis tools to quantify and validate system perform-
15 ance and benefits;

16 (4) ensure the readiness of enabling tech-
17 nologies; and

18 (5) develop a transition plan for successful im-
19 plementation into the National Airspace System.

20 (c) AUTHORIZATION.—Of the amounts authorized to
21 be appropriated under section 107—

22 (1) there are authorized to be appropriated to
23 the NASA Aerospace Technology Program to carry
24 out this section—

25 (A) \$50,000,000 in fiscal year 2004;

- 1 (B) \$50,000,000 in fiscal year 2005;
2 (C) \$100,000,000 in fiscal year 2006;
3 (D) \$100,000,000 in fiscal year 2007; and
4 (E) \$50,000,000 in fiscal year 2008; and

5 (2) there are authorized to be appropriated to
6 the FAA Research, Engineering, and Development
7 account to carry out this section—

- 8 (A) \$20,000,000 in fiscal year 2004;
9 (B) \$30,000,000 in fiscal year 2005;
10 (C) \$40,000,000 in fiscal year 2006;
11 (D) \$40,000,000 in fiscal year 2007; and
12 (E) \$20,000,000 in fiscal year 2008.

13 **SEC. 107. AUTHORIZATION OF APPROPRIATIONS.**

14 (a) AUTHORIZATION.—The total amounts authorized
15 to be appropriated for aeronautics research, development,
16 and demonstration activities at NASA, including the
17 amounts authorized by sections 101 through 106 of this
18 Act, are—

- 19 (1) \$675,000,000 for fiscal year 2004;
20 (2) \$750,000,000 for fiscal year 2005;
21 (3) \$900,000,000 for fiscal year 2006;
22 (4) \$1,050,000,000 for fiscal year 2007; and
23 (5) \$1,150,000,000 for fiscal year 2008.

24 (b) LIMITATION.—All amounts authorized to be ap-
25 propriated by this title are for research and development

1 activities and do not include amounts required to support
 2 the labor, travel, environmental compliance, and nonpro-
 3 grammatic construction of facilities activities of the Office
 4 of Aeronautics.

5 **TITLE II—FEDERAL AVIATION**
 6 **ADMINISTRATION RESEARCH**
 7 **AND DEVELOPMENT**

8 **SEC. 201. UNIVERSITY-BASED CENTERS FOR RESEARCH ON**
 9 **AVIATION TRAINING.**

10 (a) IN GENERAL.—Subchapter I of chapter 449 of
 11 title 49, United States Code, is amended by adding at the
 12 end the following:

13 **“§ 44921. Grants for university-based centers for re-**
 14 **search on aviation training**

15 “(a) IN GENERAL.—The Administrator of the Fed-
 16 eral Aviation Administration shall award grants to institu-
 17 tions of higher education (or consortia thereof) to estab-
 18 lish 1 or more Centers for Research on Aviation Training.

19 “(b) PURPOSE.—The purpose of the Centers for Re-
 20 search on Aviation Training shall be to investigate the im-
 21 pact of new technologies and procedures, particularly
 22 those related to the aircraft flight deck and to the air traf-
 23 fic management functions, on training requirements for
 24 pilots and air traffic controllers.

1 “(c) APPLICATION.—An institution of higher edu-
2 cation (or a consortium of such institutions) seeking fund-
3 ing under this section shall submit an application to the
4 Administrator of the Federal Aviation Administration at
5 such time, in such manner, and containing such informa-
6 tion as the Administrator may require, including, at a
7 minimum, a 5-year research plan.

8 “(d) AWARD DURATION.—An award made by the Ad-
9 ministrator of the Federal Aviation Administration under
10 this section shall be for a period of 5 years and may be
11 renewed on the basis of—

12 “(1) satisfactory performance in meeting the
13 goals of the research plan proposed by the Center
14 for Research on Aviation Training in its application
15 under subsection (c); and

16 “(2) other requirements as specified by the Ad-
17 ministrator.

18 “(e) INSTITUTION OF HIGHER EDUCATION.—In this
19 section, the term ‘institution of higher education’ has the
20 meaning given that term by section 101 of the Higher
21 Education Act of 1965 (20 U.S.C. 1001).”.

22 (b) CHAPTER 449 TABLE OF SECTIONS.—The table
23 of sections at the beginning of subchapter I of chapter
24 449 of such title is amended by adding at the end the
25 following:

“44921. Grants for university-based centers for research on aviation training.”.

1 (c) AUTHORIZATION OF APPROPRIATIONS.—There
 2 are authorized to be appropriated to the FAA Adminis-
 3 trator to carry out this section \$5,000,000 for each of the
 4 fiscal years 2004 through 2008.

5 **SEC. 202. AUTHORIZATION OF APPROPRIATIONS.**

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

8 (1) by striking “and” at the end of paragraph
 9 (7);

10 (2) by striking the period at the end of para-
 11 graph (8) and inserting a semicolon; and

12 (3) by adding at the end the following:

13 “(9) for fiscal year 2004, \$366,100,000, includ-
 14 ing—

15 “(A) \$25,500,000 for weather projects and
 16 activities;

17 “(B) \$81,600,000 for aircraft safety tech-
 18 nology projects and activities;

19 “(C) \$27,300,000 for human factors and
 20 aviation medicine projects and activities; and

21 “(D) \$30,000,000 for environment and en-
 22 ergy projects and activities;

23 “(10) for fiscal year 2005, \$410,000,000, in-
 24 cluding—

1 “(A) \$30,600,000 for weather projects and
2 activities;

3 “(B) \$90,100,000 for aircraft safety tech-
4 nology projects and activities;

5 “(C) \$30,200,000 for human factors and
6 aviation medicine projects and activities; and

7 “(D) \$37,500,000 for environment and en-
8 ergy projects and activities;

9 “(11) for fiscal year 2006, \$462,000,000, in-
10 cluding—

11 “(A) \$37,000,000 for weather projects and
12 activities;

13 “(B) \$99,800,000 for aircraft safety tech-
14 nology projects and activities;

15 “(C) \$33,500,000 for human factors and
16 aviation medicine projects and activities; and

17 “(D) \$47,000,000 for environment and en-
18 ergy projects and activities;

19 “(12) for fiscal year 2007, \$520,000,000; and

20 “(13) for fiscal year 2008, \$550,000,000.”.

21 (b) RESEARCH PRIORITIES.—Section 48102(b) of
22 title 49, United States Code, is amended by adding at the
23 end the following new paragraphs:

24 “(4) Of the amount authorized under subsection
25 (a)(9)—

1 “(A) \$2,000,000 shall be made available for
2 wake turbulence research; and

3 “(B) \$10,000,000 shall be made available for
4 information security research.

5 “(5) Of the amount authorized under subsection
6 (a)(10)—

7 “(A) \$3,000,000 shall be made available for
8 wake turbulence research; and

9 “(B) \$12,000,000 shall be made available for
10 information security research.

11 “(6) Of the amount authorized under subsection
12 (a)(11)—

13 “(A) \$4,000,000 shall be made available for
14 wake turbulence research; and

15 “(B) \$13,200,000 shall be made available for
16 information security research.

17 “(7) The Administrator is authorized to use amounts
18 authorized under subsection (a), regardless of the appro-
19 priations account through which the amounts may be pro-
20 vided, for making grant awards for support of research
21 and development activities.”.

TITLE III—STUDIES**SEC. 301. STUDY OF MARKETS ENABLED BY ENVIRONMENTAL TECHNOLOGIES FOR FUTURE AIRCRAFT.**

(a) **OBJECTIVE.**—The NASA Administrator 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 101 into future commercial aircraft. As part of the study, the NASA Administrator shall identify whether any of the performance characteristics specified in section 101(a) would need to be made more stringent in order to create new markets or expand existing markets. The NASA 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 NASA Administrator \$500,000 to carry out this section.

1 **SEC. 302. ASSESSMENT OF WAKE TURBULENCE RESEARCH**
2 **AND DEVELOPMENT PROGRAM.**

3 (a) ASSESSMENT.—The FAA Administrator shall
4 enter into an arrangement with the National Research
5 Council for an assessment of the FAA’s proposed wake
6 turbulence research and development program. The as-
7 sessment shall include—

8 (1) an evaluation of the research and develop-
9 ment goals and objectives of the program;

10 (2) a listing of any additional research and de-
11 velopment objectives should be included in the pro-
12 gram;

13 (3) any modifications that will be necessary for
14 the program to achieve the program’s goals and ob-
15 jectives on schedule and within the proposed level of
16 resources; and

17 (4) an evaluation of the roles, if any, that
18 should be played by other Federal agencies, such as
19 NASA and the National Oceanic and Atmospheric
20 Administration, in wake turbulence research and de-
21 velopment, and how those efforts could be coordi-
22 nated.

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

1 Commerce, Science, and Transportation of the Senate not
2 later than 1 year after the date of enactment of this Act.

3 (c) AUTHORIZATION OF APPROPRIATIONS.—There
4 are authorized to be appropriated to the FAA Adminis-
5 trator for fiscal year 2004, \$500,000 to carry out this sec-
6 tion.

7 **SEC. 303. ASSESSMENT OF FUNDAMENTAL AERONAUTICS**
8 **RESEARCH CAPABILITIES.**

9 (a) ASSESSMENT.—In order to ensure that the Na-
10 tion retains needed capabilities in fundamental aero-
11 dynamics and other areas of fundamental aeronautics re-
12 search, the NASA Administrator shall enter into an ar-
13 rangement with the National Research Council for an as-
14 sessment of the Nation's future requirements for funda-
15 mental aeronautics research and the Nation's needs for
16 a skilled research workforce and research facilities com-
17 mensurate with the requirements. The assessment shall
18 include an identification of any projected gaps and rec-
19 ommendations for what steps should be taken by the Fed-
20 eral Government to eliminate those gaps.

21 (b) REPORT.—The NASA Administrator shall trans-
22 mit the assessment described in subsection (a), along with
23 NASA's response to the assessment, to the Committee on
24 Science of the House of Representatives and to the Com-
25 mittee on Commerce, Science, and Transportation of the

1 Senate not later than 2 years after the date of enactment
2 of this Act.

3 (c) AUTHORIZATION OF APPROPRIATIONS.—There
4 are authorized to be appropriated to the NASA Adminis-
5 trator \$500,000 for fiscal year 2004 to carry out this sec-
6 tion.

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