

112TH CONGRESS
1ST SESSION

H. R. 970

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

IN THE HOUSE OF REPRESENTATIVES

MARCH 9, 2011

Mr. HALL (for himself and Mr. PALAZZO) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

A BILL

To reauthorize the civil aviation research and development projects and activities of the Federal Aviation Administration, 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; TABLE OF CONTENTS.**

4 (a) SHORT TITLE.—This Act may be cited as the
5 “Federal Aviation Research and Development Reauthor-
6 ization Act of 2011”.

7 (b) TABLE OF CONTENTS.—The table of contents for
8 this Act is as follows:

- Sec. 1. Short title; table of contents.
- Sec. 2. Amendments to title 49, United States Code.
- Sec. 3. Definitions.

TITLE I—AUTHORIZATIONS

- Sec. 101. Authorization of appropriations.
- Sec. 102. Unmanned aircraft systems.
- Sec. 103. Research program on runways.
- Sec. 104. Research on design for certification.
- Sec. 105. Airport cooperative research program.
- Sec. 106. Centers of excellence.
- Sec. 107. Interagency research on aviation and the environment.
- Sec. 108. Aviation fuel research and development program.
- Sec. 109. Research program on alternative jet fuel technology for civil aircraft.
- Sec. 110. Review of FAA's energy- and environment-related research programs.
- Sec. 111. Review of FAA's aviation safety-related research programs.

1 **SEC. 2. AMENDMENTS TO TITLE 49, UNITED STATES CODE.**

2 Except as otherwise expressly provided, whenever in
3 this Act an amendment or repeal is expressed in terms
4 of an amendment to, or a repeal of, a section or other
5 provision, the reference shall be considered to be made to
6 a section or other provision of title 49, United States
7 Code.

8 **SEC. 3. DEFINITIONS.**

9 As used in this Act, the following definition apply:

10 (1) ADMINISTRATOR.—The term “Adminis-
11 trator” means the Administrator of the Federal
12 Aviation Administration.

13 (2) FAA.—The term “FAA” means the Fed-
14 eral Aviation Administration.

15 (3) INSTITUTION OF HIGHER EDUCATION.—The
16 term “institution of higher education” has the same
17 meaning given the term in section 101(a) of the
18 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

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

3 (5) NATIONAL RESEARCH COUNCIL.—The term
4 “National Research Council” means the National
5 Research Council of the National Academies of
6 Science and Engineering.

7 (6) NOAA.—The term “NOAA” means the Na-
8 tional Oceanic and Atmospheric Administration.

9 (7) SECRETARY.—The term “Secretary” means
10 the Secretary of Transportation.

11 **TITLE I—AUTHORIZATIONS**

12 **SEC. 101. AUTHORIZATION OF APPROPRIATIONS.**

13 (a) IN GENERAL.—Section 48102(a) is amended—

14 (1) in the matter before paragraph (1) by strik-
15 ing “of this title” and inserting “of this title and,
16 for each of fiscal years 2011 through 2014, under
17 subsection (g)”;

18 (2) in paragraph (11)—

19 (A) in subparagraph (K) by inserting
20 “and” at the end; and

21 (B) in subparagraph (L) by striking “and”
22 at the end;

23 (3) in paragraph (12)(L) by striking “and” at
24 the end;

1 (4) in paragraph (14) by striking the period at
2 the end and inserting a semicolon; and

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

4 “(15) for fiscal year 2011, \$165,020,000; and

5 “(16) for each of the fiscal years 2012 through
6 2014, \$146,827,000.”.

7 (b) SPECIFIC PROGRAM LIMITATIONS.—Section
8 48102 is amended by inserting after subsection (f) the fol-
9 lowing:

10 “(g) SPECIFIC AUTHORIZATIONS.—The following
11 programs described in the research, engineering, and de-
12 velopment account of the national aviation research plan
13 required under section 44501(c) are authorized:

14 “(1) Fire Research and Safety.

15 “(2) Propulsion and Fuel Systems.

16 “(3) Advanced Materials/Structural Safety.

17 “(4) Atmospheric Hazards—Aircraft Icing/Dig-
18 ital System Safety.

19 “(5) Continued Airworthiness.

20 “(6) Aircraft Catastrophic Failure Prevention
21 Research.

22 “(7) Flightdeck/Maintenance/System Integra-
23 tion Human Factors.

24 “(8) System Safety Management.

1 “(9) Air Traffic Control/Technical Operations
2 Human Factors.

3 “(10) Aeromedical Research.

4 “(11) Weather Program.

5 “(12) Unmanned Aircraft Systems Research.

6 “(13) NextGen—Alternative Fuels for General
7 Aviation.

8 “(14) Joint Planning and Development Office.

9 “(15) NextGen—Wake Turbulence research.

10 “(16) NextGen—Air Ground Integration
11 Human Factors.

12 “(17) NextGen—Self Separation Human Fac-
13 tors.

14 “(18) NextGen—Weather Technology in the
15 Cockpit.

16 “(19) Environment and Energy Research.

17 “(20) NextGen Environmental Research—Air-
18 craft Technologies, Fuels, and Metrics.

19 “(21) System Planning and Resource Manage-
20 ment.

21 “(22) The William J. Hughes Technical Center
22 Laboratory Facility.”.

23 (c) PROGRAM AUTHORIZATIONS.—From the other
24 accounts described in the national aviation research plan
25 required under section 44501(c) of title 49, United States

1 Code, for each of the fiscal years 2011 through 2014, the
2 following research and development activities are author-
3 ized:

4 (1) Runway Incursion Reduction.

5 (2) Systems Capacity, Planning and Improve-
6 ment.

7 (3) Operations Concept Validation.

8 (4) NAS Weather Requirements.

9 (5) Airspace Management Program.

10 (6) NextGen—Air Traffic Control/Technical
11 Operations Human Factors.

12 (7) NextGen—Environment and Energy—Envi-
13 ronmental Management System and Advanced Noise
14 and Emissions reduction.

15 (8) NextGen—New Air Traffic Management
16 Requirements.

17 (9) NextGen—Operations Concept Validation—
18 Validation Modeling.

19 (10) NextGen—System Safety Management
20 Transformation.

21 (11) NextGen—Wake Turbulence—Recat-
22 egorization.

23 (12) NextGen—Operational Assessments.

24 (13) NextGen—Staffed NextGen Towers.

1 (14) Center for Advanced Aviation System De-
2 velopment.

3 (15) Airports Technology Research Program—
4 Capacity.

5 (16) Airports Technology Research Program—
6 Safety.

7 (17) Airports Technology Research Program—
8 Environment.

9 (18) Airport Cooperative Research—Capacity.

10 (19) Airport Cooperative Research—Environ-
11 ment.

12 (20) Airport Cooperative Research—Safety.

13 **SEC. 102. UNMANNED AIRCRAFT SYSTEMS.**

14 (a) RESEARCH INITIATIVE.—Section 44504(b) is
15 amended—

16 (1) in paragraph (6) by striking “and” after
17 the semicolon;

18 (2) in paragraph (7) by striking the period at
19 the end and inserting “; and”; and

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

21 “(8) in conjunction with other Federal agencies,
22 as appropriate, to develop technologies and methods
23 to assess the risk of and prevent defects, failures,
24 and malfunctions of products, parts, and processes,
25 for use in all classes of unmanned aircraft systems

1 that could result in a catastrophic failure of the un-
2 manned aircraft that would endanger other aircraft
3 in the national airspace system.”.

4 (b) SYSTEMS, PROCEDURES, FACILITIES, AND DE-
5 VICES.—Section 44505(b) is amended—

6 (1) in paragraph (4) by striking “and” after
7 the semicolon;

8 (2) in paragraph (5)(C) by striking the period
9 at the end and inserting a semicolon; and

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

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

14 “(7) to develop dynamic simulation models for
15 integrating all classes of unmanned aircraft systems
16 into the national airspace system without any deg-
17 radation of existing levels of safety for all national
18 airspace system users.”.

19 **SEC. 103. RESEARCH PROGRAM ON RUNWAYS.**

20 Section 44505(c) is amended—

21 (1) by redesignating paragraphs (3) through
22 (6) as paragraphs (5) through (8); and

23 (2) by inserting after paragraph (2) the fol-
24 lowing:

25 “(3) improved runway surfaces;

1 “(4) engineered material restraining systems
2 for runways at both general aviation airports and
3 airports with commercial air carrier operations;”.

4 **SEC. 104. RESEARCH ON DESIGN FOR CERTIFICATION.**

5 Section 44505 is amended—

6 (1) by redesignating subsection (d) as sub-
7 section (e); and

8 (2) by inserting after subsection (c) the fol-
9 lowing:

10 “(d) RESEARCH ON DESIGN FOR CERTIFICATION.—

11 “(1) RESEARCH.—Not later than 1 year after
12 the date of enactment of the Federal Aviation Re-
13 search and Development Reauthorization Act of
14 2011, the Administrator shall conduct research on
15 methods and procedures to improve both confidence
16 in and the timeliness of certification of new tech-
17 nologies for their introduction into the national air-
18 space system.

19 “(2) RESEARCH PLAN.—Not later than 6
20 months after the date of enactment of the Federal
21 Aviation Research and Development Reauthorization
22 Act of 2011, the Administrator shall develop a plan
23 for the research under subsection (a) that contains
24 the objectives, proposed tasks, milestones, and 5-
25 year budgetary profile.

1 “(3) REVIEW.—The Administrator shall enter
2 into an arrangement with the National Research
3 Council to conduct an independent review of the
4 plan developed under subsection (b) and shall pro-
5 vide the results of that review to the Committee on
6 Science, Space, and Technology of the House of
7 Representatives and the Committee on Commerce,
8 Science, and Transportation of the Senate not later
9 than 18 months after the date of enactment of the
10 Federal Aviation Research and Development Reau-
11 thorization Act of 2011.”.

12 **SEC. 105. AIRPORT COOPERATIVE RESEARCH PROGRAM.**

13 Section 44511(f) is amended—

14 (1) in paragraph (1) by striking “establish a 4-
15 year pilot” and inserting “maintain an”; and

16 (2) in paragraph (4)—

17 (A) by striking “Not later than 6 months
18 after the expiration of the program under this
19 subsection,” and inserting “Not later than Sep-
20 tember 30, 2012,”; and

21 (B) by striking “program, including rec-
22 ommendations as to the need for establishing a
23 permanent airport cooperative research pro-
24 gram” and inserting “program”.

1 **SEC. 106. CENTERS OF EXCELLENCE.**

2 (a) GOVERNMENT'S SHARE OF COSTS.—Section
3 44513(f) is amended to read as follows:

4 “(f) GOVERNMENT'S SHARE OF COSTS.—The United
5 States Government's share of establishing and operating
6 the center and all related research activities that grant
7 recipients carry out shall not exceed 50 percent of the
8 costs, except that the Administrator may increase such
9 share to a maximum of 75 percent of the costs for any
10 fiscal year if the Administrator determines that a center
11 would be unable to carry out the authorized activities de-
12 scribed in this section without additional funds.”.

13 (b) ANNUAL REPORT.—Section 44513 is amended by
14 adding at the end the following:

15 “(h) ANNUAL REPORT.—The Administrator shall
16 transmit annually to the Committee on Science, Space,
17 and Technology of the House of Representatives and the
18 Committee on Commerce, Science, and Transportation of
19 the Senate at the time of the President's budget request
20 a report that lists—

21 “(1) the research projects that have been initi-
22 ated by each Center of Excellence in the preceding
23 year;

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

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

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

6 **SEC. 107. INTERAGENCY RESEARCH ON AVIATION AND THE**
7 **ENVIRONMENT.**

8 (a) **IN GENERAL.**—The Administrator, in coordina-
9 tion with NASA and after consultation with other relevant
10 agencies, may maintain a research program to assess the
11 potential effect of aviation on the environment and, if war-
12 ranted, to evaluate approaches to address any such effect.

13 (b) **RESEARCH PLAN.**—

14 (1) **IN GENERAL.**—The Administrator, in co-
15 ordination with NASA and after consultation with
16 other relevant agencies, shall jointly develop a plan
17 to carry out the research under subsection (a).

18 (2) **CONTENTS.**—Such plan shall contain an in-
19 ventory of current interagency research being under-
20 taken in this area, future research objectives, pro-
21 posed tasks, milestones, and a 5-year budgetary pro-
22 file.

23 (3) **REQUIREMENTS.**—Such plan—

24 (A) shall be completed not later than 1
25 year after the date of enactment of this Act;

1 (B) shall be submitted to Congress for re-
2 view; and

3 (C) shall be updated, as appropriate, every
4 3 years after the initial submission.

5 **SEC. 108. AVIATION FUEL RESEARCH AND DEVELOPMENT**
6 **PROGRAM.**

7 (a) IN GENERAL.—Using amounts made available
8 under section 48102(a) of title 49, United States Code,
9 the Administrator, in coordination with the NASA Admin-
10 istrator, shall continue research and development activities
11 into the qualification of an unleaded aviation fuel and safe
12 transition to this fuel for the fleet of piston engine air-
13 craft.

14 (b) REQUIREMENTS.—In carrying out the program
15 under subsection (a), the Administrator shall, at a min-
16 imum—

17 (1) not later than 120 days after the date of
18 enactment of this Act, develop a research and devel-
19 opment plan containing the specific research and devel-
20 opment objectives, including consideration of avia-
21 tion safety, technical feasibility, and other relevant
22 factors, and the anticipated timetable for achieving
23 the objectives;

24 (2) assess the methods and processes by which
25 the FAA and industry may expeditiously certify and

1 approve new aircraft and recertify existing aircraft
2 with respect to unleaded aviation fuel;

3 (3) assess technologies that modify existing pis-
4 ton engine aircraft to enable safe operation of the
5 aircraft using unleaded aviation fuel and determine
6 the resources necessary to certify those technologies;
7 and

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

11 (c) COLLABORATIONS.—In carrying out the program
12 under subsection (a), the Administrator shall collaborate
13 with—

14 (1) industry groups representing aviation con-
15 sumers, manufacturers, and fuel producers and dis-
16 tributors; and

17 (2) other appropriate Federal agencies.

18 (d) REPORT.—Not later than 270 days after the date
19 of enactment of this Act, the Administrator shall provide
20 a report to the Committee on Science, Space, and Tech-
21 nology of the House of Representatives and the Committee
22 on Commerce, Science, and Transportation of the Senate
23 on the plan, information obtained, and policies and guide-
24 lines developed pursuant to subsection (b).

1 **SEC. 109. RESEARCH PROGRAM ON ALTERNATIVE JET**
2 **FUEL TECHNOLOGY FOR CIVIL AIRCRAFT.**

3 (a) RESEARCH PROGRAM.—Using amounts made
4 available under section 48102(a) of title 49, United States
5 Code, the Secretary shall conduct a research program re-
6 lated to developing and certifying jet fuel from alternative
7 sources (such as coal, natural gas, biomass, ethanol, buta-
8 nol, and hydrogen) through grants or other measures au-
9 thorized under section 106(l)(6) of such title, including re-
10 imbursable agreements with other Federal agencies.

11 (b) PARTICIPATION BY STAKEHOLDERS.—In con-
12 ducting the program, the Secretary shall provide for par-
13 ticipation by educational and research institutions and by
14 industry partners that have existing facilities and experi-
15 ence in the research and development of technology for
16 alternative jet fuels.

17 (c) COLLABORATIONS.—In conducting the program,
18 the Secretary may collaborate with existing interagency
19 programs—

20 (1) to further the research and development of
21 alternative jet fuel technology for civil aircraft, in-
22 cluding feasibility studies; and

23 (2) to exchange information with the partici-
24 pants in the Commercial Aviation Alternative Fuels
25 Initiative.

1 **SEC. 110. REVIEW OF FAA'S ENERGY- AND ENVIRONMENT-**
2 **RELATED RESEARCH PROGRAMS.**

3 (a) REVIEW.—The Administrator shall enter into an
4 arrangement with the National Research Council for a re-
5 view of FAA energy-related and environment-related re-
6 search programs. The review shall assess whether—

7 (1) the programs have well-defined, prioritized,
8 and appropriate research objectives;

9 (2) the programs are properly coordinated with
10 the energy- and environment-related research pro-
11 grams at NASA, NOAA, and other relevant agen-
12 cies;

13 (3) the programs have allocated appropriate re-
14 sources to each of the research objectives; and

15 (4) there exist suitable mechanisms for
16 transitioning the research results into FAA's oper-
17 ational technologies and procedures and certification
18 activities.

19 (b) REPORT.—A report containing the results of such
20 review shall be provided to the Committee on Science,
21 Space, and Technology of the House of Representatives
22 and the Committee on Commerce, Science, and Transpor-
23 tation of the Senate not later than 18 months after the
24 date of enactment of this Act.

1 **SEC. 111. REVIEW OF FAA'S AVIATION SAFETY-RELATED RE-**
2 **SEARCH PROGRAMS.**

3 (a) REVIEW.—The Administrator shall enter into an
4 arrangement with the National Research Council for an
5 independent review of the FAA's aviation safety-related
6 research programs. The review shall assess whether—

7 (1) the programs have well-defined, prioritized,
8 and appropriate research objectives;

9 (2) the programs are properly coordinated with
10 the safety research programs of NASA and other
11 relevant Federal agencies;

12 (3) the programs have allocated appropriate re-
13 sources to each of the research objectives; and

14 (4) there exist suitable mechanisms for
15 transitioning the research results from the programs
16 into the FAA's operational technologies and proce-
17 dures and certification activities in a timely manner.

18 (b) AVIATION SAFETY-RELATED RESEARCH PRO-
19 GRAMS TO BE ASSESSED.—The FAA aviation safety-re-
20 lated research programs to be assessed under the review
21 shall include, at a minimum, the following:

22 (1) Air traffic control/technical operations
23 human factors.

24 (2) Runway incursion reduction.

25 (3) Flightdeck/maintenance system integration
26 human factors.

- 1 (4) Airports technology research—safety.
- 2 (5) Airport Cooperative Research Program—
- 3 safety.
- 4 (6) Weather Program.
- 5 (7) Atmospheric hazards/digital system safety.
- 6 (8) Fire research and safety.
- 7 (9) Propulsion and fuel systems.
- 8 (10) Advanced materials/structural safety.
- 9 (11) Aging aircraft.
- 10 (12) Aircraft catastrophic failure prevention re-
- 11 search.
- 12 (13) Aeromedical research.
- 13 (14) Aviation safety risk analysis.
- 14 (15) Unmanned aircraft systems research.
- 15 (c) REPORT.—Not later than 14 months after the
- 16 date of enactment of this Act, the Administrator shall sub-
- 17 mit to Congress a report on the results of such review.

○