

## Union Calendar No. 26

112<sup>TH</sup> CONGRESS  
1<sup>ST</sup> SESSION

# H. R. 970

**[Report No. 112-52]**

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

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### 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

APRIL 4, 2011

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in *italic*]

[For text of introduced bill, see copy of bill as introduced on March 9, 2011]

# **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. AMENDMENTS TO TITLE 49, UNITED STATES**  
4 **CODE.**

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

10 **TITLE X—FEDERAL AVIATION**  
11 **RESEARCH AND DEVELOP-**  
12 **MENT REAUTHORIZATION**  
13 **ACT OF 2011**

14 **SEC. 1001. SHORT TITLE.**

15 *This title may be cited as the “Federal Aviation Re-*  
16 *search and Development Reauthorization Act of 2011”.*

17 **SEC. 1002. DEFINITIONS.**

18 *In this title, the following definitions apply:*

19 (1) *ADMINISTRATOR.*—*The term “Adminis-*  
20 *trator” means the Administrator of the Federal Avia-*  
21 *tion Administration.*

22 (2) *FAA.*—*The term “FAA” means the Federal*  
23 *Aviation Administration.*

24 (3) *INSTITUTION OF HIGHER EDUCATION.*—*The*  
25 *term “institution of higher education” has the same*

1        *meaning given the term in section 101(a) of the High-*  
2        *er Education Act of 1965 (20 U.S.C. 1001(a)).*

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

5            (5) *NATIONAL RESEARCH COUNCIL.—The term*  
6        *“National Research Council” means the National Re-*  
7        *search Council of the National Academies of Science*  
8        *and Engineering.*

9            (6) *NOAA.—The term “NOAA” means the Na-*  
10       *tional Oceanic and Atmospheric Administration.*

11           (7) *SECRETARY.—The term “Secretary” means*  
12       *the Secretary of Transportation.*

13        **SEC. 1003. AUTHORIZATION OF APPROPRIATIONS.**

14        (a) *IN GENERAL.—Section 48102(a) is amended—*

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

19            (2) *in paragraph (11)—*

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

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

24            (3) *in paragraph (13) by striking “and” at the*  
25        *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 48102  
8           is amended by inserting after subsection (f) the following:

9           “(g) *SPECIFIC AUTHORIZATIONS.*—The following pro-  
10          grams described in the research, engineering, and develop-  
11          ment account of the national aviation research plan re-  
12          quired under section 44501(c) are authorized:

13           “(1) *Fire Research and Safety.*

14           “(2) *Propulsion and Fuel Systems.*

15           “(3) *Advanced Materials/Structural Safety.*

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

18           “(5) *Continued Airworthiness.*

19           “(6) *Aircraft Catastrophic Failure Prevention  
20          Research.*

21           “(7) *Flightdeck/Maintenance/System Integration  
22          Human Factors.*

23           “(8) *System Safety Management.*

24           “(9) *Air Traffic Control/Technical Operations  
25          Human Factors.*

1           “(10) *Aeromedical Research.*

2           “(11) *Weather Program.*

3           “(12) *Unmanned Aircraft Systems Research.*

4           “(13) *NextGen—Alternative Fuels for General*  
5           *Aviation.*

6           “(14) *Joint Planning and Development Office.*

7           “(15) *NextGen—Wake Turbulence Research.*

8           “(16) *NextGen—Air Ground Integration Human*  
9           *Factors.*

10          “(17) *NextGen—Self Separation Human Fac-*  
11          *tors.*

12          “(18) *NextGen—Weather Technology in the*  
13          *Cockpit.*

14          “(19) *Environment and Energy Research.*

15          “(20) *NextGen Environmental Research—Air-*  
16          *craft Technologies, Fuels, and Metrics.*

17          “(21) *System Planning and Resource Manage-*  
18          *ment.*

19          “(22) *The William J. Hughes Technical Center*  
20          *Laboratory Facility.”.*

21          (c) *PROGRAM AUTHORIZATIONS.—If the other accounts*  
22          *described in the national aviation research plan required*  
23          *under section 44501(c) of title 49, United States Code, are*  
24          *authorized for each of the fiscal years 2011 through 2014,*

1 *the following research and development activities are au-*  
2 *thorized:*

3 (1) *Runway Incursion Reduction.*

4 (2) *System Capacity, Planning, and Improve-*  
5 *ment.*

6 (3) *Operations Concept Validation.*

7 (4) *NAS Weather Requirements.*

8 (5) *Airspace Management Program.*

9 (6) *NextGen—Air Traffic Control/Technical Op-*  
10 *erations Human Factors.*

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

14 (8) *NextGen—New Air Traffic Management Re-*  
15 *quirements.*

16 (9) *NextGen—Operations Concept Validation—*  
17 *Validation Modeling.*

18 (10) *NextGen—System Safety Management*  
19 *Transformation.*

20 (11) *NextGen—Wake Turbulence—Recategoriza-*  
21 *tion.*

22 (12) *NextGen—Operational Assessments.*

23 (13) *NextGen—Staffed NextGen Towers.*

24 (14) *Center for Advanced Aviation System De-*  
25 *velopment.*

1           (15) *Airports Technology Research Program—*  
2           *Capacity.*

3           (16) *Airports Technology Research Program—*  
4           *Safety.*

5           (17) *Airports Technology Research Program—*  
6           *Environment.*

7           (18) *Airport Cooperative Research—Capacity.*

8           (19) *Airport Cooperative Research—Environ-*  
9           *ment.*

10          (20) *Airport Cooperative Research—Safety.*

11 **SEC. 1004. UNMANNED AIRCRAFT SYSTEMS.**

12          (a) *RESEARCH INITIATIVE.*—Section 44504(b) is  
13 *amended—*

14           (1) *in paragraph (6) by striking “and” after the*  
15           *semicolon;*

16           (2) *in paragraph (7) by striking the period at*  
17           *the end and inserting “; and”; and*

18           (3) *by adding at the end the following:*

19           “(8) *in conjunction with other Federal agencies,*  
20           *as appropriate, to develop technologies and methods to*  
21           *assess the risk of and prevent defects, failures, and*  
22           *malfunctions of products, parts, and processes for use*  
23           *in all classes of unmanned aircraft systems that could*  
24           *result in a catastrophic failure of the unmanned air-*



1       *craft that would endanger other aircraft in the na-*  
2       *tional airspace system.”.*

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

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

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

9               (3) *by adding at the end the following:*

10              *“(6) to develop a better understanding of the re-*  
11       *lationship between human factors and unmanned air-*  
12       *craft system safety; and*

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

18       **SEC. 1005. RESEARCH PROGRAM ON RUNWAYS.**

19       *Section 44505(c) is amended—*

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

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

24               *“(3) improved runway surfaces;*

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

4 **SEC. 1006. RESEARCH ON DESIGN FOR CERTIFICATION.**

5           Section 44505 is amended—

6           (1) by redesignating subsection (d) as subsection  
7           (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 the  
12           date of enactment of the Federal Aviation Research  
13           and Development Reauthorization Act of 2011, the  
14           Administrator shall conduct research on methods and  
15           procedures to improve both confidence in and the  
16           timeliness of certification of new technologies for their  
17           introduction into the national airspace system.

18           “(2) **RESEARCH PLAN.**—Not later than 6 months  
19           after the date of enactment of the Federal Aviation  
20           Research and Development Reauthorization Act of  
21           2011, the Administrator shall develop a plan for the  
22           research under paragraph (1) that contains the objec-  
23           tives, proposed tasks, milestones, and 5-year budg-  
24           etary 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 plan*  
4           *developed under paragraph (2) and shall provide the*  
5           *results of that review to the Committee on Science,*  
6           *Space, and Technology of the House of Representa-*  
7           *tives and the Committee on Commerce, Science, and*  
8           *Transportation of the Senate not later than 18*  
9           *months after the date of enactment of the Federal*  
10          *Aviation Research and Development Reauthorization*  
11          *Act of 2011.”.*

12   **SEC. 1007. 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. 1008. 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 a  
6 center and all related research activities that grant recipi-  
7 ents carry out shall not exceed 50 percent of the costs, except  
8 that the Administrator may increase such share to a max-  
9 imum of 75 percent of the costs for any fiscal year if the  
10 Administrator determines that a center would be unable to  
11 carry out the authorized activities described in this section  
12 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, and  
17 Technology of the House of Representatives and the Com-  
18 mittee on Commerce, Science, and Transportation of the  
19 Senate at the time of the President's budget request a report  
20 that lists—

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

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

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

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

6   **SEC. 1009. CENTER OF EXCELLENCE FOR AVIATION HUMAN**  
7                           **RESOURCE RESEARCH.**

8           (a) *ESTABLISHMENT.*—Using amounts made available  
9           under section 48102(a) of title 49, United States Code, the  
10          Administrator may establish a center of excellence to con-  
11          duct research on—

12                  (1) *human performance in the air transportation*  
13                  *environment, including among air transportation*  
14                  *personnel such as air traffic controllers, pilots, and*  
15                  *technicians; and*

16                  (2) *any other aviation human resource issues*  
17                  *pertinent to developing and maintaining a safe and*  
18                  *efficient air transportation system.*

19          (b) *ACTIVITIES.*—Activities conducted under this sec-  
20          tion may include the following:

21                  (1) *Research, development, and evaluation of*  
22                  *training programs for air traffic controllers, aviation*  
23                  *safety inspectors, airway transportation safety spe-*  
24                  *cialists, and engineers.*

1           (2) *Research and development of best practices*  
2 *for recruitment into the aviation field for mission*  
3 *critical positions.*

4           (3) *Research, in consultation with other relevant*  
5 *Federal agencies, to develop a baseline of general*  
6 *aviation employment statistics and an analysis of fu-*  
7 *ture needs in the aviation field.*

8           (4) *Research and the development of a com-*  
9 *prehensive assessment of the airframe and powerplant*  
10 *technician certification process and its effect on em-*  
11 *ployment trends.*

12           (5) *Evaluation of aviation maintenance techni-*  
13 *cian school environments.*

14           (6) *Research and an assessment of the ability to*  
15 *develop training programs to allow for the transition*  
16 *of recently unemployed and highly skilled mechanics*  
17 *into the aviation field.*

18 **SEC. 1010. INTERAGENCY RESEARCH ON AVIATION AND**

19 **THE ENVIRONMENT.**

20           (a) *IN GENERAL.*—*Using amounts made available*  
21 *under section 48102(a) of title 49, United States Code, the*  
22 *Administrator, in coordination with NASA and after con-*  
23 *sultation with other relevant agencies, may maintain a re-*  
24 *search program to assess the potential effect of aviation on*

1 *the environment and, if warranted, to evaluate approaches*  
2 *to address any such effect.*

3 *(b) RESEARCH PLAN.—*

4 *(1) IN GENERAL.—The Administrator, in coordi-*  
5 *nation with NASA and after consultation with other*  
6 *relevant agencies, shall jointly develop a plan to carry*  
7 *out the research under subsection (a).*

8 *(2) CONTENTS.—Such plan shall contain an in-*  
9 *ventory of current interagency research being under-*  
10 *taken in this area, future research objectives, proposed*  
11 *tasks, milestones, and a 5-year budgetary profile.*

12 *(3) REQUIREMENTS.—Such plan—*

13 *(A) shall be completed not later than 1 year*  
14 *after the date of enactment of this Act;*

15 *(B) shall be submitted to Congress for re-*  
16 *view; and*

17 *(C) shall be updated, as appropriate, every*  
18 *3 years after the initial submission.*

19 **SEC. 1011. AVIATION FUEL RESEARCH AND DEVELOPMENT**  
20 **PROGRAM.**

21 *(a) IN GENERAL.—Using amounts made available*  
22 *under section 48102(a) of title 49, United States Code, the*  
23 *Administrator, in coordination with the NASA Adminis-*  
24 *trator, shall continue research and development activities*

1 *into the qualification of an unleaded aviation fuel and safe*  
2 *transition to this fuel for the fleet of piston engine aircraft.*

3 (b) *REQUIREMENTS.—In carrying out the program*  
4 *under subsection (a), the Administrator shall, at a min-*  
5 *imum—*

6 (1) *not later than 120 days after the date of en-*  
7 *actment of this Act, develop a research and develop-*  
8 *ment plan containing the specific research and devel-*  
9 *opment objectives, including consideration of aviation*  
10 *safety, technical feasibility, and other relevant factors,*  
11 *and the anticipated timetable for achieving the objec-*  
12 *tives;*

13 (2) *assess the methods and processes by which the*  
14 *FAA and industry may expeditiously certify and ap-*  
15 *prove new aircraft and recertify existing aircraft with*  
16 *respect to unleaded aviation fuel;*

17 (3) *assess technologies that modify existing pis-*  
18 *ton engine aircraft to enable safe operation of the air-*  
19 *craft using unleaded aviation fuel and determine the*  
20 *resources necessary to certify those technologies; and*

21 (4) *develop recommendations for appropriate*  
22 *policies and guidelines to facilitate a transition to*  
23 *unleaded aviation fuel for piston engine aircraft.*



1           (c) *COLLABORATIONS.*—*In carrying out the program*  
2 *under subsection (a), the Administrator shall collaborate*  
3 *with—*

4                   (1) *industry groups representing aviation con-*  
5 *sumers, manufacturers, and fuel producers and dis-*  
6 *tributors; and*

7                   (2) *other appropriate Federal agencies.*

8           (d) *REPORT.*—*Not later than 270 days after the date*  
9 *of enactment of this Act, the Administrator shall provide*  
10 *a report to the Committee on Science, Space, and Tech-*  
11 *nology of the House of Representatives and the Committee*  
12 *on Commerce, Science, and Transportation of the Senate*  
13 *on the plan, information obtained, and policies and guide-*  
14 *lines developed pursuant to subsection (b).*

15 **SEC. 1012. RESEARCH PROGRAM ON ALTERNATIVE JET**  
16 **FUEL TECHNOLOGY FOR CIVIL AIRCRAFT.**

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

1           (b) *PARTICIPATION BY STAKEHOLDERS.*—*In con-*  
2 *ducting the program, the Secretary shall provide for par-*  
3 *ticipation by educational and research institutions and by*  
4 *industry partners that have existing facilities and experi-*  
5 *ence in the research and development of technology for alter-*  
6 *native jet fuels.*

7           (c) *COLLABORATIONS.*—*In conducting the program,*  
8 *the Secretary may collaborate with existing interagency*  
9 *programs—*

10                 (1) *to further the research and development of al-*  
11 *ternative jet fuel technology for civil aircraft, includ-*  
12 *ing feasibility studies; and*

13                 (2) *to exchange information with the partici-*  
14 *pants in the Commercial Aviation Alternative Fuels*  
15 *Initiative.*

16 **SEC. 1013. REVIEW OF FAA'S ENERGY- AND ENVIRONMENT-**  
17 **RELATED RESEARCH PROGRAMS.**

18           (a) *REVIEW.*—*Using amounts made available under*  
19 *section 48102(a) of title 49, United States Code, the Admin-*  
20 *istrator shall conduct a review of FAA energy-related and*  
21 *environment-related research programs. The review shall*  
22 *assess whether—*

23                 (1) *the programs have well-defined, prioritized,*  
24 *and appropriate research objectives;*

1 (2) *the programs are properly coordinated with*  
2 *the energy- and environment-related research pro-*  
3 *grams at NASA, NOAA, and other relevant agencies;*

4 (3) *the programs have allocated appropriate re-*  
5 *sources to each of the research objectives; and*

6 (4) *there exist suitable mechanisms for*  
7 *transitioning the research results into FAA’s oper-*  
8 *ational technologies and procedures and certification*  
9 *activities.*

10 (b) *REPORT.*—*A report containing the results of such*  
11 *review shall be provided to the Committee on Science,*  
12 *Space, and Technology of the House of Representatives and*  
13 *the Committee on Commerce, Science, and Transportation*  
14 *of the Senate not later than 18 months after the date of*  
15 *enactment of this Act.*

16 **SEC. 1014. REVIEW OF FAA’S AVIATION SAFETY-RELATED**  
17 **RESEARCH PROGRAMS.**

18 (a) *REVIEW.*—*Using amounts made available under*  
19 *section 48102(a) of title 49, United States Code, the Admin-*  
20 *istrator shall conduct a review of the FAA’s aviation safety-*  
21 *related research programs. The review shall assess wheth-*  
22 *er—*

23 (1) *the programs have well-defined, prioritized,*  
24 *and appropriate research objectives;*

1           (2) *the programs are properly coordinated with*  
2 *the safety research programs of NASA and other rel-*  
3 *evant Federal agencies;*

4           (3) *the programs have allocated appropriate re-*  
5 *sources to each of the research objectives;*

6           (4) *the programs should include a determination*  
7 *about whether a survey of participants across the air*  
8 *transportation system is an appropriate way to study*  
9 *safety risks within such system; and*

10          (5) *there exist suitable mechanisms for*  
11 *transitioning the research results from the programs*  
12 *into the FAA's operational technologies and proce-*  
13 *dures and certification activities in a timely manner.*

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

18           (1) *Air traffic control/technical operations*  
19 *human factors.*

20           (2) *Runway incursion reduction.*

21           (3) *Flightdeck/maintenance system integration*  
22 *human factors.*

23           (4) *Airports technology research—safety.*

24           (5) *Airport Cooperative Research Program—*  
25 *safety.*

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

Union Calendar No. 26

112<sup>TH</sup> CONGRESS  
1<sup>ST</sup> Session

**H. R. 970**

[Report No. 112-52]

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