

**AMENDMENT IN THE NATURE OF A SUBSTITUTE  
TO H.R. 970  
OFFERED BY MR. HALL OF TEXAS**

Strike all after the enacting clause and insert the following:

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

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

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

13 **SEC. 1001. SHORT TITLE.**

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

16 **SEC. 1002. DEFINITIONS.**

17 In this title, the following definitions apply:

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

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

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

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

12          (5) NATIONAL RESEARCH COUNCIL.—The term  
13          “National Research Council” means the National  
14          Research Council of the National Academies of  
15          Science and Engineering.

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

18          (7) SECRETARY.—The term “Secretary” means  
19          the Secretary of Transportation.

20   **SEC. 1003. AUTHORIZATION OF APPROPRIATIONS.**

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

22               (1) in the matter before paragraph (1) by strik-  
23               ing “of this title” and inserting “of this title and,  
24               for each of fiscal years 2011 through 2014, under  
25               subsection (g)”;

1 (2) in paragraph (11)—

2 (A) in subparagraph (K) by inserting  
3 “and” at the end; and

4 (B) in subparagraph (L) by striking “and”  
5 at the end;

6 (3) in paragraph (13) by striking “and” at the  
7 end;

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

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

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

12 “(16) for each of the fiscal years 2012 through  
13 2014, \$146,827,000.”.

14 (b) SPECIFIC PROGRAM LIMITATIONS.—Section  
15 48102 is amended by inserting after subsection (f) the fol-  
16 lowing:

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

21 “(1) Fire Research and Safety.

22 “(2) Propulsion and Fuel Systems.

23 “(3) Advanced Materials/Structural Safety.

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

1 “(5) Continued Airworthiness.

2 “(6) Aircraft Catastrophic Failure Prevention  
3 Research.

4 “(7) Flightdeck/Maintenance/System Integra-  
5 tion Human Factors.

6 “(8) System Safety Management.

7 “(9) Air Traffic Control/Technical Operations  
8 Human Factors.

9 “(10) Aeromedical Research.

10 “(11) Weather Program.

11 “(12) Unmanned Aircraft Systems Research.

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

14 “(14) Joint Planning and Development Office.

15 “(15) NextGen—Wake Turbulence Research.

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

18 “(17) NextGen—Self Separation Human Fac-  
19 tors.

20 “(18) NextGen—Weather Technology in the  
21 Cockpit.

22 “(19) Environment and Energy Research.

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

1           “(21) System Planning and Resource Manage-  
2           ment.

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

5           (c) PROGRAM AUTHORIZATIONS.—From the other  
6 accounts described in the national aviation research plan  
7 required under section 44501(c) of title 49, United States  
8 Code, for each of the fiscal years 2011 through 2014, the  
9 following research and development activities are author-  
10 ized:

11           (1) Runway Incursion Reduction.

12           (2) System Capacity, Planning, and Improve-  
13           ment.

14           (3) Operations Concept Validation.

15           (4) NAS Weather Requirements.

16           (5) Airspace Management Program.

17           (6) NextGen—Air Traffic Control/Technical  
18           Operations Human Factors.

19           (7) NextGen—Environment and Energy—Envi-  
20           ronmental Management System and Advanced Noise  
21           and Emissions reduction.

22           (8) NextGen—New Air Traffic Management  
23           Requirements.

24           (9) NextGen—Operations Concept Validation—  
25           Validation Modeling.

1           (10) NextGen—System Safety Management  
2 Transformation.

3           (11) NextGen—Wake Turbulence—Recat-  
4 egorization.

5           (12) NextGen—Operational Assessments.

6           (13) NextGen—Staffed NextGen Towers.

7           (14) Center for Advanced Aviation System De-  
8 velopment.

9           (15) Airports Technology Research Program—  
10 Capacity.

11          (16) Airports Technology Research Program—  
12 Safety.

13          (17) Airports Technology Research Program—  
14 Environment.

15          (18) Airport Cooperative Research—Capacity.

16          (19) Airport Cooperative Research—Environ-  
17 ment.

18          (20) Airport Cooperative Research—Safety.

19 **SEC. 1004. UNMANNED AIRCRAFT SYSTEMS.**

20          (a) RESEARCH INITIATIVE.—Section 44504(b) is  
21 amended—

22           (1) in paragraph (6) by striking “and” after  
23 the semicolon;

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

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

2           “(8) in conjunction with other Federal agencies,  
3           as appropriate, to develop technologies and methods  
4           to assess the risk of and prevent defects, failures,  
5           and malfunctions of products, parts, and processes  
6           for use in all classes of unmanned aircraft systems  
7           that could result in a catastrophic failure of the un-  
8           manned aircraft that would endanger other aircraft  
9           in the national airspace system.”.

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

12           (1) in paragraph (4) by striking “and” after  
13           the semicolon;

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

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

17           “(6) to develop a better understanding of the  
18           relationship between human factors and unmanned  
19           aircraft system safety; and

20           “(7) to develop dynamic simulation models for  
21           integrating all classes of unmanned aircraft systems  
22           into the national airspace system without any deg-  
23           radation of existing levels of safety for all national  
24           airspace system users.”.

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

2 Section 44505(c) is amended—

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

5 (2) by inserting after paragraph (2) the fol-  
6 lowing:

7 “(3) improved runway surfaces;

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

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

12 Section 44505 is amended—

13 (1) by redesignating subsection (d) as sub-  
14 section (e); and

15 (2) by inserting after subsection (c) the fol-  
16 lowing:

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

18 “(1) RESEARCH.—Not later than 1 year after  
19 the date of enactment of the Federal Aviation Re-  
20 search and Development Reauthorization Act of  
21 2011, the Administrator shall conduct research on  
22 methods and procedures to improve both confidence  
23 in and the timeliness of certification of new tech-  
24 nologies for their introduction into the national air-  
25 space system.

1           “(2) RESEARCH PLAN.—Not later than 6  
2 months after the date of enactment of the Federal  
3 Aviation Research and Development Reauthorization  
4 Act of 2011, the Administrator shall develop a plan  
5 for the research under paragraph (1) that contains  
6 the objectives, proposed tasks, milestones, and 5-  
7 year budgetary profile.

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

19 **SEC. 1007. AIRPORT COOPERATIVE RESEARCH PROGRAM.**

20 Section 44511(f) is amended—

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

23           (2) in paragraph (4)—

24                   (A) by striking “Not later than 6 months  
25 after the expiration of the program under this

1 subsection,” and inserting “Not later than Sep-  
2 tember 30, 2012,”; and

3 (B) by striking “program, including rec-  
4 ommendations as to the need for establishing a  
5 permanent airport cooperative research pro-  
6 gram” and inserting “program”.

7 **SEC. 1008. CENTERS OF EXCELLENCE.**

8 (a) GOVERNMENT’S SHARE OF COSTS.—Section  
9 44513(f) is amended to read as follows:

10 “(f) GOVERNMENT’S SHARE OF COSTS.—The United  
11 States Government’s share of establishing and operating  
12 a center and all related research activities that grant re-  
13 cipients carry out shall not exceed 50 percent of the costs,  
14 except that the Administrator may increase such share to  
15 a maximum of 75 percent of the costs for any fiscal year  
16 if the Administrator determines that a center would be  
17 unable to carry out the authorized activities described in  
18 this section without additional funds.”.

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

21 “(h) ANNUAL REPORT.—The Administrator shall  
22 transmit annually to the Committee on Science, Space,  
23 and Technology of the House of Representatives and the  
24 Committee on Commerce, Science, and Transportation of

1 the Senate at the time of the President's budget request  
2 a report that lists—

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

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

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

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

12 **SEC. 1009. INTERAGENCY RESEARCH ON AVIATION AND**  
13 **THE ENVIRONMENT.**

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

19       (b) **RESEARCH PLAN.**—

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

24           (2) **CONTENTS.**—Such plan shall contain an in-  
25 ventory of current interagency research being under-

1 taken in this area, future research objectives, pro-  
2 posed tasks, milestones, and a 5-year budgetary pro-  
3 file.

4 (3) REQUIREMENTS.—Such plan—

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

7 (B) shall be submitted to Congress for re-  
8 view; and

9 (C) shall be updated, as appropriate, every  
10 3 years after the initial submission.

11 **SEC. 1010. AVIATION FUEL RESEARCH AND DEVELOPMENT**  
12 **PROGRAM.**

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

20 (b) REQUIREMENTS.—In carrying out the program  
21 under subsection (a), the Administrator shall, at a min-  
22 imum—

23 (1) not later than 120 days after the date of  
24 enactment of this Act, develop a research and devel-  
25 opment plan containing the specific research and de-

1       velopment objectives, including consideration of avia-  
2       tion safety, technical feasibility, and other relevant  
3       factors, and the anticipated timetable for achieving  
4       the objectives;

5           (2) assess the methods and processes by which  
6       the FAA and industry may expeditiously certify and  
7       approve new aircraft and recertify existing aircraft  
8       with respect to unleaded aviation fuel;

9           (3) assess technologies that modify existing pis-  
10      ton engine aircraft to enable safe operation of the  
11      aircraft using unleaded aviation fuel and determine  
12      the resources necessary to certify those technologies;  
13      and

14           (4) develop recommendations for appropriate  
15      policies and guidelines to facilitate a transition to  
16      unleaded aviation fuel for piston engine aircraft.

17      (c) COLLABORATIONS.—In carrying out the program  
18      under subsection (a), the Administrator shall collaborate  
19      with—

20           (1) industry groups representing aviation con-  
21      sumers, manufacturers, and fuel producers and dis-  
22      tributors; and

23           (2) other appropriate Federal agencies.

24      (d) REPORT.—Not later than 270 days after the date  
25      of enactment of this Act, the Administrator shall provide

1 a report to the Committee on Science, Space, and Tech-  
2 nology of the House of Representatives and the Committee  
3 on Commerce, Science, and Transportation of the Senate  
4 on the plan, information obtained, and policies and guide-  
5 lines developed pursuant to subsection (b).

6 **SEC. 1011. RESEARCH PROGRAM ON ALTERNATIVE JET**  
7 **FUEL TECHNOLOGY FOR CIVIL AIRCRAFT.**

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

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

22 (c) COLLABORATIONS.—In conducting the program,  
23 the Secretary may collaborate with existing interagency  
24 programs—

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

4 (2) to exchange information with the partici-  
5 pants in the Commercial Aviation Alternative Fuels  
6 Initiative.

7 **SEC. 1012. REVIEW OF FAA'S ENERGY- AND ENVIRONMENT-**  
8 **RELATED RESEARCH PROGRAMS.**

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

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

15 (2) the programs are properly coordinated with  
16 the energy- and environment-related research pro-  
17 grams at NASA, NOAA, and other relevant agen-  
18 cies;

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

21 (4) there exist suitable mechanisms for  
22 transitioning the research results into FAA's oper-  
23 ational technologies and procedures and certification  
24 activities.

1 (b) REPORT.—A report containing the results of such  
2 review shall be provided to the Committee on Science,  
3 Space, and Technology of the House of Representatives  
4 and the Committee on Commerce, Science, and Transpor-  
5 tation of the Senate not later than 18 months after the  
6 date of enactment of this Act.

7 **SEC. 1013. REVIEW OF FAA'S AVIATION SAFETY-RELATED**  
8 **RESEARCH PROGRAMS.**

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

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

15 (2) the programs are properly coordinated with  
16 the safety research programs of NASA and other  
17 relevant Federal agencies;

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

20 (4) there exist suitable mechanisms for  
21 transitioning the research results from the programs  
22 into the FAA's operational technologies and proce-  
23 dures and certification activities in a timely manner.

24 (b) AVIATION SAFETY-RELATED RESEARCH PRO-  
25 GRAMS TO BE ASSESSED.—The FAA aviation safety-re-

1 lated research programs to be assessed under the review  
2 shall include, at a minimum, the following:

3 (1) Air traffic control/technical operations  
4 human factors.

5 (2) Runway incursion reduction.

6 (3) Flightdeck/maintenance system integration  
7 human factors.

8 (4) Airports technology research—safety.

9 (5) Airport Cooperative Research Program—  
10 safety.

11 (6) Weather Program.

12 (7) Atmospheric hazards/digital system safety.

13 (8) Fire research and safety.

14 (9) Propulsion and fuel systems.

15 (10) Advanced materials/structural safety.

16 (11) Aging aircraft.

17 (12) Aircraft catastrophic failure prevention re-  
18 search.

19 (13) Aeromedical research.

20 (14) Aviation safety risk analysis.

21 (15) Unmanned aircraft systems research.

22 (c) REPORT.—Not later than 14 months after the  
23 date of enactment of this Act, the Administrator shall sub-  
24 mit to Congress a report on the results of such review.

