

116TH CONGRESS
1ST SESSION

H. R. 4166

To improve technology and address human factors in aviation safety, and
for other purposes.

IN THE HOUSE OF REPRESENTATIVES

AUGUST 6, 2019

Mr. DESAULNIER introduced the following bill; which was referred to the Committee on Transportation and Infrastructure, and in addition to the Committee on Science, Space, and Technology, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

A BILL

To improve technology and address human factors in aviation
safety, 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 “Safe Landings Act”.

5 **SEC. 2. FINDINGS.**

6 Congress finds the following:

7 (1) Given that the United States enjoys an ex-
8 ceptionally safe aviation system with an exceedingly
9 low frequency of airline accidents, efforts to improve

1 aviation safety should examine nonaccident safety
2 incidents for all possible insights.

3 (2) Aviation safety should not be taken for
4 granted, and even with so few accidents, the U.S.
5 Aerospace System should proactively address safety
6 concerns that emerge from our dynamic and evolving
7 economic conditions, technology, aviation industry,
8 and other factors.

9 (3) Preventing accidents from occurring in the
10 airport runway environment remains an objective re-
11 quiring continued effort, and incidents of runway
12 confusion, defined as the subset of runway incur-
13 sions in which an aircraft unintentionally takes off
14 or lands on a taxiway or incorrect runway, should be
15 carefully monitored, reviewed, and studied for in-
16 sights to improve safety.

17 (4) While technology continues to advance and
18 new opportunities to use technology to address safe-
19 ty risks in aviation are examined and pursued, the
20 evolving role of technology and the expanding use of
21 automation should not be used as justification to di-
22 minish attention to and prioritization of the human
23 contribution to aviation safety. The aviation industry
24 and the Government must ensure that training pro-
25 grams for flight crews and other personnel are ap-

1 appropriately evolving, that training standards and ex-
2 pectations remain rigorous, and that risks and con-
3 cerns associated with the interaction between hu-
4 mans, technology, and automated systems are identi-
5 fied, studied, and addressed in a timely manner.

6 **SEC. 3. IMPLEMENTATION OF NTSB RECOMMENDATIONS.**

7 (a) NAVIGATIONAL RADIOS.—The Administrator
8 shall implement the recommendation of the National
9 Transportation Safety Board numbered as A–18–23 and
10 issued on October 11, 2018, with respect to the tuning
11 of navigational radios to assist flight crews in managing
12 the flight path of aircraft on visual approaches. The Ad-
13 ministrator shall work with part 121 air carriers on imple-
14 mentation of this recommendation, and, not later than 1
15 year after the enactment of this Act, the Administrator
16 shall issue to Congress a report on air carrier compliance
17 rate.

18 (b) NTSB RECOMMENDATION.—

19 (1) IN GENERAL.—The Administrator shall im-
20 plement the recommendation of the National Trans-
21 portation Safety Board numbered as A–18–25 and
22 issued on October 11, 2018, and, not later than 1
23 year after the enactment of this Act, the Adminis-
24 trator shall issue to Congress a report on the status
25 of the implementation.

1 (2) CONSIDERATION.—In implementing this
2 recommendation, the Administrator shall consider
3 any relevant findings identified pursuant to section
4 334 of the FAA Reauthorization Act of 2018 (Pub-
5 lic Law 115–254).

6 (c) PILOT ALERTS.—The Administrator shall—

7 (1) collaborate with aircraft and avionics manu-
8 facturers, labor organizations representing pilots op-
9 erating under part 121 of title 14, Code of Federal
10 Regulations, and software developers to develop the
11 technology for a cockpit system that provides an
12 alert to pilots when an airplane is not aligned with
13 the intended runway surface;

14 (2) once such technology described in para-
15 graph (1) is available, establish a requirement for
16 the technology to be installed on aircraft operating
17 under part 121 of title 14, Code of Federal Regula-
18 tions, landing at airports within Class B and Class
19 C airspace and certified under part 139 of title 14,
20 Code of Federal Regulations;

21 (3) in establishing the requirement as described
22 in paragraph (2), consider any relevant findings
23 identified pursuant to section 334 of the FAA Reau-
24 thorization Act of 2018 (Public Law 115–254); and

1 (4) not later than 1 year after the date of en-
2 actment of this Act, issue to Congress a report on
3 the progress of the work described in paragraph (1).

4 (d) NTSB RECOMMENDATION.—

5 (1) IN GENERAL.—The Administrator shall im-
6 plement the recommendation of the National Trans-
7 portation Safety Board numbered as A-18-27 and
8 issued on October 11, 2018, and, not later than 1
9 year after the enactment of this Act, the Adminis-
10 trator shall issue to Congress a report on the status
11 of the implementation.

12 (2) CONSIDERATION.—In implementing this
13 recommendation, the Administrator shall consider
14 any relevant findings identified pursuant to section
15 334 of the FAA Reauthorization Act of 2018 (Pub-
16 lic Law 115-254).

17 **SEC. 4. INVESTIGATIONS FOR COVERED EVENTS.**

18 (a) IN GENERAL.—Once implementation of section
19 3(b) of this Act is complete, the National Transportation
20 Safety Board may initiate investigations of covered events
21 to determine risk factors specific to the airport at which
22 such an event occurred and other elements of the National
23 Airspace System that may contribute to the cause of the
24 event. The National Transportation Safety Board may
25 also elect to consider multiple events in a single report

1 as part of a special investigation or study to examine safe-
2 ty factors contributing to these events.

3 (b) ADDITIONAL INVESTIGATIVE INFORMATION.—In
4 addition to any investigation that the National Transpor-
5 tation Safety Board is conducting with respect to any spe-
6 cific covered event, the NTSB shall utilize voluntarily pro-
7 vided safety information in its evaluation of associated risk
8 in the National Airspace System and protect such infor-
9 mation from public release in accordance with section
10 1114(b)(3) of title 49, United States Code.

11 (c) CONTENT.—The review and analysis shall exam-
12 ine factors present at the time of any covered event at
13 such airport, including—

14 (1) challenges pilots perceive when flying into
15 and out of the airport;

16 (2) challenges that air traffic controllers face
17 when working at the airport;

18 (3) characteristics of the communications
19 among and between groups of personnel whose work
20 relates to the movement of aircraft into and out of
21 the airport including pilots, air traffic controllers,
22 maintenance workers, dispatchers, and airline air-
23 port operations personnel; and

1 (4) physical characteristics of the airport and
2 its facilities, such as the configuration of runways,
3 runway lighting, and construction activity.

4 **SEC. 5. TASK FORCE ON HUMAN FACTORS IN AVIATION**
5 **SAFETY.**

6 (a) IN GENERAL.—Not later than 6 months after the
7 date of enactment of this Act, the Administrator shall con-
8 vene an FAA Task Force on Human Factors in Aviation
9 Safety.

10 (b) COMPOSITION.—The Task Force shall consist of
11 members appointed by the Administrator and having ex-
12 pertise in an operational or academic discipline that is rel-
13 evant to the analysis of human errors in aviation. The
14 number of members shall be determined by the Adminis-
15 trator to ensure sufficient representation of relevant oper-
16 ational and academic disciplines.

17 (c) DURATION.—

18 (1) IN GENERAL.—Members of the Task Force
19 shall be appointed for the length of the existence of
20 the Task Force.

21 (2) LENGTH OF EXISTENCE.—

22 (A) IN GENERAL.—The Task Force shall
23 have an initial length of existence of 2 years.

24 (B) OPTION.—The Administrator may ex-
25 ercise an option to lengthen the duration of the

1 existence of the Task Force for a period of 2
2 years.

3 (d) DISCIPLINES.—For purposes of subsection (b),
4 disciplines may include air carrier operations, line pilot ex-
5 pertise, air traffic control, technical operations, aero-
6 nautical information, aircraft maintenance and mechanics
7 psychology, linguistics, human-machine integration, gen-
8 eral aviation operations, and organizational behavior and
9 culture.

10 (e) EXPERTISE.—

11 (1) IN GENERAL.—No less than half of the
12 members shall have expertise in aviation.

13 (2) ADDITIONAL EXPERTISE.—The Task Force
14 shall include members with expertise on human fac-
15 tors but whose experience and training are not in
16 aviation specifically and who have not previously
17 been engaged in work related to the FAA or the
18 aviation industry. The Task Force shall also include
19 pilot labor organizations and at least one member
20 from an air traffic controller labor organization.

21 (f) FAA MEMBERS.—

22 (1) IN GENERAL.—Not more than 4 members
23 may be employees of the FAA and NTSB, excluding
24 representatives of the labor representatives of em-
25 ployees of the air traffic control system. Not more

1 than 2 members may be employees of the NTSB.
2 The FAA and the NTSB members shall be non-vot-
3 ing.

4 (2) FAA EMPLOYEES.—Any member who is an
5 FAA employee shall have expertise in safety.

6 (g) DUTIES.—In coordination with the Research, En-
7 gineering, and Development Advisory Committee estab-
8 lished under section 44508 of title 49, United States Code,
9 the Task Force shall—

10 (1) not later than the date on which the Task
11 Force is no longer in existence, produce a written re-
12 port that—

13 (A) to the greatest extent possible, identi-
14 fies the most significant human factors and
15 their relative contribution to aviation safety
16 risk;

17 (B) identifies new research priorities for
18 research in human factors in aviation safety;

19 (C) reviews existing products by other
20 working groups related to human factors in
21 aviation safety including the Commercial Avia-
22 tion Safety Team (CAST)’s work pertaining to
23 flight crew responses to abnormal events;

24 (D) provides recommendations on potential
25 revisions to any FAA regulations and guidance

1 pertaining to the certification of aircraft under
2 part 25 of title 14, Code of Federal Regula-
3 tions, including sections related to presumed
4 pilot response times and assumptions about the
5 reliability of pilot performance during unex-
6 pected, stressful events;

7 (E) reviews rules, regulations, or standards
8 regarding flight crew rest and fatigue that are
9 used by a sample of international air carriers,
10 including those deemed to be more stringent
11 and less stringent than the current standards
12 pertaining to United States air carriers, and
13 identify risks to the National Airspace System
14 from any such variation in standards across
15 countries;

16 (F) reviews pilot training requirements and
17 recommend any revisions necessary to ensure
18 adequate understanding of automated systems
19 on aircraft; and

20 (G) reviews approach and landing mis-
21 alignment and make any recommendations for
22 improving these events;

23 (2) produce a written report to Congress not
24 less than once every 2 years that—

1 (A) summarizes new research developments
2 on human factors in aviation safety;

3 (B) to the greatest extent possible, identi-
4 fies the most significant human factors and
5 their relative contribution to aviation safety
6 risk; and

7 (C) provides any recommendations for pol-
8 icy or regulatory action; and

9 (3) if the Secretary exercises the option de-
10 scribed in subsection (c)(2)(B), not later than the
11 date that is 2 years after the date of establishment
12 of the Task Force, produce an interim report con-
13 taining the information described in paragraph (1).

14 (h) APPLICABLE LAW.—The Federal Advisory Com-
15 mittee Act (5 U.S.C. App.) shall not apply to the Task
16 Force.

17 **SEC. 6. RESEARCH AND DEVELOPMENT PROGRAM ON NEW**
18 **APPROACHES TO DATA ANALYSIS FOR AVIA-**
19 **TION SAFETY.**

20 (a) IN GENERAL.—The Secretary shall establish a
21 new research and development program to be undertaken
22 by the FAA's Consortium in Aviation Operations Research
23 (NEXTOR II) to investigate and develop new approaches
24 to data analysis for understanding the factors in aviation

1 safety incidents and identifying emerging risks of future
2 safety incidents.

3 (b) APPROACHES.—The approaches described in sub-
4 section (a) include the use of new algorithms for analyzing
5 the text and audio of communications between flight crews
6 and air traffic controllers and the use of machine learning
7 or artificial intelligence methods for analyzing a variety
8 of data sets, including, data on weather, performance of
9 communication, navigation and surveillance equipment
10 and facilities, flight delays, safety incidents, flight crew
11 work schedules, and air traffic and crew member commu-
12 nications for detecting anomalies in the National Airspace
13 System.

14 (c) COLLABORATION.—In carrying out the research
15 program established in this section, member institutions
16 of the Consortium shall collaborate in the sharing of data
17 for the purpose of testing and demonstrating the potential
18 effectiveness of new approaches to analysis—

19 (1) with each other;

20 (2) with aviation industry partners;

21 (3) with units within the FAA including groups
22 within the Air Traffic Organization, NextGen Office,
23 Office of Airports, and Aviation Safety; and

24 (4) with the National Aeronautics and Space
25 Administration’s Aviation Safety Reporting System.

1 (d) RESEARCH.—

2 (1) IN GENERAL.—The research undertaken
3 pursuant to this section shall prioritize under-
4 standing the ways that various forms of human fac-
5 tors contribute to aviation safety risk.

6 (2) FACTORS.—The factors described in para-
7 graph (1) may include fatigue and distraction during
8 critical phases of work among pilots or other avia-
9 tion personnel, tasks and workload, organizational
10 structure and culture, communication among per-
11 sonnel, adherence to safety procedures, and any
12 other relevant factors that are the cause or potential
13 cause of human error in aviation operations.

14 (3) HIGHLY AUTOMATED AIRCRAFT.—Research
15 should seek ways to improve the design of highly
16 automated aircraft to reduce instances of mode con-
17 fusion and to combat problems of reduced awareness
18 of basic flight parameters resulting from compla-
19 cency about automated systems.

20 (e) AUTHORIZATION OF APPROPRIATIONS.—There is
21 authorized to be appropriated \$20,000,000 for carrying
22 out the program described in this section for each fiscal
23 year from 2019 through 2024, including grants to partici-
24 pating research institutions, including the academic insti-
25 tutions that make up the FAA’s Consortium in Aviation

1 Operations Research, the National Aeronautics and Space
2 Administration, the FAA's Office of Safety, the NextGen
3 office, and units within the FAA's Air Traffic Organiza-
4 tion that work on safety issues.

5 (f) SUNSET.—The program shall terminate on the
6 date that is 6 years after the date on which the program
7 is established.

8 **SEC. 7. USING INSTRUMENT APPROACH PROCEDURES AS**
9 **BACKUPS TO VISUAL APPROACHES.**

10 (a) REPORT.—Not later than 120 days after the date
11 of enactment of this Act, the Administrator shall issue a
12 report to the Committee on Transportation and Infra-
13 structure of the House of Representatives and the Com-
14 mittee on Commerce, Science, and Transportation of the
15 Senate that uses a representative sample of part 121 and
16 part 129 air carriers to review the current range of air
17 carrier practices in requiring the use of instrument ap-
18 proach procedures as a backup system for visual ap-
19 proaches and the extent to which operators require pilots
20 to use approach procedures.

21 (b) ISSUANCE OF GUIDANCE.—Not later than 1 year
22 after the date of enactment of this Act, the Administrator
23 shall review and analyze the collected data from the report
24 described in subsection (a) and issue guidance to air car-
25 riers on the most effective techniques and procedures to

1 use instrument approach procedures as a backup system
2 for visual approaches. Such guidance shall encourage the
3 use of instruments to provide vertical and lateral guidance
4 to mitigate the potential for a wrong surface alignment
5 and to provide flight crews with more precise vertical and
6 lateral deviation information.

7 **SEC. 8. NOTAM MODERNIZATION INITIATIVE.**

8 (a) IN GENERAL.—The Administrator shall lead an
9 effort to reform and update the “notices to airmen”
10 (NOTAM) system to harmonize with International Civil
11 Aviation Organization (ICAO) Annexes and Standards
12 and Recommended Practices (SARPS), including the ex-
13 isting methods of writing, formatting, and disseminating
14 information under this system, for the purposes of improv-
15 ing these notices’ clarity, user-friendliness, and effective-
16 ness in conveying priority, safety-related concerns.

17 (b) REQUIREMENTS.—In carrying out this initiative,
18 the Administrator shall—

19 (1) collaborate with airlines and labor organiza-
20 tions representing pilots operating under part 121 of
21 title 14, Code of Federal Regulations, organizations
22 representing general aviation, air traffic controllers,
23 airport operations personnel, and the military on de-
24 veloping recommendations for improving the user-
25 friendliness of the content, style, and formatting of

1 NOTAMs, including any changes to existing conven-
2 tions for such items as abbreviations, punctuation,
3 font, and font size;

4 (2) collaborate with avionics manufacturers and
5 software developers in considering hardware and
6 software options for sending, accessing, and dis-
7 playing NOTAMs; and

8 (3) take appropriate actions within the Inter-
9 national Civil Aviation Organization (ICAO) to
10 adopt recommended standards on the writing, for-
11 matting, and disseminating of NOTAMs.

12 (c) REPORT TO CONGRESS.—The Administrator shall
13 issue a report to Congress not later than 1 year after the
14 date of enactment of this Act, and no less than every 6
15 months thereafter, until new standards for the writing,
16 formatting, and dissemination of NOTAMs have been
17 adopted by the FAA. This report shall include an update
18 on the progress of the work described in this section, in-
19 cluding an explanation of how any new recommendations
20 that have been developed will improve safety and an expla-
21 nation of any obstacles remaining to achieving consensus
22 for new international standards for the NOTAM system.

1 **SEC. 9. GAO STUDY ON RISKS ASSOCIATED WITH THE USE**
2 **OF CVR DATA IN FOREIGN COUNTRIES.**

3 (a) IN GENERAL.—The Comptroller General shall
4 take the lead in carrying out a study on the risks associ-
5 ated with the use of CVR data in investigations led by
6 foreign governments or units of foreign governments.

7 (b) CONTENTS.—At minimum, this study shall—

8 (1) review past incidents in which CVR data
9 was used by foreign governments or units of foreign
10 governments in such a way that the National Trans-
11 portation Safety Board found to depart from the
12 National Transportation Safety Board’s standards
13 and procedures for a safety investigation, including
14 the use or circulation of CVR data for purposes
15 other than determining the causes of an accident or
16 safety incident, inappropriate release of data con-
17 tained on a CVR, or the dissemination of informa-
18 tion or conclusions based on a misinterpretation of
19 data contained on a CVR;

20 (2) document the protections provided for cock-
21 pit voice recordings and transcripts by ICAO and
22 other countries where United States-based air car-
23 riers operate;

24 (3) identify and assess the risks to United
25 States flight crews, air carriers, manufacturers, and
26 other stakeholders in the aviation industry associ-

1 ated with CVRs capable of recording more than 2
2 hours of data; and

3 (4) provide recommendations on measures to
4 adopt to mitigate against such risks and ensure that
5 any use of CVR data serves the sole purpose of a
6 safety investigation, including recommendations for
7 the United States to make to ICAO to mitigate
8 these risks.

9 **SEC. 10. TRANSPARENCY IN AIRCRAFT MAINTENANCE AND**
10 **REPAIR WORK.**

11 (a) IN GENERAL.—Not later than 1 year after the
12 date of enactment of this Act, the Administrator shall up-
13 date the guidelines of the FAA for part 121 certificate
14 holders in implementing a Continuing Analysis and Sur-
15 veillance System (CASS) for their air carrier maintenance
16 programs to include reporting no less than once every 6
17 months by certificate holders to the FAA of any failure
18 to follow procedures in aircraft maintenance as well as any
19 major alteration, complete overhaul, or repair of mechan-
20 ical irregularities of each airframe, engine, propeller, and
21 appliance.

22 (b) ADVISORY.—Not later than 1 year after the date
23 of enactment of this Act, the Administrator shall issue an
24 advisory with formatting guidelines for air carriers to re-
25 port information as required under subsection (a).

1 (c) INCLUSION.—For each instance of a failure to fol-
2 low procedures and for each major alteration, overhaul,
3 or repair reported under the requirements of this section,
4 the Administrator shall require certificate holders to in-
5 clude any name and any physical address where the work
6 is carried out for each maintenance provider that performs
7 work.

8 (d) NOTIFICATIONS TO THE NTSB.—The Adminis-
9 trator shall notify the National Transportation Safety
10 Board of each instance identified in carrying out sub-
11 section (c) of this section and shall share with the Na-
12 tional Transportation Safety Board all information it
13 gathers in relation to each such instance.

14 (e) UNSCHEDULED LANDINGS DUE TO MECHANICAL
15 ISSUES.—

16 (1) IN GENERAL.—Each Certificate Manage-
17 ment Office within the FAA shall immediately notify
18 the National Transportation Safety Board in any in-
19 stance in which a part 121 air carrier falling under
20 its supervision completes an unscheduled landing at
21 any airport in the United States, including any in-
22 stance in which an airplane returns to its airport of
23 origin after takeoff before or without completing its
24 scheduled flight, in which a mechanical issue was a
25 factor.

1 (2) CONTENT.—The notification described in
 2 paragraph (1) shall include any information avail-
 3 able about the cause of the unscheduled landing.

4 (f) NTSB ANALYSIS AND REPORT.—The National
 5 Transportation Safety Board, in collaboration with the
 6 FAA, shall analyze information in the notifications it re-
 7 ceives in subsections (d) and (e) of this section, for the
 8 purpose of identifying any trends or emerging concerns
 9 with any individual air carriers. Not less than once per
 10 year, the National Transportation Safety Board shall sub-
 11 mit to the Committee on Transportation and Infrastruc-
 12 ture of the House of Representatives and the Committee
 13 on Commerce, Science, and Transportation of the Senate
 14 a report on its analysis, the findings of its analysis, and
 15 any safety recommendations resulting from the analysis.

16 (g) DEFINITIONS.—In this section, the terms “major
 17 alterations”, “airframe”, “propeller”, and “appliance”
 18 have the meanings given such terms in part 1 of title 14,
 19 Code of Federal Regulations.

20 **SEC. 11. REVIEW OF FAA’S AVIATION SAFETY INSPECTION**
 21 **PROGRAM.**

22 (a) AUDIT BY THE DEPARTMENT OF TRANSPOR-
 23 TATION INSPECTOR GENERAL.—Not later than 6 months
 24 after the date of enactment of this Act, the Inspector Gen-
 25 eral of the Department of Transportation shall initiate a

1 review of the FAA's August 2017 Flight Standards reor-
2 ganization and its aviation safety inspection program.

3 (b) REVIEW.—The review shall include an evaluation
4 of—

5 (1) the FAA Flight Standards reorganization
6 from a geographic-based system to a functional-
7 based system;

8 (2) the implementation of the FAA's Compli-
9 ance Philosophy as it relates to safety inspections
10 and enforcements;

11 (3) the FAA's new oversight system known as
12 the Safety Assurance System (SAS);

13 (4) training for aviation safety inspector and
14 operational research analysts on the Compliance
15 Philosophy and SAS; and

16 (5) the impact of the FAA's reorganization and
17 SAS on the FAA's ability to produce reliable esti-
18 mates of aviation safety inspector and operational
19 research analyst staffing needs.

20 (c) REPORT.—The Inspector General shall submit to
21 the Committee on Transportation and Infrastructure of
22 the House of Representatives and the Committee on Com-
23 merce, Science, and Transportation of the Senate a report
24 on the results of its review and any recommendations to

1 improve the aviation safety inspection program of the
2 FAA.

3 **SEC. 12. DEFINITIONS.**

4 In this Act:

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

8 (2) COVERED EVENT.—The term “covered
9 event” means—

10 (A) a category A or B runway incursion,
11 as defined in Order 7050.1B of the Federal
12 Aviation Administration (dated November 3,
13 2013);

14 (B) a landing on a taxiway, incorrect run-
15 way, or other area not designed as a runway at
16 a public-use airport on land;

17 (C) descent by an aircraft below 300 feet
18 above ground level on approach to a taxiway,
19 incorrect runway, or other area not designed as
20 a runway at a public-use airport on land; or

21 (D) a landing by an aircraft notwith-
22 standing an instruction by air traffic control
23 that the aircraft perform a missed approach or
24 go-around.

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

3 (4) PART 121 AIR CARRIER.—The term “part
4 121 air carrier” means an air carrier that holds a
5 certificate issued under part 121 of title 14, Code of
6 Federal Regulations.

7 (5) PART 129 AIR CARRIER.—The term “part
8 129 air carrier” means an air carrier that holds a
9 certificate issued under part 129 of title 14, Code of
10 Federal Regulations.

○