

117TH CONGRESS  
2D SESSION

# H. R. 7447

To direct the Administrator of the National Aeronautics and Space Administration to conduct a study on the modernization of aeronautical standards, and for other purposes.

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## IN THE HOUSE OF REPRESENTATIVES

APRIL 7, 2022

Mr. BROWN of Maryland introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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## A BILL

To direct the Administrator of the National Aeronautics and Space Administration to conduct a study on the modernization of aeronautical standards, 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 “Modernizing Aero-  
5 nautical Standards Act”.

6 **SEC. 2. MODERNIZING AERONAUTICAL STANDARDS.**

7 (a) FINDINGS.—Congress finds the following:

1           (1) The work of the U.S. Committee on Extension  
2           to the Standard Atmosphere, established in  
3           1953, led to the 1958, 1962, 1966, and 1976  
4           versions of the U.S. Standard Atmosphere.

5           (2) These models were published in book form  
6           jointly by the National Oceanic and Atmospheric Administration,  
7           the National Aeronautics and Space Administration, and the U.S. Air Force.

9           (3) The U.S. Standard Atmosphere is widely  
10          used as a basis for the design, testing, and operation  
11          of aircraft and other equipment.

12          (4) The Department of Defense has supplemented  
13          the standard atmosphere with data models of climatic  
14          extremes, most recently with MIL-HDBK-310, Climatic  
15          Information to Determine Design and Test Requirements  
16          for Military Systems and Equipment, which was published  
17          in 1997 and “provides climatic data primarily for use  
18          in engineering analyses to develop and test military  
19          equipment and materiel”.

21          (5) The most recent standard atmosphere published  
22          in 1976 assumed a standard sea-level temperature  
23          of 59 degrees Fahrenheit in continuation of the  
24          assumption established in 1924 by Resolution

1 192 of the International Commission for Air Naviga-  
2 tion.

3 (6) Between 1924 and 1976, the average global  
4 sea-level temperature rose by 0.5 degree Fahrenheit.

5 (7) Since 1976, the average global sea-level  
6 temperature has risen by more than 1.5 degrees  
7 Fahrenheit, the five warmest years in the modern  
8 record have all occurred since 2015, and nine of the  
9 10 warmest years have occurred since 2005.

10 (8) Under the Fifth Assessment Report of the  
11 Intergovernmental Panel on Climate Change (AR5  
12 IPCC), all scenarios considered result in an average  
13 global temperature rise in 2040 by more than 2.5  
14 degrees Fahrenheit since 1976, with the most ex-  
15 treme scenario resulting in a temperature rise of 3.5  
16 degrees Fahrenheit.

17 (9) By 2100, the IPCC projects that the global  
18 mean temperature will increase by more than 4 de-  
19 grees Fahrenheit under moderate scenarios, with the  
20 potential to exceed 7.5 degrees Fahrenheit under the  
21 most extreme scenarios.

22 (10) Aircraft performance is negatively affected  
23 by increased temperatures, resulting in lower pay-  
24 load capacity, increased runway requirements, re-

1       duced range, slower climb out speeds, and negative  
2       impacts to environmental performance.

3           (11) For existing aircraft and engine designs,  
4       the increase to ambient temperature will result in  
5       impacts to operations to account for the lower en-  
6       gine and aircraft performance, which may include in-  
7       creased noise exposure, increased operations, in-  
8       crease to emissions, and degradation of air quality.

9           (12) For new aircraft and engine designs, the  
10      increase to ambient temperature will require im-  
11      proved engine designs that provide required thrust  
12      at higher ambient temperatures to meet mission re-  
13      quirements, which may result in de-rating at air-  
14      ports with excess runway length, resulting in lower  
15      operational noise compared to current levels.

16          (13) The military and commercial aircraft being  
17      designed today are expected to be in operation for  
18      thirty to fifty years, with an expected end of life be-  
19      tween 2050 to 2070.

20      (b) STUDY ON AERONAUTICAL STANDARDS.—

21          (1) STUDY REQUIRED.—The Administrator of  
22      the National Aeronautics and Space Administration,  
23      in consultation with the Secretary of Defense, the  
24      Administrator of the Federal Aviation Administra-  
25      tion, and the Administrator of the National Oceanic

1 and Atmospheric Administration, shall conduct a  
2 study on the modernization of aeronautical stand-  
3 ards.

4 (2) DESIGNATION.—The study conducted under  
5 paragraph (1) shall be known as the “Modernization  
6 of Aeronautical Standards and Aircraft Performance  
7 Study”.

8 (3) ELEMENTS.—The study conducted under  
9 paragraph (1) shall include the following:

10 (A) An assessment of differences between  
11 the current atmospheric conditions and the  
12 baseline atmospheric conditions, to include both  
13 the mean and extreme values.

14 (B) An analysis of the impacts to oper-  
15 ation, maintenance, and sustainment costs of  
16 covered commercial aircraft due to the dif-  
17 ferences identified in subparagraph (A).

18 (C) An estimation of the number of weight  
19 restriction hours for the covered commercial  
20 aircraft at the covered commercial airports  
21 under the baseline, current, and projected at-  
22 mospheric conditions.

23 (D) An assessment of the required infra-  
24 structure investment at the covered commercial  
25 airports such that the number of weight restric-

1           tion hours under the projected atmospheric con-  
2           ditions is equivalent to the number of weight re-  
3           striction hours with the current infrastructure  
4           and route structure under the baseline and cur-  
5           rent atmospheric conditions.

6           (E) Recommendations for atmospheric and  
7           climatic design requirements for future com-  
8           mercial aircraft to account for projected atmos-  
9           pheric conditions.

10          (F) An analysis of the impacts to oper-  
11          ation, maintenance, and sustainment costs and  
12          aircraft performance of military aircraft due to  
13          the differences identified in subparagraph (A).

14          (G) Atmospheric and climatic design re-  
15          quirements for military aircraft, or other equip-  
16          ment, which should be updated to account for  
17          current and projected atmospheric conditions.

18          (H) Recommended updates or supplements  
19          to the atmospheric standards due to current at-  
20          mospheric conditions.

21          (I) Criteria under which future updates or  
22          supplements to the atmospheric standards  
23          should be made.

24          (4) TRANSMITTAL.—The Administrator shall  
25          transmit the results of the study to the Committee

1 on Science, Space, and Technology and the Com-  
2 mittee on Transportation and Infrastructure of the  
3 House of Representatives, the Committee on Com-  
4 merce, Science, and Transportation of the Senate,  
5 and the congressional defense committees not later  
6 than 18 months after the date of enactment of this  
7 Act.

8 (5) DEFINITIONS.—In this section:

9 (A) The term “atmospheric standards”  
10 means—

11 (i) the United States Standard At-  
12 mosphere of 1976;

13 (ii) MIL–HDBK–310, Climatic Infor-  
14 mation to Determine Design and Test Re-  
15 quirements for Military Systems and  
16 Equipment; and

17 (iii) any other standard as determined  
18 by the Administrator.

19 (B) The term “baseline atmospheric condi-  
20 tions” means the atmospheric conditions re-  
21 ferred to in the most recent release of an at-  
22 mospheric standard.

23 (C) The term “current atmospheric condi-  
24 tions” means the atmospheric conditions ob-

1 served in the 5 most recent calendar years end-  
2 ing before the date of enactment of this Act.

3 (D) The term “projected atmospheric condi-  
4 tions” means the mean atmospheric condi-  
5 tions projected by the International Panel on  
6 Climate Change under the Sixth Assessment  
7 Report in scenarios—

- 8 (i) SSP1–1.9;
- 9 (ii) SSP1–2.6;
- 10 (iii) SSP2–4.5;
- 11 (iv) SSP3–7.0; and
- 12 (v) SSP5–8.5.

13 (E) The term “aircraft performance” in-  
14 cludes—

- 15 (i) range;
- 16 (ii) payload capacity;
- 17 (iii) runway length requirement;
- 18 (iv) climb rate;
- 19 (v) turn rate;
- 20 (vi) operating altitude; and
- 21 (vii) acceleration.

22 (F) The term “covered commercial air-  
23 ports” means—

- 24 (i) the 30 commercial service airports  
25 (as defined in section 47102(7) of title 49,



1 United States Code) with the most pas-  
2 senger boardings in the most recent cal-  
3 endar year ending before the date of enact-  
4 ment of this Act; and

5 (ii) the 5 public airports (as defined  
6 in section 47102(21) of title 49, United  
7 States Code) not covered by clause (i) with  
8 the highest all-cargo landed weight in the  
9 most recent calendar year ending before  
10 the date of enactment of this Act.

11 (G) The term “covered commercial air-  
12 craft” means the 10 aircraft types still in pro-  
13 duction with the highest number of operations  
14 at covered commercial airports in the most re-  
15 cent calendar year ending before the date of en-  
16 actment of this Act.

17 (H) The term “commercial aircraft”  
18 means an air carrier operating under part 121  
19 of title 14, Code of Federal Regulations.

20 (I) The term “passenger boardings” has  
21 the meaning given the term in section  
22 47102(15) of title 49, United States Code.

23 (J) The term “military aircraft” means an  
24 aircraft that—

1 (i) is currently being developed, pro-  
2 cured, or operated by the Department of  
3 Defense; and

4 (ii) is a bomber, fighter, attack heli-  
5 copter, transport helicopter, strategic  
6 transport, tactical transport, or surveil-  
7 lance aircraft.

8 (K) The term “weight restriction day”  
9 means a day when the daily maximum tempera-  
10 ture matches or exceeds the weight-restriction  
11 temperature threshold for a specific aircraft.

12 (L) The term “congressional defense com-  
13 mittees” has the meaning given that term in  
14 section 101(a)(16) of title 10, United States  
15 Code.

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