

118TH CONGRESS
1ST SESSION

S. 447

To establish a demonstration program for the active remediation of orbital debris and to require the development of uniform orbital debris standard practices in order to support a safe and sustainable orbital environment, and for other purposes.

IN THE SENATE OF THE UNITED STATES

FEBRUARY 15, 2023

Mr. HICKENLOOPER (for himself, Ms. LUMMIS, Ms. CANTWELL, Mr. WICKER, Ms. SINEMA, and Mrs. FEINSTEIN) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

A BILL

To establish a demonstration program for the active remediation of orbital debris and to require the development of uniform orbital debris standard practices in order to support a safe and sustainable orbital environment, 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 “Orbital Sustainability
5 Act of 2023” or the “ORBITS Act of 2023”.

1 **SEC. 2. FINDINGS; SENSE OF CONGRESS.**

2 (a) FINDINGS.—Congress makes the following find-
3 ings:

4 (1) The safety and sustainability of operations
5 in low-Earth orbit and nearby orbits in outer space
6 have become increasingly endangered by a growing
7 amount of orbital debris.

8 (2) Exploration and scientific research missions
9 and commercial space services of critical importance
10 to the United States rely on continued and secure
11 access to outer space.

12 (3) Efforts by nongovernmental space entities
13 to apply lessons learned through standards and best
14 practices will benefit from government support for
15 implementation both domestically and internation-
16 ally.

17 (b) SENSE OF CONGRESS.—It is the sense of Con-
18 gress that to preserve the sustainability of operations in
19 space, the United States Government should—

20 (1) to the extent practicable, develop and carry
21 out programs, establish or update regulations, and
22 commence initiatives to minimize orbital debris, in-
23 cluding initiatives to demonstrate active debris reme-
24 diation of orbital debris generated by the United
25 States Government;

1 (2) lead international efforts to encourage other
2 spacefaring countries to mitigate and remediate or-
3 bital debris under their jurisdiction and control; and

4 (3) encourage space system operators to con-
5 tinue implementing best practices for space safety
6 when deploying satellites and constellations of sat-
7 ellites, such as transparent data sharing and design-
8 ing for system reliability, so as to limit the genera-
9 tion of future orbital debris.

10 **SEC. 3. DEFINITIONS.**

11 In this Act:

12 (1) **ACTIVE DEBRIS REMEDIATION.**—The term
13 “active debris remediation”—

14 (A) means the deliberate process of facili-
15 tating the de-orbit, repurposing, or other dis-
16 posal of orbital debris, which may include mov-
17 ing orbital debris to a safe position, using an
18 object or technique that is external or internal
19 to the orbital debris; and

20 (B) does not include de-orbit, repurposing,
21 or other disposal of orbital debris by passive
22 means.

23 (2) **ADMINISTRATOR.**—The term “Adminis-
24 trator” means the Administrator of the National
25 Aeronautics and Space Administration.

1 (3) APPROPRIATE COMMITTEES OF CON-
2 GRESS.—The term “appropriate committees of Con-
3 gress” means—

4 (A) the Committee on Appropriations, the
5 Committee on Commerce, Science, and Trans-
6 portation, and the Committee on Armed Serv-
7 ices of the Senate; and

8 (B) the Committee on Appropriations, the
9 Committee on Science, Space, and Technology,
10 and the Committee on Armed Services of the
11 House of Representatives.

12 (4) DEMONSTRATION PROGRAM.—The term
13 “demonstration program” means the active orbital
14 debris remediation demonstration program carried
15 out under section 4(b).

16 (5) ELIGIBLE ENTITY.—The term “eligible enti-
17 ty” means—

18 (A) a United States-based—

19 (i) non-Federal, commercial entity;

20 (ii) institution of higher education (as
21 defined in section 101(a) of the Higher
22 Education Act of 1965 (20 U.S.C.
23 1001(a))); or

24 (iii) nonprofit organization;

1 (B) any other United States-based entity
2 the Administrator considers appropriate; and

3 (C) a partnership of entities described in
4 subparagraphs (A) and (B).

5 (6) ORBITAL DEBRIS.—The term “orbital de-
6 bris” means any human-made space object orbiting
7 Earth that—

8 (A) no longer serves an intended purpose;
9 and

10 (B)(i) has reached the end of its mission;
11 or

12 (ii) is incapable of safe maneuver or oper-
13 ation.

14 (7) SECRETARY.—The term “Secretary” means
15 the Secretary of Commerce.

16 (8) SPACE TRAFFIC COORDINATION.—The term
17 “space traffic coordination” means the planning, co-
18 ordination, and on-orbit synchronization of activities
19 to enhance the safety and sustainability of oper-
20 ations in the space environment.

21 **SEC. 4. ACTIVE DEBRIS REMEDIATION.**

22 (a) PRIORITIZATION OF ORBITAL DEBRIS.—

23 (1) LIST.—Not later than 90 days after the
24 date of the enactment of this Act, the Administrator,
25 in consultation with the Secretary, the Secretary of

1 Defense, the National Space Council, and represent-
2 atives of the commercial space industry, academia,
3 and nonprofit organizations, shall publish a list of
4 identified orbital debris that pose the greatest imme-
5 diate risk to the safety and sustainability of orbiting
6 satellites and on-orbit activities.

7 (2) CONTENTS.—The list required under para-
8 graph (1)—

9 (A) shall be developed using appropriate
10 sources of data and information derived from
11 governmental and nongovernmental sources, in-
12 cluding space situational awareness data ob-
13 tained by the Office of Space Commerce, to the
14 extent practicable;

15 (B) shall include, to the extent prac-
16 ticable—

17 (i) a description of the approximate
18 age, location in orbit, size, tumbling state,
19 post-mission passivation actions taken, and
20 national jurisdiction of each orbital debris
21 identified; and

22 (ii) data required to inform decisions
23 regarding potential risk and feasibility of
24 safe remediation; and

1 (C) may include orbital debris that poses a
2 significant risk to terrestrial people and assets,
3 including risk resulting from potential environ-
4 mental impacts from the uncontrolled reentry of
5 the orbital debris identified.

6 (3) PUBLIC AVAILABILITY; PERIODIC UP-
7 DATES.—

8 (A) IN GENERAL.—Subject to subpara-
9 graph (B), the list required under paragraph
10 (1) shall be published in unclassified form on a
11 publicly accessible internet website of the Na-
12 tional Aeronautics and Space Administration.

13 (B) EXCLUSION.—The Administration may
14 not include on the list published under subpara-
15 graph (A) data acquired from nonpublic
16 sources.

17 (C) PERIODIC UPDATES.—Such list shall
18 be updated periodically.

19 (4) RESEARCH AND DEVELOPMENT.—With re-
20 spect to orbital debris identified under paragraph
21 (1), the Administrator shall, to the extent prac-
22 ticable and subject to the availability of appropria-
23 tions, carry out the additional research and develop-
24 ment activities necessary, in consultation with the
25 commercial space industry, to mature technologies

1 that close commercial capability gaps and enable po-
2 tential future remediation missions for such orbital
3 debris.

4 (5) ACQUISITION, ACCESS, USE, AND HANDLING
5 OF DATA OR INFORMATION.—In carrying out the ac-
6 tivities under this subsection, the Administrator—

7 (A) shall acquire, access, use, and handle
8 data or information in a manner consistent with
9 applicable provisions of law and policy, includ-
10 ing laws and policies providing for the protec-
11 tion of privacy and civil liberties, and subject to
12 any restrictions required by the source of the
13 information;

14 (B) shall have access, upon written re-
15 quest, to all information, data, or reports of any
16 executive agency that the Administrator deter-
17 mines necessary to carry out the activities
18 under this subsection, provided that such access
19 is—

20 (i) conducted in a manner consistent
21 with applicable provisions of law and policy
22 of the originating agency, including laws
23 and policies providing for the protection of
24 privacy and civil liberties; and

1 (ii) consistent with due regard for the
2 protection from unauthorized disclosure of
3 classified information relating to sensitive
4 intelligence sources and methods or other
5 exceptionally sensitive matters; and

6 (C) may obtain commercially available in-
7 formation that may not be publicly available.

8 (b) ACTIVE ORBITAL DEBRIS REMEDIATION DEM-
9 ONSTRATION PROGRAM.—

10 (1) ESTABLISHMENT.—Not later than 180 days
11 after the date of the enactment of this Act, subject
12 to the availability of appropriations, the Adminis-
13 trator, in consultation with the head of each relevant
14 Federal department or agency, shall establish a dem-
15 onstration program to make competitive awards for
16 the development of technologies leading to the reme-
17 diation of selected orbital debris identified under
18 subsection (a)(1).

19 (2) PURPOSE.—The purpose of the demonstra-
20 tion program shall be to enable eligible entities to
21 pursue the phased development and demonstration
22 of technologies and processes required for active de-
23bris remediation.

1 (3) PROCEDURES AND CRITERIA.—In estab-
2 lishing the demonstration program, the Adminis-
3 trator shall—

4 (A) establish—

5 (i) eligibility criteria for participation;

6 (ii) a process for soliciting proposals
7 from eligible entities;

8 (iii) criteria for the contents of such
9 proposals;

10 (iv) program compliance and evalua-
11 tion metrics; and

12 (v) program phases and milestones;

13 (B) identify government-furnished data or
14 equipment; and

15 (C) develop a plan for National Aero-
16 nautics and Space Administration participation
17 in technology development, as appropriate, and
18 intellectual property rights.

19 (4) PROPOSAL EVALUATION.—In evaluating
20 proposals for the demonstration program, the Ad-
21 ministrators shall—

22 (A) consider the safety, feasibility, cost,
23 benefit, and maturity of the proposed tech-
24 nology;

1 (B) consider the potential for the proposed
2 demonstration to successfully remediate orbital
3 debris and to advance the commercial state of
4 the art with respect to active debris remedi-
5 ation;

6 (C) carry out a risk analysis of the pro-
7 posed technology that takes into consideration
8 the potential casualty risk to humans in space
9 or on the Earth's surface;

10 (D) in an appropriate setting, conduct
11 thorough testing and evaluation of the proposed
12 technology and each component of such tech-
13 nology or system of technologies; and

14 (E) consider the technical and financial
15 feasibility of using the proposed technology to
16 conduct multiple remediation missions.

17 (5) DEMONSTRATION MISSION.—

18 (A) IN GENERAL.—The Administrator
19 shall consult with the head of each relevant
20 Federal department or agency in advance of
21 each demonstration mission.

22 (B) ACTIVE DEBRIS REMEDIATION DEM-
23 ONSTRATION MISSION.—It is the sense of Con-
24 gress that the Administrator should consider
25 maximizing competition for, and use best prac-

1 tices to engage commercial entities in, an active
2 debris remediation demonstration mission.

3 (C) SPECTRUM CONSIDERATIONS.—The
4 Administrator shall convey any potential spec-
5 trum allocations and licensing needs for active
6 debris remediation demonstration missions to
7 the Federal Communications Commission
8 through the National Telecommunications and
9 Information Administration as soon as prac-
10 ticable after any such spectrum allocation or li-
11 censing need has been identified.

12 (6) REPORTS.—

13 (A) RECOMMENDATIONS.—Not later than
14 1 year after the date on which the first dem-
15 onstration mission is carried out under this
16 subsection, the Administrator, in consultation
17 with the head of each relevant Federal depart-
18 ment or agency, shall submit to Congress a re-
19 port that provides legislative, regulatory, and
20 policy recommendations to improve active debris
21 remediation missions, as applicable.

22 (B) TECHNICAL ANALYSIS.—

23 (i) IN GENERAL.—To inform decisions
24 regarding the acquisition of active debris
25 remediation services by the Federal Gov-

1 ernment, not later than 180 days after the
2 completion of the demonstration program,
3 the Administrator shall submit to Congress
4 a report that—

5 (I) summarizes a technical anal-
6 ysis of technologies developed under
7 the demonstration program;

8 (II) identifies any technology
9 gaps addressed by the demonstration
10 program and any remaining tech-
11 nology gaps; and

12 (III) provides, as applicable, any
13 further legislative, regulatory, and
14 policy recommendations to enable ac-
15 tive debris remediation missions.

16 (ii) AVAILABILITY.—The Administra-
17 tion shall make the report submitted under
18 clause (i) available to the Secretary, the
19 Secretary of Defense, and other relevant
20 Federal departments and agencies, as de-
21 termined by the Administrator.

22 (7) INTERNATIONAL COOPERATION.—

23 (A) IN GENERAL.—In carrying out the
24 demonstration program, the Administrator, in
25 consultation with the National Space Council

1 and in collaboration with the Secretary of
2 State, may pursue a cooperative relationship
3 with one or more partner countries to enable
4 the remediation of orbital debris that is under
5 the jurisdiction of such partner countries.

6 (B) ARRANGEMENT OR AGREEMENT WITH
7 PARTNER COUNTRY.—Any arrangement or
8 agreement entered into with a partner country
9 under subparagraph (A) shall be—

10 (i) concluded—

11 (I) in the interests of the United
12 States Government; and

13 (II) without prejudice to any con-
14 tractual arrangement among commer-
15 cial parties that may be required to
16 complete the active debris remediation
17 mission concerned; and

18 (ii) consistent with the international
19 obligations of the United States under the
20 international legal framework governing
21 outer space activities.

22 (c) AUTHORIZATION OF APPROPRIATIONS.—There is
23 authorized to be appropriated to the Administrator to
24 carry out this section \$150,000,000 for the period of fiscal
25 years 2024 through 2028.

1 **SEC. 5. ACTIVE DEBRIS REMEDIATION SERVICES.**

2 (a) IN GENERAL.—To foster the competitive develop-
3 ment, operation, improvement, and commercial availability
4 of active debris remediation services, and in consideration
5 of the economic analysis required by subsection (b) and
6 the reports under section 4(b)(6), the Administrator and
7 the head of each relevant Federal department or agency
8 may acquire services for the remediation of orbital debris,
9 whenever practicable, through fair and open competition
10 for contracts that are well-defined, milestone-based, and
11 in accordance with the Federal Acquisition Regulation.

12 (b) ECONOMIC ANALYSIS.—Based on the results of
13 the demonstration program, the Secretary, acting through
14 the Office of Space Commerce, shall publish an assess-
15 ment of the estimated Federal Government and private
16 sector demand for orbital debris remediation services for
17 the 10-year period beginning in 2025.

18 **SEC. 6. UNIFORM ORBITAL DEBRIS STANDARD PRACTICES**
19 **FOR UNITED STATES SPACE ACTIVITIES.**

20 (a) IN GENERAL.—Not later than 90 days after the
21 date of the enactment of this Act, and every 5 years there-
22 after, the National Space Council, in coordination with the
23 Secretary, the Administrator of the Federal Aviation Ad-
24 ministration, the Secretary of Defense, the Federal Com-
25 munications Commission, and the Administrator, shall ini-

1 tiate an update to the Orbital Debris Mitigation Standard

2 Practices that—

3 (1) considers planned space systems, including

4 satellite constellations; and

5 (2) addresses—

6 (A) collision risk;

7 (B) casualty probability;

8 (C) post-mission disposal of space systems;

9 (D) time to disposal or de-orbit;

10 (E) spacecraft collision avoidance and

11 automated identification capability; and

12 (F) the ability to track orbital debris of de-

13 creasing size.

14 (b) CONSULTATION.—In developing the update under

15 subsection (a), the National Space Council, or a designee

16 of the National Space Council, shall seek advice and input

17 on commercial standards and best practices from rep-

18 resentatives of the commercial space industry, academia,

19 and nonprofit organizations, including through workshops

20 and, as appropriate, advance public notice and comment

21 processes under chapter 5 of title 5, United States Code.

22 (c) PUBLICATION.—Not later than 1 year after the

23 date of the enactment of this Act, such update shall be

24 published in the Federal Register and posted to the rel-

25 evant Federal Government websites.

1 (d) REGULATIONS.—To promote uniformity and
2 avoid duplication in the regulation of space activity, in-
3 cluding licensing by the Federal Aviation Administration,
4 the National Oceanic and Atmospheric Administration,
5 and the Federal Communications Commission, such up-
6 date, after publication, shall be used to inform the further
7 development and promulgation of Federal regulations re-
8 lating to orbital debris.

9 (e) INTERNATIONAL PROMOTION.—To encourage ef-
10 fective and nondiscriminatory standards, best practices,
11 rules, and regulations implemented by other countries,
12 such update shall inform bilateral and multilateral discus-
13 sions focused on the authorization and continuing super-
14 vision of nongovernmental space activities.

15 **SEC. 7. STANDARD PRACTICES FOR SPACE TRAFFIC CO-**
16 **ORDINATION.**

17 (a) IN GENERAL.—The Secretary, in coordination
18 with members of the National Space Council and the Fed-
19 eral Communications Commission, shall facilitate the de-
20 velopment of standard practices for on-orbit space traffic
21 coordination based on existing guidelines and best prac-
22 tices used by Government and commercial space industry
23 operators.

24 (b) CONSULTATION.—In facilitating the development
25 of standard practices under subsection (a), the Secretary,

1 through the Office of Space Commerce, in consultation
2 with the National Institute of Standards and Technology,
3 shall engage in frequent and routine consultation with rep-
4 resentatives of the commercial space industry, academia,
5 and nonprofit organizations.

6 (c) PROMOTION OF STANDARD PRACTICES.—On
7 completion of such standard practices, the Secretary, the
8 Secretary of State, the Secretary of Transportation, the
9 Administrator, and the Secretary of Defense shall promote
10 the adoption and use of the standard practices for domes-
11 tic and international space missions.

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