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1ST SESSION**S. 99****[Report No. 112-17]**

To promote the production of molybdenum-99 in the United States for medical isotope production, and to condition and phase out the export of highly enriched uranium for the production of medical isotopes.

IN THE SENATE OF THE UNITED STATES

JANUARY 25 (legislative day, JANUARY 5), 2011

Mr. BINGAMAN (for himself and Ms. MURKOWSKI) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

MAY 18, 2011

Reported by Mr. BINGAMAN, with an amendment

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

A BILL

To promote the production of molybdenum-99 in the United States for medical isotope production, and to condition and phase out the export of highly enriched uranium for the production of medical isotopes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “American Medical Iso-
3 topes Production Act of 2011”.

4 **SEC. 2. IMPROVING THE RELIABILITY OF DOMESTIC MED-
5 ICAL ISOTOPE SUPPLY.**

6 (a) **MEDICAL ISOTOPE DEVELOPMENT PROJECTS.—**

7 (1) **IN GENERAL.—**The Secretary of Energy
8 shall establish a technology-neutral program—

9 (A) to evaluate and support projects for
10 the production in the United States, without
11 the use of highly enriched uranium, of signifi-
12 cant quantities of molybdenum-99 for medical
13 uses;

14 (B) to be carried out in cooperation with
15 non-Federal entities; and

16 (C) the costs of which shall be shared in
17 accordance with section 988 of the Energy Pol-
18 icy Act of 2005 (42 U.S.C. 16352).

19 (2) **CRITERIA.—**Projects shall be judged against
20 the following primary criteria:

21 (A) The length of time necessary for the
22 proposed project to begin production of molyb-
23 denum-99 for medical uses within the United
24 States.

25 (B) The capability of the proposed project
26 to produce a significant percentage of United

1 States demand for molybdenum-99 for medical
2 uses.

3 (C) The cost of the proposed project.

4 (3) EXEMPTION.—An existing reactor fueled
5 with highly enriched uranium shall not be disquali-
6 fied from the program if the Secretary of Energy de-
7 termines that—

8 (A) there is no alternative nuclear reactor
9 fuel, enriched in the isotope U-235 to less than
10 20 percent, that can be used in that reactor;

11 (B) the reactor operator has provided as-
12 surances that, whenever an alternative nuclear
13 reactor fuel, enriched in the isotope U-235 to
14 less than 20 percent, can be used in that reac-
15 tor, it will use that alternative in lieu of highly
16 enriched uranium; and

17 (C) the reactor operator has provided a
18 current report on the status of its efforts to
19 convert the reactor to an alternative nuclear re-
20 actor fuel enriched in the isotope U-235 to less
21 than 20 percent, and an anticipated schedule
22 for completion of conversion.

23 (4) PUBLIC PARTICIPATION AND REVIEW.—The
24 Secretary of Energy shall—

1 (A) develop a program plan and annually
2 update the program plan through public work-
3 shops; and

4 (B) use the Nuclear Science Advisory
5 Committee to conduct annual reviews of the
6 progress made in achieving the program goals.

7 (5) AUTHORIZATION OF APPROPRIATIONS.—

8 There are authorized to be appropriated to the Sec-
9 retary of Energy for carrying out the program under
10 paragraph (1) \$143,000,000 for the period encom-
11 passing fiscal years 2011 through 2014.

12 (b) DEVELOPMENT ASSISTANCE.—The Secretary of
13 Energy shall establish a program to provide assistance
14 for—

15 (1) the development of fuels, targets, and proc-
16 esses for domestic molybdenum-99 production that
17 do not use highly enriched uranium; and

18 (2) commercial operations using the fuels, tar-
19 gets, and processes described in paragraph (1).

20 (c) URANIUM LEASE AND TAKE BACK.—The Sec-
21 retary of Energy shall establish a program to make low
22 enriched uranium available, through lease contracts, for
23 irradiation for the production of molybdenum-99 for med-
24 ical uses. The lease contracts shall provide for the Sec-
25 retary to retain responsibility for the final disposition of

1 radioactive waste created by the irradiation, processing,
2 or purification of leased uranium. The lease contracts
3 shall also provide for compensation in cash amounts equiv-
4 alent to prevailing market rates for the sale of comparable
5 uranium products and for compensation in cash amounts
6 equivalent to the net present value of the cost to the Fed-
7 eral Government for the final disposition of such radio-
8 active waste, provided that the discount rate used to deter-
9 mine the net present value of such costs shall be no great-
10 er than the average interest rate on marketable Treasury
11 securities. The Secretary shall not barter or otherwise sell
12 or transfer uranium in any form in exchange for services
13 related to final disposition of the radioactive waste from
14 such leased uranium.

15 **SEC. 3. EXPORTS.**

16 Section 134 of the Atomic Energy Act of 1954 (42
17 U.S.C. 2160d) is amended by striking subsections b. and
18 e. and inserting in lieu thereof the following:

19 “b. Effective 7 years after the date of enactment of
20 the American Medical Isotopes Production Act of 2011,
21 the Commission may not issue a license for the export of
22 highly enriched uranium from the United States for the
23 purposes of medical isotope production.

24 “e. The period referred to in subsection b. may be
25 extended for no more than 6 years if, no earlier than 6

1 years after the date of enactment of the American Medical
2 Isotopes Production Act of 2011, the Secretary of Energy
3 certifies to the Committee on Energy and Commerce of
4 the House of Representatives and the Committee on En-
5 ergy and Natural Resources of the Senate that—

6 “(1) there is insufficient global supply of molyb-
7 denum-99 produced without the use of highly en-
8 riched uranium available to satisfy the domestic
9 United States market; and

10 “(2) the export of United States-origin highly
11 enriched uranium for the purposes of medical iso-
12 tope production is the most effective temporary
13 means to increase the supply of molybdenum-99 to
14 the domestic United States market.

15 “d. To ensure public review and comment, the devel-
16 opment of the certification described in subsection c. shall
17 be carried out through announcement in the Federal Reg-
18 ister.

19 “e. At any time after the restriction of export licenses
20 provided for in subsection b. becomes effective, if there
21 is a critical shortage in the supply of molybdenum-99
22 available to satisfy the domestic United States medical iso-
23 tope needs, the restriction of export licenses may be sus-
24 pended for a period of no more than 12 months, if—

1 “(1) the Secretary of Energy certifies to the
2 Congress that the export of United States-origin
3 highly enriched uranium for the purposes of medical
4 isotope production is the only effective temporary
5 means to increase the supply of molybdenum-99 nec-
6 essary to meet United States medical isotope needs
7 during that period; and

8 “(2) the Congress enacts a Joint Resolution ap-
9 proving the temporary suspension of the restriction
10 of export licenses.

11 “f. As used in this section—

12 “(1) the term ‘alternative nuclear reactor fuel
13 or target’ means a nuclear reactor fuel or target
14 which is enriched to less than 20 percent in the iso-
15 tope U-235;

16 “(2) the term ‘highly enriched uranium’ means
17 uranium enriched to 20 percent or more in the iso-
18 tope U-235;

19 “(3) a fuel or target ‘can be used’ in a nuclear
20 research or test reactor if—

21 “(A) the fuel or target has been qualified
22 by the Reduced Enrichment Research and Test
23 Reactor Program of the Department of Energy;
24 and

1 “(B) use of the fuel or target will permit
2 the large majority of ongoing and planned ex-
3 periments and isotope production to be con-
4 ducted in the reactor without a large percentage
5 increase in the total cost of operating the reac-
6 tor; and

7 “(4) the term ‘medical isotope’ includes molyb-
8 denum-99, iodine-131, xenon-133, and other radio-
9 active materials used to produce a radiopharma-
10 ceutical for diagnostic, therapeutic procedures or for
11 research and development.”.

12 **SEC. 4. REPORT ON DISPOSITION OF EXPORTS.**

13 Not later than 1 year after the date of the enactment
14 of this Act, the Chairman of the Nuclear Regulatory Com-
15 mission, after consulting with other relevant agencies,
16 shall submit to the Congress a report detailing the current
17 disposition of previous United States exports of highly en-
18 riched uranium, including—

19 (1) their location;

20 (2) whether they are irradiated;

21 (3) whether they have been used for the pur-
22 pose stated in their export license;

23 (4) whether they have been used for an alter-
24 native purpose and, if so, whether such alternative

1 purpose has been explicitly approved by the Commis-
2 sion;

3 (5) the year of export, and reimportation, if ap-
4 plicable;

5 (6) their current physical and chemical forms;
6 and

7 (7) whether they are being stored in a manner
8 which adequately protects against theft and unau-
9 thorized access.

10 **SEC. 5. DOMESTIC MEDICAL ISOTOPE PRODUCTION.**

11 (a) IN GENERAL.—Chapter 10 of the Atomic Energy
12 Act of 1954 (42 U.S.C. 2131 et seq.) is amended by add-
13 ing at the end the following new section:

14 “SEC. 112. DOMESTIC MEDICAL ISOTOPE PRODUC-
15 TION.— a. The Commission may issue a license, or grant
16 an amendment to an existing license, for the use in the
17 United States of highly enriched uranium as a target for
18 medical isotope production in a nuclear reactor, only if,
19 in addition to any other requirement of this Act—

20 “(1) the Commission determines that—

21 “(A) there is no alternative medical isotope
22 production target, enriched in the isotope U-
23 235 to less than 20 percent, that can be used
24 in that reactor; and

1 “(B) the proposed recipient of the medical
2 isotope production target has provided assur-
3 ances that, whenever an alternative medical iso-
4 tope production target can be used in that reac-
5 tor, it will use that alternative in lieu of highly
6 enriched uranium; and

7 “(2) the Secretary of Energy has certified that
8 the United States Government is actively supporting
9 the development of an alternative medical isotope
10 production target that can be used in that reactor.

11 “b. As used in this section—

12 “(1) the term ‘alternative medical isotope pro-
13 duction target’ means a nuclear reactor target which
14 is enriched to less than 20 percent of the isotope U-
15 ~~235~~;

16 “(2) a target ‘can be used’ in a nuclear re-
17 search or test reactor if—

18 “(A) the target has been qualified by the
19 Reduced Enrichment Research and Test Reac-
20 tor Program of the Department of Energy; and

21 “(B) use of the target will permit the large
22 majority of ongoing and planned experiments
23 and isotope production to be conducted in the
24 reactor without a large percentage increase in
25 the total cost of operating the reactor;

1 “(3) the term ‘highly enriched uranium’ means
2 uranium enriched to 20 percent or more in the iso-
3 tope U-235; and

4 “(4) the term ‘medical isotope’ includes molyb-
5 denum-99, iodine-131, xenon-133, and other radio-
6 active materials used to produce a radiopharma-
7 ceutical for diagnostic, therapeutic procedures or for
8 research and development.”.

9 (b) TABLE OF CONTENTS.—The table of contents for
10 the Atomic Energy Act of 1954 is amended by inserting
11 the following new item at the end of the items relating
12 to chapter 10 of title I:

“Sec. 112. Domestic medical isotope production.”.

13 **SEC. 6. ANNUAL DEPARTMENT OF ENERGY REPORTS.**

14 The Secretary of Energy shall report to Congress no
15 later than one year after the date of enactment of this
16 Act, and annually thereafter for 5 years, on Department
17 of Energy actions to support the production in the United
18 States, without the use of highly enriched uranium, of mo-
19 lybdenum-99 for medical uses. These reports shall include
20 the following:

21 (1) For medical isotope development projects—

22 (A) the names of any recipients of Depart-
23 ment of Energy support under section 2 of this
24 Act;

1 (B) the amount of Department of Energy
2 funding committed to each project;

3 (C) the milestones expected to be reached
4 for each project during the year for which sup-
5 port is provided;

6 (D) how each project is expected to sup-
7 port the increased production of molybdenum-
8 99 for medical uses;

9 (E) the findings of the evaluation of
10 projects under section 2(a)(2) of this Act; and

11 (F) the ultimate use of any Department of
12 Energy funds used to support projects under
13 section 2 of this Act.

14 (2) A description of actions taken in the pre-
15 vious year by the Secretary of Energy to ensure the
16 safe disposition of radioactive waste from used mo-
17 lybdenum-99 targets.

18 **SEC. 7. NATIONAL ACADEMY OF SCIENCES REPORT.**

19 The Secretary of Energy shall enter into an arrange-
20 ment with the National Academy of Sciences to conduct
21 a study of the state of molybdenum-99 production and uti-
22 lization, to be provided to the Congress not later than 5
23 years after the date of enactment of this Act. This report
24 shall include the following:

25 (1) For molybdenum-99 production—

1 (A) a list of all facilities in the world pro-
2 ducing molybdenum-99 for medical uses, includ-
3 ing an indication of whether these facilities use
4 highly enriched uranium in any way;

5 (B) a review of international production of
6 molybdenum-99 over the previous 5 years, in-
7 cluding—

8 (i) whether any new production was
9 brought online;

10 (ii) whether any facilities halted pro-
11 duction unexpectedly; and

12 (iii) whether any facilities used for
13 production were decommissioned or other-
14 wise permanently removed from service;
15 and

16 (C) an assessment of progress made in the
17 previous 5 years toward establishing domestic
18 production of molybdenum-99 for medical uses,
19 including the extent to which other medical iso-
20 topes that have been produced with molyb-
21 denum-99, such as iodine-131 and xenon-133,
22 are being used for medical purposes.

23 (2) An assessment of the progress made by the
24 Department of Energy and others to eliminate all
25 worldwide use of highly enriched uranium in reactor

1 fuel, reactor targets, and medical isotope production
2 facilities.

3 **SEC. 8. DEFINITIONS.**

4 In this Act the following definitions apply:

5 (1) **HIGHLY ENRICHED URANIUM.**—The term
6 “highly enriched uranium” means uranium enriched
7 to 20 percent or greater in the isotope U-235.

8 (2) **LOW ENRICHED URANIUM.**—The term “low
9 enriched uranium” means uranium enriched to less
10 than 20 percent in the isotope U-235.

11 **SEC. 9. BUDGETARY EFFECTS.**

12 The budgetary effects of this Act, for the purpose of
13 complying with the Statutory Pay-As-You-Go Act of 2010,
14 shall be determined by reference to the latest statement
15 titled “Budgetary Effects of PAYGO Legislation” for this
16 Act, submitted for printing in the Congressional Record
17 by the Chairman of the Senate Budget Committee, pro-
18 vided that such statement has been submitted prior to the
19 vote on passage.

20 **SECTION 1. SHORT TITLE.**

21 *This Act may be cited as the “American Medical Iso-*
22 *topes Production Act of 2011”.*

23 **SEC. 2. DEFINITIONS.**

24 *In this Act:*

1 (2) *CRITERIA.*—*Projects shall be judged against*
2 *the following primary criteria:*

3 (A) *The length of time necessary for the pro-*
4 *posed project to begin production of molyb-*
5 *denum-99 for medical uses within the United*
6 *States.*

7 (B) *The capability of the proposed project*
8 *to produce a significant percentage of United*
9 *States demand for molybdenum-99 for medical*
10 *uses.*

11 (C) *The cost of the proposed project.*

12 (3) *EXEMPTION.*—*An existing reactor in the*
13 *United States fueled with highly enriched uranium*
14 *shall not be disqualified from the program if the Sec-*
15 *retary determines that—*

16 (A) *there is no alternative nuclear reactor*
17 *fuel, enriched in the isotope U-235 to less than*
18 *20 percent, that can be used in that reactor;*

19 (B) *the reactor operator has provided assur-*
20 *ances that, whenever an alternative nuclear reac-*
21 *tor fuel, enriched in the isotope U-235 to less*
22 *than 20 percent, can be used in that reactor, it*
23 *will use that alternative in lieu of highly en-*
24 *riched uranium; and*

1 (C) the reactor operator has provided a cur-
2 rent report on the status of its efforts to convert
3 the reactor to an alternative nuclear reactor fuel
4 enriched in the isotope U-235 to less than 20
5 percent, and an anticipated schedule for comple-
6 tion of conversion.

7 (4) *PUBLIC PARTICIPATION AND REVIEW.*—The
8 Secretary shall—

9 (A) develop a program plan and annually
10 update the program plan through public work-
11 shops; and

12 (B) use the Nuclear Science Advisory Com-
13 mittee to conduct annual reviews of the progress
14 made in achieving the program goals.

15 (5) *AUTHORIZATION OF APPROPRIATIONS.*—
16 There are authorized to be appropriated to the Sec-
17 retary for carrying out the program under paragraph
18 (1) \$143,000,000 for the period encompassing fiscal
19 years 2011 through 2014.

20 (b) *DEVELOPMENT ASSISTANCE.*—The Secretary shall
21 establish a program to provide assistance for—

22 (1) the development of fuels, targets, and proc-
23 esses for domestic molybdenum-99 production that do
24 not use highly enriched uranium; and

1 (2) *commercial operations using the fuels, tar-*
2 *gets, and processes described in paragraph (1).*

3 (c) *URANIUM LEASE AND TAKE-BACK.—*

4 (1) *IN GENERAL.—The Secretary shall establish*
5 *a program to make low-enriched uranium available,*
6 *through lease contracts, for irradiation for the pro-*
7 *duction of molybdenum-99 for medical uses.*

8 (2) *TITLE.—The lease contracts shall provide for*
9 *the producers of the molybdenum-99 to take title to*
10 *and be responsible for the molybdenum-99 created by*
11 *the irradiation, processing, or purification of ura-*
12 *anium leased under this section.*

13 (3) *DUTIES.—*

14 (A) *SECRETARY.—The lease contracts shall*
15 *require the Secretary—*

16 (i) *to retain responsibility for the final*
17 *disposition of spent nuclear fuel created by*
18 *the irradiation, processing, or purification*
19 *of uranium leased under this section for the*
20 *production of medical isotopes; and*

21 (ii) *to take title to and be responsible*
22 *for the final disposition of radioactive waste*
23 *created by the irradiation, processing, or*
24 *purification of uranium leased under this*
25 *section for which the Secretary determines*

1 *the producer does not have access to a dis-*
2 *posal path.*

3 *(B) PRODUCER.—The producer of the spent*
4 *nuclear fuel and radioactive waste shall accu-*
5 *rately characterize, appropriately package, and*
6 *transport the spent nuclear fuel and radioactive*
7 *waste prior to acceptance by the Department.*

8 *(4) COMPENSATION.—*

9 *(A) IN GENERAL.—Subject to subparagraph*
10 *(B), the lease contracts shall provide for com-*
11 *ensation in cash amounts equivalent to pre-*
12 *vailing market rates for the sale of comparable*
13 *uranium products and for compensation in cash*
14 *amounts equivalent to the net present value of*
15 *the cost to the Federal Government for—*

16 *(i) the final disposition of spent nu-*
17 *clear fuel and radioactive waste for which*
18 *the Department is responsible under para-*
19 *graph (3); and*

20 *(ii) other costs associated with car-*
21 *rying out the uranium lease and take-back*
22 *program authorized by this subsection.*

23 *(B) DISCOUNT RATE.—The discount rate*
24 *used to determine the net present value of costs*
25 *described in subparagraph (A)(ii) shall be not*

1 *greater than the average interest rate on market-*
2 *able Treasury securities.*

3 (5) *AUTHORIZED USE OF FUNDS.—The Secretary*
4 *may obligate and expend funds received under leases*
5 *entered into under this subsection, which shall remain*
6 *available until expended, for the purpose of carrying*
7 *out the activities authorized by this Act, including ac-*
8 *tivities related to the final disposition of spent nu-*
9 *clear fuel and radioactive waste for which the Depart-*
10 *ment is responsible under paragraph (3).*

11 (6) *EXCHANGE OF URANIUM FOR SERVICES.—*
12 *The Secretary shall not barter or otherwise sell or*
13 *transfer uranium in any form in exchange for—*

14 (A) *services related to the final disposition*
15 *of the spent nuclear fuel and radioactive waste*
16 *for which the Department is responsible under*
17 *paragraph (3); or*

18 (B) *any other services associated with car-*
19 *rying out the uranium lease and take-back pro-*
20 *gram authorized by this subsection.*

21 (d) *COORDINATION OF ENVIRONMENTAL REVIEWS.—*
22 *The Department and the Nuclear Regulatory Commission*
23 *shall ensure to the maximum extent practicable that envi-*
24 *ronmental reviews for the production of the medical isotopes*
25 *shall complement and not duplicate each review.*

1 (e) *OPERATIONAL DATE.*—*The Secretary shall estab-*
2 *lish a program as described in subsection (c)(3) not later*
3 *than 3 years after the date of enactment of this Act.*

4 (f) *RADIOACTIVE WASTE.*—*Notwithstanding section 2*
5 *of the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10101),*
6 *radioactive material resulting from the production of med-*
7 *ical isotopes that has been permanently removed from a re-*
8 *actor or subcritical assembly and for which there is no fur-*
9 *ther use shall be considered low-level radioactive waste if*
10 *the material is acceptable under Federal requirements for*
11 *disposal as low-level radioactive waste.*

12 (g) *AUTHORIZATION OF APPROPRIATIONS.*—*There are*
13 *authorized to be appropriated to the Secretary \$5,000,000*
14 *for the establishment of a program for the final disposition*
15 *of spent nuclear fuel and radioactive waste for which the*
16 *Department is responsible under subsection (c).*

17 **SEC. 4. EXPORTS.**

18 Section 134 of the Atomic Energy Act of 1954 (42
19 U.S.C. 2160d) is amended by striking subsection c. and in-
20 serting the following:

21 “c. *Effective 7 years after the date of enactment of the*
22 *American Medical Isotopes Production Act of 2011, the*
23 *Commission may not issue a license for the export of highly*
24 *enriched uranium from the United States for the purposes*
25 *of medical isotope production.*”

1 *“d. The period referred to in subsection b. may be ex-*
2 *tended for no more than 6 years if, no earlier than 6 years*
3 *after the date of enactment of the American Medical Iso-*
4 *topes Production Act of 2011, the Secretary of Energy cer-*
5 *tifies to the Committee on Energy and Commerce of the*
6 *House of Representatives and the Committee on Energy and*
7 *Natural Resources of the Senate that—*

8 *“(1) there is insufficient global supply of molyb-*
9 *denum-99 produced without the use of highly enriched*
10 *uranium available to satisfy the domestic United*
11 *States market; and*

12 *“(2) the export of United States-origin highly en-*
13 *riched uranium for the purposes of medical isotope*
14 *production is the most effective temporary means to*
15 *increase the supply of molybdenum-99 to the domestic*
16 *United States market.*

17 *“e. To ensure public review and comment, the develop-*
18 *ment of the certification described in subsection c. shall be*
19 *carried out through announcement in the Federal Register.*

20 *“f. At any time after the restriction of export licenses*
21 *provided for in subsection b. becomes effective, if there is*
22 *a critical shortage in the supply of molybdenum-99 avail-*
23 *able to satisfy the domestic United States medical isotope*
24 *needs, the restriction of export licenses may be suspended*
25 *for a period of no more than 12 months, if—*

1 “(1) the Secretary of Energy certifies to the Con-
2 gress that the export of United States-origin highly
3 enriched uranium for the purposes of medical isotope
4 production is the only effective temporary means to
5 increase the supply of molybdenum-99 necessary to
6 meet United States medical isotope needs during that
7 period; and

8 “(2) the Congress enacts a Joint Resolution ap-
9 proving the temporary suspension of the restriction of
10 export licenses.

11 “g. As used in this section—

12 “(1) the term ‘alternative nuclear reactor fuel or
13 target’ means a nuclear reactor fuel or target which
14 is enriched to less than 20 percent in the isotope U-
15 235;

16 “(2) the term ‘highly enriched uranium’ means
17 uranium enriched to 20 percent or more in the iso-
18 tope U-235;

19 “(3) a fuel or target ‘can be used’ in a nuclear
20 research or test reactor if—

21 “(A) the fuel or target has been qualified by
22 the Reduced Enrichment Research and Test Re-
23 actor Program of the Department of Energy; and

24 “(B) use of the fuel or target will permit the
25 large majority of ongoing and planned experi-

1 *ments and medical isotope production to be con-*
2 *ducted in the reactor without a large percentage*
3 *increase in the total cost of operating the reactor;*
4 *and*

5 *“(4) the term ‘medical isotope’ includes molyb-*
6 *denum-99, iodine-131, xenon-133, and other radio-*
7 *active materials used to produce a radiopharma-*
8 *ceutical for diagnostic or therapeutic procedures or*
9 *for research and development.”.*

10 **SEC. 5. REPORT ON DISPOSITION OF EXPORTS.**

11 *Not later than 1 year after the date of the enactment*
12 *of this Act, the Chairman of the Nuclear Regulatory Com-*
13 *mission, after consulting with other relevant agencies, shall*
14 *submit to the Congress a report detailing the current dis-*
15 *position of previous United States exports of highly en-*
16 *riched uranium used as fuel or targets in a nuclear research*
17 *or test reactor, including—*

18 *(1) their location;*

19 *(2) whether they are irradiated;*

20 *(3) whether they have been used for the purpose*
21 *stated in their export license;*

22 *(4) whether they have been used for an alter-*
23 *native purpose and, if so, whether such alternative*
24 *purpose has been explicitly approved by the Commis-*
25 *sion;*

1 (5) *the year of export, and reimportation, if ap-*
2 *plicable;*

3 (6) *their current physical and chemical forms;*
4 *and*

5 (7) *whether they are being stored in a manner*
6 *which adequately protects against theft and unauthor-*
7 *ized access.*

8 **SEC. 6. DOMESTIC MEDICAL ISOTOPE PRODUCTION.**

9 (a) *IN GENERAL.*—Chapter 10 of the Atomic Energy
10 *Act of 1954 (42 U.S.C. 2131 et seq.) is amended by adding*
11 *at the end the following:*

12 “*SEC. 112. DOMESTIC MEDICAL ISOTOPE PRODUC-*
13 *TION.— a. The Commission may issue a license, or grant*
14 *an amendment to an existing license, for the use in the*
15 *United States of highly enriched uranium as a target for*
16 *medical isotope production in a nuclear reactor, only if,*
17 *in addition to any other requirement of this Act—*

18 “*(1) the Commission determines that—*

19 “*(A) there is no alternative medical isotope*
20 *production target, enriched in the isotope U-235*
21 *to less than 20 percent, that can be used in that*
22 *reactor; and*

23 “*(B) the proposed recipient of the medical*
24 *isotope production target has provided assur-*
25 *ances that, whenever an alternative medical iso-*

1 *tope production target can be used in that reac-*
2 *tor, it will use that alternative in lieu of highly*
3 *enriched uranium; and*

4 *“(2) the Secretary of Energy has certified that*
5 *the United States Government is actively supporting*
6 *the development of an alternative medical isotope pro-*
7 *duction target that can be used in that reactor.*

8 *“b. As used in this section—*

9 *“(1) the term ‘alternative medical isotope pro-*
10 *duction target’ means a nuclear reactor target which*
11 *is enriched to less than 20 percent of the isotope U-*
12 *235;*

13 *“(2) a target ‘can be used’ in a nuclear research*
14 *or test reactor if—*

15 *“(A) the target has been qualified by the Re-*
16 *duced Enrichment Research and Test Reactor*
17 *Program of the Department of Energy; and*

18 *“(B) use of the target will permit the large*
19 *majority of ongoing and planned experiments*
20 *and medical isotope production to be conducted*
21 *in the reactor without a large percentage in-*
22 *crease in the total cost of operating the reactor;*

23 *“(3) the term ‘highly enriched uranium’ means*
24 *uranium enriched to 20 percent or more in the iso-*
25 *tope U-235; and*

1 “(4) the term ‘medical isotope’ includes molyb-
 2 denum-99, iodine-131, xenon-133, and other radio-
 3 active materials used to produce a radiopharma-
 4 ceutical for diagnostic or therapeutic procedures or
 5 for research and development.”.

6 (b) *TABLE OF CONTENTS.*—The table of contents for
 7 the Atomic Energy Act of 1954 is amended by inserting
 8 the following new item at the end of the items relating to
 9 chapter 10 of title I:

 “Sec. 112. Domestic medical isotope production.”.

10 **SEC. 7. ANNUAL DEPARTMENT REPORTS.**

11 (a) *IN GENERAL.*—Not later than 1 year after the date
 12 of enactment of this Act, and annually thereafter for 5
 13 years, the Secretary shall report to Congress on Department
 14 actions to support the production in the United States,
 15 without the use of highly enriched uranium, of molyb-
 16 denum-99 for medical uses.

17 (b) *CONTENTS.*—The reports shall include the fol-
 18 lowing:

19 (1) *For medical isotope development projects—*

20 (A) *the names of any recipients of Depart-*
 21 *ment support under section 3;*

22 (B) *the amount of Department funding*
 23 *committed to each project;*

1 (C) the milestones expected to be reached for
2 each project during the year for which support
3 is provided;

4 (D) how each project is expected to support
5 the increased production of molybdenum-99 for
6 medical uses;

7 (E) the findings of the evaluation of projects
8 under section 3(a)(2); and

9 (F) the ultimate use of any Department
10 funds used to support projects under section 3.

11 (2) A description of actions taken in the previous
12 year by the Secretary to ensure the safe disposition of
13 spent nuclear fuel and radioactive waste for which the
14 Department is responsible under section 3(c).

15 **SEC. 8. NATIONAL ACADEMY OF SCIENCES REPORT.**

16 (a) *IN GENERAL.*—The Secretary shall enter into an
17 arrangement with the National Academy of Sciences to con-
18 duct a study of the state of molybdenum-99 production and
19 utilization, to be provided to Congress not later than 5
20 years after the date of enactment of this Act.

21 (b) *CONTENTS.*—The report shall include the following:

22 (1) *For molybdenum-99 production—*

23 (A) *a list of all facilities in the world pro-*
24 *ducing molybdenum-99 for medical uses, includ-*

1 *ing an indication of whether these facilities use*
2 *highly enriched uranium in any way;*

3 *(B) a review of international production of*
4 *molybdenum-99 over the previous 5 years, in-*
5 *cluding—*

6 *(i) whether any new production was*
7 *brought online;*

8 *(ii) whether any facilities halted pro-*
9 *duction unexpectedly; and*

10 *(iii) whether any facilities used for*
11 *production were decommissioned or other-*
12 *wise permanently removed from service; and*

13 *(C) an assessment of progress made in the*
14 *previous 5 years toward establishing domestic*
15 *production of molybdenum-99 for medical uses,*
16 *including the extent to which other medical iso-*
17 *topes that have been produced with molybdenum-*
18 *99, such as iodine-131 and xenon-133, are being*
19 *used for medical purposes.*

20 *(2) An assessment of the progress made by the*
21 *Department and others to eliminate all worldwide use*
22 *of highly enriched uranium in reactor fuel, reactor*
23 *targets, and medical isotope production facilities.*

1 **SEC. 9. BUDGETARY EFFECTS.**

2 *The budgetary effects of this Act, for the purpose of*
3 *complying with the Statutory Pay-As-You-Go-Act of 2010,*
4 *shall be determined by reference to the latest statement titled*
5 *“Budgetary Effects of PAYGO Legislation” for this Act,*
6 *submitted for printing in the Congressional Record by the*
7 *Chairman of the Senate Budget Committee, provided that*
8 *such statement has been submitted prior to the vote on pas-*
9 *sage.*

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112TH CONGRESS
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S. 99

[Report No. 112-17]

A BILL

To promote the production of molybdenum-99 in the United States for medical isotope production, and to condition and phase out the export of highly enriched uranium for the production of medical isotopes.

MAY 18, 2011

Reported with an amendment