

Calendar No. 244

111TH CONGRESS
1ST SESSION**H. R. 730**

IN THE SENATE OF THE UNITED STATES

MARCH 26, 2009

Received; read twice and referred to the Committee on Homeland Security and
Governmental Affairs

DECEMBER 17, 2009

Reported by Mr. LIEBERMAN, with an amendment

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

AN ACT

To strengthen efforts in the Department of Homeland Security to develop nuclear forensics capabilities to permit attribution of the source of nuclear material, 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 “Nuclear Forensics and
5 Attribution Act”.

6 **SEC. 2. FINDINGS.**

7 Congress finds the following:

1 (1) The threat of a nuclear terrorist attack on
2 American interests, both domestic and abroad, is one
3 of the most serious threats to the national security
4 of the United States. In the wake of an attack, attri-
5 bution of responsibility would be of utmost impor-
6 tance. Because of the destructive power of a nuclear
7 weapon, there could be little forensic evidence except
8 the radioactive material in the weapon itself.

9 (2) Through advanced nuclear forensics, using
10 both existing techniques and those under develop-
11 ment, it may be possible to identify the source and
12 pathway of a weapon or material after it is inter-
13 dicted or detonated. Though identifying intercepted
14 smuggled material is now possible in some cases,
15 pre-detonation forensics is a relatively undeveloped
16 field. The post-detonation nuclear forensics field is
17 also immature, and the challenges are compounded
18 by the pressures and time constraints of performing
19 forensics after a nuclear or radiological attack.

20 (3) A robust and well-known capability to iden-
21 tify the source of nuclear or radiological material in-
22 tended for or used in an act of terror could also
23 deter prospective proliferators. Furthermore, the
24 threat of effective attribution could compel improved
25 security at material storage facilities, preventing the

1 unwitting transfer of nuclear or radiological mate-
2 rials.

3 (4)(A) In order to identify special nuclear mate-
4 rial and other radioactive materials confidently, it is
5 necessary to have a robust capability to acquire sam-
6 ples in a timely manner, analyze and characterize
7 samples, and compare samples against known signa-
8 tures of nuclear and radiological material.

9 (B) Many of the radioisotopes produced in the
10 detonation of a nuclear device have short half-lives,
11 so the timely acquisition of samples is of the utmost
12 importance. Over the past several decades, the abil-
13 ity of the United States to gather atmospheric sam-
14 ples—often the preferred method of sample acquisi-
15 tion—has diminished. This ability must be restored
16 and modern techniques that could complement or re-
17 place existing techniques should be pursued.

18 (C) The discipline of pre-detonation forensics is
19 a relatively undeveloped field. The radiation associ-
20 ated with a nuclear or radiological device may affect
21 traditional forensics techniques in unknown ways. In
22 a post-detonation scenario, radiochemistry may pro-
23 vide the most useful tools for analysis and character-
24 ization of samples. The number of radiochemistry
25 programs and radiochemists in United States Na-

1 tional Laboratories and universities has dramatically
2 declined over the past several decades. The nar-
3 rowing pipeline of qualified people into this critical
4 field is a serious impediment to maintaining a robust
5 and credible nuclear forensics program.

6 (5) Once samples have been acquired and char-
7 acterized, it is necessary to compare the results
8 against samples of known material from reactors,
9 weapons, and enrichment facilities, and from med-
10 ical, academic, commercial, and other facilities con-
11 taining such materials, throughout the world. Some
12 of these samples are available to the International
13 Atomic Energy Agency through safeguards agree-
14 ments, and some countries maintain internal sample
15 databases. Access to samples in many countries is
16 limited by national security concerns.

17 (6) In order to create a sufficient deterrent, it
18 is necessary to have the capability to positively iden-
19 tify the source of nuclear or radiological material,
20 and potential traffickers in nuclear or radiological
21 material must be aware of that capability. Inter-
22 national cooperation may be essential to catalogue
23 all existing sources of nuclear or radiological mate-
24 rial.

1 **SEC. 3. SENSE OF CONGRESS ON INTERNATIONAL AGREE-**
2 **MENTS FOR FORENSICS COOPERATION.**

3 It is the sense of the Congress that the President
4 should—

5 (1) pursue bilateral and multilateral inter-
6 national agreements to establish, or seek to establish
7 under the auspices of existing bilateral or multilat-
8 eral agreements, an international framework for de-
9 termining the source of any confiscated nuclear or
10 radiological material or weapon, as well as the
11 source of any detonated weapon and the nuclear or
12 radiological material used in such a weapon;

13 (2) develop protocols for the data exchange and
14 dissemination of sensitive information relating to nu-
15 clear or radiological materials and samples of con-
16 trolled nuclear or radiological materials, to the ex-
17 tent required by the agreements entered into under
18 paragraph (1); and

19 (3) develop expedited protocols for the data ex-
20 change and dissemination of sensitive information
21 needed to publicly identify the source of a nuclear
22 detonation.

1 **SEC. 4. RESPONSIBILITIES OF DOMESTIC NUCLEAR DETEC-**
2 **TION OFFICE.**

3 (a) **ADDITIONAL RESPONSIBILITIES.**—Section 1902
4 of the Homeland Security Act of 2002 (as redesignated
5 by Public Law 110–53; 6 U.S.C. 592) is amended—

6 (1) in subsection (a)—

7 (A) in paragraph (9), by striking “and”
8 after the semicolon;

9 (B) by redesignating paragraph (10) as
10 paragraph (14); and

11 (C) by inserting after paragraph (9) the
12 following:

13 “(10) develop and implement, with the approval
14 of the Secretary and in coordination with the heads
15 of appropriate departments and agencies, methods
16 and capabilities to support the attribution of nuclear
17 or radiological material to its source when such ma-
18 terial is intercepted by the United States, foreign
19 governments, or international bodies or is dispersed
20 in the course of a terrorist attack or other nuclear
21 or radiological explosion;

22 “(11) establish, within the Domestic Nuclear
23 Detection Office, the National Technical Nuclear
24 Forensics Center to provide centralized stewardship,
25 planning, assessment, gap analysis, exercises, im-
26 provement, and integration for all Federal nuclear

1 forensics activities in order to ensure an enduring
2 national technical nuclear forensics capability and
3 strengthen the collective response of the United
4 States to nuclear terrorism or other nuclear attacks;

5 “(12) establish a National Nuclear Forensics
6 Expertise Development Program which—

7 “(A) is devoted to developing and main-
8 taining a vibrant and enduring academic path-
9 way from undergraduate to post-doctorate
10 study in nuclear and geochemical science spe-
11 cialties directly relevant to technical nuclear
12 forensics, including radiochemistry, geo-
13 chemistry, nuclear physics, nuclear engineering,
14 materials science, and analytical chemistry; and

15 “(B) shall—

16 “(i) make available for undergraduate
17 study student scholarships, with a duration
18 of up to four years per student, which shall
19 include, whenever possible, at least one
20 summer internship at a national laboratory
21 or appropriate Federal agency in the field
22 of technical nuclear forensics during the
23 course of the student’s undergraduate ca-
24 reer;

1 “(ii) make available for graduate
2 study student fellowships, with a duration
3 of up to five years per student, which—

4 “(I) shall include, whenever pos-
5 sible, at least two summer internships
6 at a national laboratory or appro-
7 priate Federal agency in the field of
8 technical nuclear forensics during the
9 course of the student’s graduate ca-
10 reer; and

11 “(II) shall require each recipient
12 to commit to serve for two years in a
13 post-doctoral position in a technical
14 nuclear forensics-related specialty at a
15 national laboratory or appropriate
16 Federal agency after graduation;

17 “(iii) make available to faculty
18 awards, with a duration of three to five
19 years each, to ensure faculty and their
20 graduate students a sustained funding
21 stream; and

22 “(iv) place a particular emphasis on
23 reinvigorating technical nuclear forensics
24 programs, while encouraging the participa-
25 tion of undergraduate students, graduate

1 students, and university faculty from his-
 2 torically Black colleges and universities,
 3 Hispanic-serving institutions, and Tribal
 4 Colleges and Universities;

5 “(13) provide an annual report to Congress on
 6 the activities carried out under paragraphs (10),
 7 (11), and (12); and”;

8 (2) by adding at the end the following new sub-
 9 section:

10 “(b) DEFINITIONS.—In this section:

11 “(1) HISTORICALLY BLACK COLLEGE OR UNI-
 12 VERSITY.—The term ‘historically Black college or
 13 university’ has the meaning given the term ‘part B
 14 institution’ in section 322(2) of the Higher Edu-
 15 cation Act of 1965 (20 U.S.C. 1061(2)).

16 “(2) HISPANIC-SERVING INSTITUTION.—The
 17 term ‘Hispanic-serving institution’ has the meaning
 18 given that term in section 502 of the Higher Edu-
 19 cation Act of 1965 (20 U.S.C. 1101a).

20 “(3) TRIBAL COLLEGE OR UNIVERSITY.—The
 21 term ‘Tribal College or University’ has the meaning
 22 given that term in section 316(b) of the Higher
 23 Education Act of 1965 (20 U.S.C. 1059e(b)).”.

24 (b) AUTHORIZATION OF APPROPRIATIONS.—There is
 25 authorized to be appropriated the sum of \$30,000,000 for

1 each of the fiscal years 2009, 2010, and 2011 to carry
2 out paragraphs (10) through (13) of section 1902(a) of
3 the Homeland Security Act of 2002, as added by sub-
4 section (a) of this section.

5 **SECTION 1. SHORT TITLE.**

6 *This Act may be cited as the “Nuclear Forensics and*
7 *Attribution Act”.*

8 **SEC. 2. FINDINGS.**

9 *Congress finds the following:*

10 *(1) The threat of a nuclear terrorist attack on*
11 *American interests, both domestic and abroad, is one*
12 *of the most serious threats to the national security of*
13 *the United States. In the wake of an attack, attribu-*
14 *tion of responsibility would be of utmost importance.*
15 *Because of the destructive power of a nuclear weapon,*
16 *there could be little forensic evidence except the radio-*
17 *active material in the weapon itself.*

18 *(2) Through advanced nuclear forensics, using*
19 *both existing techniques and those under development,*
20 *it may be possible to identify the source and pathway*
21 *of a weapon or material after it is interdicted or deto-*
22 *nated. Though identifying intercepted smuggled mate-*
23 *rial is now possible in some cases, pre-detonation*
24 *forensics is a relatively undeveloped field. The post-*
25 *detonation nuclear forensics field is also immature,*

1 *and the challenges are compounded by the pressures*
2 *and time constraints of performing forensics after a*
3 *nuclear or radiological attack.*

4 *(3) A robust and well-known capability to iden-*
5 *tify the source of nuclear or radiological material in-*
6 *tended for or used in an act of terror could also deter*
7 *prospective proliferators. Furthermore, the threat of*
8 *effective attribution could compel improved security*
9 *at material storage facilities, preventing the unwit-*
10 *ting transfer of nuclear or radiological materials.*

11 *(4)(A) In order to identify special nuclear mate-*
12 *rial and other radioactive materials confidently, it is*
13 *necessary to have a robust capability to acquire sam-*
14 *ples in a timely manner, analyze and characterize*
15 *samples, and compare samples against known signa-*
16 *tures of nuclear and radiological material.*

17 *(B) Many of the radioisotopes produced in the*
18 *detonation of a nuclear device have short half-lives, so*
19 *the timely acquisition of samples is of the utmost im-*
20 *portance. Over the past several decades, the ability of*
21 *the United States to gather atmospheric samples—*
22 *often the preferred method of sample acquisition—has*
23 *diminished. This ability must be restored and modern*
24 *techniques that could complement or replace existing*
25 *techniques should be pursued.*

1 (C) *The discipline of pre-detonation forensics is*
2 *a relatively undeveloped field. The radiation associ-*
3 *ated with a nuclear or radiological device may affect*
4 *traditional forensics techniques in unknown ways. In*
5 *a post-detonation scenario, radiochemistry may pro-*
6 *vide the most useful tools for analysis and character-*
7 *ization of samples. The number of radiochemistry*
8 *programs and radiochemists in United States Na-*
9 *tional Laboratories and universities has dramatically*
10 *declined over the past several decades. The narrowing*
11 *pipeline of qualified people into this critical field is*
12 *a serious impediment to maintaining a robust and*
13 *credible nuclear forensics program.*

14 (5) *Once samples have been acquired and charac-*
15 *terized, it is necessary to compare the results against*
16 *samples of known material from reactors, weapons,*
17 *and enrichment facilities, and from medical, aca-*
18 *demical, commercial, and other facilities containing*
19 *such materials, throughout the world. Some of these*
20 *samples are available to the International Atomic*
21 *Energy Agency through safeguards agreements, and*
22 *some countries maintain internal sample databases.*
23 *Access to samples in many countries is limited by na-*
24 *tional security concerns.*

1 (6) *In order to create a sufficient deterrent, it is*
2 *necessary to have the capability to positively identify*
3 *the source of nuclear or radiological material, and po-*
4 *tential traffickers in nuclear or radiological material*
5 *must be aware of that capability. International co-*
6 *operation may be essential to catalogue all existing*
7 *sources of nuclear or radiological material.*

8 **SEC. 3. SENSE OF CONGRESS ON INTERNATIONAL AGREE-**
9 **MENTS FOR FORENSICS COOPERATION.**

10 *It is the sense of the Congress that the President*
11 *should—*

12 (1) *pursue bilateral and multilateral inter-*
13 *national agreements to establish, or seek to establish*
14 *under the auspices of existing bilateral or multilateral*
15 *agreements, an international framework for deter-*
16 *mining the source of any confiscated nuclear or radi-*
17 *ological material or weapon, as well as the source of*
18 *any detonated weapon and the nuclear or radiological*
19 *material used in such a weapon;*

20 (2) *develop protocols for the data exchange and*
21 *dissemination of sensitive information relating to nu-*
22 *clear or radiological materials and samples of con-*
23 *trolled nuclear or radiological materials, to the extent*
24 *required by the agreements entered into under para-*
25 *graph (1); and*

1 (3) develop expedited protocols for the data ex-
2 change and dissemination of sensitive information
3 needed to publicly identify the source of a nuclear det-
4 onation.

5 **SEC. 4. RESPONSIBILITIES OF DOMESTIC NUCLEAR DETEC-**
6 **TION OFFICE.**

7 (a) *ADDITIONAL RESPONSIBILITIES.*—Section 1902 of
8 the Homeland Security Act of 2002 (as redesignated by
9 Public Law 110–53; 6 U.S.C. 592) is amended—

10 (1) in subsection (a)—

11 (A) in paragraph (9), by striking “and”
12 after the semicolon;

13 (B) by redesignating paragraph (10) as
14 paragraph (14); and

15 (C) by inserting after paragraph (9) the fol-
16 lowing:

17 “(10) lead the development and implementation
18 of the national strategic five-year plan for improving
19 the nuclear forensic and attribution capabilities of the
20 United States required under section 1036 of the Na-
21 tional Defense Authorization Act for Fiscal Year
22 2010;

23 “(11) establish, within the Domestic Nuclear De-
24 tection Office, the National Technical Nuclear
25 Forensics Center to provide centralized stewardship,

1 *planning, assessment, gap analysis, exercises, im-*
2 *provement, and integration for all Federal nuclear*
3 *forensics and attribution activities—*

4 *“(A) to ensure an enduring national tech-*
5 *nical nuclear forensics capability to strengthen*
6 *the collective response of the United States to nu-*
7 *clear terrorism or other nuclear attacks; and*

8 *“(B) to coordinate and implement the na-*
9 *tional strategic five-year plan referred to in*
10 *paragraph (10);*

11 *“(12) establish a National Nuclear Forensics Ex-*
12 *pertise Development Program, which—*

13 *“(A) is devoted to developing and maintain-*
14 *ing a vibrant and enduring academic pathway*
15 *from undergraduate to post-doctorate study in*
16 *nuclear and geochemical science specialties di-*
17 *rectly relevant to technical nuclear forensics, in-*
18 *cluding radiochemistry, geochemistry, nuclear*
19 *physics, nuclear engineering, materials science,*
20 *and analytical chemistry;*

21 *“(B) shall—*

22 *“(i) make available for undergraduate*
23 *study student scholarships, with a duration*
24 *of up to 4 years per student, which shall in-*
25 *clude, if possible, at least 1 summer intern-*

1 *ship at a national laboratory or appro-*
2 *priate Federal agency in the field of tech-*
3 *nical nuclear forensics during the course of*
4 *the student's undergraduate career;*

5 *“(ii) make available for doctoral study*
6 *student fellowships, with a duration of up*
7 *to 5 years per student, which shall—*

8 *“(I) include, if possible, at least 2*
9 *summer internships at a national lab-*
10 *oratory or appropriate Federal agency*
11 *in the field of technical nuclear*
12 *forensics during the course of the stu-*
13 *dent's graduate career; and*

14 *“(II) require each recipient to*
15 *commit to serve for 2 years in a post-*
16 *doctoral position in a technical nuclear*
17 *forensics-related specialty at a national*
18 *laboratory or appropriate Federal*
19 *agency after graduation;*

20 *“(iii) make available to faculty*
21 *awards, with a duration of 3 to 5 years*
22 *each, to ensure faculty and their graduate*
23 *students have a sustained funding stream;*
24 *and*

1 “(iv) place a particular emphasis on
2 reinvigorating technical nuclear forensics
3 programs while encouraging the participa-
4 tion of undergraduate students, graduate
5 students, and university faculty from his-
6 torically Black colleges and universities,
7 Hispanic-serving institutions, Tribal Col-
8 leges and Universities, Asian American and
9 Native American Pacific Islander-serving
10 institutions, Alaska Native-serving institu-
11 tions, and Hawaiian Native-serving institu-
12 tions; and

13 “(C) shall—

14 “(i) provide for the selection of indi-
15 viduals to receive scholarships or fellowships
16 under this section through a competitive
17 process primarily on the basis of academic
18 merit and the nuclear forensics and attribu-
19 tion needs of the United States Government;

20 “(ii) provide for the setting aside of up
21 to 10 percent of the scholarships or fellow-
22 ships awarded under this section for indi-
23 viduals who are Federal employees to en-
24 hance the education of such employees in
25 areas of critical nuclear forensics and attri-

1 *bution needs of the United States Govern-*
2 *ment, for doctoral education under the*
3 *scholarship on a full-time or part-time*
4 *basis;*

5 *“(iii) provide that the Secretary may*
6 *enter into a contractual agreement with an*
7 *institution of higher education under which*
8 *the amounts provided for a scholarship*
9 *under this section for tuition, fees, and*
10 *other authorized expenses are paid directly*
11 *to the institution with respect to which such*
12 *scholarship is awarded;*

13 *“(iv) require scholarship recipients to*
14 *maintain satisfactory academic progress;*
15 *and*

16 *“(v) require that—*

17 *“(I) a scholarship recipient who*
18 *fails to maintain a high level of aca-*
19 *demie standing, as defined by the Sec-*
20 *retary, who is dismissed for discipli-*
21 *nary reasons from the educational in-*
22 *stitution such recipient is attending, or*
23 *who voluntarily terminates academic*
24 *training before graduation from the*
25 *educational program for which the*

1 *scholarship was awarded shall be liable*
2 *to the United States for repayment*
3 *within 1 year after the date of such de-*
4 *fault of all scholarship funds paid to*
5 *such recipient and to the institution of*
6 *higher education on the behalf of such*
7 *recipient, provided that the repayment*
8 *period may be extended by the Sec-*
9 *retary if the Secretary determines it*
10 *necessary, as established by regulation;*
11 *and*

12 “(II) a scholarship recipient who,
13 *for any reason except death or dis-*
14 *ability, fails to begin or complete the*
15 *post-doctoral service requirements in a*
16 *technical nuclear forensics-related spe-*
17 *cialty at a national laboratory or ap-*
18 *propriate Federal agency after comple-*
19 *tion of academic training shall be lia-*
20 *ble to the United States for an amount*
21 *equal to—*

22 “(aa) the total amount of the
23 *scholarship received by such re-*
24 *ipient under this section; and*

1 “(bb) *the interest on such*
2 *amounts which would be payable*
3 *if at the time the scholarship was*
4 *received such scholarship was a*
5 *loan bearing interest at the max-*
6 *imum legally prevailing rate;*

7 “(13) *provide an annual report to Congress on*
8 *the activities carried out under paragraphs (10), (11),*
9 *and (12); and*”;
10 *and*

11 (2) *by adding at the end the following new sub-*
12 *section:*

13 “(b) *DEFINITIONS.—In this section:*

14 “(1) *ALASKA NATIVE-SERVING INSTITUTION.—*
15 *The term ‘Alaska Native-serving institution’ has the*
16 *meaning given the term in section 317 of the Higher*
17 *Education Act of 1965 (20 U.S.C. 1059d).*

18 “(2) *ASIAN AMERICAN AND NATIVE AMERICAN*
19 *PACIFIC ISLANDER-SERVING INSTITUTION.—The term*
20 *‘Asian American and Native American Pacific Is-*
21 *lander-serving institution’ has the meaning given the*
22 *term in section 320 of the Higher Education Act of*
23 *1965 (20 U.S.C. 1059g).*

24 “(3) *HAWAIIAN NATIVE-SERVING INSTITUTION.—*
25 *The term ‘Hawaiian native-serving institution’ has*

1 *the meaning given the term in section 317 of the*
2 *Higher Education Act of 1965 (20 U.S.C. 1059d).*

3 “(4) *HISPANIC-SERVING INSTITUTION.*—*The term*
4 *‘Hispanic-serving institution’ has the meaning given*
5 *that term in section 502 of the Higher Education Act*
6 *of 1965 (20 U.S.C. 1101a).*

7 “(5) *HISTORICALLY BLACK COLLEGE OR UNIVER-*
8 *SITY.*—*The term ‘historically Black college or univer-*
9 *sity’ has the meaning given the term ‘part B institu-*
10 *tion’ in section 322(2) of the Higher Education Act*
11 *of 1965 (20 U.S.C. 1061(2)).*

12 “(6) *TRIBAL COLLEGE OR UNIVERSITY.*—*The*
13 *term ‘Tribal College or University’ has the meaning*
14 *given that term in section 316(b) of the Higher Edu-*
15 *cation Act of 1965 (20 U.S.C. 1059c(b)).”.*

16 (b) *JOINT INTERAGENCY ANNUAL REPORTING RE-*
17 *QUIREMENT TO CONGRESS AND THE PRESIDENT.*—

18 (1) *IN GENERAL.*—*Section 1907(a)(1) of the*
19 *Homeland Security Act of 2002 (6 U.S.C. 596a(a)(1))*
20 *is amended—*

21 (A) *in subparagraph (A)(ii), by striking “;*
22 *and” and inserting a semicolon;*

23 (B) *in subparagraph (B)(iii), by striking*
24 *the period at the end and inserting “; and”; and*

1 (C) by adding at the end the following new
2 subparagraph:

3 “(C) the Director of the Domestic Nuclear
4 Detection Office and each of the relevant depart-
5 ments that are partners in the National Tech-
6 nical Forensics Center—

7 “(i) include, as part of the assessments,
8 evaluations, and reviews required under
9 this paragraph, each office’s or department’s
10 activities and investments in support of nu-
11 clear forensics and attribution activities
12 and specific goals and objectives accom-
13 plished during the previous year pursuant
14 to the national strategic five-year plan for
15 improving the nuclear forensic and attribu-
16 tion capabilities of the United States re-
17 quired under section 1036 of the National
18 Defense Authorization Act for Fiscal Year
19 2010;

20 “(ii) attaches, as an appendix to the
21 Joint Interagency Annual Review, the most
22 current version of such strategy and plan;
23 and

24 “(iii) includes a description of new or
25 amended bilateral and multilateral agree-

1 *ments and efforts in support of nuclear*
2 *forensics and attribution activities accom-*
3 *plished during the previous year.”.*

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H. R. 730

AN ACT

To strengthen efforts in the Department of Homeland Security to develop nuclear forensics capabilities to permit attribution of the source of nuclear material, and for other purposes.

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Reported with an amendment