

## Calendar No. 1086

110TH CONGRESS  
2D SESSION**H. R. 2631**

IN THE SENATE OF THE UNITED STATES

JUNE 19, 2008

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

SEPTEMBER 25 (legislative day, SEPTEMBER 17), 2008

Reported by Mr. LIEBERMAN (for himself and Ms. COLLINS), 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 the weap-  
7 on, there could be little forensic evidence except the  
8 radioactive material in the bomb 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 to ensure an enduring national  
2 technical nuclear forensics capability to strengthen  
3 the collective response of the United States to nu-  
4 clear 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. FINDINGS.**

6 *Congress finds the following:*

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

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

1           (3) *A robust and well-known capability to identify the source of nuclear or radiological material intended for or used in an act of terror could also deter prospective proliferators. Furthermore, the threat of effective attribution could compel improved security at material storage facilities, preventing the unwitting transfer of nuclear or radiological materials.*

8           (4)(A) *In order to identify special nuclear material and other radioactive materials confidently, it is necessary to have a robust capability to acquire samples in a timely manner, analyze and characterize samples, and compare samples against known signatures of nuclear and radiological material.*

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

23           (C) *The discipline of pre-detonation forensics is a relatively undeveloped field. The radiation associated with a nuclear or radiological device may affect*

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

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

22 *(6) In order to create a sufficient deterrent, it is*  
23 *necessary to have the capability to positively identify*  
24 *the source of nuclear or radiological material, and po-*  
25 *tential traffickers in nuclear or radiological material*

1       *must be aware of that capability. International co-*  
2       *operation may be essential to catalogue all existing*  
3       *sources of nuclear or radiological material.*

4   **SEC. 2. SENSE OF CONGRESS ON INTERNATIONAL AGREE-**  
5                   **MENTS FOR FORENSICS COOPERATION.**

6       *It is the sense of the Congress that the President*  
7       *should—*

8               (1) *pursue bilateral and multilateral inter-*  
9               *national agreements to establish, or seek to establish*  
10              *under the auspices of existing bilateral or multilateral*  
11              *agreements, an international framework for deter-*  
12              *mining—*

13                   (A) *the source of any confiscated nuclear or*  
14                   *radiological material or weapon; and*

15                   (B) *the source of any detonated weapon and*  
16                   *the nuclear or radiological material used in such*  
17                   *a weapon;*

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

24               (3) *develop expedited protocols for the data ex-*  
25               *change and dissemination of sensitive information*

1       *needed to publicly identify the source of a nuclear det-*  
2       *onation.*

3       **SEC. 3. RESPONSIBILITIES OF DOMESTIC NUCLEAR DETEC-**  
4       **TION OFFICE.**

5       *(a) ADDITIONAL RESPONSIBILITIES.—Section 1902 of*  
6       *the Homeland Security Act of 2002 (6 U.S.C. 592) is*  
7       *amended—*

8               *(1) by striking “(a) MISSION”;*

9               *(2) in paragraph (9), by striking “and” at the*  
10       *end;*

11               *(3) by redesignating paragraph (10) as para-*  
12       *graph (14); and*

13               *(4) by inserting after paragraph (9) the fol-*  
14       *lowing:*

15               *“(10) develop and implement, with the approval*  
16       *of the Secretary, and in consultation with the Attor-*  
17       *ney General, the Secretary of Defense, the Secretary*  
18       *of Energy, the Secretary of State, the Director of Na-*  
19       *tional Intelligence, and the heads of appropriate de-*  
20       *partments and agencies, a ‘National Strategy and*  
21       *Five-Year Implementation Plan for Improving the*  
22       *Nuclear Forensic and Attribution Capabilities of the*  
23       *United States Government’ and the methods, capabili-*  
24       *ties, and capacity for nuclear materials forensics and*  
25       *attribution, including—*

1           “(A) an investment plan to support nuclear  
2 materials forensics and attribution;

3           “(B) the allocation of roles and responsibil-  
4 ities for pre-detonation, detonation, and post-det-  
5 onation activities; and

6           “(C) the attribution of nuclear or radio-  
7 logical material to its source when such material  
8 is intercepted by the United States, foreign gov-  
9 ernments, or international bodies or is dispersed  
10 in the course of a terrorist attack or other nu-  
11 clear or radiological explosion;

12           “(11) establish, within the Domestic Nuclear De-  
13 tention Office, the National Technical Nuclear  
14 Forensics Center to provide centralized stewardship,  
15 planning, assessment, gap analysis, exercises, im-  
16 provement, and integration for all Federal nuclear  
17 forensics and attribution activities—

18           “(A) to ensure an enduring national tech-  
19 nical nuclear forensics capability to strengthen  
20 the collective response of the United States to nu-  
21 clear terrorism or other nuclear attacks; and

22           “(B) to coordinate and implement the na-  
23 tional strategic plan and 5-year plan to improve  
24 national forensics and attribution capabilities

1           *for all Federal nuclear and radiological forensics*  
2           *capabilities;*

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

5                     “(A) *is devoted to developing and maintain-*  
6                     *ing a vibrant and enduring academic pathway*  
7                     *from undergraduate to post-doctorate study in*  
8                     *nuclear and geochemical science specialties di-*  
9                     *rectly relevant to technical nuclear forensics, in-*  
10                    *cluding radiochemistry, geochemistry, nuclear*  
11                    *physics, nuclear engineering, materials science,*  
12                    *and analytical chemistry; and*

13                   “(B) *shall—*

14                             “(i) *make available for undergraduate*  
15                             *study student scholarships, with a duration*  
16                             *of up to 4 years per student, which shall in-*  
17                             *clude, if possible, at least 1 summer intern-*  
18                             *ship at a national laboratory or appro-*  
19                             *priate Federal agency in the field of tech-*  
20                             *nical nuclear forensics during the course of*  
21                             *the student’s undergraduate career;*

22                             “(ii) *make available for graduate study*  
23                             *student fellowships, with a duration of up*  
24                             *to 5 years per student, which shall—*

1                   “(I) include, if possible, at least 2  
2                   summer internships at a national lab-  
3                   oratory or appropriate Federal agency  
4                   in the field of technical nuclear  
5                   forensics during the course of the stu-  
6                   dent’s graduate career; and

7                   “(II) require each recipient to  
8                   commit to serve for 2 years in a post-  
9                   doctoral position in a technical nuclear  
10                  forensics-related specialty at a national  
11                  laboratory or appropriate Federal  
12                  agency after graduation;

13                  “(iii) make available to faculty  
14                  awards, with a duration of 3 to 5 years  
15                  each, to ensure faculty and their graduate  
16                  students have a sustained funding stream;  
17                  and

18                  “(iv) place a particular emphasis on  
19                  reinvigorating technical nuclear forensics  
20                  programs; and”.

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

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

1           (A) in subparagraph (A)(ii), by striking  
2           “and” at the end;

3           (B) in subparagraph (B)(iii), by striking  
4           the period at the end and inserting “; and”; and

5           (C) by adding at the end the following:

6           “(C) the Director of the Domestic Nuclear  
7           Detection Office and each of the relevant Depart-  
8           ments that are partners in the National Tech-  
9           nical Forensics Center—

10           “(i) includes, as part of the assess-  
11           ments, evaluations, and reviews required  
12           under this paragraph, each relevant agen-  
13           cy’s activities and investments in support of  
14           nuclear forensics and attribution activities;

15           “(ii) attaches, as an appendix to the  
16           Joint Interagency Annual Review, the most  
17           current version of the plan required under  
18           section 1902(a)(10); and

19           “(iii) after March 31 of each year,  
20           funds allocated for activities authorized  
21           under section 1902 are not spent until the  
22           submission to Congress of the report re-  
23           quired under subsection (b).”.



**Calendar No. 1086**

110<sup>TH</sup> CONGRESS  
2<sup>D</sup> SESSION

**H. R. 2631**

---

---

**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.

---

---

SEPTEMBER 25 (legislative day, SEPTEMBER 17), 2008

Reported with an amendment