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# NUCLEAR NON-PROLIFERATION POLICY ACT OF 1977

GOVERNMENT

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## HEARINGS

BEFORE THE

MAR 17 1978

SUBCOMMITTEE ON  
ENERGY RESEARCH AND DEVELOPMENT

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OF THE

## COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

NINETY-FIFTH CONGRESS

FIRST SESSION

ON

S. 897

A BILL TO STRENGTHEN UNITED STATES POLICIES ON NON-PROLIFERATION AND TO REORGANIZE CERTAIN EXPORT FUNCTIONS OF THE FEDERAL GOVERNMENT TO PROMOTE MORE EFFICIENT ADMINISTRATION OF SUCH FUNCTIONS

S. 1432

A BILL TO PROVIDE FOR MORE EFFICIENT AND EFFECTIVE CONTROL OVER THE PROLIFERATION OF NUCLEAR EXPLOSIVES BY AMENDMENTS TO THE ATOMIC ENERGY ACT OF 1954, AS AMENDED, AND FOR OTHER PURPOSES

JUNE 10, SEPTEMBER 13, AND 14, 1977

Publication No. 95-86



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INFORMATION





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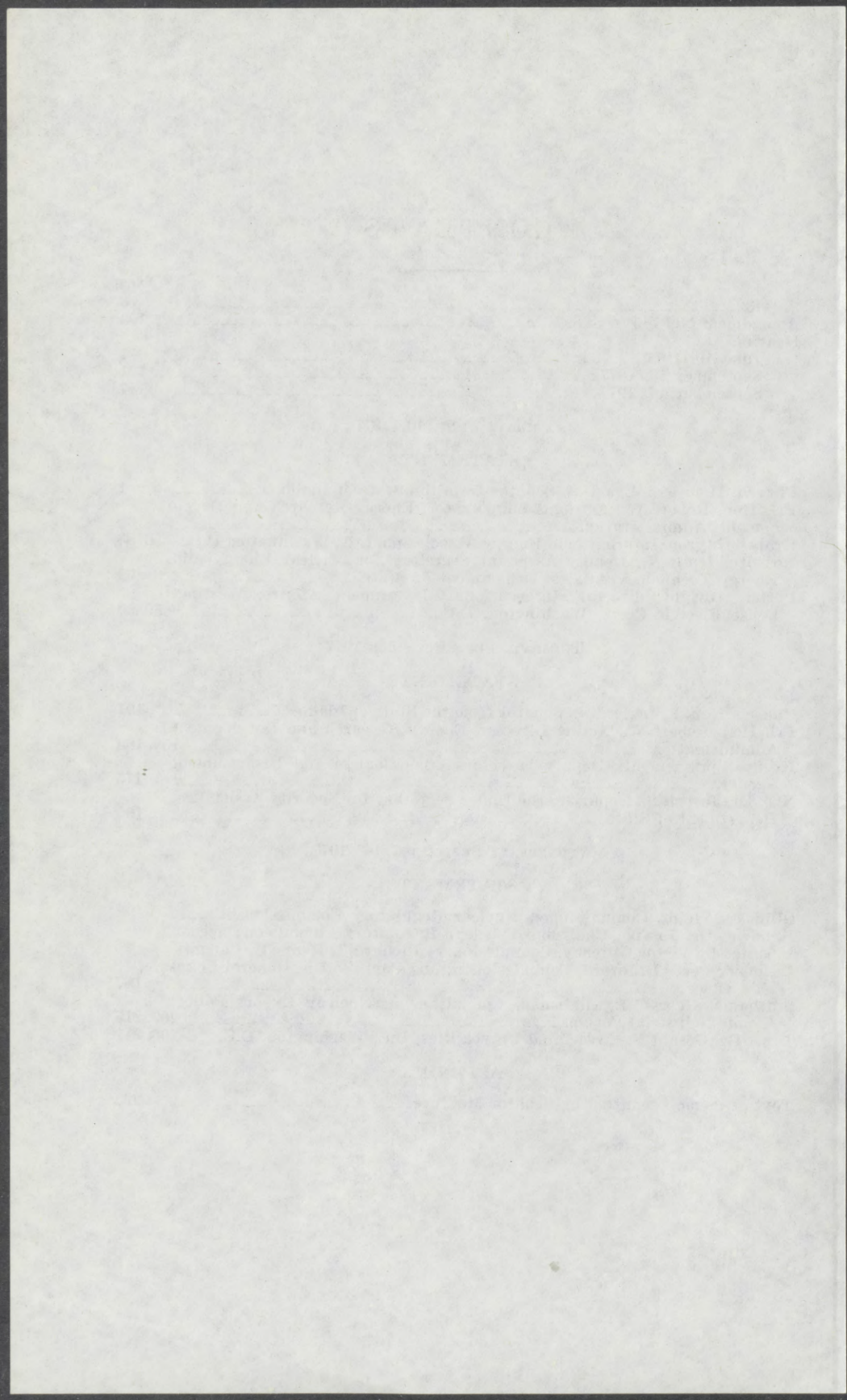
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# NUCLEAR NON-PROLIFERATION POLICY ACT OF 1977

FRIDAY, JUNE 10, 1977

U.S. SENATE,  
SUBCOMMITTEE ON ENERGY RESEARCH AND DEVELOPMENT,  
OF THE COMMITTEE ON ENERGY AND NATURAL RESOURCES,  
*Washington, D.C.*

The subcommittee met, pursuant to notice, at 9:30 a.m., in room 3110, Dirksen Office Building, Hon. Frank Church, presiding.

Present: Senators Church and McClure.

Also present: Ben Yamagata, counsel; Willis Smith, counsel; and Charles Trabandt, counsel for the minority.

## OPENING STATEMENT OF HON. FRANK CHURCH, A U.S. SENATOR FROM THE STATE OF IDAHO

Senator CHURCH. The hearing will come to order.

On April 7, 1977, President Carter announced his nuclear power policy. The policy statement set forth seven specific objectives which have substantial ramifications for the future use of nuclear energy in this country and the rest of the world.

The two proposed instruments for implementing this policy are the revised fiscal year 1978 ERDA authorization draft bill and S. 1432, the Nuclear Non-Proliferation Act of 1977, which was introduced at the President's request.

These legislative proposals are linked in that S. 1432 is designed to establish a nonproliferation framework with specific objectives established for the ERDA nuclear energy programs. The ERDA authorization bill is the budgetary vehicle to implement those objectives.

Therefore, the Committee on Energy and Natural Resources obtained joint referral of certain portions of the Nuclear Non-Proliferation Act to insure that nonproliferation policy is implemented in a manner consistent with the policy of having sufficient energy for this country and foreign countries in the future.

Additionally, the Subcommittee on Energy Research and Development must examine the costs and the consequences of various initiatives before they are implemented. For example, the proposal to guarantee uranium enrichment services for foreign nations poses specific requirements on ERDA to expand considerably our enrichment capacity by the year 2000.

Without reprocessing, it is expected that spent fuel rods from abroad will be returned to this country for storage with attendant costs and siting decisions. Also, international fuel cycle evaluation programs must be carefully examined to insure that all options, including re-

gional fuel cycle centers with international controls and inspection, are considered in seeking international approaches to the nonproliferation objectives.

It is these and related questions to which the subcommittee seeks answers at our hearing this morning.

I will place in the record at this point a copy of S. 1432.

[The text of S. 1432 follows:]



95TH CONGRESS  
1ST SESSION

# S. 1432

## IN THE SENATE OF THE UNITED STATES

APRIL 29 (legislative day, APRIL 28), 1977

Mr. GLENN introduced the following bill; which was read twice and jointly referred to the Committee on Governmental Affairs, the Committee on Foreign Relations, and the Committee on Energy and Natural Resources with the proviso that the Energy and Natural Resources Committee shall be limited in its consideration to sections 202, 302, 303, and 305, and further that if the Governmental Affairs Committee or the Foreign Relations Committee reports the legislation prior to the Energy and Natural Resources Committee, then the Energy and Natural Resources Committee shall report its recommendations on such sections to the Senate not later than 10 days during which the Senate is in session, after either of the other two committees report or be discharged from further consideration of the legislation, and further that when either Foreign Relations or Governmental Affairs reports the legislation, the other committee shall have 30 additional days, during which the Senate is in session, to report the legislation or, at the end of such 30 days, be discharged from further consideration of the legislation, by unanimous consent

## A BILL

To provide for more efficient and effective control over the proliferation of nuclear explosives by amendments to the Atomic Energy Act of 1954, as amended, 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 That this Act may be cited as the "Nuclear Non-Prolifera-
- 4 tion Policy Act of 1977".

II

## STATEMENT OF POLICY

1  
2 SEC. 2. The Congress hereby finds and declares that the  
3 proliferation of nuclear explosive devices poses a grave threat  
4 to security interests of the United States and continued inter-  
5 national progress toward world peace and development.  
6 Recent events emphasize the urgency of this threat and the  
7 imperative need to increase the effectiveness of international  
8 safeguards and controls on peaceful nuclear activities to  
9 prevent further proliferation of nuclear explosive devices.  
10 Accordingly, it is the policy of the United States to—

11 (a) actively pursue through international initiatives  
12 the establishment of more effective international controls  
13 over the transfer and use of nuclear equipment, material,  
14 and nuclear technology for peaceful purposes in order to  
15 prevent the further proliferation of nuclear explosive de-  
16 vices, including the establishment of common interna-  
17 tional sanctions to prevent such proliferation;

18 (b) take such actions as are required to enhance  
19 the reliability of the United States as a supplier of nu-  
20 clear reactors and fuel to nations which share our non-  
21 proliferation policies;

22 (c) strongly encourage nations which have not rati-  
23 fied the Treaty on the Non-Proliferation of Nuclear  
24 Weapons (the "Treaty") to do so at the earliest pos-  
25 sible date; and



(d) aid foreign nations in identifying and adapting appropriate technology for energy production consistent with the economic and material resources and environmental protection of those nations.

#### STATEMENT OF PURPOSE

SEC. 3. It is the purpose of this Act to promote the policies set forth above by—

(a) establishing a more effective framework for international cooperation to insure that the worldwide development of peaceful nuclear activities and the export by any nation of nuclear materials, equipment, and nuclear technology intended for use in peaceful nuclear activities do not contribute to the proliferation of nuclear explosive devices;

(b) authorizing the United States to take such actions as are required to assert itself as a reliable supplier of nuclear reactors and fuel to nations which share our non-proliferation policies;

(c) providing incentives to the other nations of the world to join in such international cooperative efforts;  
and

(d) insuring effective controls by the United States over its exports of nuclear equipment, materials, and sensitive nuclear technology.

1 CHAPTER I. UNITED STATES INITIATIVES FOR  
2 INTERNATIONAL NUCLEAR COOPERATION

3 SEC. 101. The United States shall act immediately to  
4 seek to achieve from all nations and groups of nations  
5 stronger and more comprehensive commitments to adhere  
6 to the nonproliferation principles and the other objectives  
7 set forth in this Act, and to develop adequate means and  
8 mechanisms for insuring such adherence. Accordingly, the  
9 President shall take immediate steps to seek to have all  
10 nations and groups of nations, including nuclear supplier  
11 nations, commit themselves to international arrangements or  
12 other mutual undertakings in furtherance of the following  
13 objectives:

14 (a) preventing the use of nuclear material, equip-  
15 ment, or technology in, under the jurisdiction of, or  
16 under the control of any non-nuclear-weapon state for  
17 nuclear explosive devices for any purpose or for research  
18 on or development of nuclear explosive devices for any  
19 purpose, except as permitted by the treaty;

20 (b) achieving universal application of International  
21 Atomic Energy Agency safeguards to all peaceful nu-  
22 clear activities in, under the jurisdiction of, or under the  
23 control of, non-nuclear-weapon states;

24 (c) establishing and maintaining adequate physical



1 security measures by all nations or groups of nations  
2 on all of their nuclear activities;

3 (d) insuring that no nuclear material, equipment,  
4 or technology intended for peaceful purpose in, under  
5 the jurisdiction of, or under the control of any nation  
6 or group of nations shall be transferred by them to the  
7 jurisdiction of any other nation or group of nations  
8 unless such recipient nation or group of nations agrees  
9 to stringent undertakings meeting the objectives of this  
10 section;

11 (e) restraining the further spread of nuclear fuel  
12 reprocessing or uranium enrichment facilities on a na-  
13 tional basis;

14 (f) otherwise preventing the further spread or ac-  
15 quisition of material, equipment, or technology that will  
16 assist, encourage, or induce, any non-nuclear-weapon  
17 state to manufacture or otherwise acquire any nuclear  
18 explosive device;

19 (g) adopting general principles and procedures,  
20 including common international sanctions, to be followed  
21 in the event a nation violates any material obligation  
22 with respect to the peaceful use of nuclear materials,  
23 equipment, or technology, or in the event that any  
24 nation violates the principles of the Treaty, including

1 the detonation by a non-nuclear-weapon state of a nu-  
2 clear explosive device;

3 (h) establishing international procedures to be  
4 followed in the event of diversion, theft, or sabotage of  
5 nuclear materials or sabotage of nuclear facilities and for  
6 recovering nuclear materials that have been lost or  
7 stolen, or obtained or used by a nation or by any person  
8 or group in contravention of the principles of the Treaty;  
9 and

10 (i) protecting the international environment from  
11 radioactive, chemical or thermal contamination arising  
12 from peaceful nuclear activities.

13 CHAPTER II. UNITED STATES INITIATIVES  
14 TO STRENGTHEN THE INTERNATIONAL  
15 ATOMIC ENERGY AGENCY

16 SEC. 201. The United States is committed to a strength-  
17 ened and more effective International Atomic Energy  
18 Agency (IAEA) and to a comprehensive safeguards sys-  
19 tem administered by that agency to deter the further pro-  
20 liferation of nuclear explosives. Accordingly, the United  
21 States will continually seek to act with other nations to  
22 strengthen the IAEA through contribution of technical re-  
23 sources, support, funding, and by—

24 (a) continuing to strengthen the safeguards pro-  
25 gram of the IAEA and, in order to implement this initia-



1       tive, contributing funds, technical resources, and other  
2       support to assist the IAEA in effectively implementing  
3       safeguards at this time when international utilization of  
4       nuclear power for growing energy needs is rapidly in-  
5       creasing;

6           (b) assuring that the IAEA has the resources to  
7       carry out the provisions of article XII ("agency safe-  
8       guards") of the Statute of the International Atomic  
9       Energy Agency;

10          (c) improving the IAEA safeguards system (in-  
11       cluding accountability) to insure—

12           (1) the timely detection of a possible diver-  
13       sion of source or special nuclear materials which  
14       could be used for nuclear explosive devices;

15           (2) the timely dissemination of information  
16       regarding such diversion; and

17           (3) the timely implementation of internation-  
18       ally agreed procedures in the event of such diver-  
19       sion;

20          (d) assuring both that the IAEA receives the data  
21       needed for it to administer an effective and compre-  
22       hensive international safeguards program and that the  
23       IAEA provides timely notice to the world community  
24       of any evidence of violation of safeguards agreements  
25       to which it is a party; and

1           (e) consistent with the policies of this Act, devis-  
2       ing feasible and environmentally sound approaches for  
3       the siting, development, and management under effective  
4       international auspices of facilities for the provision of  
5       nuclear fuel services and the storage of special nuclear  
6       material which is sensitive from the standpoint of pre-  
7       venting the proliferation of nuclear explosive devices.

8       SEC. 202. The Energy Research and Development Ad-  
9       ministration, in consultation with the Nuclear Regulatory  
10      Commission, shall establish and operate a safeguards and  
11      physical security training program to be made available to  
12      persons from nations or groups of nations which have or may  
13      be expected to develop or acquire, nuclear materials or equip-  
14      ment for use for peaceful purposes. Any such program shall  
15      include training in the most advanced safeguards and phys-  
16      ical security techniques and technology, consistent with na-  
17      tional security interests of the United States.

18      SEC. 203. The Department of Commerce (acting  
19      through the National Bureau of Standards), the Energy  
20      Research and Development Administration, and the Nu-  
21      clear Regulatory Commission shall, in consultation with the  
22      Department of State and the Arms Control and Disarma-  
23      ment Agency, work cooperatively to establish a program to  
24      develop reference methods and standards for measurement of  
25      nuclear materials and other substances needed to insure



1 that consistent and compatible measurements can be made  
2 at all points of the nuclear materials safeguards system of  
3 sufficient accuracy to meet the requirements of the system.  
4 These standards and services may be made available to the  
5 International Atomic Energy Agency for such safeguards  
6 purposes and to nations and groups of nations selected for  
7 such assistance by the above named agencies in accordance  
8 with the Atomic Energy Act of 1954, as amended.

9 CHAPTER III. UNITED STATES INITIATIVES FOR  
10 ASSURING ADEQUATE NUCLEAR FUEL SUPPLY

11 SEC. 301. The United States, as a matter of national  
12 policy, shall take such actions and institute such measures  
13 as may be necessary and feasible to assure other nations  
14 and groups of nations that may seek to utilize the benefits  
15 of atomic energy for peaceful purposes, including the genera-  
16 tion of electricity, that it will provide a reliable supply of  
17 nuclear fuel to those nations or groups of nations which  
18 adhere to policies designed to prevent the proliferation of  
19 nuclear explosive devices. Such nuclear fuel shall be pro-  
20 vided under agreements entered into pursuant to section  
21 161 of the Atomic Energy Act of 1954, as amended, or as  
22 otherwise authorized by law. The United States will strive  
23 to assure that it will have available the capacity to carry  
24 out this policy on a long-term basis. The United States, as  
25 a matter of national policy, shall, on a timely basis, issue

1 licenses for, or otherwise authorize the export of, nuclear  
2 materials and equipment, when all the applicable statutory  
3 requirements are met.

4 SEC. 302. The Administrator of Energy Research and  
5 Development is directed to initiate construction planning and  
6 design, construction, and operation activities for expansion  
7 of uranium enrichment capacity, as elsewhere provided by  
8 law.

9 SEC. 303. The President shall promptly undertake a  
10 study to determine the need for additional United States en-  
11 richment capacity to meet domestic needs and to promote  
12 United States nonproliferation objectives abroad. The Presi-  
13 dent shall report to the Congress on the results of this study  
14 within six months after the enactment of this Act.

15 SEC. 304. The President shall institute prompt discus-  
16 sions with other nations or groups of nations to develop  
17 multilateral approaches for meeting future worldwide nuclear  
18 fuel needs. The President shall report to the Congress on the  
19 progress of these discussions as required by section 601 of  
20 this Act, and shall propose to the Congress any legislation  
21 he considers necessary to promote the objective of assuring  
22 a reliable supply of nuclear fuel to nations which have dem-  
23 onstrated a commitment to preventing the proliferation of  
24 nuclear explosive devices.

25 SEC. 305. The President shall institute an immediate



1 initiative to establish an intensive international fuel cycle  
 2 evaluation program involving other nuclear supplier and  
 3 recipient countries to reevaluate all aspects of the nuclear  
 4 fuel cycle, with emphasis on alternatives to an economy  
 5 based on separation of pure plutonium or the presence of  
 6 high enriched uranium and problems related to spent fuel  
 7 storage. The President shall submit a special report to the  
 8 Congress no later than one year after enactment of this Act,  
 9 detailing the progress of the international nuclear fuel cycle  
 10 evaluation program.

#### 11 CHAPTER IV. AGREEMENTS FOR COOPERATION

12 SEC. 401. Section 123 of the Atomic Energy Act of  
 13 1954, as amended, is amended to read as follows:

14 "SEC. 123. COOPERATION WITH OTHER NATIONS.—  
 15 No cooperation with any nation or regional defense orga-  
 16 nization pursuant to section 53, 54a, 57, 64, 82, 91, 103,  
 17 104, or 144 shall be undertaken until—

18 "a. the proposed agreement for cooperation has  
 19 been submitted to the President, which proposed agree-  
 20 ment shall include (1) the terms, conditions, duration,  
 21 nature, and scope of the cooperation; (2) a guaranty  
 22 by the cooperating party that safeguards as set forth in  
 23 the agreement for cooperation will be maintained with  
 24 respect to all nuclear materials and equipment transferred  
 25 pursuant thereto, and with respect to all special nuclear

1 material produced through the use of such nuclear ma-  
2 terials and equipment, so long as the material or equip-  
3 ment remains under the jurisdiction or control of the  
4 cooperating party, irrespective of the duration of other  
5 provisions in the agreement or whether the agreement  
6 is terminated or suspended for any reason; (3) in the  
7 case of non-nuclear-weapon states, a requirement, as a  
8 condition of continued United States nuclear supply  
9 under the agreement for cooperation, that IAEA safe-  
10 guards be maintained with respect to all nuclear ma-  
11 terials in all peaceful nuclear activities within the  
12 territory of such state, under its jurisdiction, or carried  
13 out under its control anywhere; (4) except in the case  
14 of those agreements for cooperation arranged pursuant  
15 to subsection 91 c., a guaranty by the cooperating party  
16 that any material to be transferred pursuant to such  
17 agreement, and any special nuclear material produced  
18 through the use of any material, production facility, or  
19 utilization facility transferred pursuant to such agree-  
20 ment, and any sensitive nuclear technology transferred  
21 pursuant to such agreement, will not be used for atomic  
22 weapons or any nuclear explosive devices, or for re-  
23 search on or development of atomic weapons or any  
24 nuclear explosive devices, or for any other military  
25 purpose; (5) except in the case of those agreements



1 for cooperation arranged pursuant to subsection 91 c.  
2 and agreements for cooperation with nuclear-weapon  
3 states, a stipulation that United States cooperation under  
4 the agreement for cooperation shall cease if the co-  
5 operating party detonates a nuclear explosive device,  
6 terminates or abrogates an agreement providing for  
7 IAEA safeguards, or materially violates an IAEA safe-  
8 guards agreement or any guarantee it has given under  
9 the agreement for cooperation; (6) a guaranty by the  
10 cooperating party that any material or any Restricted  
11 Data transferred pursuant to the agreement for coopera-  
12 tion and, except in the case of agreements arranged  
13 pursuant to subsection 91 c., 144 b. or 144 c., any pro-  
14 duction or utilization facility transferred pursuant to the  
15 agreement for cooperation or any special nuclear ma-  
16 terial produced through the use of any such facility  
17 or through the use of any material transferred pursuant  
18 to the agreement, will not be transferred to unauthorized  
19 persons or beyond the jurisdiction or control of the  
20 cooperating party without the consent of the United  
21 States; (7) a guaranty by the cooperating party that  
22 adequate physical security will be maintained with re-  
23 spect to any material transferred pursuant to such agree-  
24 ment and with respect to any special nuclear material  
25 used in or produced through the use of any material,

1 production facility, or utilization facility transferred pur-  
2 suant ot such agreement; (8) except in the case of  
3 agreements for cooperation arranged pursuant to sub-  
4 section 91 c., 144 b., or 144 c., a guaranty by the co-  
5 operating party that no material transferred pursuant  
6 to the agreement for cooperation and no material used  
7 in or produced through the use of any material,  
8 production facility, or utilization facility transferred  
9 pursuant to the agreement for cooperation will be re-  
10 processed or otherwise altered in form or content with-  
11 out the prior approval of the United States or stored  
12 in any facility that has not been approved in advance  
13 by the United States; and (9) except in the case of  
14 agreements for cooperation arranged pursuant to sub-  
15 section 91 c., 144 b., or 144 c., a guaranty by the  
16 cooperating party that any special nuclear material,  
17 production facility, or utilization facility produced or  
18 constructed in the territory of the cooperating party  
19 by or through the use of any sensitive nuclear tech-  
20 nology transferred pursuant to such agreement for co-  
21 operation will be subject to all the guarantees specified  
22 in this subsection. The President may exempt a pro-  
23 posed agreement for cooperation (except an agreement  
24 arranged pursuant to section 91 c., 144 b., or 144 c.)  
25 from any of the requirements of the foregoing sentence



1 if he determines that inclusion of any such requirement  
2 would be seriously prejudicial to the achievement of  
3 United States nonproliferation objectives or otherwise  
4 jeopardize the common defense and security. Except  
5 in the case of those agreements for cooperation arranged  
6 pursuant to subsection 91 c., 144 b., or 144 c., any pro-  
7 posed agreement for cooperation shall (i) be negotiated  
8 by the Secretary of State, with the technical assistance  
9 and concurrence of the Administrator of Energy Re-  
10 search and Development; (ii) after consultations with  
11 the Nuclear Regulatory Commission, be submitted to  
12 the President jointly by the Secretary of State and the  
13 Administrator; and (iii) be submitted to the President  
14 accompanied by the views and recommendations of the  
15 Secretary of State, the Administrator, and the Director  
16 of the Arms Control and Disarmament Agency who  
17 shall also provide to the President an unclassified Nu-  
18 clear Proliferation Assessment Statement regarding the  
19 adequacy of the safeguards and other control mecha-  
20 nisms and the peaceful use assurances contained in the  
21 agreement for cooperation to insure that any assistance  
22 furnished thereunder will not be used to further any  
23 military or nuclear explosive purpose. In the case of  
24 these agreements for cooperation arranged pursuant to  
25 subsection 91 c., 144 b., or 144 c., any proposed agree-

1       ment for cooperation shall be submitted to the Presi-  
2       dent by the Administrator of Energy Research and  
3       Development or, in the case of those agreements for  
4       cooperation arranged pursuant to subsection 91 c. or  
5       144 b. which are to be implemented by the Department  
6       of Defense, by the Secretary of Defense;

7       “b. the President has approved and authorized the  
8       execution of the proposed agreement for cooperation and  
9       has made a determination in writing that the perform-  
10      ance of the proposed agreement will promote and will  
11      not constitute an unreasonable risk to the common de-  
12      fense and security;

13      “c. the proposed agreement for cooperation (if not  
14      an agreement subjection to subsection d.), together with  
15      the approval and determination of the President, has  
16      been submitted to the Committee on International Rela-  
17      tions of the House of Representatives and the Committee  
18      on Foreign Relations of the Senate and a period of  
19      thirty days has elapsed while Congress is in session (in  
20      computing such thirty days, there shall be excluded the  
21      days on which either House is not in session because  
22      of an adjournment of more than three days) : *Provided,*  
23      *however,* That these committees, after having received  
24      such agreement for cooperation, may by resolution in



1 writing waive the conditions of all or any portion of  
2 such thirty-day period;

3 "d. the proposed agreement for cooperation together  
4 with the approval and determination of the President,  
5 if arranged pursuant to subsection 91 c., 144 b., or  
6 144 c., or if entailing implementation of section 53, 54a,  
7 103, or 104 in relation to a reactor that may be capable  
8 of producing more than five thermal megawatts or spe-  
9 cial nuclear material for use in connection therewith,  
10 has been submitted to the Congress together with any  
11 required nuclear proliferation assessment statement  
12 prepared by the Director of the Arms Control and Dis-  
13 armament Agency, and referred to the Committee on  
14 International Relations of the House of Repre-  
15 sentatives and the Committee on Foreign Relations of  
16 the Senate and a period of sixty days has elapsed while  
17 Congress is in session (in computing such sixty days  
18 there shall be excluded the days on which either House  
19 is not in session because of an adjournment of more than  
20 three days), but such proposed agreement for coopera-  
21 tion shall not become effective if during such sixty-day  
22 period a joint resolution is enacted stating in substance  
23 that the Congress does not favor the proposed agree-  
24 ment for cooperation;

1           “e. following submission of a proposed agreement  
2       for cooperation (except an agreement for cooperation  
3       arranged pursuant to subsection 91 c., 144 b., or 144  
4       c.) to the Committee on Foreign Relations of the Sen-  
5       ate and Committee on International Relations of the  
6       House of Representatives, the Nuclear Regulatory Com-  
7       mission, the Department of State, the Energy Research  
8       and Development Administration, the Arms Control  
9       and Disarmament Agency, and Department of Defense  
10      shall, upon the request of either of those committees,  
11      promptly furnish to those committees their views as to  
12      whether the safeguards and other controls contained  
13      therein provide an adequate framework to insure that  
14      the export of any nuclear materials or equipment as con-  
15      templated by such agreement will not be inimical to or  
16      constitute an unreasonable risk to the common defense  
17      and security.”.

18      SEC. 402. The amendments to section 123 of the Atomic  
19      Energy Act of 1954, as amended, made by this Act, shall  
20      not affect the authority to continue cooperation pursuant to  
21      agreements for cooperation entered into prior to the effective  
22      date of this Act.

23      SEC. 403. The President shall initiate an immediate  
24      program to renegotiate agreements for cooperation in effect  
25      on the date of the enactment of this Act, or otherwise to



1 obtain the agreement of parties to such agreements, to the  
2 undertakings that would be required for new agreements  
3 under this Act. The President shall also institute an immedi-  
4 ate initiative to seek international arrangements or other  
5 mutual undertakings with nuclear supplier nations for the  
6 application of the policies contained in section 123 a., as  
7 amended, by such nations as nuclear export guidelines.

8       SEC. 404. Prior to entering into any subsequent arrange-  
9 ments under agreement for cooperation other than an agree-  
10 ment for cooperation arranged pursuant to subsection 91 c.,  
11 144 b., or 144 c. of the Atomic Energy Act of 1954, as  
12 amended, the Energy Research and Development Adminis-  
13 tration shall obtain the concurrence of the Secretary of State  
14 and shall consult with and take into full consideration the  
15 recommendations of the Nuclear Regulatory Commission,  
16 the Arms Control and Disarmament Agency, and the De-  
17 partment of Defense, in order, to assure that the subsequent  
18 arrangements are consistent with the agreement for co-  
19 operation and the policy of preventing the proliferation of  
20 nuclear explosive devices. For purposes of this subsection,  
21 the term "subsequent arrangements" shall include contracts  
22 for the furnishing of nuclear materials or equipment; ap-  
23 provals for the reexport of nuclear materials or equipment  
24 previously exported pursuant to an agreement for coopera-  
25 tion; authorization for the distribution of nuclear materials

1 or equipment pursuant to the Atomic Energy Act; arrange-  
2 ments for physical security; arrangements for the applica-  
3 tion of safeguards with respect to United States supplied  
4 source material, special nuclear material, production facili-  
5 ties, or utilization facilities, or any other arrangement which  
6 the President finds to be important from the standpoint of  
7 preventing the proliferation of nuclear explosive devices.

8 SEC. 405. No court shall have any jurisdiction under  
9 any law to compel the performance of, or to review the  
10 adequacy of the performance of, any Nuclear Proliferation  
11 Assessment Statement called for in this Act.

## 12 CHAPTER V. CLARIFICATION OF EXPORT

### 13 FUNCTIONS

14 SEC. 501. Section 54 a. of the Atomic Energy Act of  
15 1954, as amended, is amended by inserting the following as  
16 the second sentence thereof: "The authority of the Energy  
17 Research and Development Administration to distribute  
18 special nuclear material under this section other than under  
19 an export license granted by the Nuclear Regulatory Com-  
20 mission shall extend only to small quantities of special  
21 nuclear material (in no event more than five hundred grams  
22 per year of contained special nuclear material to any  
23 recipient): (1) which are contained in laboratory samples,  
24 medical devices, or monitoring or other instruments; or



1 (2) the distribution of which is needed to deal with an  
2 emergency situation in which time is of the essence.”.

3 SEC. 502. Subsection 57 b. of the Atomic Energy Act  
4 of 1954, as amended, is amended to read as follows:

5 “b. It shall be unlawful for any person to directly or  
6 indirectly engage in the production of any special nuclear  
7 material outside of the United States except (1) under an  
8 agreement for cooperation made pursuant to section 123, or  
9 (2) upon authorization by the Administrator of Energy  
10 Research and Development after a determination that such  
11 activity will not be inimical to the interest of the United  
12 States: *Provided*, That any such determination by the Ad-  
13 ministrator shall be made only after consultation with the  
14 Department of State, the Arms Control and Disarmament  
15 Agency, and the Nuclear Regulatory Commission under  
16 mutually agreed-to procedures which shall be established  
17 within not more than ninety days after the date of enactment  
18 of this proviso. Any trade secrets or proprietary informa-  
19 tion submitted by any person seeking an authorization under  
20 this subsection shall be afforded the maximum degree of  
21 protection allowable by law.”.

22 SEC. 503. Chapter 11 of the Atomic Energy Act of  
23 1954, as amended, entitled “International Activities,” is  
24 amended by adding thereto the following sections:

1       "SEC. 126. EXPORT LICENSING PROCEDURES.—

2       "a. Following enactment of this section, no license may  
3 be issued by the Commission for the export of any produc-  
4 tion or utilization facility, or any source material or special  
5 nuclear material, and no exemption from any requirement  
6 for such an export license may be granted by the Commis-  
7 sion, until the Commission has been notified by the Secretary  
8 of State that, in his judgment, the issuance of the license or  
9 grant of exemption will not be inimical to the common  
10 defense and security.

11       "b. In making the judgment called for by subsection a.,  
12 the Secretary of State shall obtain the views of the Energy  
13 Research and Development Administration, the Department  
14 of Commerce, the Arms Control and Disarmament Agency  
15 and the Department of Defense, in accordance with proce-  
16 dures established by the President. The procedures shall  
17 include provision of appropriate data and recommendations,  
18 subject to requests for additional data and recommendations,  
19 as required by the Nuclear Regulatory Commission to carry  
20 out its export licensing functions.

21       "c. Within one hundred and twenty days of the effective  
22 date of this section, the Commission shall, after consultations  
23 with the Secretary of State, promulgate regulations estab-  
24 lishing procedures (1) for the granting, suspending, revok-  
25 ing, or amending of any license for the export of source



1 material, special nuclear material, or production or utilization  
2 facilities; (2) for public participation in nuclear export  
3 licensing proceedings when the Commission finds that such  
4 participation will be in the public interest and will assist the  
5 Commission in making the statutory determinations required  
6 by this Act, and (3) for public written Commission opinion  
7 accompanied by the dissenting or separate views of any  
8 Commissioner, in those proceedings where one or more  
9 Commissioners have dissenting views on the issuance of an  
10 export license.

11 "d. The procedures to be established pursuant to sub-  
12 section c. shall constitute the exclusive basis for hearings in  
13 nuclear export licensing proceedings before the Commission.  
14 No person shall possess a right to demand an on-the-record  
15 hearing in such a proceeding.

16 "SEC. 127. CRITERIA GOVERNING UNITED STATES  
17 NUCLEAR EXPORTS.—

18 "a. The United States adopts as a matter of policy, the  
19 following criteria, which in addition to other requirements of  
20 law, will govern its exports for peaceful nuclear uses of source  
21 material, special nuclear material, production or utilization  
22 facilities, and any sensitive nuclear technology:

23 "(1) IAEA safeguards as required by article III  
24 (2) of the treaty shall be applied with respect to such  
25 material or facilities proposed to be exported, to any

1 material or facilities previously exported by the United  
2 States and subject to the applicable agreement for coop-  
3 eration, and to any special nuclear material used in or  
4 produced through the use thereof.

5 “(2) No such material, facilities, or sensitive nu-  
6 clear technology proposed to be exported, no material  
7 or sensitive nuclear technology previously exported by  
8 the United States and subject to the applicable agree-  
9 ment for cooperation, and no special nuclear material  
10 produced through the use of such materials, facilities, or  
11 sensitive nuclear technology will be used for any nuclear  
12 device or for research on or development of any nuclear  
13 explosive device.

14 “(3) Adequate physical security measures will be  
15 maintained with respect to such material or facilities  
16 proposed to be exported and to any special nuclear  
17 material used in or produced through the use thereof.

18 “(4) No such materials, facilities, or sensitive nu-  
19 clear technology proposed to be exported, and no special  
20 nuclear material produced through the use of such  
21 material, will be retransferred to the jurisdiction of any  
22 other nation or group of nations unless the prior approval  
23 of the United States is obtained for such retransfer. The  
24 United States shall not approve such retransfer unless  
25 the nation or group of nations designated to receive



1 such retransfer agrees that it shall be subject to the  
2 conditions required by this subsection.

3 “(5) No such material proposed to be exported  
4 and no special nuclear material produced through the  
5 use of such material will be reprocessed, and no irradi-  
6 ated fuel elements containing such material removed  
7 from a reactor shall be altered in form or content, unless  
8 the prior approval of the United States is obtained for  
9 such reprocessing or alteration.

10 “(6) No such sensitive nuclear technology shall  
11 be exported unless the foregoing conditions shall be  
12 applied to any nuclear material or equipment which is  
13 produced or constructed in the recipient nation or group  
14 of nations by or through the use of any such exported  
15 sensitive nuclear technology.

16 “b. The Nuclear Regulatory Commission shall not issue  
17 any export license for source material, special nuclear mate-  
18 rial, production or utilization facilities, and the Energy Re-  
19 search and Development Administration shall not distribute  
20 any source or special nuclear material under sections 54 and  
21 64 of the Atomic Energy Act of 1954, as amended, until  
22 the Commission or the Administration, as the case may be—

23 “(1) finds that the criteria in subsection a. or their  
24 equivalent, and other applicable statutory requirements  
25 of the Atomic Energy Act of 1954, as amended, will be

1 satisfied in a manner acceptable to the United States:  
2 *Provided*, That the provisions of paragraphs (4) and  
3 (5) of subsection a. shall not prevent continued coop-  
4 eration under agreements for cooperation as authorized  
5 in accordance with section 124 of this Act if nations  
6 or groups of nations bound by such agreements have  
7 agreed to negotiations as contemplated in section 403  
8 of the Nuclear Non-Proliferation Policy Act of 1977 or  
9 while the commitments in such agreements are under  
10 negotiation; and

11 “(2) receives advice, in accordance with proce-  
12 dures established under subsection 126 b., that it is the  
13 judgment of the Department of State and other con-  
14 cerned executive branch agencies and departments that  
15 the proposed export would not be inimical to the com-  
16 mon defense and security of the United States. In sub-  
17 mitting such judgment, the Secretary of State shall spe-  
18 cifically address the extent to which the foregoing cri-  
19 teria are met. In addition, in the event he considers it  
20 warranted, he may address the following additional fac-  
21 tors, among others:

22 “(A) that issuance of the license will materially  
23 advance the nonproliferation goals of the United  
24 States by encouraging the recipient nation to adhere  
25 to the Treaty, or to participate in the undertakings



1 contemplated by section 101 or 403 of the Nuclear  
2 Non-Proliferation Policy Act of 1977.

3 “(B) that failure to issue the license would  
4 otherwise be seriously prejudicial to the nonprolif-  
5 eration objectives of the United States;

6 (C) that the recipient nation or group of na-  
7 tions has agreed that conditions substantially identi-  
8 cal to the foregoing criteria will be applied to the  
9 proposed United States export by another nuclear  
10 supplier nation or group of nuclear supplier nations  
11 and that in his judgment those conditions will be  
12 implemented in a manner acceptable to the United  
13 States: *Provided*, That no such material, equipment,  
14 or sensitive nuclear technology shall be exported to  
15 a non-nuclear-weapon state that, at any time after  
16 the effective date of the Nuclear Non-Proliferation  
17 Policy Act of 1977—

18 (i) detonates a nuclear explosive device;

19 (ii) terminates or abrogates IOEA safe-  
20 guards; or

21 (iii) is found by the President to have ma-  
22 terially violated an IAEA safeguard agreement  
23 or any guarantee it has given under an agree-  
24 ment for cooperation with the United States;  
25 unless the President determines that the cessation



1 of such exports would be seriously prejudicial to the  
2 achievement of the United States nonproliferation  
3 objectives or otherwise jeopardize the common de-  
4 fense and security. Prior to the effective date of any  
5 such determination, a report containing the Presi-  
6 dent's reasons for such determination shall be sub-  
7 mitted to the Congress.

8 "c. In the event the Commission, after receiving from  
9 the Secretary of State the executive branch judgment that  
10 the issuance of the proposed export license will not be inimi-  
11 cal to the common defense and security, does not issue the  
12 proposed license because it is unable to make the statutory  
13 determinations required under this Act, the Commission shall  
14 publicly issue its decision to that effect, and shall submit the  
15 license application to the President. In its decision, which  
16 shall not be a final order for the purpose of section 189 b.  
17 of this Act, the Commission shall explain the basis for its  
18 finding and shall include any dissenting views of individual  
19 Commissioners. If, after receiving the proposed license ap-  
20 plication and reviewing the Commission's decision, the Pres-  
21 ident determines that withholding the proposed export would  
22 be seriously prejudicial to the achievement of United States  
23 nonproliferation objectives or otherwise jeopardize the com-  
24 mon defense and security, the proposed export may be au-



1 thorized by Executive order: *Provided*, That prior to any  
2 such export authorized by Executive order, such Executive  
3 order shall, together with the President's explanation of the  
4 reasons why the export should be authorized, be submitted  
5 to the Congress and referred to the Committee on Interna-  
6 tional Relations of the House of Representatives and the  
7 Committee on Foreign Relations of the Senate and a period  
8 of sixty days has elapsed while Congress is in session (in  
9 computing such sixty days there shall be excluded the days  
10 on which either House is not in session because of an adjourn-  
11 ment of more than three days), but any such proposed  
12 export shall not occur if during such sixty-day period, a joint  
13 resolution is enacted stating in substance that the Congress  
14 does not favor the proposed export. Notwithstanding the  
15 provisions of section 57 a. of this Act, any such Executive  
16 order shall constitute full authorization to export the nuclear  
17 material or equipment covered thereby.

18 "d. Notwithstanding section 402 of the Nuclear Non-  
19 Proliferation Policy Act of 1977, at such time as the pro-  
20 gram of renegotiation called for by section 403 of that Act  
21 is completed, or at such time as any international arrange-  
22 ment or other mutual undertaking called for by section 403  
23 is achieved, the President shall propose to the Congress  
24 amendments to paragraph a. of this section to implement as



1 additional licensing criteria any one or more of the require-  
2 ments set forth in clauses (3), (4), (6), (8), and (9)  
3 of section 123 a. of this Act.

4 SEC. 504. Section 109 of the Atomic Energy Act of  
5 1954, as amended, is amended to read as follows:

6 "SEC. 109. COMPONENT AND OTHER PARTS OF FACIL-  
7 ITIES.—

8 "a. With respect to those utilization and production  
9 facilities which are so determined by the Commission  
10 pursuant to subsection 11 v. (2) or 11 cc. (2) the  
11 Commission may issue general licenses for domestic activities  
12 required to be licensed under section 101, if the Commis-  
13 sion determines in writing that such general licensing will  
14 not be inimical to the common defense and security.

15 "b. The Commission is authorized and directed to deter-  
16 mine which component parts as defined in subsection 11 v.  
17 or 11 cc. of the Atomic Energy Act of 1954, as amended,  
18 and which other items or substances are especially relevant  
19 from the standpoint of export control because of their signifi-  
20 cance for nuclear explosive purposes. Except as provided in  
21 section 127 c., no such component, substance, or item which  
22 is so determined by the Commission shall be exported unless  
23 the Commission issues a general or specific license for its  
24 export, after determining in writing that the issuance of



1 each such general or specific license will not be inimical to  
2 the common defense and security.

3 "c. The Commission, within not more than one hundred  
4 and twenty days after the date of the enactment of this Act,  
5 shall publish regulations to implement the provisions of this  
6 section. Among other things, these regulations shall provide  
7 for the prior consultation by the Commission with the De-  
8 partment of State, the Energy Research and Development  
9 Administration, the Department of Defense, the Department  
10 of Commerce, and the Arms Control and Disarmament  
11 Agency.

12 "d. The Commission shall not issue an export license  
13 under the authority of subsection b. if it is advised by the  
14 executive branch, in accordance with the procedures estab-  
15 lished under subsection 126 b., that the export would be  
16 inimical to the common defense and security of the United  
17 States.

18 "e. The President, within not more than one hundred  
19 and twenty days after the date of the enactment of this Act,  
20 shall publish procedures regarding the control by the Depart-  
21 ment of Commerce over all export items, other than those  
22 licensed by the Commission, which could be, if used for  
23 purposes other than those for which the export is intended,  
24 of significance for nuclear explosive purposes. Among other



1 things, these procedures shall provide for prior consultations,  
2 as required, by the Department of Commerce with the De-  
3 partment of State, the Arms Control and Disarmament  
4 Agency, the Nuclear Regulatory Commission, and the  
5 Energy Research and Development Administration.

6 CHAPTER VI. EXECUTIVE REPORTING

7 SEC. 601. (a) The President shall review all activities  
8 of Government departments and agencies relating to pre-  
9 venting the proliferation of nuclear explosive devices and  
10 shall make a report to Congress within not more than one  
11 year after the date of enactment of this Act and annually in  
12 January of each year thereafter on the Government's efforts  
13 to prevent such proliferation. This report is to include but  
14 not be limited to—

15 (1) a description of the progress made toward—

16 (A) negotiating the international arrange-  
17 ments or other mutual undertakings contemplated  
18 in sections 101 and 403 of this Act;

19 (B) negotiating the initiatives contemplated  
20 in sections 304 and 305 of this Act;

21 (C) promoting adherence to the Treaty on the  
22 Non-Proliferation of Nuclear Weapons, and dis-  
23 couraging or prohibiting nuclear exports to non-  
24 nuclear weapon states that are not parties to the



1 treaty or have not entered into comparable agree-  
2 ments with respect to safeguards and forsaken the  
3 development of any nuclear explosive devices;

4 (D) strengthening the safeguards of the In-  
5 ternational Atomic Energy Agency as contemplat-  
6 ed in section 201 of this Act; and

7 (E) renegotiating agreements for cooperation  
8 as contemplated in section 403 of this Act;

9 (2) an assessment of the impact of the progress  
10 described in paragraph (1) on the nonproliferation of  
11 goals of the United States; an explanation of the pre-  
12 cise reasons why progress has not been made on any  
13 particular point and recommendations with respect to  
14 appropriate measures to encourage progress; and a state-  
15 ment of what legislative modifications, if any, are neces-  
16 sary in his judgment to achieve the nonproliferation  
17 goals of the United States; and

18 (3) a determination as to which non-nuclear-  
19 weapon states with which the United States has an  
20 agreement for cooperation in effect or under negotiation,  
21 if any, have—

22 (A) exploded a nuclear device of any kind;

23 (B) refused to accept the safeguards of the  
24 IAEA on all of their peaceful nuclear activities; or



1                   (C) refused to give specific assurances that they  
2           will not engage in the development of any nuclear  
3           explosive device.

4       SEC. 601. (b) Within not more than one year after  
5       the date of enactment of this Act, the President shall sub-  
6       mit a report to the Congress containing an analysis of each  
7       civil agreement for cooperation negotiated pursuant to sec-  
8       tion 123 of the Atomic Energy Act, including a discussion  
9       of the scope and adequacy of the requirements and obliga-  
10      tions relating to the safeguards and other controls contained  
11      therein.

12      SEC. 602. (a) The annual reports to the Congress by  
13      the Nuclear Regulatory Commission and the Energy Re-  
14      search and Development Administration which are other-  
15      wise required by law shall also include views and recom-  
16      mendations regarding the policies and actions of the United  
17      States to prevent the proliferation of nuclear explosive de-  
18      vices which are the statutory responsibility of those agen-  
19      cies. The Administration's report shall include a detailed  
20      analysis of the implications of advanced enrichment and  
21      reprocessing techniques for the proliferation of nuclear ex-  
22      plosive devices and of alternative nuclear fuel cycles which  
23      do not involve access to weapons usable materials. This  
24      part of the report shall include a comprehensive version  
25      which includes classified information to be submitted to the



1 Committee on Foreign Relations of the Senate and the Com-  
2 mittee on International Relations of the House of Repre-  
3 sentatives and a summary unclassified version.

4 (b) The reporting requirements of this chapter are in  
5 addition to and not in lieu of any other reporting require-  
6 ments under applicable law.

7 (c) The Department of State, the Arms Control and  
8 Disarmament Agency, the Department of Commerce, the  
9 Energy Research and Development Administration, and the  
10 Nuclear Regulatory Commission, shall keep the Committee  
11 on Foreign Relations of the Senate and the Committee on  
12 International Relations of the House of Representatives fully  
13 and currently informed with respect to their activities to  
14 carry out the purposes and policies of this Act and to other-  
15 wise prevent the proliferation of nuclear explosive devices.

16 (d) Any classified portions of the reports required by  
17 this Act shall be submitted to the Senate Foreign Relations  
18 Committee and the House International Relations Com-  
19 mittee.

## 20 CHAPTER VII. DEFINITIONS AND SAVINGS

### 21 PROVISIONS

22 SEC. 701. As used in this Act:

23 (a) The term "nuclear materials and equipment" means  
24 source materials, special nuclear material, production facili-  
25 ties, utilization facilities, and items or substances determined



1 to have significance for nuclear explosive purposes pursuant  
2 to subsection 109 b. or e. of the Atomic Energy Act of 1954,  
3 as amended.

4 (b) The term "physical security measures" means meas-  
5 ures to prevent the theft or sabotage or unauthorized use of  
6 source or special nuclear material.

7 (c) The term "safeguards" means a system of controls  
8 designed to ensure that any materials, equipment, compo-  
9 nents, or substances subject thereto are not used to further  
10 any military purposes, including use in or development of  
11 any nuclear explosive device.

12 (d) The term "sensitive nuclear technology" means  
13 any information (including information incorporated in a  
14 production or utilization facility or important component part  
15 thereof, or in a nuclear-related substance) which is not avail-  
16 able to the public and which is important to the design, con-  
17 struction, fabrication, operation or maintenance of a uranium  
18 enrichment or nuclear fuel reprocessing facility, or a facility  
19 for the production of heavy water, but shall not include  
20 Restricted Data controlled pursuant to chapter 12 of the  
21 Atomic Energy Act of 1954, as amended.

22 (e) All other terms used in this Act shall have the  
23 meanings ascribed to them by the Atomic Energy Act of



1 1954, as amended, the Energy Reorganization Act of 1974,  
2 and the Treaty on the Non-Proliferation of Nuclear  
3 Weapons.

4 SEC. 702. All orders, determinations, rules, regulations,  
5 permits, contracts, agreements, certificates, licenses, and  
6 privileges—

7 (1) which have been issued, made, granted, or al-  
8 lowed to become effective in the exercise of functions  
9 which are the subject of this Act, by (i) any agency or  
10 office, or part thereof, in exercising the functions which  
11 are affected by this Act, or (ii) any court of competent  
12 jurisdiction; and,

13 (2) which are in effect at the time this Act takes  
14 effect;

15 shall continue in effect according to their terms until modi-  
16 fied, terminated, superseded, set aside, or repealed as the  
17 case may be, by the parties thereto or by any court of com-  
18 petent jurisdiction.

19 SEC. 703. Nothing in this Act shall affect the procedures  
20 or requirements applicable to agreements for cooperation  
21 entered into pursuant to sections 91 c., 144 b., or 144 c. of  
22 the Atomic Energy Act of 1954, as it was in effect immedi-  
23 ately prior to enactment of this Act.



Senator CHURCH. Our first witness is Mr. Robert Fri, the Acting Administrator for ERDA. Mr. Fri, will you identify your associate this morning.

**STATEMENT OF HON. ROBERT W. FRI, ACTING ADMINISTRATOR,  
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION**

Mr. FRI. On my left is Mr. Louis Nosenzo, Department of State, who is actually the next witness. But if it's all right with you, we thought we would sit here together this morning.

Mr. Chairman, I have a prepared statement, which I would like to submit for the record, if I may. It would take several minutes to read, and make a few opening remarks, briefly.

[The prepared statement of Mr. Fri follows:]

**STATEMENT OF HON. ROBERT W. FRI, ACTING ADMINISTRATOR, ENERGY RESEARCH  
AND DEVELOPMENT ADMINISTRATION**

Mr. Chairman and members of the subcommittee, I appreciate this opportunity to discuss the views of the Energy Research and Development Administration (ERDA) on S. 1432, the President's nuclear non-proliferation bill. As this legislation proposes major revisions to existing U.S. nuclear export control policies, I should first like to make several observations of a broad nature and then address myself to the specifics of S. 1432, especially to those sections in which I understand this Subcommittee is interested. And while a written analysis has already been provided to the Congress by the Executive Branch, I would like to draw your attention to several aspects of S. 1432 in terms of their implications for ERDA.

The Legislative and Executive Branches share a strong appreciation of the necessity to strengthen U.S. non-proliferation policies so as to restrain and, hopefully, prevent the proliferation of nuclear weapons, while still helping other nations meet their energy needs. I am confident that all of us agree on the importance of non-proliferation to the future security and peace of the U.S. and the entire world.

In evaluating S. 1432, it is worthwhile to compare its provisions to those in S. 897, a Senate bill entitled "Nuclear Non-Proliferation Act of 1977." The most striking difference is one of approach to the ultimate goal of non-proliferation. S. 897 suggests a unilateral tone calling for immediate restrictions on nuclear exports which would, for all practical purposes, result in a moratorium on such exports in many important cases. Then, after 18 months, additional export criteria automatically come into effect that go beyond the conditions in existing Agreements for Cooperation. Despite the provision permitting the President to delay this, we believe this approach would be unwise and counter-productive for several reasons.

First, the U.S. does not have the power to use this basically unilateral approach effectively. There are now available other suppliers of nuclear material, equipment and technology. We must, therefore, seek to persuade other countries to share our views on non-proliferation through negotiation and incentives rather than attempt to coerce them to accept new unilateral conditions. The progress we have made with other suppliers in developing common export policies is clear evidence that persuasion through negotiations is the best way to achieve our goals.

On the other hand, if our actions can be construed as breaching our international commitments, then we not only lose our moral strength and leadership but we encourage recipient nations to strive for nuclear independence rather than relying on us and on other supplier nations.

Second, even those other supplier nations are also recipients. Unilateral U.S. policies would alienate them and fail to gain their cooperation which is absolutely vital in preventing proliferation.

Third, there is a serious risk that the unilateral approach could undermine the NPT, which is a pillar of our non-proliferation policy.

S. 1432, the Administration's Bill, reflects our determination to avoid actions that could be seen by others as raising questions under the cooperation aspects



of Article IV of the NPT. It also is designed to initiate a program that should help other parties enjoy the benefits of nuclear power consistent with the basic objectives of that treaty.

In short, our emphasis must be on negotiation and assistance to other nations. I am convinced that we must follow the approach in S. 1432, which is to furnish incentives, such as nuclear fuel assurances and assistance to other nations in developing their non-nuclear energy resources, and to foster the establishment of a network of cooperating nations.

I understand that this subcommittee is particularly interested in Sections 202, 302, 303, and 305 of S. 1432.

Section 202 directs ERDA to establish and operate a safeguards and physical security training program for persons from nations or groups of nations with nuclear programs for peaceful purposes. ERDA and its predecessor, the AEC, have been doing some training of foreigners in this area, especially inspectors of the International Atomic Energy Agency (IAEA).

The IAEA has a program for training persons from member states in safeguards and is contemplating doing this in physical security also. The U.S. has a great deal of expertise in this area and its training programs combined with those of the IAEA will do much to strengthen other countries' safeguards and physical security. This S. 1432 program will be a very valuable ingredient in our non-proliferation efforts.

Section 302 directs the Administrator of ERDA to initiate construction planning and design, construction and operation activities for the expansion of uranium enrichment capacity as provided in other statutes. As you are undoubtedly aware, this specific additional capacity is needed both for domestic and foreign customers and to enable the United States to be a reliable nuclear supplier.

Section 303 directs the President to undertake a study to determine the need for additional U.S. enrichment capacity to meet future U.S. domestic needs and to promote U.S. non-proliferation objectives abroad by allowing the United States to assure other countries, which follow our non-proliferation standards, that their needs for enrichment services will be met. A report is to be made to Congress within six months after the date of enactment. ERDA has been following the need for enrichment capacity, but the situation is not static and the U.S. non-proliferation objectives give another dimension which must be taken into account.

Section 305 directs the President to launch an intensive international fuel cycle evaluation program involving other nuclear suppliers and recipient countries to re-evaluate all aspects of the nuclear fuel cycle, with emphasis on alternatives to an economy based on separation of pure plutonium or the presence of highly enriched uranium and problems related to spent fuel storage. A report to Congress is required no later than one year after the date of enactment. The Administration has already broached this program with many countries and the concept is now being actively discussed.

Other parts of S. 1432 also affect ERDA. Chapter IV provides for the negotiation of new agreements for cooperation and revisions to existing agreements, in order to attain U.S. non-proliferation objectives. ERDA is deeply involved in this. Section 404 leaves with ERDA the negotiation of subsequent arrangements under agreements for cooperation but here again, as in other sections of S. 1432, provision is made for close relationships among the various agencies of the Executive Branch and the NRC by means of concurrence and consultations.

Under Section 54a of the Atomic Energy Act ERDA has authority to distribute special nuclear material. S. 1432, Section 501 permits ERDA to make only small distributions for certain purposes. At the present time, ERDA confers with State, ACDA and NRC prior to such distributions. S. 1432 would require a continuation of this procedure. Larger quantities would be exported under NRC license.

ERDA presently has the responsibility to approve activities by persons in the United States which constitute directly or indirectly engaging in the production of any special nuclear material outside of the United States. ERDA and other agencies of the Executive Branch now have consultative procedures in effective which are satisfactory to State, ACDA and NRC. Section 502 of S. 1432 mandates procedures for concurrence and consultation in these matters.

As you know, under Section 57 of the Atomic Energy Act, ERDA controls unclassified nuclear activities abroad by U.S. companies or individuals. These controls are implemented by our regulations 10 CFR 810 which require specific approval by the Administrator of ERDA for activities in the Free World in the areas of reprocessing, uranium enrichment, and heavy water production. Specific



approvals are required for all nuclear activities in the Sino-Soviet block by U.S. companies or individuals except for the furnishing of unclassified published information. I have recently approved a proposal to amend 10 CFR in support of the Administration's non-proliferation policies. This proposal would require specific approval for activities in the Free World involving mixed-oxide or plutonium fuel fabrication. A notice of proposed rulemaking has been published in the Federal Register of May 11, 1977, and we are awaiting public comment on this proposal.

In conclusion, in our judgment, an effective U.S. non-proliferation policy should achieve a balance of constraints and incentives. On the constraint side, we need to undertake more vigorous efforts to assure that the spread of nuclear technology does not aggravate the proliferation problem, we need to convince the Congress and the American people that the Executive Branch is acting in a prudent fashion, and we need to convince other countries that we are very resolute in our determination to give non-proliferation extremely high priority in the conduct of U.S. foreign policy. I believe that constraints are forcefully and effectively represented in several sections of S. 1432. These include the criteria that will govern the negotiations of new and amended agreements for cooperations and the sanction of no further nuclear exports to a non-nuclear weapon state that detonates a nuclear explosive, terminates or abrogates IAEA safeguards, or is found by the President to have materially violated an IAEA safeguard agreement or any guarantee it has given under an agreement for cooperation.

At the same time, we believe it is absolutely essential that the United States maintain its role as a major nuclear supplier. To this end, we must convince nations that we are willing to meet our conditions that we are truly prepared to be a reliable and attractive nuclear supplier. S. 1432 seeks to provide cooperating nations with a greater degree of predictability in the U.S. export licensing process by more clearly specifying the ground rules to which we shall adhere. Furthermore, it underscores the interest and determination of the United States in providing enriching services to cooperating nations on a timely basis.

I will be pleased to respond to your questions.

Mr. FRI. When we met 2 days ago, we agreed on at least one thing, and that was that the solution to the proliferation problem is apparently an international solution. In trying to arrive at that kind of international solution the President has proposed a strategy of several elements. Those elements have come to the Congress, and indeed to the public, in various forms.

S. 4032, the Export Control Act. The changes in the ERDA budget, policy statements that have been made by the President on April 7, and other dates, and I thought I might just try to tie that together again.

Senator CHURCH. Good.

Mr. FRI. The first and in some ways most important part of the strategy, it seems to me, is the element we discussed at some length on Wednesday, and that is to demonstrate our seriousness in purpose in taking up the question of proliferation.

And for that reason, among others, that the President determined that we should not here in the United States commit the commercialization of the processing and the breeder reactor so that among other things it would not be perceived as using our concern for proliferation that would cover sometimes the commercial ploy to advance the state of our technology vis-a-vis the other nations that we are serious about it and that we are prepared to take some risk ourselves in order to get at the question of proliferation in a serious way.

The policy itself has three or four elements. First and of crucial importance is the question of incentives. And in particular, the ability to provide fuel to other countries so that their legitimate needs for nuclear power are served without the need of their constructing sensitive facilities to provide nuclear fuels.



The crucial element of our policy, and it shows up in both the ERDA authorization bill, and our request to construct a new plant, using the centrifuge technology of enriched uranium, and it shows up also in the export control act because what that act does of terribly great importance is to lay out the difficult procedures by which export licensing can take place.

So that the United States will be perceived by its customers as a reliable supplier, one that not only has the capacity to enrich uranium, but also a procedure that will produce an export license if in fact our receiving countries receive our nonproliferation objectives. And I cannot stress the need for that kind of capability too much.

Senator CHURCH. May I ask a question at this point. As I understand it, in line with our shared concern with proliferation, the United States will not export either enriching plants or new processing plants.

Mr. FRI. That's correct, that's been in our policy indeed for 5 or 6 years.

Senator CHURCH. Yes; and therefore, any country purchasing nuclear reactors from the United States would have to look to third countries if it wished to reprocess, is that correct?

Mr. FRI. It would certainly have to look to third countries in which to require a reprocessing plant, and so long as we do not have commercial reprocessing, it would have to look to service to another country as well.

Senator CHURCH. So my question is this. Nonweapons states, desiring nuclear reactors, and desiring to make their fuel go as far as possible, and with reprocessing you get that extra 30 percent from the fuel, under the administration's policy, as I understand it, could not come to this country for the reprocessing because we won't be offering reprocessing services?

Mr. FRI. Certainly not at this time, not until the fuel cycle evaluation is complete and we determine how to proceed with reprocessing for disk fuel cycling, or some other.

Senator CHURCH. All of the physicists we had before us yesterday appear to be agreement, although they took varying positions for or against the administration's program, they appear to be in agreement that a fuel cycle based on fission, will require reprocessing.

The plutonium cycle would require reprocessing, and why wouldn't it better serve our interest, in attempting to deal with the proliferation problem, to offer a reprocessing service subject to all those controls and restraints that would serve as a model for the government of an international system, which everyone envisions would be necessary?

Mr. FRI. Well, taking as an assumption that we can agree on a fuel cycle other than the ones through light water fuel cycle, which is the only one, really, that doesn't require some kind of reprocessing, then there are two questions that have to be answered.

One is, what kind of reprocessing under what kind of international controls represents the regime toward which we would like to move. That issue is one of the fundamental issues in the international fuel cycle evaluation that we hope to undertake internationally over the next couple of years.

Mr. Nosenzo is just back from Paris at a meeting of the experts following up on the summit on this question, and I understand from him



that there was an encouraging degree of agreement on the content of the technical program for that evaluation, and that we may be able to move ahead reasonably expeditiously with that.

So once that question is answered, it may indeed be the correct step to identify the facility that could be put under some kind of international control to demonstrate that regime.

The second question is when does one need to begin reprocessing and for what purpose. And our judgment is, and certainly my judgment is, that there is no inherent urgency certainly in agreeing with nations who are just beginning nuclear power programs to do their reprocessing, nor in many cases to do reprocessing for nations who presently have power programs.

Because in many cases reprocessing is done for one or two reasons, either to provide plutonium for a breeder reactor program, or second just to get rid of the spent fuel. Japan, for example, just doesn't have any place to put spent fuel, so part of the program is an incentive that I was about to mention, to handle this spent fuel problem so that the motivation to go ahead and to Plutonium reprocessing before this evaluation is done, is thereby ameliorated.

Senator CHURCH. I can see the need to lay the basis for any international system with the necessary discussions and necessary associations. It would seem to me that since we have a facility that is largely built, though it may require modifications, it still seems to me it would be prudent to do something about keeping that facility on reserve. So that it might later form the first cog in the wheel of an international fuel cycle system.

Do you see any objection to retaining that facility in reserve in some manner so that it might be put to some future use at this time?

Mr. FRI. I see no inherent objection in either using the talents of that particular team in the assessment program if those talents are important to some aspect of the assessment program, which has the effect of then keeping that team together, which as you said the other day is probably as important as anything else.

Nor do I see inherent objectives in looking at a study basis, alternative modes in which that plant might be used if those options are analyzed, and ready when the decision is made on the kind of regime on which we would like to move out.

We would not like to start hot operations of the plant.

Senator CHURCH. No; I'm not suggesting that. It might be premature. I think, certainly before we come to some understanding with other supplier countries. It would be premature. On that standby basis what would it cost, in your estimation, to accomplish that objective for the coming year?

Mr. FRI. Well, as you may recall, you asked us to look into that question on Wednesday, and I've seen the draft of the letter that's on its way back to you. The figure in that letter is \$10 million or \$11 million.

Now, I obviously caveat that statement, as I do in the letter, that is an exceedingly preliminary kind of thing. It is not given that great consideration until we discuss with Dr. Schlesinger and Dr. Schlesinger's representatives on this subject.

So it's a preliminary figure, but it sounds about right as an order of magnitude, in effect.



Senator CHURCH. If the Congress were to authorize that amount for such a purpose, would the administration object? Would this be considered contrary to the policy?

Mr. FRI. I guess I have to extrapolate from Dr. Schlesinger's letter, which was forthcoming, on the subject of investigating ways of cooperating with the Barnwell facility in the evaluation program. We have not analyzed if the administration would object to adding \$10 million or \$11 million to our budget.

But extrapolating from our letter, I should say that the objection, if it came, would be more budgetary than there would be policy kinds of objections.

Senator CHURCH. All right, let's consider the waste problem under a throwaway cycle, that is a throwaway system which would not involve recycling or reprocessing.

Presently, in our own nuclear plants, the spent fuel rods which contain both unused uranium and plutonium are being stored at the reactor sites, is that correct?

Mr. FRI. Yes, and a few rods, I think, stored at the Morris site in Illinois, which is one of the reprocessing plants that never got started on.

But basically they are all stored at the reactor sites.

Senator CHURCH. So that for the most part they are stored at the reactors.

Mr. FRI. That is correct.

Senator CHURCH. Now, isn't it beginning to create a problem? It's my understanding that in some cases where utility companies are attempting to enlarge their storage facilities at the reactors, they are encountering considerable opposition, and this is a problem that is likely to get worse and not better if we do not find some place, some permanent depository for the burial of these waste products.

Mr. FRI. The problem of storage at reactor sites is a problem in a few instances today and after 3 or 4 years from now it will tend to get worse fairly rapidly unless we do something about it.

Consequently, our waste management program at ERDA for spent fuel now is looking at three kinds of storage. One is some more centralized-pool-type storage where you could take the rods from a reactor site and move it into another large pool someplace. This would be done, I would hope, privately.

The Morris plant has space, the Barnwell plant has space.

Senator CHURCH. I was going to ask about the Barnwell plant as a possible depository, since if it was put to use a part of the operation would have to draw the spent fuel rods from its own pool and use them and therefore has been built for that purpose.

Isn't that one place where the spent fuel rods might be stored?

Mr. FRI. It's certainly possible. They would have to receive the necessary license from the NRC and all that, but it's technically fairly possible at this stage of the game. A business deal on the part of the Barnwell people as to whether they want to use the spent fuel storage facility, there for storage, without starting up the plant.

They have given some consideration to that, I believe.

Senator CHURCH. I am just wondering how we solve our problem, ERDA and the Government, because for years now the undertaking to locate a permanent burial or permanent depository for the spent fuel



rods has been made and some pledges given, and we've never managed and it keeps slipping by year after year.

And, I assume the reactors will be running out of their own capacity to store at the site, and if we don't have some depository we're really going to be facing a rather critical problem.

Mr. FRI. Well, beyond looking at the question of where to put spent fuel in pools on a temporary basis, off the reactor site, our program is designed now to construct either both interim or permanent storage facilities by 1985. And I will explain what I mean by that.

We will construct a permanent subsurface facility, which can take either reprocessed waste or spent fuel rods for permanent disposal.

It is also highly likely that in addition to that we will construct a surface storage facility, which could hold spent fuel rods for quite a period of time, but would not be permanent storage in the event that they have to be reclaimed, and ultimately reprocessed.

The technical program is in place to do that, and the funding requests that we have made, which I think amount to something like \$170 million for the program in 1978.

Senator CHURCH. I don't think there's ever been a problem about technology development or the money. The problem is where you are going to put it.

Mr. FRI. Yes.

Senator CHURCH. And everybody says, that's fine, as long as you put it somewhere else, but every time you try to locate a site, political resistance has been such that you have not yet managed.

And I think that this has to be faced because as we consider the international posture of the administration, what in effect we are asking other countries to do is to adopt the same throwaway system.

Now, that means that as far as foreign reactors are concerned, they're either going to have to find storage for the spent rods in their respective countries, in which case we greatly aggravate the proliferation problem because then we leave in those countries the rods from which the bomb-making materials could be constructed.

Now, we're not going to do that which flows in the opposite direction of reducing proliferation. Then we have to bring those foreign spent rods back into this country, so the United States becomes the world depository insofar as we sell the reactors and make such arrangements, we become the world repository for the spent fuel rods, making still more urgent the location of a place within the United States that will be acceptable for this purpose as a world burial ground for spent fuel rods, highly radioactive for 20,000 years.

Mr. FRI. Let me comment on two parts of that. First of all, we certainly wouldn't foreclose the possibility that some of those rods needs to come back to the United States, but we also would like to pursue, and will pursue, other options of regional storage, for example, of spent fuel rods around the world because it makes some sense to do that.

On the question of siting, you are quite right, of course, it would be a very tough problem in determining where the site for the initial repository would be.

In the past I think we've made the mistake of singling out the site a priori and then trying to persuade everybody that that is the right place to go. We have since then, since failing on that score a couple



of times a few years back, we've taken a rather different approach and that is to conduct a series of surveys, geological surveys, in most of the states, in the continental United States to determine on the basis of technical information which are the most promising formations of doing this in cooperation with the State and local government, and have discussed this with all the Governors and pointed out that we would not want to get in a position where the pressing ahead in a State where the government of that State resisted violently to the location of a site, but at the same time—

Senator CHURCH. You're not talking about a surface site, now, are you?

Mr. FRI. Principally a subterranean site. We need the geologic formation for that.

Senator CHURCH. And have you gotten any Governor to bring it to his State?

Mr. FRI. I think I would be in serious trouble if I characterize any Governor as saying that, although I think some are more sanguine about the prospects than others. We have a couple of Governors who have said, we would really rather not, but the response to this approach to the program has on the whole been, I think, quite good. It seems like a responsible way to proceed, and the Governors to whom I have talked have been understanding when I point out to them that we do have this problem.

It's got to be solved, we just can't leave this stuff sitting around in pools forever. Ultimately we're going to have to find a site, and there are two ways of doing that.

One is to do it through a thorough, technical study in cooperation with the State and local governments, and then try to arrive a consensus of some likely site. Or we have to fight about it.

And one way or another, it's really better to have a consensus solution than to have a fight about it. And that seems the most that the Governors and other State officials to whom I have talked seems to be a sensible way to proceed.

We are proceeding at this time in a way that is far more likely to produce an acceptable site than some of the older approaches to the problem.

Senator CHURCH. Well, I think we both would prefer—not that I can speak for you, but from the tone of your answer, I think most any of us would prefer that the United States should not become the single world storage bin for all of the nuclear wastes used by the light water reactor.

And your suggestions that regional storage facilities should be established makes a great deal of sense. Again, that would have to come as a part of international fuel cycle control systems, would it not?

Mr. FRI. That is part of the technical program and the evaluation that we talked about.

Senator CHURCH. I'm told that the budget, the new budget includes \$20 million for an undefined, spent fuel storage effort, both for our own and for foreign spent fuel. Has the decision been made in connection with the President's proposal? It would seem to be a logical part of such a package that we would accept that or require the return of spent fuel rods for permanent storage in this country from foreign reactors that we supply?



We said we will supply the services to enrich the uranium fuel. Now, what do we do at the end of the cycle? Do we take the rods back?

Mr. FRI. That specific decision has not at this point been made. I would hope that the necessary paper work gets through the system in fairly short order, to the President, so that he can address that decision himself.

Senator CHURCH. An interagency task force has done the analysis, has it not?

Mr. FRI. Of the major elements of that decision, yes, that's true.

Senator CHURCH. Well, it would seem necessary if the major purpose to be served by this program is to produce the hazards of or reduce the hazards of proliferation, that we would have to make certain that the spent fuel rods, which are the hazard, are returned to the United States in the absence of some international system that could accommodate them.

Mr. FRI. We are very sensitive to the needs to get that decision made so that it can become part of our policy as quickly as possible. I might say on the \$20 million, that it is not all together an unspecified amount. We recognize as a result of the policy decisions that were made by the President that the waste management program had to be expanded, both to consider the surface storage facility, and to study the problem of temporary storage, and to work with the international group in order to come to a solution there.

So the \$20 million is programed for those kinds of purposes.

Senator CHURCH. Would you explain to me why you are considering a surface, central surface site? Aren't these an interim step, because of the difficulty of locating and reaching agreement upon a permanent repository? What is the difficulty apart from the political system? Are there actual sites that you have looked at which in your judgment could simply contain this radioactive waste for the next 20,000 years?

Mr. FRI. Yes, I believe there are. It's a question of finding the most desirable from both a geological and political, if you will, standpoint. The reason for considering a surface site is to keep open the option that we may want to store this material, the spent fuel in retrievable form, for a period of time, in dry storage rather than the wet pool storage.

And it's more convenient to do that in a surface facility than it is in an underground facility, although it is possible to do so in an underground facility.

Senator CHURCH. The only reason you would want to retrieve it would be if you wished to reprocess it.

Mr. FRI. That's correct. But I want to make what I think is an exceedingly important point, because we at the AEC started out in the surface storage facility program a while back, and one of the first things we inherited at ERDA was the impact statement on that, and a series of comments that forced us to withdraw the program.

And the reason really was that the Government had not offered a complete solution, they had offered temporary solutions. They had offered up a temporary retrieval surface site rather than a permanent site, so we feel we have to keep in the program the permanent site as well as the possibility of a retrievable surface site.

So that we have the option developed in hand to take any nuclear waste from the commercial cycle and put it in permanent safe storage.



So that would solve the problem, not one left for the future. It's been left for the future for far too long already.

Senator CHURCH. Now if you can establish such a permanent repository that is physically satisfactory and politically acceptable, will that repository accommodate both the spent fuel rods and other forms of radioactive wastes associated with the general research and development program?

I have in mind, and maybe you may not know, that I've long been concerned about the fact that we have a large quantity of radioactive waste buried at the testing facility in Idaho. The worry being it's over an aquifer, which reaches the Snake River which in turn feeds the State.

And though the odds may be very great that nothing will ever happen there, still the possibility exists that it's in an earthquake region and something could happen in that the aquifer would be affected.

Some years ago the AEC promised that these temporary burial sites would be removed to a permanent site within a 10-year period. Now, they are obviously not going to get that done because none of the solutions have been found that would enable them to move these wastes.

But when such a solution is found, would there be the intention of removing the radioactive waste from these temporary burial grounds to the final burial place?

Mr. FRI. Yes; but the final burial place, as you put it, for the wastes in Idaho which are generated from the defense program, rather than the commercial cycle, would probably be a different repository because the wastes in Idaho and the wastes of some other sites around the country are of a different character.

The volumes are somewhat larger, of the radioactivity, compared to the commercial cycle, which is in order of magnitude or so less than particularly that material out in Idaho is solid and is boxed for burial, and not as thermally hot as spent fuel rods are, and a lot of differences.

So we anticipate different sites for different characteristics, but we're also as part of the defense program, working on a site in which those wastes could also be buried.

Senator CHURCH. One final question: Before the spent fuel rods are permanently laid to rest, will they be classified or put in a form that is meant to be their final form? I know there is a classification process that you have experimented with. Can you explain that to me, please?

Mr. FRI. If the fuel has been reprocessed, and the fission products are separated out for storage, they can then be solidified in powder form, and put in a glass can, a cannable glass, basically, which we have done with defense waste on an experimental basis, and are doing with the small batch of commercial wastes, just to demonstrate the technology.

If it were decided for one reason or another to dispose of the spent fuel as such, without reprocessing it, then the solid spent fuel would be passed possibly surrounded with some kind of impervious material, like glass, and these casts very directly as spent fuel rods.

Both options are effectively and technically feasible.

Senator CHURCH. All right, I interrupted in your presentation.



Mr. FRI. Well, the discussion is entirely appropriate because we were discussing one of the elements of the policy, and that is incentives and that boils down to assuring fuel supplies and handling spent fuel. These are terribly important elements of our policy.

The second element of the policy is, of course, reliance on an international form to develop the kind of machine that we all agree we must seek. That forum, we hope, will be the international fuel cycle evaluation, which was discussed in Paris just in the last few days.

And for our part, the funding for our participation in that program, and indeed for international assessment, is contained in the modifications to the ERDA budget.

A third element of the policy is the question of controls. What controls pertain to the export of nuclear fuels, and that is the fundamental issue of S. 1432.

The President's proposal is one that is tailored, it seems to me, to an international approach to the program in that it sets forth as official criteria criteria which can be met by people who are really interested in nonproliferation and would not suspend unilateral shipments of fuel by the United States, but are nonetheless firm criteria.

And then sets the terms for negotiating objectives with our international partners, somewhat more stringent controls, which as those objectives are achieved, either through bilateral negotiations with our customers, or bilateral negotiations of some other form, and when those objectives are achieved and incorporated into long, but not precipitously unilaterally, but couched in the international needs of this program.

The final element of the program, of course, of the strategy, of course, has to do with sanctions, not an all-together pleasant subject to discuss, but nonetheless there has to be someplace in here a commitment to do something.

If you find a proliferating activity going on, and the statute, the bill, S. 1432, would authorize the President, in some circumstances, where our agreements are broken, to exercise the sanction of cutting off supplies of nuclear materials and facilities which I would suspect is the minimum that we could do.

So between the two bills, the authorization and S. 1432 I think you see, if you will, the statutory reflection of this multifaceted policy that I've tried to describe.

Senator CHURCH. Well, I think a national policy is a good beginning, it's the only place we have to start. But, I have confidence that a national policy will succeed in the absence of international arrangements because today the nuclear market is a buyer's market, and it will remain so unless the buyers can get together on a common guideline and abide by common restraints.

And we've already seen what has happened in the field of conventional items which is totally out of control by virtue of the same set of facts. National policies are very difficult to observe.

I understand and fully share the President's concern about the arm's race worldwide. I have difficulty bringing that under control in the absence of international cooperation, and so far it has proven to be unsuitable and I'm afraid it's going to be true.

I just feel confident we will have the same experience to observe a national policy, if France and Germany and other supplier countries are meeting the buyer's terms as the need took place in Brazil.



Mr. FRI. One of the things we clearly want to do is to avoid the distribution of reprocessing plants or enrichment plants, or other sensitive technologies, as an inducement to buy reactors.

I think we've seen that happen in cases, although I in my own conversations with some of the other countries, I think there's a great sensitivity for that problem, and I at least am guardedly optimistic that we can make some real progress in harmonizing our domestic problems at an international forum.

Senator CHURCH. I should think that we could, because all the supplier countries, it seems to me, share a common interest in preventing weapons proliferation. If that is possible, and that's such an international system, could give all supplier countries access to the world market under one set of restraints, which would be of disadvantage to no particular supplier if all suppliers had to abide them.

Mr. FRI. Yes, sir.

Senator CHURCH. But such a system also has to accommodate the legitimate needs of states that are purchasing the reactors, and it seems to me that only an international system can do that.

Consumer countries are going to require a return for their own willingness to forego the manufacture of nuclear weapons, and to forego reprocessing and enrichment facilities which would enable them to have their own fuel cycle.

They're going to have to be guaranteed fuel, enriched fuel, for their reactors in a way that is not subject to the decisions of a single government as to whether or not they can continue to get fuel.

They will never agree to that, so it's got to be an international system that can guarantee them the fuel that they will need, and the processing that they may need.

Mr. FRI. As you know, we have considered and will consider with other countries, a number of options. Obviously it is terribly important that the bilateral arrangements that exist, and there will always be a number of bilateral arrangements for supply to be regarded by the customer to be as stable as possible, which is one of the great things that this export control bill would do is to bring some stability to our procedure.

But beyond that we have discussed a second set of arrangements backing up the principal bilateral arrangements where a customer might have backup arrangements with other suppliers, let's say of enriched uranium, how much they could fall back if something happened to the principal bilateral arrangement.

And we have also considered in a third tier of kind of international insurance fund that will hold an amount of enriched uranium that could be supplied if these other normal commercial arrangements fail. At least Senator Glenn has discussed an amendment on this subject.

Senator CHURCH. Yes, I've discussed that same amendment with Senator Glenn and I favor very strongly some kind of international provider of fuel. I think ultimately the ideal system will be a system that is entirely an international control for the purposes of supplying fuel and enrichment reprocessing to those countries that are not representative states and that are willing to participate.

I would like to go to the question of how much additional enrichment capacity we are going to need. We didn't have a chance last time to get into the specifics of the various options that you presented for



the construction of those enrichment sites. Can we return to that subject?

Mr. FRI. All right. Perhaps the easiest way to do it is the following. We, of course, feel that we need to initiate, probably, construction of an additional enrichment plant. We have three plants today which are being expanded so that each is capable of producing 9 million separate work units, which is a measure of enrichment capacity called SWU's. We need a fourth 9 million separate work unit plant which would be constructed with centrifuge technology as opposed to gaseous and fusion technology that is existing in the plant.

We need that additional plant really for two reasons. One is to provide some additional capacity in which the right contrast for additional supplies be on the eighties because our present land is fully contracted; and second to run tailed assay systems at about 22 percent, which means we could use less natural uranium and more enrichment to get out the same enriched product. We could strip more of the isotope  $U^{235}$  out of the uranium, out of the ore, tailed assay.

Now, our projections of additional capacity beyond that for plant are frankly somewhat influx just now. In the middle of last year we were talking in terms of possibly 8 to 12 additional plants of the 9 million separate work unit capacity by the end of the century.

Since we made those estimates both U.S. and worldwide estimates of nuclear power, installations have gone down substantially, and that would drag the number of enrichment plants down. And so we are going back and trying to refigure what the requirements would be.

But I imagine we're still talking in the range of five to eight to plants by the end of the century anyhow.

Senator CHURCH. Now, the one plant that you are definitely planning on building you're requesting money for this year?

Mr. FRI. Yes.

Senator CHURCH. And how much will that plant cost?

Mr. FRI. Well, the construction cost of the plant is at a minimum, about \$4 million, in 1978 dollars, but the actual cost depends on whether we need one site or two sites, and need one operator or multiple operators.

Senator CHURCH. Why don't you build it in a way that is least costly? Why build it on two sites if you can build it on one?

Mr. FRI. There has been some dispute between the advocates of an Oak Ridge site and the advocates of a Portsmouth, Ohio site, which is being resolved by the President. The programmatic reasons for considering the two sites are to—are basically strategic, not to have all your eggs in one basket.

That's why we have three sites now, for the existing enrichment plant, so that they cannot all be attacked, if you will, in one place.

Senator CHURCH. Does that make a lot of sense? Are you thinking about a nuclear attack on the United States, or something like that?

Mr. FRI. Or they are also supplied by different power sources. If one power source went down, for example, at our Oak Ridge site, we had to dump power from our diffusion plant a little when the New York blackout occurred. The TVA diverted power north, and our fusion plant took a licking.

So we'd like multiple power sources. We don't want one tornado knocking down all the plants. There are a variety of those kinds of security reasons for having multiple sites.



Senator CHURCH. I see. What are the principal costs between the various options and shouldn't Congress make some decision in this regard? It seems to me that you're talking anywhere from \$4 million to \$1 billion, more than \$1 billion, \$1½ billion difference, depending on what option that you take. That's a lot of money.

Mr. FRI. Yes.

Senator CHURCH. Should we just leave that to you to decide?

Mr. FRI. Well, I hope you would give us some role in that decision, Mr. Chairman, but I'm sure the administration will be happy to seek your role in that as well. The other part of the question is—is the question of how many operators, whether you turn all of the new plant over to one operator or whether you invite in three or four operators because there are a number of companies who have gotten in the centrifuge business.

Senator CHURCH. May I ask this, for my own understanding. With respect to the plants that we now are operating, for commercial purposes, are those plants operated by the Government?

Mr. FRI. Through contract, yes. Union Carbide operates two of the plants.

Senator CHURCH. Through contracts, so you would contemplate that this new centrifuge plant would be operated by the Government through a contractor as well?

Mr. FRI. One or more.

Senator CHURCH. Would more than one be more costly?

Mr. FRI. Yes.

Senator CHURCH. Why would we want to have more than one operator. Do we have more than one operator on any of the existing plants?

Mr. FRI. There were two operators in one plant.

Senator CHURCH. Why would you want to do it differently with regard to the centrifuge plant?

Mr. FRI. Competition is the short answer. There are three companies, maybe more, who are in the centrifuge business, either intending to operate if they can, or manufacture the machines. We need a competitive manufacturing industry, and we also think it would be useful to have multiple operators to be qualified to run these sites if later on let's say building a fifth plant it was decided to let the private sector finance this plant, which is a perfectly good business venture, then one would have the basis for competitive industry, rather than putting one guy in business and giving him essentially a monopoly advantage.

If on the other hand it were decided that all future plants under Government control, the Government would then have two or three competitors from which to choose for subsequent plants, rather than being locked into one.

So the short term costs of involving multiple operators is higher than involving one operator. But in my judgment the long term benefits of competition are going to be substantial, and whether they are privately done or governmentally owned in the future would obtain some competition in the future.

Senator CHURCH. Well, I think perhaps our respective staffs should have some further discussion on these options.

Mr. FRI. I think that would be useful.



Senator CHURCH. In framing the authorization so that it's not a wide open proposition. I think the Congress should share in this judgment because of the different levels of public expenditure.

Mr. FRI. Yes; I don't regard that the 1978 authorization commits us to one course or another, but it does take the people who are already working for us in the centrifuge business and to get the project started.

And, the total, and we're asking for something under \$200 million out of \$500 million total estimated cost, to get started on the decision on the multiple operators, for example. That's one that does not have to be made before we get started.

And it's terribly urgent, in my judgment, that we have a plant project underway. So I would urge moving ahead with this year's authorization in any event.

Senator CHURCH. And if we did that it would not in any way prejudice the matter one way or another with respect to either the siting, or would it, or the operators? I can see that that might be a matter that could be left to the future, but the site would have to be faced now, wouldn't it?

Mr. FRI. The siting has to be faced fairly quickly, yes. And that is a decision that has moved into the White House, at least as far as the executive branch is concerned. It would be delightful if we could agree on a course we would like to follow quickly.

But I'm sure that if the question of multiple operators was too difficult to resolve, I feel myself strongly that it's useful to have multiple operators. I'm sure we could handle the situation in a way that lets us get started while reserving that decision for a few months, for participation.

Senator CHURCH. Do you expect the President to make his decision soon?

Mr. FRI. I certainly hope so, Mr. Chairman, but I don't know when that decision will be made.

Senator CHURCH. It would be greatly easier for us if he made the decision. We could review it.

Mr. FRI. It would be a lot easier for us too. It would cut out about 50 percent of my telephone calls.

Senator CHURCH. I think that completes my questions for the moment. Senator McClure, do you have any questions?

Senator McCLURE. No questions.

Senator CHURCH. Mr. Fri, could you stay while Mr. Nosenzo gives his testimony?

Mr. FRI. I certainly can, yes.

Senator CHURCH. I have one question for you, Mr. Fri, before you leave, that has just been brought to my attention. This has to do with the GAO, and proposed termination of the Clinch River breeder.

Senator Baker and Senator Jackson, when they were informed that the administration intended to terminate the Clinch River project, were of the opinion that such an action was illegal because the program had been established by statute, and had previously been funded at considerable expense.

And now I am told that it is expected that the GAO reviewing this question may issue a legal opinion that the administration's proposal to terminate the Clinch River plant is not within the permissible limits of the authority presently granted in the law.



Now, if the Comptroller General issues such a legal opinion, where are we?

Mr. FRI. Well, I'm not sure which opinion we were talking about. Senator Jackson and Senator Baker, I think it was asked the Comptroller General whether to—to examine whether the deferral notice that the President set up should be considered a deferral or issue made under the budget, control from 1974, the GAO is authorized to make a unilateral determination whether the deferral is in fact a decision that would make a lot of difference because the nature of the congressional action is different as to whether it's a deferral or a decision.

It may well be. I'll be talking about the GAO turning the deferral into a decision. Is that the opinion we're talking about?

Senator CHURCH. I suppose we had better wait for the opinion. It's a little bit difficult to predict an opinion. I don't know what it will be.

Mr. FRI. There are two company extensions. One is the budget control and the question of whether it's a deferral or a rescission. And the other is section 106B, I think, of the Atomic Energy Act, which would require us to come forward to change the basis of arrangement, as it is called, for the Clinch River project. My letter to Senator Jackson initially was to change the basis for arrangement under the Atomic Energy Act.

And I think a day before or a day later, the President sent out the deferral message to responding to that change on the basis of an arrangement. Senator Jackson and Senator Baker sent back my letter saying, we don't think that's satisfactory, and then went ahead and asked the GAO to look at the question of whether it was a deferral or a rescission.

All three acts, we changed the basis of arrangement. The decision on deferral has to lie before the Congress for 45 days, at which time there will be a great deal of confusion over what to do next. Unless the authorizing committees of both the House and the Senate have solved the problem.

But we are left to the devices of sorting out rescission or deferral, and it's not a very constructive kind of form, I think, because it just won't permit the kind of resolution of this issue in an orderly way, that we would like to see.

Senator McCLURE. Could I ask a question on that?

Senator CHURCH. Yes.

Senator McCLURE [presiding]. What is technically involved, not from a legal standpoint but from an operational standpoint, in shutting down the Clinch River plant?

Mr. FRI. We would have to terminate all the existing contracts, in some cases we would pay termination charges to terminate for convenience of the Government, and we would have to pay for close up and wrap up costs.

I think there is a contract with the utilities through which they fund part of the project, some \$100 million of their dollars have been spent.

If the project were not to go ahead, I would not be surprised. If the utilities asked for their money back, but that would be something that would have to be negotiated out.

Senator McCLURE. Has notification been given to the contractor for the proposed closure, and the decision?



Mr. FRI. We have not signed new contracts but we have not terminated the contracts, to my knowledge. We are in a position where the President has said let's not come into construction. So during this 45-day period, we are trying not to commit ourselves to additional expenditures of funds while all this gets sorted out.

But at the same time we are still operating under the 1977 authorization, so we can't stop anything either.

Senator McCURE. As a matter of fact, the GAO indicates that the contractors have been told to be prepared.

Mr. FRI. Oh, yes, we've done the planning for what we would have to do, if it is finally settled out, to not to commit to construction of the project.

Senator McCURE. Would it not be better to await a decision by the Congress, in other words defer the shutdown dates so the Congress can make a decision, so that we'll know whether or not that is the actions the companies will take before we actually shutdown.

Mr. FRI. We haven't taken, as far as I know, any actual shutdown actions, but we certainly have started doing something about what would have to be done if the decision is finally made to shut the thing down.

We tried to be careful to operate, however, under the 1977 authorization, which requires us to go ahead with the project. Now, it is a somewhat different position we're trying to operate in in compliance with the law while at the same time preparing for a couple of eventualities, which if we don't prepare for them we'll just sit around on our hands and they'll cost us more money.

Senator McCURE. I recognize the dilemma. It is just that, where the proposed course of action is somewhat uncertain; without stating my own view at this time I think it's a topic, and this is a rather hotly contested decision and at some point it will have to be determined whether it will be closed down or not.

And I recognize there can be costs, whichever way it goes, and those costs can be increased or minimized, depending upon your best guess as to what the final outcome will be.

Mr. FRI. On the one hand, if it is continued to be authorized, and on the other hand it will minimize our loss if the result is—

Senator McCURE. My understanding is that they are preparing to shut down, that's what they've been told.

Mr. FRI. They've been told that the President's decision is to shut it down, and if they should undertake the planning as to what would have to be done to carry out that decision, they've also been told that that decision is not final until Congress has acted.

So in the meantime, they continue to process the existing contract as planned.

Senator McCURE. If I understand from what you've said, is it's your expectation that the shutdown cannot occur unless Congress agrees.

Mr. FRI. That is clear, yes.

Senator McCURE. So until the Congress either acts under the recession or referral the shutdown will not occur.

Mr. FRI. And/or section 106B of the Atomic Energy Act, yes. All the contractors have been told, keep going just as if nothing had hap-



pened. However, something might happen so let's start thinking about how to do that in an orderly way that happens.

It's an awkward position but that's what we have to do.

Senator McCLURE. So as a matter of fact, something is happening even though nothing is happening.

Mr. FRI. In terms of an expenditure of funds, they're going ahead with a contract as originally programed, but I think it would be imprudent of us to do nothing about the possibility of termination because should it occur we can save some money by being prepared to act promptly, rather than let the system run for a few weeks while we try to figure out what to do.

Senator McCLURE. Well, again, I don't know that we can solve that question here this morning, and I'm sure you are aware, and I think the record should show, the conflict on whether or not there is legal authority to shut it down.

Mr. FRI. There's no conflict on that.

Senator McCLURE. What?

Mr. FRI. I'm not aware there's a conflict on that.

Senator McCLURE. You think there is legal authority to shut it down?

Mr. FRI. Not until Congress has acted. That's why we set up our letter, and the deferral notice. Those are the requirements of the statutes, to which we have responded.

Senator McCLURE. I understand Senator Jackson and Senator Baker have indicated that they don't think it's legal authority under 106B, and contemplates and includes the authority to shutdown.

The other question is a procedural one. What is necessary prior to the time Congress may want to or the way Congress must act. But I think the record ought to indicate that so far Congress has not conceded that the authority under 106B includes a shutdown.

Mr. FRI. There is some dispute as to the question of 106B.

Senator McCLURE. And I don't ask you this morning to concede that point. Obviously you are not prepared to.

Mr. FRI. I think my lawyers would kill me if I did.

Senator McCLURE. I understand that, and I don't ask you to throw yourself on the swords of the enemy, but I do think the record ought to indicate that there's no agreement on this side that you have that authority, and under that statute it will be contested, I am certain.

Mr. FRI. We, of course, agree. We have complied with the statute because we don't know what else to do. Here's what we want to do and we've sent you the paperwork and what seems to be the appropriate statute saying this is our position.

And so we sent a bunch of 45-day clocks to run, and basically, I think, what has happened, I'd rather see this whole thing settled, Mr. McClure, not so much by that process as by the authorizing committees on the House, Senate, and administration getting together on a solution to this thing. Then we could straighten out the paperwork, with some agreement as to what the answer is.

Senator McCLURE. I agree with that and that's the way it ought to happen, however if you can't proceed under the allegation under authority under the Atomic Energy Act, then you're not simply leaving it to that process.



I suspect it will end up in court, among of other things, as well as a rather difficult impasse between Congress and the administration over what the meaning of that statute is.

Mr. FRI. There is a box, of course, of having taken the decision and having to do something to be responsive to the statute, but what in effect that says is before these 45-day talks run out we would really like to get this stuff resolved, which we have a great motivation to do because it's our authorization bill and it means a lot of other stuff as well.

And after the experience last year of not getting an authorization bill, we would obviously like to get this thing wrapped up.

Senator McCLURE. I hope we can resolve it without the kind of conflict that will come if the administration insists that it has the authority under that act. Senator Jackson and Senator Baker have indicated that from their standpoint and it's a standpoint which I support, but they don't have the authority to do that.

Now, if the administration proceeds under that, we are in inevitable conflict, and that will not be resolved in the way you suggest it ought to be.

Mr. FRI. That's why we proceeded under both applicable statutes. The other being the budget control and accountable act, and I hope there's no question that the Congress and the President has the right to send up a deferral and decision notice, and Congress has the right to act.

Senator McCLURE. There is no doubt the President has that authority under the other act, and that will be acted upon by the Congress under the procedures which are set forth for that act.

The question I would leave is whether or not the administration intends to act under the purported authority under 106B. If they do attempt to close down under that authority irrespective of the other, then I think there's an inevitable conflict between the administration and the Congress. I hope we can avoid that, but since you have sent it up under that act, and Senator Jackson has responded to that submission, I think the ball is in your court to indicate whether you intend to go ahead on that purported authority, or whether you are going to await the resolution of the legislative process.

I don't know that you are prepared to answer that this morning.

Mr. FRI. All I can really say, Senator McClure, is we're doing what we felt needed to be done to respond to the statute, and there is a debate over the legal point. The practical issue is that whether we proceeded under only the budget impoundment act is a 45-day clock that has started running, and I don't think the right response here is either to—let me do that another way.

I think the right response is to somehow try and get this whole thing ironed out within the 45-day period, rather than rely on either act, and neither act is neither to produce a kind of result that everybody is going to be happy with.

If that's the way the law stands.

Senator McCLURE. I'm going to have to go to the floor to vote, I think Senator Church will be back, but let me leave with just this note so far as I am concerned. I would assume that if the Congress turns down the act, and does not agree with the decision or deferral, that the adminis-



tration will also assume that that is a determination of the issues so far as the authority is concerned under 106B.

I wouldn't expect that the administration would try to push the authority if 106B in congress disagrees with the action taken under rescission or deferral. And that decision, in my judgment, is now back in your court, and the administration at some point is going to have to answer the question of whether they agree that that will be the resolution process.

Mr. FRI. I see your point, Senator. My response continues to be I would rather work with the authorizing committees and not have to rely on statutory provisions, which are in a sense, they never envisioned being the process for making this kind of decision in the first place.

Senator McCURE. I understand that, but if on the other hand the Congress should refuse to agree with the rescission or deferral, the administration could then conceivably say, I don't care what you did over there, we're going to use the authority of 106B and go ahead and do what we want to do anyhow. I hope it doesn't come to that, but at some point the administration is going to have to answer that question, or has.

Mr. FRI. I hope we don't get that far, clearly, and if that would happen it would not escape our attention.

Senator McCURE. Thank you, and the committee will stand in recess.

[Whereupon, the committee recessed for a floor vote.]

Senator CHURCH. The hearing will come to order. Mr. Nosenzo, Deputy Assistant Secretary of State, Nuclear Energy and Energy Technology Affairs, is here to testify, and I understand you've come back from Paris and are rather tired. I am sorry that this has put you to that inconvenience, but we'll be happy to take your testimony.

**STATEMENT OF LOUIS V. NOSENZO, DEPUTY ASSISTANT SECRETARY  
FOR NUCLEAR ENERGY AND ENERGY TECHNOLOGY AFFAIRS,  
DEPARTMENT OF STATE**

Mr. NOSENZO. Thank you, Mr. Chairman, I am very pleased to have this opportunity to testify before you today. Yes, I am a bit tired. The doctor and I would very much have liked to be here to testify before you. He has to stay to complete the meeting we were having on experts, as a followup to the economic summit meeting to discuss non-proliferation matters, and particularly to discuss the terms of reference for the proposed international fuel cycle evaluation that the President called for in his April 7 statement.

What I would like to do is to enter my statement for the record and to paraphrase the first portion of it, because I think it basically sets the framework for the administration's nuclear nonproliferation policy.

[The prepared statement of Mr. Nosenzo follows:]

**STATEMENT OF LOUIS V. NOSENZO, DEPUTY ASSISTANT SECRETARY FOR NUCLEAR  
ENERGY AND ENERGY TECHNOLOGY AFFAIRS, DEPARTMENT OF STATE**

Thank you, Mr. Chairman, I am pleased to have this opportunity to testify on our non-proliferation and nuclear export policies on behalf of the Department of State, particularly because the actions this Subcommittee on Energy Research



and Development takes on the ERDA authorization request for fiscal year 1978 will have crucial implications for the foreign policy dimension of our new policy.

I believe it accurate to say that the future of nuclear energy is today at a decisive point. For three decades we have viewed it as the ultimate panacea for the world's energy needs. The energy crisis of 1973 and the subsequent large increase in oil prices accentuated this belief. However, in the past few years, hard questions have been asked about the implications of nuclear power for nuclear weapons proliferation.

In response to these concerns, we have just completed a comprehensive review of our energy policy, including nuclear policy. I would like to outline for you some of our findings.

In all his statements on the subject, President Carter has made it clear that the United States remains committed to the use of nuclear energy at home and to peaceful nuclear cooperation abroad. His energy program envisages a substantial increase in our nuclear power generating capacity. Moreover, he has explicitly recognized the considerations that have led other nations to consider nuclear energy to be important in their own energy plans. To those countries who rely on our nuclear cooperation to meet their energy needs, the President has pledged that the United States will remain a reliable supplier of nuclear equipment and services. To that end, we have taken steps to enhance our own enrichment capacity in order to be able to meet our own needs and the needs of other nations. To those countries, particularly those adhering to the NPT, with whom we have not previously engaged in nuclear cooperation and who share our nonproliferation objectives, we remain prepared to undertake negotiation of bilateral agreements for cooperation under which the U.S. can assist in their use of nuclear power. In short, we remain firmly committed to assist other nations in the peaceful uses of nuclear energy. The current generation of commercial nuclear reactors, without reprocessing, does not pose a major proliferation hazard, as the plutonium remains locked up in the spent fuel rods.

However, there remains the key question of how we can reconcile the next stage of nuclear power development in which plutonium might be widely used commercially with the increased threat of nuclear weapons proliferation. This is one of the most important challenges facing us. The further spread of nuclear explosive capabilities to an increasing number of countries would present a serious danger to the world community. A multi-proliferated world would not be a stable world. It would increase the prospects of nuclear war. It would adversely affect our ability to control international events and expose us to new risks. It would have a dissolvent effect on international relationships and increase the prospect of terrorist nuclear attacks.

There are two crucial elements of the proliferation problem: (1) the motivation to acquire nuclear explosive devices and (2) the technical capability to do so. Neither dimension can be ignored. First, we must diminish the political and security motivations that lead states to acquire an explosive capability. Our bilateral and multilateral security guarantees contribute significantly to reducing the incentives of states to acquire nuclear weapons. The Non-Proliferation Treaty provides another important way to diminish the role of nuclear weapons in world politics. It creates an essential framework for reassurances that one's neighbors are confining their nuclear activities to peaceful purposes and that, in the event of diversion to explosive purposes, the safeguard system provided for by the Treaty would give timely warning for diplomacy to work. For these reasons, it is essential that we continue to seek the widest possible adherence to the NPT and to support measures which strengthen the international safeguards system of the IAEA.

The second element of the proliferation problem—technical capability—presents us with a different set of challenges. For if a sudden sense of insecurity should happen to coincide with a capability to produce nuclear explosive devices, further proliferation is all but inevitable. To avoid such situations, we must pay attention to capabilities as well as motivations.

To date, the IAEA safeguard system has been successful in the case of the current generation of reactors in that it provides an alarm that would ring early enough for diplomacy to work in the event of deliberate diversion. But for certain technologies such as PUREX reprocessing, the timely warning function of even the most effective safeguards would all but vanish. In other words, our present challenge is how to cope with developments in commercial nuclear energy which threaten to empty safeguards of their central political meaning.



It was in response to this dilemma that President Carter decided to defer indefinitely domestic commercial reprocessing, and to continue our embargo on the export of sensitive facilities. I would emphasize that President Carter's April 7 statement did not foreclose the option in the future of some form of fuel recycle if it is necessary that we enter a breeder economy. Rather he said that we have a responsibility to search for alternative fission cycles and technologies that will meet our energy needs while reducing security risks. In short, he opposed the premature entry into a plutonium economy.

At the same time, we fully recognize the concern of other countries for security of fuel supply. To accommodate this need, we will be embarking on a wide-ranging program to examine ways to provide an assured supply of non-sensitive nuclear fuel services on a timely, adequate, reliable, and economic basis. Specifically, we will expand U.S. enrichment capacity and re-open our order books. In addition, we will examine ways to go beyond a strictly bilateral approach. We believe we should explore:

Multilateral arrangements designed to substantiate guarantees to consumers by fuel suppliers backing up each other's fuel contracts as well as to assure access to fuel supply by reactor exporters having no indigenous fuel capabilities and resources; and

Wider international arrangements such as an "International Fuel Bank" which might serve as a contingency reserve.

I should emphasize that these concepts are still in their formative stages and need further investigation. We are now discussing them in international forums. The important point, however, is that the fuel assurances we envisage should be designed to provide real multilateral incentives for countries to forego the costly and dangerous acquisition of sensitive facilities. To be credible, such international incentives must be non-discriminatory, they must not increase the dependency of recipient nations on any one supplier, and they must not create any perception abroad that we are seeking to obtain any commercial advantage.

The problems related to the back end of the fuel cycle, notably the need to ensure adequate spent fuel and nuclear waste storage are equally urgent. We are presently studying a wide range of solutions which would, as is the case with fuel assurances, alleviate the pressure for acquisition of reprocessing capabilities. Among others, the concepts under study include an expansion of domestic U.S. storage capacity for spent fuel, the possibility of making storage capacity available for the interim storage of foreign spent fuel, and international spent fuel storage arrangements, including regional centers.

My comments thus far have related to the current generation of nuclear reactors. With respect to the next generation, we have proceeded for thirty years on the assumption that reprocessing would begin when there were sufficient light water reactors to justify the large-scale facilities needed for economic operation and that plutonium would be recycled in light water reactors until fast breeder reactors are introduced. The question that arises is whether there is still time to affect the next generation of nuclear technology. Our conclusion is that we do have time to examine future fuel cycle alternatives that present less proliferation and health risks. This was a major element in the President's April 7 decision to restructure the U.S. breeder reactor program. I should emphasize that our intent is not to deprive any other nation of required energy sources, but to explore whether we are able to shape the future of nuclear technology to serve our broader goals, while at the same time deriving the benefits of its energy potential. It is a misconception to say we have asked other nations to cancel their breeder programs. We have not.

I believe we have to examine options and alternatives to reprocessing and recycle that have long been overlooked or forgotten because they were out of line with past policies. These include the tandem fuel cycle, various conroccessing schemes, the spectral shift reactor, and the thorium-uranium cycle. All of these possibilities have the potential to extract additional energy from a nuclear fuel cycle while making it more proliferation-resistant. There is no guarantee, of course, that any of them will prove technically and economically viable, but the dangers of nuclear proliferation demand that they be explored while we still have time.

It is in this spirit that the U.S. has embarked on a major program to examine fuel cycle alternatives. We have invited some thirty other countries to join us in this endeavor. This is the point of the President's call for an International Nuclear Fuel Cycle Evaluation open to all interested nations. We envision that this Evaluation would study urgent problems associated with the current opera-



tion of the fuel cycle, such as reliable fuel supply and means of storing spent fuel, as well as studying alternative future fuel cycles, including future generation reactors and institutional arrangements for reducing proliferation risks.

Among the specific technical studies envisaged in this proposed multinational effort are: (1) uranium and thorium supply; (2) enrichment availability; (3) institutional arrangements related to fuel assurances; (4) spent fuel storage including study of the technology for long-term retrievable and permanent disposal in international/multinational repositories as well as near-term capacity options; (5) methods to increase once-through uranium utilization in light water reactors; and (6) advanced reactors and breeder options. This includes studies of alternative forms of and institutional means of managing reprocessing to reduce proliferation risks.

I am pleased to report an encouraging level of interest among the countries with which we have been discussing it.

Let me turn now to S. 1432, the Administration's nonproliferation bill, four sections of which have been referred to this Committee, and related policy decisions made by the President. This bill, submitted by the President to the Congress on April 27, together with the Fact Sheet released by the White House on the same date, constitute, I believe, a balanced and workable new approach to deal with the dangers of nuclear proliferation. First, let me review for you the policy decisions set forth in the Fact Sheet. Prior to the issuance of a license for the export of nuclear material or facilities, the Nuclear Regulatory Commission must have been notified by the Executive Branch of its judgment that the issuance of the license will not be inimical to the common defense and security of the U.S. In making this judgment, the Executive Branch will adhere to the following policies:

We will continue to embargo the export of enrichment and reprocessing plants from the U.S.;

We will avoid new commitments to export significant amounts of plutonium except for gram quantities for research and analytical uses;

We will avoid new commitments to export significant quantities of highly enriched uranium except when the project is of exceptional merit and the use of low enriched fuel or some other less weapons-usable material is clearly shown to be technically infeasible;

We will not approve any supply of highly enriched uranium greater than 15 kilograms unless the President has himself approved the export;

We will undertake efforts to identify projects and facilities which might be converted to the use of low enriched uranium from highly enriched uranium;

We will take steps to minimize inventories of weapons-usable uranium abroad.

These policies represent a significant tightening of United States nuclear export policy.

Turning now to S. 1432, I shall not review the bill in detail as the Administration's section-by-section analysis of it has already been provided to you. Rather, I will highlight some of the key differences between it and S. 897 introduced by members of the Senate Government Affairs Committee.

We believe that S. 897, if enacted, would impose immediate export criteria that could force a moratorium on our nuclear exports, adversely affecting certain allies whose cooperation is needed if we are to achieve our nonproliferation objectives. The immediately applicable nuclear export conditions in the Administration bill reflect, I believe, commitments we can reasonably ask other nations to assume while we negotiate more stringent arrangements.

Unlike S. 897, the Administration bill sets forth several additional nuclear export conditions which will be required in new agreements for cooperation, including the provision that recipients have all their nuclear activities under IAEA safeguards as a continuing condition of U.S. supply.

Again unlike S. 897, the Administration bill focuses on tightening the conditions for U.S. nuclear cooperation through the renegotiation of existing agreements to meet the same standards as we will require in new agreements. S. 897 would employ the technique of trying unilaterally to impose new export licensing conditions after 18 months. Enactment of such a measure could drive recipient nations to other suppliers or toward the development of indigenous facilities to meet their nuclear fuel needs and hence would be severely counterproductive to our non-proliferation objectives.

Lastly, the Administration bill, as contrasted with S. 897, would give the President the ability to deal with the extremely complex problem of proliferation



in a manner which will best suit the circumstances of particular cases. We believe our proposal for Presidential flexibility in certain limited instances, with provision for congressional veto by joint resolution, strikes the proper balance between Executive Branch and Congressional responsibilities, and at the same time maintains our credibility as a nuclear supplier, credibility which is absolutely essential to the achievement of our non-proliferation objectives.

I should like now to address briefly the ERDA authorization request for FY 1978 because it bears so directly on our international non-proliferation efforts. As you are well aware, the President has proposed reducing the funding for the existing liquid metal fast breeder reactor program and to redirect it toward an evaluation of alternative breeders and other fuel cycles that present less risk of proliferation. We also are proposing to cancel construction of the Clinch River Breeder Reactor Demonstration Project. The design work would be completed and a technology base program would be maintained, including the Fast Flux Test Facility.

We are confident that these actions will not affect long-term energy supplies in the United States. As I noted earlier, we are convinced that we have the time to examine alternative fuel cycles that present less danger of proliferation. I should also stress in the most emphatic terms that we are not ruling out the eventual development of a breeder reactor. The amended funding level for breeder R&D would still total almost half a billion dollars.

The basic rationale for these actions relates to our belief that we do not have to rush ahead into the plutonium economy. For to do so would send exactly the wrong political signal abroad at this critical juncture when we appear to be making progress with other nations in our efforts to examine alternatives to the plutonium option. Foreign nations will heed our budget, not our rhetoric. And if our budget does not reflect the President's non-proliferation policy, how can we credibly ask other nations to pause and re-examine their plutonium option?

Other factors which affect our approach to this issue include :

Our reservations regarding the economics of proceeding with the Clinch River Demonstration Project, and

The considerable downward revision in the number of nuclear reactors that we anticipate will be on-line by the year 2000.

In sum, therefore, we believe that the President's proposals represent a prudent balance between foreseen nuclear energy needs and the compelling demands placed on us by the critical dangers of nuclear proliferation.

I would be pleased now to try and respond to questions you may have.

Senator CHURCH. In setting framework, you make a statement that I think needs to be called to special attention. You say on the first page of your written statement, which has been submitted for the record, for three decades we have—let me read the paragraph:

I believe it accurate to say that the future of nuclear energy is today at the decisive point. For three decades we have viewed it as the ultimate panacea of the world's energy needs. The energy crisis of 1973 and the subsequent large increase in oil prices accentuated this belief. However, in the past few years, hard questions have been asked about the implications of nuclear power, for nuclear weapons proliferation.

This is an excellent summary, I think, of the framework of which you speak.

It's just possible that 20 years from now that statement, which I accept, will be looked upon as a complete misreading of the situation. I don't think we can base national policy upon that possibility, but it does exist, and I don't mean to interrupt your testimony but I want to put this question to Mr. Fri. And it's one of the reasons I asked him to stay on.

Is it true that despite our feeling that nuclear plants are going to play an indispensable role, and many, many more will be built in this country and throughout the world between now and the end of the century, is it nonetheless true that we haven't had an importer for a nuclear plant in this country since March of 1976, and that we have had several cancellations and deferrals on existing orders?



Mr. FRI. Essentially you are correct. I haven't reviewed the statistics for the exact date, but there have been very few orders for nuclear plants, and there have been a number of deferrals, though the same thing has been true of a number of coal plants as well.

Senator CHURCH. It's just possible, and at some point the committee must look at this, that the economics of big powerplants are going in a way that the cost of producing electricity at enormous prices is giving serious pause to utilities when it can't be certain of what the curve will in fact be in the future.

Or that such costs can be justified, and that while we are projecting how many of these new plants we're going to have, and how our system will continue to be based upon these huge generating facilities, perhaps it is going as nearly unnoticed that new orders for such facilities are not forthcoming, and that the economics is being reexamined. I really think we might be entirely wrong about all of this.

Mr. FRI. I think it's a very important point, and indeed I regard the most serious impact to the oil embargo of 1973 to be the degree of uncertainty, it has introduced into the whole energy picture because energy solutions inherently require large investments, and inventors do not make investments when there are great uncertainties.

That's why I regard the comprehensive national energy plan to be so important because it helps regress the uncertainty. And furthermore I think it's important that in that energy plan, since the president has said a couple of things which may not have received notice that they should, as your observation has not received the notice it should, that first of all we will need light water reactors as an important part of the energy mix for through the end of this century at any rate.

And second, that we need not add to the uncertainty of light water reactors by connecting them intimately with the whole question of whether we need to use plutonium or not, but admit we can have light water reactors for the clear period of time, for a once through cycle, and commit ourselves to that.

And then on a separate though clearly related, but nonetheless separate path, let's examine the question of the plutonium reprocessing breeder, and come to an answer. But let's not fool ourselves into thinking that the only way that we can have nuclear power in this country is to start a reprocessing plant today, or to irretrievably commit ourselves to the commercial application.

That introduces a whole uncertainty that we just don't need today in the light water reactors.

Senator CHURCH. There seems to me a new book coming out, based upon a whole different analysis of energy for the future. A highly unorthodox book but from my review of it, it strikes me as terribly compelling. And it's based upon the close analysis of the economics of energy, and the conclusions are not evolutionary, they are revolutionary.

The conclusions being that we will find that the economics of what we are doing will force us to a recognition that this is not the whole course that we are taking, is not feasible, and that already the United States is using a great deal more electricity, which is the most costly form of energy than any other industrial nation, and is wasting most of it.



The figures, as I recall them, are that the average use of other industrial nations of electricity in their total energy consumption, is about 5 percent, in this country it's 13 percent, most of which is used for space heating, and cannot possibly be justified by any economic measurement, based upon the present cost of reproducing electricity.

And, I am told that in Michigan one utility company is not financing the installation of methods of insulation and solar heating units to reduce the use of electricity, which would have been absurd for a utility to undertake and finance ways to reduce the consumption of its product. But the committee has found that it makes more money on financing methods to conserve electricity, and thus enabling the customers to make these installations.

It also avoids the tremendous problems of assembling the necessary money and waiting for 10 years to get a nuclear plant completed, which accelerates those costs immensely.

So I don't know. We may find that much of our thinking is misplaced, and I would commend this book to you. I think it's just coming out to read and it's worthy of serious consideration, particularly in your position, charged as you are, in helping to formulate the national energy policy of the country.

All right, I'm sorry, Mr. Nosenzo.

Mr. NOSENZO. Quite all right, Mr. Chairman, it's an important intervention.

On all statements on the subject, President Carter has made it clear that the United States remains committed to nuclear energy at home and for peaceful nuclear cooperation abroad.

His energy program envisages a substantial increase in our nuclear-power-generating capacity. Moreover, he has explicitly recognized the considerations that have led other nations to consider nuclear energy to be important in their own energy plans.

To those countries who rely on our nuclear cooperation to meet their energy needs, the President has pledged that the United States will remain a reliable supplier of nuclear equipment and services. To that end we have taken steps to enhance our own enrichment capacity in order to be able to meet our own needs, and the needs of other nations.

To those countries, particularly those adhering to NPT, with whom we've not previously engaged in their cooperation, who share our non-proliferation objectives, we remain prepared to undertake negotiational bilateral agreements for cooperation under which the United States can assist in the use of nuclear power.

In short, we remain firmly committed to assist other nations in the peaceful uses of nuclear energy. The current generation of commercial nuclear reactors without reprocessing, the so-called watch through cycle, does not pose a major proliferation hazard, as the plutonium remains locked up in the spent fuel rods.

I think the point that Dr. Fri made that our concern about the next generation of nuclear energy should not prejudice how we handle the current generation of nuclear energy.

And it was partially for this reason, I think, that the President expressed his views so strongly on the future generation because he recognized that if we did not develop the capabilities to handle the next development of nuclear energy, it could in fact prejudice our ability



ability to move in this area, both in the current generation as well as in the future generation of nuclear energy.

Senator CHURCH. Let me ask you about the statement. The current generation of commercial nuclear reactors without reprocessing does not pose a major proliferation hazard as the plutonium remains locked up in the spent fuel rods.

Well, if the spent fuel rods are not recovered by the United States, there is no assurance that the plutonium will remain locked up in them.

Mr. NOSENZO. That's very true, Mr. Chairman, but let me explain the rationale behind that statement. What is being said is that the current generation of reactors with low enriched fuel, and spent fuels coming out, that has a degree of protection when it comes out of the reactor in that the material has fission products there, that do serve to protect it and the international safeguard system, which through accountability, surveillance and to those elements are able to detect subversion.

But the safeguards have a much broader political ability in that international safeguards act as a deterrent. The second aspect is if deterrents fail, the nations for some reason decide to divert material, it rings an alarm bell. It lets us know that something has happened.

But more importantly, it gives us sufficient time to do something about it. In the words of the statement where diplomacy is at work now, the diplomacy could work in many ways, as Dr. Fri indicated, through sections.

Hopefully we could have diplomacy work through correcting what was the basic instability that caused, or basic insecurity that caused that country to move in that direction.

But the point is that you have time because a country without reprocessing, even with the capability, even with the technology, cannot move rapidly to develop a nuclear weapons capability.

You really have on the order of months, and perhaps years, before they can convert that spent fuel.

Senator CHURCH. But the key to all this, and the reason that I challenge the accuracy of the statement, is that nations without reprocessing, using present nuclear reactor, can, and indeed as demonstrated, have produced nuclear weapons.

Mr. NOSENZO. Mr. Chairman, if I can intervene. India did in fact have a reprocessing capability.

Senator CHURCH. Well, the President himself has said that today there may be as many as a dozen countries that possess the capability, if they desire to do so, to produce nuclear weapons from the spent fuel of the light water reactors.

I think there's no question but what this nuclear proliferation hazard does in fact exist today. Now, the only thing that would enlarge that, it seems to me, would be reprocessing facilities for enriching facilities that would enable nonweapons states to have a cycle that would produce, from which they could produce sizeable numbers of nuclear weapons. Would you agree with that?

Mr. NOSENZO. Yes, sir.

Senator CHURCH. So the purpose of an international system would be to avoid the proliferation of enrichment facilities or reprocessing facilities, and place them under effective international control. Isn't



that the general opinion, so that the hazard of proliferation could be restrained?

Mr. NOSENZO. I would say that that is one solution to the problem, but let me—

Senator CHURCH. What are the other solutions?

Mr. NOSENZO. Let me clarify that. The current generation of reactors consists of sensitive facilities such as enrichment facilities able to produce in fact highly rich material where the light-water cycle produces low-enrichment facilities, and that the reactors themselves with low and rich fuel coming, spent fuel coming up with some degree of protection and some degree of time before a country could move from that point to a nuclear weapons capability.

What you would like to see in a nuclear fuel cycle is as few sensitive facilities as possible, and to have as much of the cycle as nonsensitive as possible.

Senator CHURCH. Yes.

Mr. NOSENZO. Therefore, that's why the current cycle is very proliferation resistant, but part of that is one doesn't want to build sensitive facilities if you don't have to build sensitive facilities.

The point has to be, I think, justified, that before you move to reprocessing there has to be a need, a clear need, to move there, and the institutions that will allow reprocessing or any sensitive portion of the fuel cycle to meet our essential needs.

So what the President is saying in this policy is:

Let's pause, We have signed. Let's pause and look how you can take the next step, so that we can meet our social requirements.

Senator CHURCH. The critical question in my mind is not whether or not we can pause, and I believe we can, the critical question in my mind is whether nations like France that have already committed themselves to the breeder, can pause.

Whether the real need now is to recognize that the plutonium age has come to the world and not the United States, and therefore we must now begin at once to build an international system necessary to accommodate the needs of a plutonium-based system.

It is already here, and the need to deal with it isn't something that we have to face 10 or 15 years from now. I don't think we'll have the time then to establish a system. We have to get about establishing it now. Do you agree?

Mr. NOSENZO. I guess I would disagree, Mr. Chairman, because I do think we have the time and we have the responsibility now to find alternatives, either to find alternatives or to find safe ways to live.

Senator CHURCH. Maybe I didn't put my question to you clearly. I have no objection to trying to find alternatives. I honor very highly my colleague from Idaho who used to say that the greatest single act of contamination in history was splitting the atom. And I think perhaps he was right.

I would have preferred a world in which the atom had never been split. The world would never have known a Nagasaki or a Hiroshima, a world that was never plagued with the massive accumulation of nuclear weapons. I wish it hadn't happened, but it did, and we are now facing a world in which the French, the Germans, and others have already committed themselves to the breeder reactor. I wish they hadn't done it, but they have.



There is nothing wrong in looking at other cycles to see if we can develop other and better cycles, but in the meanwhile we have to accommodate through some kind of international system a world in which the breeder has arrived.

Mr. NOSENZO. Senator, a part of the international fuel cycle evaluation study, as you know, is to look at the breeder, the plutonium breeder as well as alternatives to the plutonium breeder, to see how we can make it more proliferation resistant. This is part of the study.

The question is, though, do we move prematurely into this area, at least in our view prematurely before we have established those guidelines, before we know what they are, before we know how to formulate them, and to formulate them we have to formulate them on an international basis. And that really is the basis of the study that is being called for.

As you point out—

Senator CHURCH. You know, the super phoenix is about 90 feet underground, so we'd better get about establishing a system that is capable of accommodating it. Are the French going to tear it down?

Mr. NOSENZO. I agree in the case of the French they are far advanced, for example, the Germans are not that far advanced, the British are not that far advanced, and of course Japan is slightly further behind. They have just started. I agree with you that they are going to have to develop ways to cope with the next generation but I think we need to identify what that next generation is, and I think there is time to turn countries around, and we're not going to do it by rhetoric.

We're going to have to do it by finding hard, concrete solutions to these problems, and there may not be any. You may be absolutely right.

Senator CHURCH. Well, I'm not so sure there aren't solutions. I think the prospects for finding an adequate international solution looked to me to be pretty good.

Senator McCLURE. Did I understand you to say you think there is time to turn France around on the super phoenix principle?

Mr. NOSENZO. No, sir, I didn't say that.

Senator McCLURE. I thought I heard that, and I didn't believe what I thought I heard.

Mr. NOSENZO. I guess what I'm saying is I think there's time. Well, what we're talking about now, we call it the next generation of nuclear reactors, but I think we're really talking about the systems we're going to have to live with in the next century. It's not just something that's going to happen in 10 or 15 years, it's something that we're going to have happen in perhaps 100 years.

And if we can't find the time now to determine either how to live with the direction that we are moving in, or better yet to find alternatives that are more proliferation resistant, I really think the responsibility is on every country to prove that they don't have time to move ahead now.

Because in fact, as I said, we're going to have to live with this system for the next 100 years, and if we don't produce the social structure for that system, that will allow us to live with it so that we don't end up in a nuclear proliferation world, I think we really have not met our responsibilities.



Now, we can argue about the amount of uranium resources, and your point before about assuring fuel supplies to these countries, I think is critical. You can expect people—if you look at the European situation, and many other countries, they are developing nuclear power because they don't have sufficient fuel sources, because they are protecting themselves against imported oil, they're moving toward the breeder to protect themselves against imported uranium.

And they are concerned that at some point in the future they could be restricted to that source of material.

Senator CHURCH. I think that's a consideration. Mr. Fri said the other day, even if you were a Frenchman, he would be pushing the breeder full speed ahead, and I think that's the reality with which we have to live.

Mr. FRI. I think the question, Mr. Chairman, if I may intrude, is not so much whether a weapon state like France goes ahead and builds a breeder reactor, but should we because that happens, then assume that it is an accomplished fact that France will then sell not only reprocessing plants but breeder reactors to Pakistan.

If not that then what other alternatives? And those are the kinds of questions we've got to answer.

Senator CHURCH. You know how strongly I believe that we ought to establish now an international system that would take the pressure off France to sell reprocessing plants and enrichment facilities to other countries. But without international systems, the pressure will all on the supplier countries.

France has made a big investment in that breeder, how will she recover it. Only by international sell. And if the buyers are going to dictate the terms, which is indeed the fact today, there is no way to stop proliferation. And you're going to have to recognize that now, and you're going to have to deal with it now.

We can't live in a pretend world. There is an international system, it's been described in detail, that could take care of the hazards of proliferation far more effectively than we are doing today. If we set it up, and I should think that France and Germany and England and even the Russians have a common motivation for setting up such system because they all have a common interest in preventing the proliferation of nuclear weapons.

So this plutonium age doesn't have to be so hazardous, if we build the necessary institutions to deal with it.

Senator McCURE. Mr. Chairman, might I interject a question. I would understand that the administration's thrust is, and the State Department in particular, that the breeder reactor is, if not the only, certainly the major threat of proliferation.

Mr. NOSENZO. If I gave that impression, Senator, if we look at what future cycles we may come up with, I can't imagine a future cycle that doesn't have sensitive portions to it. There just are no such cycles that I know of.

Senator McCURE. Let's not look at future cycles, let's look at our present technology. How many different routes can you follow to obtain weapons-free material—1, 2, 10?

Mr. NOSENZO. But the point is, what we're trying to do is develop the framework that prevents that, or if not preventing it gives us warning with sufficient time for us to do something about that point.



Senator McCLURE. I recognize that, but it seems to me you put the burden on the plutonium cycle when there are a great many nuclear fuel cycles or opportunities for weapons grade materials that are harder or at least as hard to control as the security of the plutonium fuel cycle.

And so we are going to prevent the proliferation on the plutonium fuel cycle as the major effort. When that's at least as easy to safeguard, and perhaps easier to safeguard, than any number of other opportunities, which a weapons hungry country might desire to follow.

Mr. NOSENZO. Senator, perhaps Dr. Fri could respond to your question on a technical basis, but what we are trying to do is to build a structure that minimizes access to weapons usable material to the degree that we can, recognizing that most cycles that we can think of, using one form or another, weapons usable material would be an exception of the current cycle, which of course uses low enriched fuel.

Senator CHURCH. But produces weapons.

Senator McCLURE. Very easily applied technology, that any country that is really bent on producing a weapon, and technology, that any one of them can buy and use outside of the breeder reactor or the plutonium fuel cycle.

You don't stop proliferation by stopping the breeder reactor, or reprocessing.

Mr. NOSENZO. You stop proliferation by not developing cycles that will allow a country to break into a weapons capability.

Senator McCLURE. We're not talking about developing cycles, we're talking about existing technologies. You can safeguard the plutonium fuel cycle much more easily than you can prevent a country from using a research reactor.

You can safeguard a plutonium fuel cycle much more easily than you can prevent a country from using a chemical separation process. Why then the fixation upon this one?

Mr. NOSENZO. The fixation is on the form of the material, as it's produced, and as it's transported through the system, because that's where the access is.

Senator McCLURE. And isn't it quite possible to put plutonium fuels in a condition which is at least as difficult for them to handle, or as other fuels or other elements?

Mr. NOSENZO. Absolutely.

Senator McCLURE. And that can be done with a breeder reactor in existence with the fuel reprocessing in existence?

Mr. NOSENZO. Yes; it can.

Senator McCLURE. Why do we say the only means to safeguard it is to stop doing any of those things?

Mr. NOSENZO. Let's look at how we're doing it now, Senator. We are doing it using purex reprocessing. Purex processing was a chemical processing system set up for the specific purpose of producing very pure plutonium. It was for the weapons program, and now we're using it commercially because it was the available technology.

Senator CHURCH. That's the technology you're going to preserve.

Senator McCLURE. Why don't we then set up proliferations that particular technology, modify it so that it becomes—

Mr. NOSENZO. I couldn't agree more.



Senator McCURE. So it becomes relatively more secure than it now is, rather than just saying we won't have any breeder reactors.

Mr. FRI. The breeder is the road to energy targets. It is viewed as a device that can be constructed within a country, with its necessary fuel cycle facilities, to get that country, any country, essentially an inexhaustible source of energy independent upon supply.

Now, when that is done, and that's a desirable objective from the standpoint of domestic energy policy in most countries, when that is done one has automatically spread reprocessing on a national basis, and that is a unit, that's a world in which I would rather not have lived, when we can think of an alternative.

Now, what then one is thinking, which is not simply the question of the technical control of proliferation, but the interdependence of countries on energy supplies, and that is a concept that we've got to implant in this world, and it's not promoted by pressing ahead with the breeder reactor as a national independent source of energy.

Senator McCURE. Quite to the contrary. The only way you avoid that is to make certain that we have adequate fuel supplies in the United States. It doesn't force other countries to go the independent route, which is where the current policy will take us.

Mr. FRI. The way to avoid it is to make sure that the legitimate energy needs of all countries can be solved without the spread on a national basis of sensitive facilities.

To do that one must break through the idea that the future of the breeder is to become the device of energy independence with all its pertaining fuel cycles.

Senator CHURCH. I object to that on one ground, because I think it overlooks the fact that though Brazil clearly wants the same sort of national independence in its fuel supplies that we are seeking for ourselves, and makes that the basis for its contract with Germany, that to become self sufficient rests upon the sale by Germany of the entire fuel cycle. It's not just the breeder, as you know.

Mr. FRI. That's right.

Senator CHURCH. It's the reprocessing and enrichment.

Mr. FRI. One needs to deal with two terribly important motivations.

Senator CHURCH. The only place I take issue with you is saying the breeder is the key to this. The real key to this, as I see it, is—the only key is to establish an international system that will satisfy the demand of nonweapon states by assuring them that they will have fuel supplies and reprocessing, through an international safeguarded system, so that they won't demand the enrichment plants and the reprocessing plants in the wrong countries. We would give them this capacity.

I don't see the breeder as the key, I see the sale of the fuel cycle which can only be avoided through the establishment of effective international control systems.

Mr. FRI. Well, two points. First of all you raise an issue which is not only important but often overlooked, is that not only must the legitimate energy needs of consuming countries be met, but the legitimate commercial interest of supplier countries must be met.

There must be no motivation to sweeten the reactor deal to a sensitive facilities, but I do regard the view of the breeder as one that I can get myself a whole complete fuel cycle with a reprocessing and fuel



fabrication, and the whole works, and have an energy source independent of the Arabs.

Now, that's not only a powerful motivation, but it will lead to a situation, if not corrected by some international regime that produces a national proliferation of reprocessing, and other sensitive facilities beyond a level that I'm prepared to believe is sufficiently riskfree.

So the international regime for the breeder, if anything more complicated to develop, because if one's even more powerful motivation is in regime for a water processing facility, and it's those kinds of questions that we have to get our hands on in this international fuel cycle evaluation.

Senator McCURE. I am not certain that we can tell exactly what's happening, and I have to refer to very unreliable sources like the Washington Post. The Brazilian foreign ministry was reported in the June 7 Washington Post as having confirmed that the United States has proposed an alternative to Brazil's plan to acquire from West Germany the capability to make its own enriched uranium, and to reprocess used nuclear fuel.

The U.S. proposal reportedly calls for putting in a reprocessing plant in a third country that would sell reprocessed fuel to other nations. The third country has not been selected, but the—Canada has been one nation that has been selected, as this source reportedly has said.

Is the U. S. policy now to agree to reprocessing internationally but not reprocessing domestically?

Mr. NOSENZO. Senator, I am not free, of course, to discuss the conversations we've had with countries like the Federal Republic of Germany, and Brazil. But in this case I would certainly quote the President in his conversation at the economic summit where he indicated that the only remaining problem he saw was the U. S. concern over the reprocessing issue with regard to the Federal Republic of Germany, Brazil, and our worldwide concern with the growth of purex reprocessing.

This has been a major element of the President's policy, so I would categorically deny that report.

Senator McCURE. The report in the Post is wrong or the Brazilian foreign ministry is wrong.

Mr. NOSENZO. I haven't seen the article, Senator.

Senator McCURE. Here it is.

It seems a curious inversion to assume that the greatest risk to security is to assure that others will do it, or to assume that others will not do it, is to deprive them of the supply opportunity.

Perhaps my logic is perverted, but it seems to me that we are embarked upon the course of the greatest possible danger, and not the greatest possible security.

If as a matter of fact the United States wasn't involved at all, and had not been involved at all, in reprocessing technology, or breeder technology, and we saw the rest of the world doing what we now see the rest of the world doing, it would seem to me that policy would impell us to get into it to acquire the technology, to be involved in the technology in order to create the security in which we say we want to remove from foreign countries the absolutely compelling argument that they've got to it themselves because there's no place else to go.



And yet we're in it and proposing to get out. And it seems to me that all logic tells us that if we're out we'd be getting in, and maybe that's a truism about whatever it is we're doing, that no matter what we're doing we seek to do something different.

Mr. FRI. Well, it's clear, Senator, that the United States supports the legitimate national desires of not only ourselves but other countries for secure energy supply. The nuclear arena is a question of how that structure gets built and I don't think there's any argument over that.

The question of our attitude to commercialization of the breeder reactor in the United States, whether we should commit ourselves to construction at Clinch River as a first step in that process or pause for a while.

That is, as we were discussing 2 days ago, in my judgment, fundamentally in earnest in our concern over the nature of this problem. Then what we are asking people to do in rethinking how nuclear energy can be supplied to satisfy the security needs of all countries is not a commercial ploy of the United States.

We are not motivated by beating France to the export market, and in taking this position that we're trying to make it clear that that earnest is there. Now, clearly others say you don't have to do that in order to make your point, but that's our feeling.

Senator CHURCH. And I appreciate this exchange we are having. It is hard for me to feel that keeping the Clinch River demonstration plan on schedule could be construed as an attempt to beat the French to the market because they have their demonstration plant operating for 2 years, sufficiently successfully, so that they are going ahead with the commercial plant, and according to our schedule we wouldn't even have a demonstration plant completed until 4 years after they had gone commercial.

We have no plant to build a commercial plant until 1990 or beyond. I find it hard to believe that a decision on Clinch River could be subject to the interpretation that we're trying to beat the French into the market. We've lost that race, we've lost it. They'll be in the market all right.

The important thing is to get that international system set up.

Mr. FRI. Maybe I'm responding not so much to what we've said today but to what I've heard in earlier hearings, not necessarily before this committee. That some kind of terrible and terrifying concern that we are not technologically ahead.

I don't regard being ahead in that sense as the essential criteria of formulating our nuclear strategy.

Senator CHURCH. I would agree with that statement. One of the things, we had four of the most eminent physicists in the world before this committee yesterday, all Americans, and all of them agreed that if there were a way to avoid the breeder, any alternative fuel system, that had any possibility of fulfilling the energy needs of the world, to the extent nuclear energy must be looked to for that purpose, would not only involve proliferation problems since all fission produces these nuclear weapons, waste products, but also that any alternative system will, if it's to meet those energy needs beyond the turn of the century, which the throw away process might manage, has to involve reprocessing.



Now, if they're right, and I'm not in a position to say they're wrong, I respect the expertise of the State Department, but I think those physicists know what they're talking about when all of them agreed they were of different minds about what we should do right now.

But all of them agree that any alternative to the plutonium breeder, if research can prove some alternative practical, its going to involve reprocessing.

Now, if they're right, and I must assume they are, what possible national advantage is served, or national interest is served by closing down or sitting on ice, our own reprocessing facility.

Mr. NOSENZO. Mr. Chairman, I surely wouldn't disagree with those groups of eminent scientists that you had here yesterday.

Senator McCLURE. Could you pull the mike a little closer?

Mr. NOSENZO. I certainly wouldn't disagree with the group of eminent scientists that you had here yesterday, on the subject. But I would add that what kind of reprocessing. Is it purex reprocessing? I don't think they were inferring that it would be reprocessing of plutonium. I think they were indicating that some degree of fuel reprocessing would be required.

Senator CHURCH. And they were saying that we should therefore be developing a processing plant that had variable capabilities, and we've got a start on one, and Barnwell, that is based upon the present system, but they said this could be modified to accommodate other fuel cycles.

In any event, we're going to have to have it. That's what makes me wonder why we are asking the Congress to endorse a policy that closes down the reprocessing facility at Barnwell, rather than utilizing it for this purpose, and in my judgment for the purpose of using it for an example of how an international system would work.

Assume leadership again, which has been lost in the nuclear field, and it stands to lose still further if we don't face up to these questions.

Senator McCLURE. And to use that leadership to develop the very kind of systems that both you gentlemen say this administration wants us to have. I don't see how we develop the alternatives by stopping what we're doing.

Mr. FRI. It seems to me the reprocessing case is a very clear-cut one, Mr. Chairman, at least it is in my judgment. If in the reprocessing case we have a situation where two countries have already agreed to export reprocessing plants, we have asked as a part of all of this to let's start them off.

And I think that's a wise policy.

Senator McCLURE. I agree.

Mr. FRI. Now, it's pretty clear, and here is a case where we are saying to other countries, don't export your processing plants until we get through with this evaluation and understand what kind of regime might exist if we were able to do that.

And if during that interim we, the United States, went about putting the Allied General Nuclear Corp. into the nuclear processing building in a big way, and encouraging Exxon to build a processing plant, it's pretty clear we would be allowing our industry to catch up with the industry, and particularly France and Great Britain. And I think there is a pretty clear case of being perceived of using a pause to our commercial advantage.



Senator CHURCH. And that's why we've explored together the possibility of preserving in tact the expertise.

Mr. FRI. The key point is to make it clear that we are not forging ahead to a commercial capability that could compete with these other countries in this pause while we ask them not to export.

I think that in a reprocessing case is a real and present danger of why we've taken a position that we have.

Mr. NOSENZO. Senator, may I respond?

Senator McCLURE. Of course. To whatever extent you are able to or desire to.

Mr. NOSENZO. Having read it for the first time, I would only say that I am not aware that the proposal was made. It could have been, but the nature of the proposal seems totally inconsistent with current U.S. policy.

Senator McCLURE. It certainly seems totally inconsistent with what I had heard of U.S. policy, but that's not the first time that we've been saying one thing, publicly, and doing another thing privately. And that's the reason I asked the question.

Could we for the record get a response from the State Department?

Mr. NOSENZO. Yes, sir.

Senator McCLURE. I would appreciate that.

Dr. Fri, I have handed to you a summary of a letter dated March 9, 1977, to Chairman Walter Flowers of the House subcommittee, on possible nuclear energy research and development from Robert Thorn, the Acting Assistant Administrator for Nuclear Energy in which ERDA stated a number of things in response to the subcommittee's questions.

And I particularly, without reading them all in detail, and I would say to anyone in the room who desires copies of that, it will be available, but I'm trying to save a little time here. There are paragraphs numbered A, C, D, and F, in particular, and I've made a remark on that copy for your records.

Are those statements still correct?

Mr. FRI. I haven't had a chance to read them. If you would stop or ask Mr. Nosenzo a question, I will read them.

Senator McCLURE. If you will do that. It reminds me of a story of a fellow who was in court and he had one attorney, and he told his attorney he would like to have another attorney, and he said why, don't you have confidence in me. And he said, yes, I have a great deal of confidence in you, I just would like to have another attorney that's thinking while you are talking. So you go ahead and think while he's talking and we'll perhaps expedite the hearing.

Mr. NOSENZO. Mr. Chairman, if I might, I indicated at the beginning of my presentation that I would indicate briefly what the results of the Paris meeting was when I left. As you know, the meeting was a meeting of experts from six countries; Great Britain, West Germany, France, Italy, Japan, and Canada. As a followup to the May economic summit meeting.

As called for, the summit communique, we examined ways to make nonproliferation policies more acceptable to all nations, including the study of possible terms of reference for international fuel cycle evaluation.

The results of the meeting were very encouraging. The group came to complete agreement on the desirability of fuel cycle studies. There



are still some bilateral issues but they don't concern the technical terms of reference of the study, which were agreed in memorandum.

So the countries would then be taking back, or their representatives would then be taking them back to their countries to get approval for those terms of reference. We see in that taking the comments and the understanding from these other six countries, and integrating them into our proposed fuel cycle evaluation studies, and going out to the remaining countries.

As you know, there were some 30 countries that we contacted, and on the basis of that, coming up with final terms of reference, and hopefully starting the study in early fall.

Senator CHURCH. Well, that's good. It tends to underscore the feeling of optimism that I would have that such an international system is right. The time is right for not only such a study but an international system of some kind to follow, built upon, I would think, the IAEA and the existing structure within its limits.

And it would do a reasonably good job.

Mr. FRI. I have read the statement, Senator McClure.

Senator CHURCH. Senator, do you want answers now or do you want written answers to these series of questions?

Senator McCLURE. If Dr. Fri is ready to answer now, I would be glad to have them now; if he would rather submit written answers that would be satisfactory too.

Dr. FRI. I would like to submit a written answer analyzing each of the paragraphs in some detail, but fundamentally I think the statements in Mr. Thorn's letter are essentially accurate, and in response too.

But in answer to the unasked question, it is our intention through this international fuel cycle evaluation to pursue the whole range of possibilities, technological possibilities as well as institutional policies, abilities that are suggested by Mr. Thorn's letter.

And indeed our domestic program in both the breeder technology and in response to the alternatives thereto, it is in my judgment sufficient to examine the alternatives and to come to a decision as to what steps and technologies and controls are therefore nonproliferation.

Senator McCLURE. If you would submit those written answers, I would appreciate it.

Mr. Chairman, the reference that I made to Mr. Fri also appears in the record. The copy has been furnished to the reporter.

Senator CHURCH. Very well. And Mr. Fri, you will supply written answers.

[The material supplied by Senator McClure follows:]

1. In a letter dated March 9, 1977, to Chairman Walter Flowers of the House Subcommittee on Fossil and Nuclear Energy Research and Development, from Robert Thorne, acting assistant administrator for nuclear energy, ERDA stated the following in response to the subcommittee's questions:

A. That foreign breeder plants and their proposed scale-up follow-ons will not meet the nonproliferation objectives based on current U.S. thinking, in terms of the specific technologies, such as, the types of core designs and fuel.

B. That it was possible to develop a plutonium economy which could be considered acceptable from both a nonproliferation and an energy supply standpoint by the use of co-processing or highly radioactive recycle fuels. The letter suggested assessing energy center concepts and working on the development of these "technological fixes" while continuing our on-going R & D programs.



C. That to date, ERDA has seen no evidence that other nations which have breeder reactors and reprocessing programs have undertaken any significant technological development efforts to reduce the nuclear weapons proliferation potential of their facilities. And, further, that based on past experience, ERDA would expect that advanced safeguards instrumentation and processing developments by the United States would be utilized by foreign nations. The example was offered that the United States has requests from France and Russia for some of our equipment still in the development stage. In other words, U.S. technological improvements for nonproliferation probably will be the only improvements available.

D. ERDA agreed that if the United States does not develop more proliferation-resistant technologies, they probably will not be developed by other nations, and even if there might be such developments by others, they would not be developed as rapidly.

E. In the LMFBR program that the reactor plant and engineering which require the majority of funds for plant, component development, systems development and materials development are not effected regardless of what type of nonproliferation requirements might be evolved. This suggests strongly that continuing those activities while paralleling them with nonproliferation efforts is a rational and well-reasoned approach.

F. That U.S. actions can have significant influence over the actions of other nations when the U.S. actions are perceived to be in the best interest of them, such as, when a U.S. development program produces an advanced reactor or reprocessing technology offering improved economics or resource conservation. This, again, suggests that an incorporation of nonproliferation advances in a U.S. development advanced reactor or reprocessing technology could have the greatest influence on the programs of other nations.

G. That it is possible to develop nonproliferation acceptable reprocessing technology.

H. That the United States will be in a poorer bargaining position in carrying out our bilateral cooperative agreements, which are based on quid pro quo information exchanges (where we understand problems have already been experienced).

I. That foreign nuclear programs treat proliferation issues primarily from the standpoint of improving safeguards, rather than by attempting to develop and incorporate technology advances designed to provide greater proliferation resistance.

*Question.* In light of these statements and the apparent conclusion that the most effective way to influence the programs of other nations is to proceed with a technology development program with proliferation resistance characteristics incorporated within the system, why does the Administration now suggest that we stop our development—wouldn't it be better to proceed in a parallel manner with both breeder and reprocessing development and proliferation motivated R & D, and attempt to merge them for either foreign or domestic commercialization as appropriate to satisfy all policy objectives, including energy supply and nonproliferation?

2. It is our understanding that the countries which have tentatively indicated an interest in participating in the international nuclear fuel cycle evaluation program have categorically stated their intention to at the same time proceed with their on-going breeder and reprocessing programs.

A. Is that your understanding of the situation?

B. If that turns out to be the case, wouldn't it be more effective to proceed as fast as we can with our own development programs including proliferation considerations in order to best influence their programs, rather than stop our programs and proceed with a multi-year "study"?

3. The State Department's proposal to other nations on the international fuel cycle evaluation basically equates to a series of paper studies combined with coordination of the research programs of participating nations. In effect then, isn't the U.S. giving up its hardware programs for paper studies while the rest of the world is proceeding right along with their own programs with coordination as they see fit (which may be less than more information exchange on specific technologies since we have pulled out)?

4. Hasn't there already been an ongoing effort through the IAEA to do some of the evaluations included in the State Department's proposal, for instance, the April, 1977, report of the IAEA study project, "Regional Nuclear Fuel Cycle Centers"?



5. The May, 1977, ERDA draft preliminary program plan, "non-proliferation alternative systems assessment program", indicates that the alternative assessment will be completed in October, 1978, with recommendations for U.S. and other nation programs. The draft expressly states that the effort will consist exclusively of systems evaluations and potentially some design studies. The total working time available to complete the proposed program is 15 months, assuming the availability of resources and agreement of all the participating agencies. Realistically, in that time frame we will only have the opportunity to review previously completed R & D results, analyses and studies, and perhaps to do some new comparative assessments and analyse. All of this will proceed while the U.S. programs are deferred. Do we really expect to know much more than we do now? Aren't we simply throwing away the momentum and the advances of continuing the ongoing program during that period? Isn't it highly probable that such a program, particularly with foreign involvement, is likely to go on for many more months? In fact, couldn't such a study program effectively be used to continue to delay our hardware development on breeders and reprocessing, particularly in light of the interminable delay in the review of and debate on results and recommendations? And, after all that, then the subsequent congressional consideration (one could easily perceive a 5-year cycle resulting).

Senator McCURE. I have a couple of questions I would like to address to Mr. Nosenzo. It is our understanding from reports that have emanated both publically and privately from the European meetings in which our country participated, that the countries which have tentatively indicated an interest in the participating of the international nuclear fuel cycle evaluation program, have categorically stated that their intention to at the same time proceed with their ongoing breeder and reprocessing programs. Is that your understanding of the situation?

Mr. NOSENZO. Yes, sir, that's my understanding.

Senator McCURE. If that turns out to be the case, wouldn't it be more effective to proceed as fast as we can with our own development programs, including proliferation considerations in order to best influence their programs rather than stop our programs and proceed with a multiyear study while they are going forward?

Mr. NOSENZO. Sir, we have been indicating concern to these countries in their premature movement in this direction, not because we did not want to consider a future component economy as one possibility, only we felt we were moving in this direction before we had the social framework for handling that situation.

And it seems that this technology has developed and we're hoping in this direction of examining further alternatives. That was the basis of the study we were calling for.

We also felt in order for this study to work, in order for these countries to recognize the concern and share our concern, that we needed to take leadership, we needed to take a leadership role.

One particular element is the area of pure X-ray processing. We felt this was a proliferation danger, a very serious one. Countries were moving in this direction and that the only way for the United States to take a leadership in that area was to say we are not going ahead with commercialization until either we find alternatives or we find ways to solve while we're moving in that direction.

Because we basically don't feel we need to move at this time. Without that leadership we won't accomplish anything.

Senator CHURCH. It has been a manifestation of leadership since other countries are moving ahead with their projects, to have included on your agenda the discussion on regional reprocessing plants under international control.



Mr. NOSENZO. Sir, they are included under the international fuel cycle agreement.

Senator CHURCH. And has the United States come to a decision with reference to regional reprocessing during the talks?

Mr. NOSENZO. It was not a matter of taking a position, it was a matter of putting together a technical terms of reference, which is basically what items were we going to study.

And these were included as an advisory study.

Senator CHURCH. As was the regional reprocessing?

Mr. NOSENZO. And the plutonium breeder was one item, and other types of breeders, other types of cycles.

Senator CHURCH. Very well.

Senator McCCLURE. Hasn't there already been an ongoing effort to the IAEA. Some of the evaluations included in the State Department's proposal, for the instance the April 1977 report of IAEA study project entitled "Regional Nuclear Fuel Cycle Centers."

Mr. NOSENZA. Yes, sir, and what we would hope to do in the fuel cycle evaluation, and in particular in this area, would be to build other work that has been done in the past.

Senator McCCLURE. So build on IAEA and try to expand it and bring more people into it, and make it a more effective instrument?

Mr. NOSENZO. As a general proposition, yes, sir. But you were referring to that report which was a report published by the IAEA and done by a working group within the IAEA to look at the question of multinational fuel centers. What I was saying was the international effort that we foresee in this area would start with that study and other studies that have been done to see what movement we could make, both toward solving some of the legal problems that have been identified, but siting problems and the other types of problems identified in this particular study.

Senator McCCLURE. One final comment, so we can go on to the other witness, Mr. Chairman. Just as a frame of reference, I would like to go back to the proposal that was made by ERDA in a December 3, 1976 letter to the President in which there were a number of proposals including a program which would have provided evidence of national commitment as one item, and second, evidence of international cooperation, and third, technical safeguard to control information.

It seems to me that that letter and the proposal letter made last December would provide the framework for an ongoing very effective program. I would hope we don't just assign that proposal of last December to the trash heap.

I think, Mr. Chairman, with that, I will subside.

Senator CHURCH. Your full written statement will appear in the record, and thank you, very much.

Mr. FRI. I would like to comment on the proposals. I would hate to see it in the trash heap. I would like to refresh my memory on it.

Senator McCCLURE. Very good. And I would also like to submit in the record at this point, if I may, a memorandum from staff in bringing from the proposed final environmental statement from LMFBR dated December 1974, all of the comments in that environmental proposed final environmental statement, that indicate that the LMFBR is not a commercial commitment, but an R. & D. commitment.



May that be a part of the record?

Senator CHURCH. Yes; that will be made a part of the record.<sup>1</sup>

Thank you, gentlemen.

Mr. FRI. Thank you, Mr. Chairman.

Senator CHURCH. Our next witness is Mr. Myron Kratzer of the International Energy Association, Ltd., Washington, D.C.

I wonder if, in the interest of time, we could have Mr. Dwight Porter also here, and we will consider this as a panel, if we may.

I would ask that, as we've done with Mr. Nosenzo's statement, that the written statement of both gentlemen be included in the record in full, and that you make an oral summary as succinctly as you can so we can have some time for questions.

### STATEMENT OF MYRON KRATZER, INTERNATIONAL ENERGY ASSOCIATION, LTD., WASHINGTON, D.C.

Mr. KRATZER. Thank you, very much, Mr. Chairman, members of the committee, I would be very pleased to proceed in that manner. I think the first point we should recognize is that we have had a nuclear cooperation policy, a nuclear nonproliferation policy, for many, many years.

That start in 1954—it was a policy that was based on the principle that we could more effectively limit proliferation by cooperating under effective controls than we could by denying our assistance to others.

Now, that policy began to change in 1964, and that's an important point to recognize. I think, in all fairness to the witnesses who just appeared, to the administration, President Carter's statement of April 7 is not a bolt out of the blue.

We began to change our nonproliferation policy in 1974. There were a lot of complex reasons for that. I think the reason which is most often cited—it was an important one but by no means the only—was the Indian nuclear explosion of that year. But that was a change not simply in degree; it was a change in fundamental direction.

What we began to see in 1974 is that at least certain parts of the nuclear fuel cycle, the so-called sensitive activity, should no longer be undertaken nationally under safeguards. That they were too risky from the proliferation point of view to be handled in that way.

And that instead we ought to perhaps deny them, perhaps put them under some sort of international control, and that change in our policy, as I say, has been widely received—and I think correctly so. Not simply as a change in degree but as a fundamental change in direction.

I think it's important to recognize that, because at times I think we appear disingenuous by saying this is a no problem; we haven't thought of it before; and here's the way it ought to be handled. It's an old problem. We always knew that plutonium came from reactors; we also knew that the plutonium was part of the cycle.

What has changed is not the problem, but I believe some persons' perceptions of it. Now let me comment just a moment on what the old policy did. I submit, Mr. Chairman, that the old policy, certainly in the perception of most of our partners abroad—and I would believe in an objective evaluation—was not a bad one.

It led to the creation of the International Atomic Energy Agency; it led to the development of the so-called safeguards principle. In other

<sup>1</sup> See Appendix, page 223.



words, the international verification, nonproliferation undertakings, which I believe is an important step in the evolution, not just of this issue but in the evolution of international law itself.

It led to the development of the nonproliferation treaty which is certainly, by any odds, a remarkable document. It's a treaty under which some 100 countries have given up their right, their sovereign right, to have nuclear weapons, in exchange for the promise that they could pursue without discrimination their peaceful nuclear programs.

And the policy didn't fail. The Indian nuclear explosion is certainly something that is extremely regrettable, but even in that case there are some very special circumstances, some ambiguities which, by and large, I believe suggests that the policy that has been followed was a successful one.

And I don't believe that we have really satisfied other nations as to the reason why a policy which they, by and large, view as a successful one has to be attacked in such a rather drastic way.

Normally, policies which have been unsuccessful, are changed or proposals are made to change them. In this particular case, we are saying that a policy which is, by and large, apparently that successful, ought to be changed in a rather fundamental way.

And I really don't believe that the reason the message for that change has come across to our friends abroad, so they are concerned, Mr. Chairman, because they feel we may very well, in the actions that we have been recommending and taking since 1974, replace or seek to replace a fairly successful structure with something untried, which may be far less effective.

So that is pretty much the background, I think, that existed up to the time that we are now dealing with and the new policy statement of April 7.

Now, at that time, what was recommended by the administration, not only for ourselves but I think it's fair to say it was hoped and expressed that others would follow as well, is that we discontinue our steps toward commercial reprocessing, that we discontinue the plans which have been generally assumed to be desirable for recycled plutonium, and most importantly of all that we deemphasize not discontinue but certainly deemphasize the breeder, and especially its plutonium version.

I think that in that latter step, Mr. Chairman, if we took what has perhaps been the most difficult or sought to take the most difficult and most troublesome step to our partners abroad, I think that the dialog which began in mid-1975, and by and large convinced people that there was indeed a proliferation problem, of somewhat greater dimensions that had been thought, that we ought to slow down a bit and look at this, that we ought to exercise more restraint, and that we ought to pose stricter safeguards than we have been up to that time.

I believe that there was a growing consensus that reprocessing for the purpose of recycle was perhaps relatively marginal. In other words, the plutonium recycle was not extremely attractive economically, and that while it extended our fuel supplies it didn't really make a major difference in the extent to which the nuclear option would represent a major increment in our energy supplies.

But when we suggested that the breeder should be slowed down, I think we really hit people, if I may say so, in the gut because to them,



rightly or wrongly, to most of our partners abroad, the breeder has been treated abroad as really the important hope toward energy independence toward achieving the same sort of reduction independence on imported fuel supplies, whether they be fossile or whether they be uranium.

That we seek for ourselves, and which we have always indicated was a repsectable goal for our parners as well. So I think we frankly have somewhat overstepped ourselves in that respect and that is the source of a lot of the present difficulty.

Nevertheless, we have done something which would clearly sensitize the world system to thinking about the problem of proliferation in a way that hasn't been done before, in a way which I still think may lead to some rather crucial results.

I believe there is a growing receptivity abroad to an idea which has been around for some time, which has always been, if not dismissed at least looked at somewhat askance as being administratively too difficult or politically too difficult and the like, and I'm talking about the concept of putting certain sensitive parts of the fuel cycle under not simply international safeguards but in a more pervasive form of international control and custody. I believe, as I say, a real receptivity to that, which didn't exist before, and which I think can be properly viewed as the benefit to the recent administration policy.

So I think that we may be able to get back on the right track. I don't think that we are far apart from our colleagues in where we want to go, I don't believe—I think it's been clear from the reaction abroad that the reaction which has been spoken of here this morning, they plan to go ahead with their breeder programs, they plan to go ahead with reprocessing.

I think, as I've thought before, that the plutonium recycle per se is something which we may well achieve agreement on, deferring for some time, if not permanently. But I believe that the concept that we have, that by engaging in this act of self denial ourselves, we can readily attract the agreement of other countries to follow in a similar course has not proven to be so.

I think it is proper for us to have thought it might be so, but I think when the chips are down we now know enough to see they view their energy situation so differently from ours that they simply do not believe that when we give up reprocessing and we give up the plutonium recycle, and when we give up the breeder, we are coming anywhere close to putting ourselves in the same energy situation that they are in.

So I believe that to make more progress from this point forward by actively cooperating and the effort that we are asking all of the others to join in on, by reviewing as we have proposed to do.

Not only as reviewing as we proposed to do, not only the alternate fuel cycles as has been suggested by some, but by looking at the plutonium reprocessing and by looking at the plutonium breeder in an indepth way.

And to me that means looking at them with the demonstration projects, and not simply paper studies. I believe that the world respects our technological capabilities and that we can make more progress by proceeding with these activities than we can by standing aside and letting it happen only in other parts of the world.



Finally I would like to make one comment on the subject that I think is extremely important. It's been touched on, not only in my testimony but Mr. Fri and others, and that's a subject of what do you do when there has in fact been a violation or an abrogation of these international undertakings.

Because it's really the international undertakings which we look to avoid proliferations. There isn't a technological fix to this, it's the international safeguard system and what follows it.

Now safeguards, as has been said many times, is a system in a technical sense which only detects diversion. A logical part of the system, one without which the system is incomplete, is that after that does occur, and I hope that it won't, and I think that it won't, it has to be a really credible, certain series of steps taken to counteract, not simply to engage in punitive measures but to really counteract the diversion which has occurred, on the violation which has occurred.

And I think we need to give much more attention in the future than we have in the past to the subject of international sanctions. I think that a credible system, an assumption of sanctions will really take place and they will really be effective.

They will deter diversion, as we have always thought the safeguard system should, and then the unlikely event that it occurs will allow us to say with some confidence that we can correct the results of what has taken place.

It's been suggested that this is fine in theory but that it certainly doesn't work while we have so little time as might occur when separated plutonium is in international hands and has been diverted.

I think that is an assertion which has never been tested. I think that the technical part of that assertion has not been tested.

In other words, a presumption that a country within a matter of days or weeks can take diverted plutonium and convert it to militarily useful, militarily deliverable, and militarily credible weapons is an assumption that needs more testing than has been received today from the governmental system.

And certainly the assumption that there's nothing we can do about it when it occurs that needs much more critical evaluation. I know very little evidence that says that the world system works more effectively and when it does a month or years in which to react to events that has only a limited time.

While I'm sorry to have taken so long in my summary, Mr. Chairman, but thank you very much.

[The prepared statement of Mr. Kratzer follows:]

STATEMENT BY MYRON B. KRATZER, INTERNATIONAL ENERGY ASSOCIATION, LTD.,  
WASHINGTON, D.C.

Mr. Chairman and members of the committee, it is a privilege to appear before your Committee today to comment on recent developments in international nuclear cooperation and nonproliferation policy. This is my first appearance before a Congressional Committee since my retirement from the Department of State earlier this year. Prior to that time, I served in a number of capacities related to international nuclear cooperation in the former Atomic Energy Commission and the Department of State, most recently as Deputy Assistant Secretary of State for Nuclear Energy and Energy Technology Affairs. I am presently acting as a consultant in the international energy field, but in my appearance here today I am speaking exclusively on my own behalf.



Since 1954, United States' nonproliferation and nuclear cooperation policy—two sides of the same coin—has been based on the concept that the spread of nuclear weapons could be more successfully limited by sharing the benefits of nuclear energy under controls against diversion to military purposes than by seeking to deny these benefits to the rest of the world. This policy was a natural consequence of the failure of the earlier policy of secrecy and denial, which by 1953 saw both the Soviet Union and Great Britain established as nuclear powers and the emergence of independent nuclear programs in France and elsewhere. The new policy of cooperation was enthusiastically welcomed by other nations anxious to share the potential peaceful benefits of nuclear energy and was adopted by countries with nuclear capability of their own in their relationships with less advanced nations.

The policy led to the creation, in 1957, of the International Atomic Energy Agency, endowed with the responsibility of developing and applying a system of safeguards designed to ensure that peaceful nuclear activities would not be diverted to military purposes. The concept that compliance with international obligations should be subject to verification by an international inspectorate with broad rights of access to sovereign national activities was an important innovation in international relations, which may, someday, have applicability far beyond the immediate field of nuclear nonproliferation.

The same policy also led to the conclusion in 1968 of the Non Proliferation Treaty, an unprecedented international convention under which some 100 nations have relinquished their sovereign right to acquire nuclear weapons, and have agreed to accept international safeguards on all their peaceful nuclear activities. In exchange for these undertakings, non-nuclear weapons states were assured that their peaceful nuclear programs would be allowed to proceed without interference, and that the advanced nuclear states would cooperate in the development of peaceful uses.

Today, more than 20 years after the inception of widespread cooperation in the peaceful uses of nuclear energy, three additional nations—France, China and India—have detonated nuclear explosives. In only one of these instances, that of India, has the development of the explosive been based upon assistance provided for peaceful uses. The pace of proliferation has been considerably lower than generally forecast in the immediate post-war years.

Despite this, there is widespread concern today that the growing use of nuclear power and the accompanying availability of plutonium will lead to a breakdown of the restraints that have served to limit proliferation so far. The Indian nuclear explosion, in particular, understandably stimulated the demand for a broad reexamination of nuclear cooperation policies. The United States has taken the lead in this re-examination as it has in virtually every other non-proliferation initiative, but a number of other nations have shared the view that past practices and policies should be critically reviewed and have cooperated with the U.S. effort.

The review has reached the stage where it is timely to examine carefully the attitudes of other nations toward the policy changes already adopted or under serious consideration in the United States. No nation challenges the right of the United States to modify its past policies and to adopt new policies in this area as it sees fit, so long as prior international obligations are fulfilled, but it is axiomatic that the success of these policies in accomplishing the U.S. objectives of reducing the risk of further proliferation is dependent on their acceptability to others. Thus, an understanding of these attitudes is essential to sound national decision making in this field.

I might add that the reverse is also true. The development of peaceful uses of nuclear energy has been marked by exceptionally close and fruitful international cooperation, in which the United States has unquestionably been the major contributor. I believe that this past history gives us a reasonable right to expect that other nations will carefully consider U.S. views on the most effective means to achieve our shared nonproliferation objectives. This consideration, I believe, has been, and is continuing, to take place.

The results to date have shown a readiness on the part of a number of key supplier nations to follow strengthened nonproliferation policies. Guidelines adopted by the original seven supplier nations which began meeting in London in mid 1975 call for IAEA safeguards on future nuclear exports, for a prohibition against the use of nuclear assistance for nuclear explosives of any kind, for the application of physical security measures against theft, seizure or sabotage, and for restraint and strengthened controls over the supply of sensitive tech-



nologies. Eight additional suppliers or potential suppliers have signified their acceptance of these guidelines and have become members of the group. France and the Federal Republic of Germany, have indicated their intention not to enter into further arrangements involving the supply of sensitive enrichment or reprocessing technologies for the time being.

These developments make it clear that U.S. concern over the dangers of nuclear proliferation is shared by many other nations. To a considerable degree, the situation abroad mirrors that in the United States itself where there is broad agreement on the objective of nonproliferation, and where any disagreement relates to means and not to goals.

It has been widely reported that our partners abroad have serious reservations concerning recent U.S. nuclear policy developments. In reality, as I have indicated already, U.S. policy, for a variety of complex reasons, began to change in 1974, following a path which led, perhaps not inevitably, but not surprisingly, to the policy expressed by President Carter on April 7 of this year. Our partners were not silent in expressing their concern over these evolving developments as they occurred. It is inaccurate and unjust, therefore, to associate the widespread concern that now exists exclusively with the Administration policy statement of April 7.

To understand this concern, it is important first to identify the key change in U.S. policy which has taken place over the last 3 years. The essence of the policy followed between 1954 and 1974—two full decades—was that peaceful nuclear activities could be safely undertaken on a national basis, if they were subject to safeguards which would provide timely warning that peaceful use undertakings had been violated. Implicit in this policy was the belief that there would be an effective international response to any violation, or better yet, that the certainty of effective sanctions would deter any violation in the first instance.

Since 1974, U.S. policy has evolved, step by step, to one which views certain sensitive operations—those which involve direct access to plutonium or other weapons useable material—as so inherently risky that they should not take place even under technically effective safeguard. This view has been reflected in the Administration's April 7 policy statement, which calls for indefinite deferral in the United States of commercial reprocessing and plutonium recycle, and the restructuring and slow down of the breeder program, with de-emphasis of the use of plutonium. While these decisions are, of course, directly applicable only to the U.S. program, the hope was expressed that others would join us in adopting them.

In the view of foreign officials, this new policy represents not merely a strengthening or tightening of previous policy, but a fundamental change in direction: a return in fact, if not in name, to the policy of denial which failed to prevent the emergence of additional nuclear powers in the first post-war decade.

Let me now try to identify the specific reservations which prevail abroad concerning this turn about in U.S. policy. In general, these can be grouped into those which relate to doubts as to the effectiveness of the policy and those which relate to concerns as to its fairness and practicality.

First, as to doubts concerning its effectiveness. Many nuclear officials abroad believe:

1. Nuclear power and the nuclear power fuel cycle represent not the easy way, but perhaps the most difficult, time consuming, and costly way to achieve a nuclear weapons capability. Reprocessing technology is not only widely available, but well within the capabilities of a large number of moderately industrialized countries. Similarly, small, production-type reactors can be built more easily, quickly, and cheaply than power reactors. Thus, as experience to date has demonstrated, countries which intend to acquire nuclear weapons will not choose the power reactor route and they will not be foreclosed from achieving nuclear weapons by withholding plutonium or sensitive parts of the power reactor fuel cycle. In short, there is no "technological fix" to the proliferation problem, a fact which is universally accepted.

2. A policy of denial may stimulate independent programs which are subject to no control; and these programs, whether by original intent or later decision, are more likely to lead to proliferation than is a policy of cooperation under effective controls. Providing nuclear assistance to countries which are on the threshold of achieving such capabilities on their own, in exchange for nonproliferation undertakings and safeguards on all similar facilities, may represent a more effective means to avoid proliferation than denial.



3. Existing control arrangements, including bilateral agreements and especially the Non-Proliferation Treaty, and their accompanying safeguards, represent an effective and established obstacle against proliferation—one which has never been violated. New measures, particularly those which can be viewed as inconsistent with the obligations of Article IV of the Treaty, run the risk of undermining the effectiveness of the existing nonproliferation regime, without providing any assurance that more effective measures will take its place.

Let me turn now to these reservations concerning current U.S. policy which relate to its fairness and practicality. In effect, these are the economic issues—the incentives for proceeding with the most effective possible use of nuclear energy and nuclear fuel resources, which, if not satisfied in a controlled manner, may induce countries to proceed on their own without controls. It is widely believed that:

1. The United States is unique among the industrially advanced nations of the West in its possession of energy resources. With its vast coal reserves and still impressive production of oil and gas the United States has energy options unavailable to most other nations. Even with respect to the nuclear option, the United States has major uranium reserves which few other possess. The readiness of the United States to delay or even to forego reprocessing, plutonium recycle, and the breeder, however well-intentioned, does not, in this view, represent equality of sacrifice or does not place this nation in the same energy circumstances as most of our partners find themselves in. In fact, it intensifies the competition for the limited uranium available.

2. For most other countries, nuclear energy, and especially the breeder, is not a question of economics. It represents the only practical road to reducing their energy dependence to tolerate levels—a goal which we rightly seek for ourselves and do not wish to deny others.

3. Recent U.S. estimates of uranium availability are regarded as overly optimistic. In any event, energy planning is done on the basis of conservative and not optimistic estimates. Moreover, it is based on energy resources available to each nation, not on global estimates.

4. For other nations, the breeder means, on the basis of present knowledge, the liquid metal cooled breeder operating on the plutonium cycle. While there is a willingness to consider alternatives, there is no confidence that any alternative put forward so far either significantly ameliorates the proliferation problem or can be ready for deployment by the time it is needed. The very long lead times involved in the development of new nuclear technologies means, in the view widely held abroad, that there is no time to lose in developing the breeder if it is to be ready for application around the end of this century.

5. There is a growing acceptance of the U.S. view that reprocessing and plutonium recycle in light water reactors is of only marginal economic attractiveness (although its energy conservation aspects are not taken lightly), but reprocessing is viewed as a vital step in the development of breeder technology, both because of its indispensable role in the breeder fuel cycle, and because only through reprocessing on a significant scale can the plutonium necessary for the development and initial deployment of the breeder be acquired.

6. Reprocessing is also viewed in some countries as essential to the prudent long-term management of nuclear waste, and there is reluctance abroad, as there has been in the United States, to proceed with the large-scale exploitation of nuclear power until the solution to permanent waste management is in hand.

7. The failure to reprocess irradiated fuel and to recycle the resultant plutonium will lead to the accumulation of vast amounts of this material. This accumulation represents both a serious environmental hazard and a proliferation risk in its own right. Many believe that the best solution to the plutonium problem is to burn it in reactors.

I cite these views, widely held abroad, and shared by many in the United States as well, not because I believe there is no other side to each of these issues, but because these views are seriously held, by serious people, and cannot be lightly dismissed. They illustrate that the issue of nonproliferation is an extremely complex one, a fact which we must accept if we are to have a serious and constructive dialogue with the rest of the world. In his April 7 policy statement, President Carter specifically recognized the complexity of the issue and our inability to bring about a solution unilaterally, and wisely stressed the importance of international consultation.

The need to understand each other's viewpoint is, as I have suggested earlier, a two-way street. I believe that the usefulness of the current dialogue is being



restricted by what appears to be a widespread misunderstanding of the basis of recent changes in U.S. policy. The concern which has developed in the United States over activities which result in the separation and accumulation of plutonium is not intended to deny the fact that there are other, in all probability, easier routes to deliberate and planned proliferation. The concern, if I understand it correctly, is that the accumulation of plutonium in national hands, even though under safeguards, could under some circumstances—for example, a change in government or a severe outside threat to a nation's security—lead to a decision to abrogate or violate nonproliferation undertakings and proceed to the manufacture of nuclear weapons. Further, in this view, this process could be accomplished so quickly that effective sanctions could not be applied, thereby vitiating the effectiveness of safeguards even if they give immediate warning of the violation.

The quality of the current debate could be improved if there were forthright acknowledgment on the part of the proponents of the present U.S. policy that there are indeed easier routes to proliferation than the nuclear power fuel cycle readily available to many other nations, and if the debate could henceforth focus on the validity of the key assumptions underlying the present policy: that nations would be prone to violate their nonproliferation undertakings, that they could quickly convert separated plutonium so obtained to militarily useful nuclear weapons, and that such action could not be effectively countered by international sanctions or diplomacy. A debate focussed on these issues might more readily isolate the factors of fundamental importance in the proliferation problem and more effectively point the way to solutions or improvements.

The April 7 policy statement, like that put forward by the previous Administration on October 28 last year, seeks to relate U.S. domestic and international nuclear policy from the viewpoint of their proliferation aspects. This approach is based on the belief that self-denial on the part of the United States would contribute to the acceptability of U.S. proposals for the denial or limitation of sensitive fuel cycle operations elsewhere. The reactions of other nations make it clear that this presumed linkage between U.S. domestic and international nuclear policy is, in fact, much weaker than anticipated. Instead, there is a strong feeling abroad that the United States can contribute more effectively to the solution of the proliferation issue now, as it has in the past, by a strong affirmative effort to find solutions to the difficult technical and institutional problems entailed in the use of plutonium and the development of the breeder.

The International Fuel Cycle Evaluation Program which the United States has proposed is an important step in this direction, and it is to be hoped that as many nations as possible will actively participate in its formulation and implementation. What is of crucial importance, in terms of its international acceptability and effectiveness, is whether this program approaches the alternatives, including the plutonium cycle, in an open-minded and positive way, with the intent to find acceptable ways to make use of the vast energy resource represented by plutonium, rather than in an adversary way with the intent to avoid its use.

The gap between present U.S. policy and that of other nations is not an unbridgeable one. No nation is pressing for the immediate commercialization of reprocessing and the breeder. At the same time, there is a strong feeling that these technologies must be developed for future use, and this development must include demonstration operation on an engineering scale. It also clearly must include early demonstration and provision for the extended storage, without reprocessing, of spent fuel. It is likely that we can achieve a significant moratorium in the commercialization of these technologies, and in their dissemination to other nations as first proposed by President Carter as long ago as May 1976, as part of a serious and affirmative effort to find better answers to their ultimate acceptable use. The principle of a moratorium has logic and is most likely to command support if it is accompanied by a serious and continuing effort, in which the United States itself should participate, to achieve the fullest possible understanding of the technical, economic, and safeguard aspects of reprocessing and the breeder.

#### EXPORT POLICY

The issue of export policy has two facets—that which relates to how we deal with new agreements or undertakings, and that which relates to how we administer existing agreements.



To say that how we deal with existing agreements is even an issue may seem surprising on the face of it: agreements are made to be kept. Yet differing views on export policy relating to existing agreements has generated the sharpest controversy and often dominated the overall nuclear debate.

I earlier described U.S. nuclear cooperation and nonproliferation policy as two sides of the same coin. Nowhere is this more evident than in the area of export policy. It was recognized from the earliest days of the cooperative program that important benefits would have to be offered and made available by the United States if we were to achieve our goal of bringing nuclear programs in other nations within the framework of nonproliferation undertakings and safeguards against diversion to military uses. The balance between these two sets of undertakings is, in effect, the subject of our agreements for cooperation.

Over the past two years, U.S. nuclear export procedures, policies, and actions have been subjected to unprecedented strains. This has resulted largely because of perceptions that U.S. undertakings to export nuclear materials and equipment were susceptible to being used as leverage to secure controls which were not bargained for and not incorporated in existing agreements. In contrast to the exceedingly complex issues involved in determining our nuclear policy for the future, the question of whether we should or should not meet our existing obligations seems to me to be clearcut and unarguable.

The fact that the performance of existing U.S. commitments has been conditioned in some instances on securing new undertakings from the recipient, and that issuance of other licenses has been long delayed while such possibilities were debated or explored has resulted in severe damage to the credibility of the United States as a supplier. In doing so, it has unquestionably set back rather than advanced the achievement of our nonproliferation objectives, and has greatly complicated the task of securing agreement to new nonproliferation policies in the future. The appropriate way to modify the supply conditions of our existing agreements is through renegotiation and not through the unilateral imposition of new controls through the leverage of the export licensing process.

It is a matter of great importance that this view is shared by the Administration, as reflected by President Carter's export legislation transmittal message as well as in recent Congressional testimony by Administration officials. It follows that I believe that S. 1432 will serve our nonproliferation interests much more effectively than S. 897 which perpetuates the view that existing U.S. obligations can be conditioned on the receipt of new undertakings. To the extent that some vestiges of this policy of retroactivity appear in S. 1432—for example, in Section 127.a(5) and (6); they should be modified to permit full conformity with the provisions of our existing agreements for cooperation.

The reestablishment of our credentials as a reliable supplier will not be easily accomplished and will require decisive action by the Administration, the Congress, and the Nuclear Regulatory Commission. As a first step, consideration should be given to much more emphatic language than that which appears in Section 301 of the Bill, affirming the intent of the United States to issue export licenses in accordance with applicable agreements for cooperation, and requiring the timely issuance of such licenses as a matter of law. The applicable standard for the issuance of export licenses, in my judgment, should, in the absence of national security consideration of the most compelling character, be whether the recipient party has fulfilled his responsibilities under the agreement for cooperation.

Chapter III of S. 1432 also provides for measures which would lead to the expansion of U.S. uranium enrichment capacity and to the development of multilateral approaches for meeting future worldwide nuclear fuel needs. These are highly desirable provisions. The expansion of U.S. uranium enrichment capacity is a necessary but not a sufficient condition to the restoration of U.S. credibility as a supplier. We must avoid the mistake of believing that reopening the order book will, in itself, overcome the erosion of our credibility as a supplier which has resulted from our recent export licensing controversies.

Chapter IV of the Bill calls for increased U.S. support for the IAEA and its safeguards program. This Section of the Bill is of great importance and deserves strong support, not simply in the abstract, but through continued concrete actions. The very existence of the IAEA and its safeguard program has been one of the principle factors in the evolution of a worldwide nonproliferation ethic—a consensus that the acquisition of nuclear weapons is neither a respectable



nor a desirable goal. Chapter IV of S. 1432 also prescribes standards for new or amended agreements for cooperation. Among the most important of the new standards is the requirement that the cooperating nation place all of its peaceful nuclear activities under IAEA safeguards. In general, I believe this is a desirable and timely step in the evolution of our nuclear cooperation policy. The authority for a Presidential waiver of this and other conditions provides the flexibility which is necessary and desirable to accommodate situations where the application of the measure would be contrary to U.S. interests.

In one respect, I believe that S. 1432 is too flexible and lenient. Section 101(g) calls, most desirably, for mutual efforts to develop common international sanctions in the event of a violation of nonproliferation obligations. Section 127(b)(2)(c) provides for a mandatory cut off of further deliveries to a violator, but provides for a Presidential waiver of this action.

The development of credible and effective sanctions goes to the very heart of the proliferation issue. Unless nations which abrogate or contemplate abrogating their nonproliferation obligations are faced with an overwhelming presumption that prompt and decisive counteraction will be taken, such questions as whether the violation involves separated plutonium or only irradiated fuel elements are of secondary importance. Neither the limited remedy of a fuel supply cut-off nor the potential availability of a Presidential waiver contribute to the creation of this presumption of strong and effective sanctions.

Mr. Chairman, during the past three years, we have gone through an intensive and, at time, embittered, debate on the issue of nonproliferation—a debate which was resulted both in gains and setbacks to the achievement of nonproliferation goals which we all share. Whether the final balance sheet will be affirmative or negative will in all likelihood be decided within the next year or so. Two points on which I believe there is now general agreement is that the issues are complex and that they cannot be resolved by unilateral U.S. actions. The Administration policy statement of April 7 has been highly effective in focussing attention on the proliferation issue, resulting in a renewed readiness on the part of our partners to seek new and imaginative solutions.

Two decades ago, an act of political faith made possible the creation of the International Atomic Energy Agency and the acceptance of the principle of international verification of sovereign undertakings. A decade later, a similar act of political faith led to the adoption of the Non Proliferation Treaty. It may now be timely to take another major step along the path of international control of nuclear energy—a step, for example, which would place sensitive facilities and materials not only under safeguards, but under direct international custody and control. Whatever the next step may be, we can help bring it about only if we continue to be an active participant in bringing the benefits of nuclear energy to the nations of the world.

Thank you for your invitation to appear here today.

Senator CHURCH. Thank you. Mr. Porter.

#### **STATEMENT OF DWIGHT PORTER, DIRECTOR, INTERNATIONAL GOVERNMENT AFFAIRS, WESTINGHOUSE ELECTRIC CORP., WASHINGTON, D.C.**

Mr. PORTER. Mr. Chairman, briefly, three or four quick points. We discussed the question of other potential routes to acquisition on nuclear weapons material, apart from that which could come from the upgraded plutonium. We've done a study of that, which I think is very interesting, and I would be glad to submit it if you so desire.

On the question of the fact that the rest of the world is going to go the breeder route, I think it goes without saying to me, one of the most important aspects of the current U.S. policy, which bears on the success we've made and now have on controlling the plutonium economy, if you will, is the question of uranium availability.

We simply are not able to prove to the rest of the world that if there is enough uranium available for our domestic use there will be enough



uranium available for them. And I think it's one of the Achilles heels of the whole approach that we now have, and it does clearly drive other countries to seeking alternatives to limited supplies of uranium.

I think a point that hasn't been brought about fully is the question of what happens in the strategic balance in the world. If other countries derive the benefits of the plutonium economy and we do not, I think in the long run this could be decisive relevance of the strategic balance and I think it's something that deserves much further study.

It certainly also means that if other countries derive technological leadership over the United States, in these fields, particularly the breeder, that we will certainly not, our Government will certainly not have the decisive forms in studying the ground rules for how these things are operated around the world.

And what sort of international agreements will be arrived at. I strongly endorse your approach to an international control mechanism. I see no other way of handling it. It is at the moment a buyer's market; sooner or later, that can shift to a seller's market, which will make it even worse.

At that particular point in time the world will be fighting for scarce supplies of energy, and we will have to consider problems of resource allocation, which at the moment aren't even on our doorstep, but they will be. And I think international mechanisms will be required as well to accomplish that—to accomplish that sort of sharing.

And finally I'm a little puzzled at what I've heard recently about the administration policy on deferral or cancellation of the reprocessing breeder.

In the States, this originally was put on nonproliferation grounds. Now, those grounds seem to be shifting as I hear the debate going on, and I suppose those grounds are shifting largely because it is becoming evidence that the rest of the world is not going to respond to a self denial decision on the part of the United States.

But if those grounds indeed are shifting then I think we must take another look at the domestic Clinch River breeder decision. If indeed it is not going to effectively assist the world in meeting nonproliferation objectives, are we making the proper decision. That's all I have to say.

[The prepared statement of Mr. Porter follows:]

STATEMENT OF DWIGHT J. PORTER, DIRECTOR, INTERNATIONAL GOVERNMENT AFFAIRS,  
WESTINGHOUSE ELECTRIC CORP., WASHINGTON, D.C.

I am pleased to appear before this subcommittee, Mr. Chairman, to give you my views on pending legislation on the subject of nuclear exports and non-proliferation. Before joining Westinghouse two years ago, I was a Career Minister in our Foreign Service, and Permanent U.S. Representative to the IAEA in Vienna. Nuclear proliferation is a subject which has concerned me deeply for many years, both in my present and previous position.

I will be expressing many of my personal views, but I assure you that they are views shared by the Westinghouse Electric Corporation, which has for many years stated its concerns with respect to the control of the use of the atom for peaceful purposes, and on the need for the development of effective multi-national and international institutions and safeguarding mechanisms. If for no other than self-interest reasons, it is clear to a corporation such as Westinghouse that world nuclear commerce must be carried out under effective and hopefully universally accepted controls. To do otherwise could produce dangerous and chaotic conditions which might rapidly lead to a breakdown in stability in an energy-short world.



May I also add that Westinghouse, which has been a leading designer and supplier of nuclear power reactors to other nations, has never sold abroad to any nation except under conditions approved by our government—conditions embodied in mutually agreed bilateral and treaty arrangements with the customer country. Nor has any export sale that we (or any other U.S. vendor) have made led to the development of a nuclear weapon or nuclear explosive device.

May I now summarize some of the basic current characteristics of the world nuclear market place:

(1) The early dominance which the U.S. manufacturers had in reactor exports—based on our light water reactor technology—is over. Through 1972, the U.S. supplied 91 percent of the reactors sold in the non-Communist world. Since 1973, the U.S. provided only 48 percent of this market, and the downward trend is evident. Six countries now can export reactors—more will soon join the list.

(2) The United States has no technological monopoly in any aspect of the nuclear fuel cycle. In the back end of the cycle, at least fourteen countries have nuclear fuel reprocessing facilities in various stages of development. (I have heard the figure 18.) Some are already accepting orders to reprocess spent fuel for other countries. Such chemical reprocessing producers reactor-grade plutonium—a potential weapons material, even if not a very good one. In the front end of the cycle, at least eight or nine nations can create enriched uranium, and others are committed to develop the capacity to do so. Their motivation is to achieve their own means of production of slightly enriched uranium—the fuel for the light water reactor. But such enrichment processes can also produce highly enriched uranium—a good weapons material.

The clear trend in the world is toward development of diversified (and where possible—national) sources of supply of enriched uranium, and away from dependence on the former U.S. monopoly provided by our large gaseous diffusion plants. In a relatively short span of time, world nuclear energy could no longer be dependent on U.S. supply of enrichment services if present trends continue.

Several countries are buying or developing heavy water moderated reactors fueled with natural (rather than enriched) uranium, such as the Canadian Candu reactor. This eliminates their dependence on foreign supplied fuel enrichment services. One sees renewed foreign customer interest in this reactor type, as concern mounts re the reliability of supply of enriched fuel from foreign sources such as the United States. This natural uranium reactor type can be operated to produce a very good weapons-grade plutonium.

Given these developments, the United States cannot premise its non-proliferation policies on the assumption that it can exercise ultimate control over the nuclear programs of other countries by the unilateral manipulation of exports. If we ever had the technological lead or resource base to enable us to achieve this, it is gone. If we try, we can only accelerate the already clearly evident international trend toward avoidance of dependence on the United States as a supplier of reactors and fuel, and toward achievement of national independence in the nuclear fuel cycle.

(3) Most countries, including many in the developing nation category, have made the decision to develop as much nuclear power electrical generating capacity as they can afford and absorb into their economies. Having limited or no national fossil fuel resources in most cases, and going into staggering debt burdens to sustain their oil imports, they view this as a matter of survival. One can understand this sense of urgency in the case of pain, for example—an industrializing country already paying \$6 billion annually for oil imports, and facing resulting severe balance of payments problems. Spain will have over 20 nuclear reactors providing electricity in the next decade—most of them, until now at least, ordered from the United States.

Current estimates of the International Atomic Energy Agency forecast a world-wide nuclear power capacity on the order of 200,000 MWe for 1980, 900,000 MWe for 1990, and 1,300,000 MWe by 2000. By the turn of the century, this will represent around 35 percent of the world's electrical energy and 15 percent of primary energy. In 1985, based on firm plans, 17 developing countries will have nuclear plants, representing 9 percent of the total world nuclear capacity.

And, to emphasize the growing global dependence on nuclear power, more electricity is now generated in nuclear plants outside the United States than within our borders.

(4) Proposed new U.S. domestic policies with respect to indefinite deferral of reprocessing of spent fuel and cancellation of the demonstration breeder reactor have suddenly created a new set of problems and tensions throughout



the world. Most of the world has until now assumed (and made its plans accordingly) that the ultimate and most dramatic benefits of nuclear energy would derive from plutonium, reprocessed from reactor spent fuel through chemical separation, used as a fuel either (a) through recycle in existing reactors, or (b) as the primary fuel for the breeder reactor. The breeder would not only generate electricity, but would breed more plutonium fuel than is consumed in the process, thus extending the energy value of our limited uranium reserves by as much as 60 fold. To illustrate, the energy value of the existing U.S. depleted uranium stockpile already mined and sitting in storage, if used in breeder reactors, is equivalent to all U.S. coal reserves, or more than five times the oil reserves of the OPEC nations.

The United States, having announced a unilateral domestic policy of deferring the use of plutonium for non-military purposes, is now suggesting that the rest of the world do likewise. Here the issue is joined. Western Europe and Japan, poised or already embarked on expensive programs to use plutonium as an energy source and committed to the breeder reactor, feel that the United States is asking them to sacrifice their energy future, and put their economic well-being in jeopardy, in order to attempt to remove plutonium as a nuclear weapon threat in the world.

They argue to the contrary:

(a) The U.S. has vast reserves of fossil fuels and uranium and can contemplate the prospect of delaying a plutonium decision. With their meager resource base, others cannot. Italy, for instance, has only enough fuel resources within her borders to last two years at current rates of consumption.

(b) The Soviet Union, also with a large domestic energy resource base, is dedicated to moving into a plutonium breeder economy; indeed, has just announced its intent to build a 1,600 MWe liquid metal fast breeder plant, fueled with plutonium—a plant even larger than France's 1,200 MWe proposed Super-Phoenix. (By contrast, the proposed U.S. Clinch River Breeder would generate only 350 MWe.)

(c) The major investments other countries have already committed to reprocessing and the breeder reactor will be lost, and their research and development efforts will atrophy.

(d) The United States, by virtue of its decision not to use plutonium fuels, will consume the world's limited supply of uranium more quickly. Others do not share the optimism, which lies at the root of the U.S. policy decision, that there is an abundance of available uranium—at least they have no optimism that it will be available for their use, at affordable prices, if they are bidding for a finite supply against the United States. Western Europe and Japan have small or no uranium reserves. The more they feel their access to imports is threatened, the more they feel impelled to use plutonium instead. It is too valuable for them to forego the option.

The U.S. will also, at the same time, compete for an even larger share of the world's oil, depleting limited supplies, forcing prices up, and causing an ever increasing strain in the economies of other nations.

(e) There is also disagreement on the social value of reprocessing. They feel that plutonium is safest being consumed in a reactor rather than becoming a potential long-term hazard if left in storage as spent fuel. Reprocessing also allows for permanent and secure disposal of radioactive waste in their opinion. In some countries, the building of new conventional reactors is legally dependent upon achieving solutions on both reprocessing and waste disposal.

(f) Finally, our friends feel that a country which wishes to make a nuclear weapon will not buy a \$1 billion power reactor in order ultimately to acquire a supply of reactor-grade plutonium as its bomb material. They point out that there are many other ways to obtain weapons grade material which are less expensive and less detectable—for example, the use of a research reactor and small reprocessing plant, operated without international safeguards, such as India developed. There are other routes, perhaps seven or eight, with no insuperable technical barriers, which could likewise be followed. These known routes could produce better weapons grade material than would the plutonium from reprocessed fuel in a light water power reactor. There are also, they point out, new technologies on the horizon—such as the laser—which may produce weapons material cheaply in small installations. Many countries are doing research and development in these new areas.

They argue, therefore, that the U.S. proposals against reprocessing close only one of many doors to the acquisition of nuclear weapons material. They feel it



wiser and safer to ensure that reprocessing, and the new technologies, are developed under careful international control and scrutiny rather than attempting to stop them altogether—an effort they feel is doomed to certain failure.

Developing countries add another argument, expressing deep concern on what they see as increasing limitations and restrictions being placed on the transfer of nuclear technology, such as reprocessing. Some believe that such restrictions are designed to preserve the monopoly of the supplier nations and to perpetuate the dependency of the recipients—all in the guise of nuclear nonproliferation. Many consider American policy to be one of technological denial, a violation of the spirit and letter of the Nuclear Non-Proliferation Treaty.

As I view the attitudes of other countries as expressed at the recent Iranian and Salzburg nuclear energy conferences this Spring, I cannot see wide acceptance by other nations of the U.S. proposals to forego the use of plutonium. France and the Soviet Union are about to enter the third generation of the plutonium fueled breeder reactor. Britain is not far behind, and Germany and Japan are on the threshold. What arguments can we muster to convince them to change their minds? And if we do succeed, what commitments must we make to assure them of replacement energy sources if needed in the future? Who will pay for financial losses they may suffer, or additional costs they may have to face later? Above all, what is the long-term viability of political alliances where our partners do not achieve a measure of energy independence which might enable them to cope with an uncertain energy future and possible disruptions of their imported fuel supplies?

The United States has not, of course, yet stated that it will bring pressure on Japan and the nations of Western Europe to bring them to acceptance of our position. We have said that we reserve the right to use our existing veto power to stop reprocessing of spent fuel which was enriched in the United States (this includes most fuel now ready for reprocessing). We could also invoke the sanction of cutting off future supplies of enriched uranium, to enforce our will on the countries which refuse to accept our views.

But this is a losing battle. Europe is moving rapidly toward development of its own enrichment plants, and it can move faster. In the meantime, it can order even more enrichment services from the Soviet Union than the substantial amount which has already been ordered. Certainly we could hurt our European allies by cutting off their nuclear fuel, if we are prepared to carry our such a threat. Japan would be even more vulnerable. If we do so, the predictable end result will be that much of the world will proceed to the development of a plutonium economy at an infinitely greater rate than is now contemplated. And the United States will have little or no voice in whatever solutions are formulated by the rest of the world in how to control and manage plutonium and other weapons materials.

One wonders how our country has worked itself into a situation where we are debating questions like the one I have just mentioned, all in the matrix of the debate on control of the proliferation of nuclear weapons. Have we forgotten that almost any country in Western Europe could easily and quickly develop a nuclear weapons capability on its own, if it had the political will to do so? Do we really think that, if Japan and Western Europe should refrain from nuclear fuel reprocessing or development and use of the breeder reactor, that the Soviet Union, or India, or Brazil, for example, will likewise refrain. The answer is "no"—plutonium technology will be developed and tested and used somewhere in the world, and whoever masters it will have a leadership in the energy field that could, at some point, be decisive.

That leadership could also be decisive in the question of setting (or not setting) the international rules for the management and control of plutonium. And I, for one, can see very little correlation between the use of plutonium for power generation by our friends and allies, and the probability that County X on some other continent may someday achieve a nuclear weapon capability, particularly through use of plutonium derived from a power reactor.

This leads to the question of why and when nations may wish to acquire nuclear weapons. This question requires much more study than it has been given. The role of alliances, nuclear free zones, regional compacts, and other political factors is much more important than technological constraints on weapons proliferation decisions. Only six nations (if we include India now) have the weapon. Many continue making dire predictions about what may happen, but our historical experience bears out that there are major political and other disincentives to nuclear proliferation. The United States neither possesses a nuclear technological monopoly, nor a monopoly on the desire to



achieve a non-proliferating world. Our objectives are shared by most of the world, including many countries in areas of heightened tension, who are assumed to be the most likely to wish to have a nuclear weapon.

But these countries also wish the benefits of peaceful nuclear power, including the full fuel cycle. They believe in an international approach—in strengthening old and developing new international or multi-national institutions which can administer adequate and reassuring safeguards and controls, in which both supplier and recipient countries have participation and a voice in making policy. There is a responsiveness at the moment to the need for creating such institutions, for example, as multinational fuel cycle centers, or international plutonium storage facilities, and much study is now underway in the International Atomic Energy Agency and some of its member states.

This approach is designed to reinforce the existing and essential fundaments on which past non-proliferation policies have been built—the Non-Proliferation Treaty and the International Atomic Energy Agency—without which we would today have nothing but chaos on the international nuclear scene. There is deep concern and fear among our foreign friends that the United States is withdrawing its support from the international non-proliferation edifice which has been built so painstakingly, and substituting therefore a denial policy through which a few nuclear supplier states will dictate, through export controls, what the rest of the world's nuclear energy program will look like. This concern has now gone even farther—many of the other supplier states now feel that the United States intends to dictate to them as well.

I believe that the United States must re-think the non-proliferation problem, or we will see the rest of the world moving toward solutions with which we may not agree, and in which we will not play the role which the world expects of us, and which we have had in the past. Our exercise of political leadership is imperative, and little time remains to exercise it. Instead, we are displaying indecision, creating confusion, and failing to apply creative solutions to a very complex problem.

Our recent indecision in nuclear export licensing matters has greatly aggravated the problem, by creating a real credibility gap between the United States, viewed as an uncertain nuclear supplier, and our customer states. After the Indian explosion, Congress rightly over the last two years has expressed great concern over the question of non-proliferation—this concern was shared by the Administration and the licensing agency, the Nuclear Regulatory Commission.

But the U.S. reaction, in retrospect, was wrong. The result was a slow down, sometimes amounting to inordinate delay, in granting export approvals (one license took 30 months before issuance), together with an attempt to renegotiate existing agreements with customer nations while we were holding up the shipments of nuclear equipment which they had contracted for, needed, and had paid for. Expensive plant delays resulted, foreign customers felt themselves blackmailed into agreeing to new constraints which were imposed on them under circumstances where they could hardly say no, and major foreign policy problems were unnecessarily created. It was not a period of diplomatic triumph for our government. The period of licensing delay, which fortunately seems to have improved in the last few weeks, amounted to a de facto moratorium on nuclear exports, and the credibility of the U.S. as a reliable nuclear supplier was put deeply in doubt. Current U.S. policy proposals on indefinite deferral of reprocessing, coupled with certain aspects of the legislation now before the Congress, have not restored our credibility.

What has been the consequence?

(1) No country has had its views, whatever they might have been, altered by these U.S. actions. If anything, it may, in its anger or annoyance, have become more resistant to future U.S. arguments on non-proliferation issues.

(2) If it has the option (and many countries do), a customer nation will buy its future reactors from non-U.S. sources. Other reactor vendor nations are viewed as politically reliable suppliers. Their governments and industry work together as a team to provide attractive financing, to use political arguments and influence to make the sale. They do not change the export licensing rules in the middle of the game. They do not demand the same veto rights as does the United States over future fuel reprocessing. In some cases, they offer commercial contracts committing themselves to reprocess the spent fuel from the reactors they sell. If that fuel is not of U.S.-origin, and not burned in a U.S. reactor, the United States has no control over the transaction. This will be increasingly the case.



(3) Many countries, particularly in the developing world, are considering banding together to share nuclear technology and experience, in order to lessen their dependence on imports from the advanced nations, particularly the United States. This is an achievable goal—fortunately, it need not and will not happen if reason prevails.

(4) Finally, the worst long-term consequence of our credibility failure as a supplier could be that we will lose influence in world policy councils searching for solutions to the non-proliferation dilemma. Our predominant influence in the past has resulted from our cooperative and helpful attitude with other countries in bringing them the benefits of the peaceful atom, from our leadership in reactor sales abroad, and from our position as the leading supplier of enriched fuel. If we lose the edge in our nuclear exports, it will not be long until we lose the edge in our capacity to influence world non-proliferation policies. We are very close to the point now.

I will only mention in passing some of our other potential losses:

(a) Jobs—more than 30,000 man-years per reactor export.

(b) Balance of payments—\$350 million or more per reactor export (depending on plant size).

(c) Maintenance of our domestic industrial base, heavily dependent on exports until domestic orders regain higher levels.

Industry, of course, endorses and supports the position that U.S. nuclear exports should not contribute to weapons proliferation. Our concern is that our inability to export, because our export policies are not harmonized with, or agreed to, by other supplier or consumer nations, will have the end result exactly opposite to that intended by our export policies. The United States will lose, rather than gain, influence, as we lose export business.

While we have been wrestling with non-proliferation policy, the market place has been ignored. I am suggesting that we can't look at one without looking at the other.

#### LEGISLATIVE PROPOSALS

In my earlier remarks, Mr. Chairman, I have tried to set the perspective for more specific comments on the legislation before this Subcommittee. Let me now summarize some of the basic elements which I see affecting all of the proposed non-proliferation bills:

1. Legislation based on a flat denial policy—specifically, denial of reactor or fuel export licenses if a country refuses to agree never to reprocess or use its own plutonium as an energy source—will not work. Some countries may agree to this; others will buy from other sources, where such denial is not a precondition of sale. We could thus see a divided world developing, with a smaller group of nations going along with the U.S. proposals for a variety of reasons, including perhaps the obvious one that they are not now interested in the prospect of using plutonium. This group might continue to trade with us. But a larger group would emerge—one which seeks, as soon as it can be achieved, to move to a plutonium economy and to attempt to disassociate itself from the United States as a source of supply. As I have said, the U.S. could, at great cost, slow this development down by applying various pressures, but the act would be self-defeating. It would only accelerate the process and the agony of division—a division that would find the U.S. selling to "safe" countries (not using plutonium) and others selling to "unsafe" ones (using plutonium).

2. The Congress should assure that flexibility is provided to the Executive Branch to adjust export policies to meet new and changing situations. Diplomacy cannot work in a rigid straight-jacket, and for many of these problems there is no solution but quiet diplomacy. If diplomacy, rather than manipulation of export licenses, had been relied on in the recent Spanish and Yugoslavia cases, I feel confident that the results would have been at least as successful, and infinitely less painful.

India represents perhaps the best example of the need for flexibility. With a new government, seemingly anxious to discuss and resolve with the United States the disturbing nuclear issues, there must be a give-and-take to find a solution. Our government would have no bargaining room if it were bound by some of the rigid legislative constraints which are now being considered, and a major opportunity might be lost.

3. The proposed legislation is cast in such a way that it provides no benefits or privileges for countries which have already taken solemn obligations to forego nuclear weapons by ratifying the Nuclear Non-Proliferation Treaty. I realize



that this omission results from a feeling that some nations party to the Treaty are not considered acceptable customers for nuclear material. I think it is a mistake to base legislation on such a "worst case nation" basis. Surely the United States does not intend to sell to maverick nations—controls over this can be easily established, most easily by not negotiating a bilateral agreement. But the bulk of the over 100 nations which are parties to the Treaty deserve to have their respectability and trustworthiness given recognition in U.S. nuclear export legislation. It is largely for this reason that the Treaty is under increasing attack by many nations who feel that their side of the treaty bargain is not being honored.

This is particularly pertinent in the case of countries like Japan, Germany, and Italy (although many developing countries also share the view). These industrialized nations (all non-nuclear weapons states parties to the Treaty) wish to move into a plutonium economy, as I have described, but U.S. legislative proposals are designed to keep, or deter, them from doing so. Not so with France, Britain, or the Soviet Union, who are their commercial competitors, but who, as nuclear weapons states outside the reach of our legislation, of course are very familiar with plutonium, and determined to move rapidly to use it in breeder reactors.

4. Our legislative approaches, while speaking of the need for using the carrot with the stick, i.e., for providing alternatives to, or compensation for, the acceptance of denial of the energy use of plutonium, do very little concrete in this regard. As I have already said, I doubt that we can long delay the achievement in much of the world of a plutonium economy. But supposing we succeed, there will be a price, and what price are we willing to pay—in cash, in sharing our uranium resources, in commitments for allocation of scarce fossil fuels? It will take substantial and increasing investments to create indefinite-term spent fuel storage facilities with minimum environmental impact. Will we bring the spent fuel back for storage in the United States, or help pay to store it abroad? Who will compensate the owner for the unused energy value in the fuel—perhaps, 30 percent of replacement cost of uranium? Will we subsidize uranium prices, or the price of enrichment services, which we provide to foreign but perhaps not to domestic customers, to assure that the plutonium moratorium continues? If we succeed in doing all of this at acceptable cost, and with the concurrence of the rest of the world, can we also control the many other options, apart from the use of reactor grade plutonium, that a determined country could exercise in developing a nuclear explosive device?

Having said this, let me nevertheless express my support for the general thrust of the amendment introduced by Senator Glenn to create an International Nuclear Fuel Authority. The financial and legal problems inherent in creating a new institution of this unique character are formidable; I have just enumerated some of them. This concept of trying to solve problems, however, instead of walking away from them, is essential if any U.S. non-proliferation solution is to succeed, and be accepted by others.

Mr. Chairman, I have concerns, which I hope I have articulated, about the wisdom of passing legislation which attempts to regulate nuclear exports through specific and detailed legal provisions, including specifically export criteria which seem to deny to other nations the use of an energy material—plutonium—which they may well need, and which we may some day agree that they need. I feel that we and all exporting nations, should approve how and perhaps when reprocessing should occur, as it relates to spent fuel derived from our exports. But it should be made clear to our customer nations that we do not intend to exercise an indefinite veto over whether reprocessing occurs.

I also feel that little of substance is contained in the legislative proposals which will remove the uncertainty which now exists that the United States will be a reliable supplier of nuclear equipment and material. The recent experience to the contrary is too close at hand. The administration bill attempts to meet this problem by promising that an export license will be issued on a "timely basis" after statutory requirements have been met. The bill itself, however, proposes that, if the Nuclear Regulatory Commission cannot or will not issue an export license, the President could do so through issuance of an Executive Order, which in turn would lie before Congress for its consideration and possible rejection, for 60 days.

While I support the need for the Presidential override, I hardly feel that this cumbersome procedure, preceded as it would be by extensive and prolonged inter-agency review (also mandated by the law), provides reassurance to a customer as to "timely" issuance of a license. Add to this the public debate which would ensue over the issuance of such a controversial license—a debate which



would be unlikely to be limited to nuclear issues—and it leads me to the conclusion that few foreign customers will be any more willing to consider the U.S. a reliable supplier than they are today.

Almost all of the non-proliferation objectives contained in pending legislation—perhaps all—can be achieved by executive action. Many of the export criteria are already well accepted in world nuclear commerce, and new ones are becoming accepted. If the Congress feels it nonetheless essential to pass legislation, I would suggest that the Administration Bill, S. 1432, be the subject of your deliberations. It provides a more flexible approach, it proposes to honor existing agreements with other countries while negotiating new ones. It recognizes the importance (indeed essentiality) of reaching agreement with other supplier and consumer states in a diplomatic, rather than a unilaterally dictated and punitive approach. It also, although imperfectly, moves toward a recognition that the United States must itself accept and honor obligations if it is to get the cooperation and support of other nations.

It should, where possible, be amended to achieve:

1. Less cumbersome and time-consuming licensing procedures which also give to the President, or his designee, the real power of decision (subject to appropriate Congressional review) over sensitive foreign policy issues such as nuclear exports, and over the terms and conditions which govern our relations with specific countries in the nuclear field.

2. A great degree of assurance to customer nations that, if they accept (and continue to honor) U.S. export conditions, they will receive their export licenses on an automatic basis and in truly "timely" fashion. In other words, that the U.S. will honor its agreements.

3. Likewise, a greater measure of assurance that the U.S. will be a reliable supplier of enrichment services, at fair prices.

4. A redefinition of what we mean by "U.S. approval for reprocessing"—namely, not a veto in perpetuity, but an understanding that the U.S. wishes to ensure that reprocessing, if and when needed, will take place under conditions which we wish to consider and endorse.

5. A recognition that most nations party to the NPT are entitled to special and trusted treatment as nuclear customers of the United States by virtue of the non-proliferation obligation which they have already taken.

6. Greater support for international and multinational solutions, and the development of corresponding institutions for the control of sensitive nuclear material, with assurance that the United States intends to take a leadership role in such undertakings. In our current preoccupation with plutonium, we must not forget that any alternate technologies which may emerge will involve the production and use of some type of weapons sensitive material, the control of which will also require comparable institutional solutions, even if the use of plutonium is deferred.

I have other minor amending suggestions, and would be glad to discuss them and the points made in my testimony with Committee Members or Staff, at your convenience.

Thank you, Mr. Chairman.

Senator CHURCH. Thank you, very much. I just have one question for both of you gentlemen, and that is in your opinion, or in the opinion of either one of you, would a congressional decision to go forward with the demonstration facility at Clinch River, or a congressional decision to retain the capability without actually operating a reprocessing plant, but to retain that capability for the coming years, adversely affect in any way such possibilities as may exist for building an international system and reaching agreements on an international system affected for inspection and control, or an international fuel cycle system or whatever.

In other words, it is being put to us by the administration that this action of self denial makes our position credible. Now it is being acknowledged by the administration that other countries have not responded in kind. My question is, would we suffer less credibility in our efforts to establish an international control system if we decided to go forward or retain this new facility.



Mr. PORTER. I have one quick comment on that. Most other supplier nations have, for instance, the Soviet Union, and certainly France, with commercial reprocessing facilities, are for the moment handling this problem simply by bringing the fuel back to their own countries and reprocessing it.

In the case of the Soviet Union, the plutonium stays there, no one ever sees it again. In the case of France it's a commercial service rendered to a country, which does not necessarily want to involve itself at the moment in developing its own reprocessing facilities.

So you have two alternatives. You have that alternative, the supplier can bring the material back and reprocess it, or you have the alternative of the regional center which you discussed earlier, which might be under international control. That second alternative is good but it's going to take a long time.

In the meantime plutonium is building up. Countries do want to have it reprocessed even though they may not use it for the time being.

My opinion is that one can better serve the interest of nonproliferation by starting a plant in this country, by testing out safeguarding measures, by establishing and perhaps as a multinationally run facility. I think the commercial argument, that is the argument that somehow or other the United States would be involving itself in gaining commercial advantage, is nonsense.

Barnwell was built a long time ago, it could have been started a long time ago. And I don't think it has any influence in other countries.

As a matter of fact, I think other countries are rather enjoying our discomfort here because simply they are getting further advantage commercially over us. Thank you.

Mr. KRATZER. Mr. Chairman, I believe that in situation in which we find ourselves, in which there are very strongly held views not only within our country but as between the United States and partners abroad, I think that it does make sense to have some sort of a breathing spell. I think the crucial question is what kind of a breathing spell is it.

I think that we can have what I would call a moratorium, a breathing spell on the commercialization of these activities. The reprocessing, certainly the plutonium recycle, and the breeder.

While we stand back and take a look at the situation, it is very much as has been proposed by the administration. But to repeat, I think that the kind of breathing spell we take is of crucial importance.

It has to be a breathing spell in which all options are seriously considered, and by that, by all options, I mean specifically the option of plutonium reprocessing and recovery of the plutonium for use in future breeder reactors.

It has to be a breathing spell, in fact, and which appears to be to our partners abroad, has been an affirmative effort to find answers, and not as a dilatory and adversary way to eventually bring a stop to these activities.

Now, I think that if there is a way to put it to that framework, the continued availability, as you put it, of activities such as Barnwell, the continued progress toward a breeder prototype in the United States, I do not believe that that needs to harm the effort that we are headed toward and in which we are asking other people to engage in.



If we in fact are going to allow, and I don't know any way in which we can prevent other countries from continuing with their reprocessing activities, which I would submit are today subcommercial and may be precommercial, but they are not really commercial reprocessing.

If we are going to allow, and I repeat, we cannot stop other countries from going ahead with a precommercial breeder development, it's a little difficult for me to understand how doing the same ourselves within this framework of the international fuel cycle evaluation plant, we can be subject to any great criticism.

I don't believe that people are trying to hang some sort of obstacle around us, in other words, sure, everyone wants to keep and enjoy what they believe to be the reasonable fruits of their efforts in the commercial market when it exists, but I don't think they want to do that at the expense of depriving us of the same opportunity, even when that commercial market exists.

So I don't really believe that the argument that we will be seen as trying to preserve our commercial advantage and so on is a valid one. Now, I think in this same opportunity, in this same exercise, the same international fuel cycle evaluation program, we also have to look at the alternatives to short-term commercialization and near-term commercialization of reprocessing of the breeder.

We have told people, and I personally believe that it's correct, that immediate reprocessing isn't essential to prudent treatment of waste material, and I think that we have to make that stick by showing that it can be done, by providing facilities in which to do it.

So I think that this has to be a broad program in which every option, including the plutonium option, is seriously looked upon at the demonstration and engineering level.

Senator CHURCH. Well, I have no more questions, and I know you are late for lunch and I am late for lunch.

Senator McCLURE. Mr. Chairman, I don't know how in the world we could improve on the last statement that was made and I won't attempt to improve on it, but I do want to ask just a couple of questions.

First of all, Mr. Kratzer, I agree with you totally. I think what we have done, what this administration has done.

Senator CHURCH. I am going to leave you at the tender mercy of Senator McClure.

Senator McCLURE [presiding]. I have in your words sensitized the world to the problem of proliferation and because we've engaged in that conversation we may be close to getting some realistic agreement that will further world security. and I applaud both the initiative that led us there, if it doesn't lead us too far, and end up in an overreaction.

And I appreciate your statement in that regard. Mr. Porter, perhaps from your standpoint, and let me emphasize at this point that I'm aware of the background of both you gentlemen. You have impressive credentials to be here today, advising us, and advising the Congress on matters of this nature.

I'm aware of your background and I appreciate that, and that's the reason I asked this question. Can industry operate in a commercial sense under regional centers, under international control.

Mr. PORTER. I think the two concepts are not incompatible, Senator. I can visualize situations, for instance, where an international or regional center with a multinational character, could take a contract



just as we have done in Oak Ridge with Union Carbide. I don't think an international agency wants to get itself involved in running large-scale technical operations.

International civil servants are not noted for their efficiency in running such things.

Senator McCLURE. I would assume from that that I wouldn't necessarily assume from that that national civil servants are noted for that.

Mr. PORTER. I'll forgo comment on that, but I see no reason why one couldn't achieve a particular competence of a firm which can do a job like that. But as the operator under a controlled mechanism which would be run by a multinational or international organization. Does that answer your question?

Senator McCLURE. It would seem to me, and now I'll just make a statement and ask if either of you or both of you have comment. It would seem to me that if we really want to subject this fuel cycle to international control, the greatest likelihood of success in that initiative would be if we have something to place under control, as well as asking other people to place theirs under control.

And it seems to me less likely that they will agree if we are not contributing something like that.

Mr. KRATZER. I completely agree with that, Senator McClure. I think one of the interesting possibilities is that we do just exactly that, that we make some sort of an offer that would have reciprocal elements, that would get the ball rolling, to put these facilities and the materials which they produce under international control.

Mr. PORTER. I just want to make one other comment on this regard, too. It goes back, really, to your previous question. You know, several countries, I think, would be extremely anxious to have us do just this.

For instance, both Germany and Sweden are now under legal restraints with respect to the continuation of their light water reactor programs. In both cases either through a law or a court action, these countries must settle the problem of reprocessing and waste disposal before they can license an additional light water reactor plant.

And the fact that the United States has delayed or indefinitely deferred its own decision on these matters has caused great concerns in both Germany and Sweden, who need such solutions in order to move ahead on the light water.

And I think the kind of an action you just suggested would lend great encouragement to them in terms of settling their own problems as well.

Senator McCLURE. We have similar problems here within the United States. The consumer dilemma that exists in California, for instance.

Well, thank you for your testimony, and with that the committee will adjourn, subject to the call of the Chair.

[Whereupon, at 12:45 p.m. the hearing was adjourned, subject to the call of the Chair.]



# NUCLEAR NON-PROLIFERATION POLICY ACT OF 1977

TUESDAY, SEPTEMBER 13, 1977

U.S. SENATE,  
SUBCOMMITTEE ON ENERGY RESEARCH AND DEVELOPMENT,  
OF THE COMMITTEE ON ENERGY AND NATURAL RESOURCES,  
*Washington, D.C.*

The subcommittee met, pursuant to notice, at 8 a.m., in room 3110, Dirksen Office Building, Hon. Frank Church presiding.

Present: Senator Church.

Also present: Ben Yamagata, counsel; Willis Smith, counsel; and Charles Trabandt, counsel for the minority.

## OPENING STATEMENT OF HON. FRANK CHURCH, A U.S. SENATOR FROM THE STATE OF IDAHO

Senator CHURCH. This week the Subcommittee on Energy Research and Development is holding 2 additional days of hearings on the Nuclear Non-Proliferation Policy Act. On June 10, the subcommittee received testimony on S. 1432, the nuclear proliferation bill prepared by the administration.

Our hearings today and tomorrow will focus on S. 897 as ordered reported by the Senate Government Affairs Committee, although there is an obvious need to compare that bill with S. 1432. The jurisdiction of the Committee on Energy and Natural Resources is restricted by agreement to certain sections of each bill. Moreover, the committee is required by the agreement to report its recommendations on S. 897 by September 20.

This committee is not the committee of primary jurisdiction over nuclear nonproliferation policy. However, the manner in which that policy is implemented can impact on our domestic nuclear energy program if commitments are made for supplying such things as uranium ore, enrichment services, and spent fuel storage capacity in return for foreign cooperation in nonproliferation policy.

Moreover, this committee is concerned with international energy policy as well as domestic energy matters. One of the objectives of S. 897 is to make the United States a reliable supplier of nuclear materials and technology, but in its present form, S. 897 may not be well designed to achieve this objective.

A country may endorse all of our nonproliferation policy objectives by signing a bilateral agreement for cooperation, and adhere to the safeguards procedures established by the International Atomic Energy Agency. However, the procedures for deciding whether to issue an export license are complicated with a potential for delay and



possible litigation before an export license can be issued. As a result, we may actually force countries which prefer to trade with the United States in nuclear technology to seek other sources for nuclear materials and technology in order to meet their domestic energy requirements because of the lack of certainty in the ability of the United States to export in a timely manner.

A subsidiary consequence would be an impact on competition in the domestic nuclear industry because foreign sales are presently a necessary part of the domestic industry's business. The irony of this bill, if it is enacted in its present form, is that it may reduce our leverage in setting the rules by which the technology will be used to prevent proliferation of nuclear weapons. This will result in a reduction in our sales of nuclear materials and technology abroad, with a possible concomitant decrease in competition in our domestic nuclear industry.

I think the bill would be a much more effective instrument of foreign policy if we accentuated the positive in foreign negotiations and initiatives to establish an international scheme for the safeguarded use of nuclear technology, including reprocessing and the breeder which I believe will be a part of the future nuclear energy system.

The concept of internationally controlled and inspected regional fuel cycle centers is one avenue which should be fully explored to insure that individual countries do not feel compelled to establish a complete fuel cycle system on a national basis.

The provisions in this bill to provide assistance in nonnuclear technologies need to be stressed so that a diversified energy supply is available to all countries and that indigenous resources are fully utilized where they are economically viable. Our committee will look at the provisions in title V of S. 897 with an aim to strengthening our cooperation in these areas as well.

I will place in the record at this point a copy of amendment No. 745 to S. 897.

[The text of amendment No. 745 to S. 897 follows:]



95TH CONGRESS  
1ST SESSION

# S. 897

## IN THE SENATE OF THE UNITED STATES

JULY 29 (legislative day, JULY 19), 1977

Jointly referred to the Committees on Foreign Relations and Governmental Affairs and ordered to be printed

AUGUST 5 (legislative day, JULY 19), 1977

Jointly referred to the Committee on Governmental Affairs, the Committee on Foreign Relations, and the Committee on Energy and Natural Resources, with the proviso that the Energy and Natural Resources Committee shall be limited in its consideration of the bill and amendment to sections 102, 103, 104, 105, 202, 501, 502 and 503 of the amendment, and that the Committee on Energy and Natural Resources shall complete its consideration of such sections not later than September 20, 1977, and further that such committees shall report their recommendations to the Senate not later than September 23, 1977.

## AMENDMENT

(IN THE NATURE OF A SUBSTITUTE)

Intended to be proposed by Mr. GLENN (for himself, Mr. PERCY, and Mr. JAVITS) to S. 897, a bill to strengthen United States policies on non-proliferation and to reorganize certain export functions of the Federal Government to promote more efficient administration of such functions, viz: strike out all after the enacting clause and insert in lieu thereof the following:

- 1 That this Act may be cited as the "Nuclear Non-Proliferation
- 2 Act of 1977".

3

### STATEMENT OF POLICY

4

- 5 SEC. 2. The Congress hereby finds and declares that the
- 6 proliferation of nuclear explosive devices or the direct capa-
- 6 bility to manufacture or otherwise acquire such devices

Amdt. No. 745



1 poses a grave threat to security interests of the United  
2 States and continued international progress toward world  
3 peace and development. Recent events emphasize the  
4 urgency of this threat and the imperative need to increase  
5 the effectiveness of international safeguards and controls  
6 on peaceful nuclear activities to prevent proliferation. Ac-  
7 cordingly, it is the policy of the United States to—

8 (a) actively pursue through international initiatives  
9 mechanisms for fuel supply assurances and the estab-  
10 lishment of more effective international controls over  
11 the transfer and use of nuclear equipment, material, and  
12 nuclear technology for peaceful purposes in order to pre-  
13 vent proliferation, including the establishment of com-  
14 mon international sanctions;

15 (b) take such actions as are required to confirm  
16 the ability of the United States to act reliably in author-  
17 izing the export of nuclear reactors and fuel to nations  
18 which share our nonproliferation policies;

19 (c) strongly encourage nations which have not  
20 ratified the Treaty on the Non-Proliferation of Nuclear  
21 Weapons (the "Treaty") to do so at the earliest pos-  
22 sible date;

23 (d) aid foreign nations in identifying and adapting  
24 appropriate technology for energy production and, in  
25 particular to provide alternative options to nuclear power



1 in aiding such nations to meet their energy needs, con-  
2 sistent with the economic and material resources and  
3 environmental protection of those nations; and

4 (e) cooperate with other nations in protecting the  
5 international environment from radioactive, chemical,  
6 or thermal contamination arising from nuclear activities.

7 STATEMENT OF PURPOSE

8 SEC. 3. It is the purpose of this Act to promote the poli-  
9 cies set forth above by—

10 (a) establishing a more effective framework for in-  
11 ternational cooperation to meet the energy needs of  
12 all nations and to ensure that the worldwide development  
13 of peaceful nuclear activities and the export by any na-  
14 tion of nuclear materials and equipment and nuclear  
15 technology intended for use in peaceful nuclear activities  
16 do not contribute to proliferation;

17 (b) authorizing the United States to take such  
18 actions as are required to ensure that it can act reliably  
19 in authorizing the export of nuclear reactors and fuel  
20 to nations which share our non-proliferation policies;

21 (c) providing incentives to the other nations of the  
22 world to join in such international cooperative efforts  
23 and to ratify the Treaty;

24 (d) ensuring effective controls by the United States



1 over its exports of nuclear equipment and materials, and  
2 nuclear technology.

3 DEFINITIONS

4 SEC. 4. As used in this Act:

5 (a) The term "Administrator" means the Administra-  
6 tor of Energy Research and Development.

7 (b) The term "Commission" means the Nuclear Regu-  
8 latory Commission.

9 (c) The term "Director" means the Director of the  
10 Arms Control and Disarmament Agency.

11 (d) The term "nuclear materials and equipment" means  
12 source material, special nuclear material, production facilities,  
13 utilization facilities, and items or substances determined to  
14 have significance for nuclear explosive purposes pursuant to  
15 subsection 109 b. or e. of the 1954 Act.

16 (e) The term "physical security measures" means meas-  
17 ures to prevent the theft or sabotage or unauthorized use of  
18 source or special nuclear material.

19 (f) The term "safeguards" means a system of controls  
20 designed to ensure that any materials, equipment, compo-  
21 nents, or substances subject thereto are not used to further  
22 any military purposes, including use in or development of  
23 any nuclear explosive device.

24 (g) The term "sensitive nuclear technology" means  
25 any information (including information incorporated in a



1 production or utilization facility or important component part  
2 thereof, or in a nuclear-related substance) which is not avail-  
3 able to the public and which is important to the design, con-  
4 struction, fabrication, operation or maintenance of a uranium  
5 enrichment or nuclear fuel reprocessing facility, or a facility  
6 for the production of heavy water, but shall not include  
7 Restricted Data controlled pursuant to chapter 12 of the  
8 1954 Act.

9 (h) The term "1954 Act" means the Atomic Energy  
10 Act of 1954, as amended.

11 (i) All other terms used in this Act shall have the  
12 meanings ascribed to them by the 1954 Act, the Energy  
13 Reorganization Act of 1974, and the Treaty.

14 TITLE I—UNITED STATES INITIATIVES TO  
15 PROVIDE ADEQUATE NUCLEAR FUEL SUPPLY

16 SEC. 101. The United States, as a matter of national  
17 policy, shall take such actions and institute such measures  
18 as may be necessary and feasible to assure other nations  
19 and groups of nations that may seek to utilize the benefits  
20 of atomic energy for peaceful purposes that it will provide  
21 a reliable supply of nuclear fuel to those nations and groups  
22 of nations which adhere to policies designed to prevent pro-  
23 liferation. Such nuclear fuel shall be provided under agree-  
24 ments entered into pursuant to section 161 of the 1954 Act  
25 or as otherwise authorized by law. The United States shall



1 strive to ensure that it will have available the capacity to  
2 carry out this policy on a long-term basis. The United States  
3 shall, on a timely basis, authorize the export of nuclear  
4 materials and equipment when all the applicable statutory  
5 requirements are met.

6 SEC. 102. The Administrator is directed to initiate  
7 construction planning and design, construction, and operation  
8 activities for expansion of uranium enrichment capacity, as  
9 elsewhere provided by law.

10 SEC. 103. The President shall promptly undertake a  
11 study to determine the need for additional United States en-  
12 richment capacity to meet domestic and foreign needs and  
13 to promote United States non-proliferation objectives abroad.  
14 The President shall report to the Congress on the results of  
15 this study within twelve months after the date of enactment  
16 of this Act.

17 SEC. 104. (a) The President shall institute prompt dis-  
18 cussions with other nations or groups of nations to develop  
19 international approaches for meeting future worldwide  
20 nuclear fuel needs. In particular, the President is authorized  
21 and directed to seek to negotiate as soon as practicable with  
22 nations possessing nuclear fuel production facilities or source  
23 material and such other nations as may be deemed appro-  
24 priate with a view toward the timely establishment of bind-  
25 ing international arrangements providing for—



1           (1) the establishment of an international nuclear  
2 fuel authority (INFA) with responsibility for allocat-  
3 ing agreed upon quantities of fuel resources to ensure  
4 fuel supply on reasonable terms in accordance with  
5 agreements between INFA and supplier and recipient  
6 nations;

7           (2) a set of conditions as called for in subsection  
8 (d) of this section under which international fuel as-  
9 surance under INFA auspices will be provided to recipi-  
10 ent nations, including conditions which will ensure that  
11 the transferred materials cannot or will not be used for  
12 nuclear explosive devices;

13           (3) the establishment of repositories under effective  
14 international auspices and inspection for the storage of  
15 spent nuclear reactor fuel;

16           (4) the establishment of arrangements under  
17 which nations placing their spent fuel in such reposi-  
18 tories would receive appropriate compensation for the  
19 energy content of such spent fuel if recovery of such  
20 spent fuel is deemed necessary or desirable;

21           (5) appropriate financial arrangements regarding  
22 transactions carried out under INFA; and

23           (6) sanctions for violations of the provisions of or  
24 for abrogation of such binding international arrange-  
25 ments.



1       (b) Pending the establishment of INFA the President  
2 shall implement such measures as are necessary to make  
3 available, for contribution to an international stockpile estab-  
4 lished pursuant to an international arrangement, an amount  
5 of uranium enriched to less than 20 percent in the isotope  
6 235 sufficient to produce up to 100,000 MWe years of power  
7 from light water nuclear reactors. The President shall submit  
8 to the Congress no later than six months after the date of  
9 enactment of this Act proposals for the establishment of  
10 an initial international arrangement to guarantee the supply  
11 of such fuel to nations that adhere to strict policies designed  
12 to prevent proliferation.

13       (c) The President shall, in the report required by sec-  
14 tion, 103, also address the desirability of and options for  
15 foreign participation including investment, in new United  
16 States uranium enrichment facilities. This report shall also  
17 address the arrangements that would be required to imple-  
18 ment such participation and the commitments that would be  
19 required as a condition of such participation. This report shall  
20 be accompanied by any proposed legislation to implement  
21 these arrangements.

22       (d) The fuel assurances provided by this section shall be  
23 exclusively for the benefit of nations that adhere to policies



1 designed to prevent proliferation. In negotiating the inter-  
2 national arrangements called for in this section, the President  
3 shall, in particular, seek to ensure that the benefits of such  
4 arrangements are available to non-nuclear-weapon states  
5 only if such states accept IAEA safeguards on all their peace-  
6 ful nuclear activities, do not manufacture or otherwise ac-  
7 quire any nuclear explosive device, do not establish any en-  
8 richment or reprocessing facilities on a national basis, and  
9 place any such existing facilities under effective international  
10 auspices inspection.

11 (e) The report required by section 601 shall include  
12 information on the progress made in any negotiations pur-  
13 suant to this section.

14 SEC. 105. The President shall take immediate initiatives  
15 to establish an intensive international fuel cycle evaluation  
16 involving other nuclear supplier and recipient countries to  
17 reevaluate all aspects of the nuclear fuel cycle, with emphasis  
18 on alternatives to an economy based on the separation of  
19 pure plutonium or the presence of high enriched uranium and  
20 methods to deal with spent fuel storage. The President shall  
21 submit a special report to the Congress no later than one year  
22 after enactment of this Act, detailing the progress of the inter-  
23 national nuclear fuel cycle evaluation.



## 10

1 TITLE II—UNITED STATES INITIATIVES TO  
2 STRENGTHEN THE INTERNATIONAL SAFE-  
3 GUARDS SYSTEM

4 SEC. 201. The United States is committed to a strength-  
5 ened and more effective International Atomic Energy  
6 Agency (IAEA) and to a comprehensive safeguards sys-  
7 tem administered by that agency to deter proliferation. Ac-  
8 cordingly, the United States shall seek to act with other  
9 nations to—

10 (a) continue to strengthen the safeguards program  
11 of the IAEA and, in order to implement this initiative,  
12 contribute funds, technical resources, and other support  
13 to assist the IAEA in effectively implementing safe-  
14 guards;

15 (b) ensure that the IAEA has the resources to carry  
16 out the provisions of Article XII of the Statute of the  
17 IAEA;

18 (c) improve the IAEA safeguards system (includ-  
19 ing accountability) to ensure—

20 (1) the timely detection of a possible diversion  
21 of source or special nuclear materials which could  
22 be used for nuclear explosive devices;

23 (2) the timely dissemination of information  
24 regarding such diversion; and

25 (3) the timely implementation of internation-



1           ally agreed procedures in the event of such diversion;  
2           (d) ensure both that the IAEA receives on a  
3           timely basis the data needed for it to administer an  
4           effective and comprehensive international safeguards  
5           program and that the IAEA provides timely notice  
6           to the world community of any evidence of a viola-  
7           tion of safeguards agreements to which it is a party;

8           (e) encourage the IAEA to the maximum degree  
9           consistent with the statute, to provide nations which sup-  
10          ply nuclear materials and equipment with the data  
11          needed to assure such nations that bilateral commitments  
12          applicable to such supply are being adhered to.

13       SEC. 202. The Energy Research and Development Ad-  
14       ministration, in consultation with the Commission, shall  
15       establish and operate a safeguards and physical security  
16       training program to be made available to persons from  
17       nations or groups of nations which have or may be expected  
18       to develop or acquire nuclear materials and equipment for  
19       use for peaceful purposes. Any such program shall include  
20       training in the most advanced safeguards and physical secu-  
21       rity techniques and technology, consistent with national secu-  
22       rity interests of the United States.

23       SEC. 203. The Department of Commerce (acting  
24       through the National Bureau of Standards), the Energy  
25       Research and Development Administration, and the Com-



1 mission shall, in consultation with the Department of State  
2 and the Arms Control and Disarmament Agency, work  
3 cooperatively to establish a program to develop reference  
4 methods and standards for measurement of nuclear materials  
5 and other substances needed to ensure that consistent and  
6 compatible measurements can be made at all points of the  
7 nuclear materials safeguards system of sufficient accuracy to  
8 meet the requirements of the system. These standards and  
9 services may be made available to the IAEA for such safe-  
10 guards purposes and to nations and groups of nations selected  
11 for such assistance by the above named agencies in accord-  
12 ance with the 1954 Act.

13 SEC. 204. The United States shall seek to negotiate with  
14 other nations and groups of nations to—

15 (a) adopt general principles and procedures, includ-  
16 ing common international sanctions, to be followed in  
17 the event that a nation violates any material obligation  
18 with respect to the peaceful use of nuclear materials and  
19 equipment or nuclear technology, or in the event that  
20 any nation violates the principles of the Treaty, includ-  
21 ing the detonation by a non-nuclear-weapon state of a  
22 nuclear explosive device; and

23 (b) establish international procedures to be fol-  
24 lowed in the event of diversion, theft, or sabotage of



1 nuclear materials or sabotage of nuclear facilities and for  
2 recovering nuclear materials that have been lost or  
3 stolen, or obtained or used by a nation or by any person  
4 or group in contravention of the principles of the Treaty.

5 TITLE III—EXPORT ORGANIZATION AND

6 CRITERIA

7 GOVERNMENT-TO-GOVERNMENT TRANSFERS

8 SEC. 301. (a) Section 54 of the 1954 Act is amended  
9 by adding a new subsection d. thereof as follows:

10 “d. The authority to distribute special nuclear material  
11 under this section other than under an export license granted  
12 by the Nuclear Regulatory Commission shall extend only  
13 to small quantities of special nuclear material (in no event  
14 more than five hundred grams per year of the uranium iso-  
15 tope 233, the uranium isotope 235, or plutonium contained  
16 in special nuclear material to any recipient): (1) which are  
17 contained in laboratory samples, medical devices, or monitor-  
18 ing or other instruments; or (2) the distribution of which  
19 is needed to deal with an emergency situation in which time  
20 is of the essence.”;

21 (b) Section 64 of the 1954 Act is amended by inserting  
22 the following immediately after the second sentence thereof:  
23 “The authority to distribute source material under this sec-  
24 tion (other than under an export license granted by the



1 Nuclear Regulatory Commission), shall in no case extend  
2 to quantities of source material in excess of three tonnes per  
3 year per recipient.”; and

4 (c) Chapter 10 of the 1954 Act is amended by adding  
5 a new section 111 as follows:

6 “SEC. 111. The Nuclear Regulatory Commission is au-  
7 thorized to license the distribution of special nuclear material  
8 and source material by the Energy Research and Develop-  
9 ment Administration pursuant to sections 54 and 64 of this  
10 Act, respectively, in accordance with the same procedures  
11 established by law for the export licensing of such material by  
12 any person.”.

13 TECHNOLOGY TRANSFERS

14 SEC. 302. Subsection 57 b. of the 1954 Act is amended  
15 to read as follows:

16 “b. It shall be unlawful for any person to directly or  
17 indirectly engage in the production of any special nuclear  
18 material outside of the United States except (1) as specifi-  
19 cally authorized under an agreement for cooperation made  
20 pursuant to section 123, or (2) upon authorization by the  
21 Administrator of Energy Research and Development after a  
22 determination that such activity will not be inimical to the  
23 interest of the United States: *Provided*, That any such deter-  
24 mination by the Administrator shall be made only with the  
25 concurrence of the Department of State and after consultation



1 with the Arms Control and Disarmament Agency and the  
2 Nuclear Regulatory Commission under mutually agreed-to  
3 procedures which shall be established within not more than  
4 ninety days after the date of enactment of this proviso. Any  
5 trade secrets or proprietary information submitted by any  
6 person seeking an authorization under this subsection shall  
7 be afforded the maximum degree of protection allowable by  
8 law.”.

9                   SUBSEQUENT ARRANGEMENTS

10       SEC. 303. (a) Any proposed subsequent arrangement  
11 under an agreement for cooperation (other than an agree-  
12 ment for cooperation arranged pursuant to subsection 91 c.,  
13 144 b., or 144 c. of the 1954 Act), shall be negotiated by  
14 the Administrator with the concurrence of the Secretary of  
15 State and in consultation with the Director and the Secretary  
16 of Defense: *Provided*, That any such proposed subse-  
17 quent arrangement regarding arrangements for the storage  
18 or disposition of irradiated fuel elements or approvals for the  
19 transfer, for which prior approval is required under an agree-  
20 ment for cooperation, by a recipient of source or special nu-  
21 clear material, production, or utilization facilities, or nuclear  
22 technology shall be negotiated by the Secretary of State, with  
23 the technical assistance and concurrence of the Administra-  
24 tor and in consultation with the Director and the Secretary  
25 of Defense. After consultation with the Commission, any such



1 proposed subsequent arrangement shall be published in the  
2 Federal Register, and shall not take effect for fifteen days  
3 after publication, together with the written determination of  
4 the Administrator or the Secretary of State, as the case may  
5 be, that such arrangement will not be inimical to the common  
6 defense and security. Whenever the Director determines that  
7 a proposed subsequent arrangement is significant from the  
8 proliferation standpoint, he shall prepare an unclassified Nu-  
9 clear Proliferation Assessment Statement regarding the ade-  
10 quacy of the terms and conditions of the proposed arrange-  
11 ment and the implications of the proposed arrangement for  
12 preventing proliferation. For the purposes of this section, the  
13 term "subsequent arrangements" shall include: United States  
14 Government contracts for the furnishing of nuclear materials  
15 and equipment; approvals for the transfer, for which prior  
16 approval is required under an agreement for cooperation by  
17 a recipient of any source or special nuclear material, produc-  
18 tion, or utilization facility, or nuclear technology; authoriza-  
19 tion for the distribution of nuclear materials and equipment  
20 pursuant to the 1954 Act; arrangements for physical secu-  
21 rity; arrangements for the storage or disposition of irradi-  
22 ated fuel elements; arrangements for the application of safe-  
23 guards with respect to nuclear materials and equipment; or  
24 any other arrangement which the President finds to be  
25 important from the standpoint of preventing proliferation.



1 (b) With regard to any special nuclear material  
2 exported by the United States or produced through the use  
3 of any nuclear materials and equipment or sensitive nuclear  
4 technology exported by the United States—

5 (1) the Secretary of State may not enter into any  
6 subsequent arrangement for the retransfer of any such  
7 material to a third country for reprocessing, for the  
8 reprocessing of any such material, or for the subsequent  
9 retransfer of any special material resulting from the  
10 reprocessing of any such material, until he has provided  
11 the Committee on International Relations of the House  
12 of Representatives and the Committee on Foreign Rela-  
13 tions of the Senate with a report containing his reasons  
14 for entering into such arrangements and a period of 15  
15 days has elapsed;

16 (2) the Secretary of State may not enter into any  
17 subsequent arrangement for the reprocessing of any such  
18 material in a facility not in commercial operation prior  
19 to the date of enactment of this Act or for the subsequent  
20 retransfer to any non-nuclear-weapon state of any special  
21 nuclear material resulting from the reprocessing of any  
22 such material, unless in his view such reprocessing or  
23 retransfer will take place under conditions that are  
24 designed to ensure reliable detection of any diversion and  
25 which would provide timely warning to the United



1 States of such diversion well in advance of the time at  
2 which the non-nuclear-weapon state could transform  
3 diverted material into a nuclear explosive device; and

4 (3) the Secretary of State shall attempt to ensure,  
5 in entering into any subsequent arrangement for the  
6 reprocessing of any such material in any facility that was  
7 in commercial operation prior to the date of enactment  
8 of this Act, that such reprocessing shall take place under  
9 conditions comparable to those which he finds satisfy the  
10 standards set forth in paragraph (2).

11 SEC. 304. (a) Chapter 11 of the 1954 Act is amended  
12 by adding a new section 126 as follows:

13 "SEC. 126. EXPORT LICENSING PROCEDURES.—

14 "a. No license may be issued by the Commission for  
15 the export of any production or utilization facility, or any  
16 source material or special nuclear material, no exemption  
17 from any requirement for such an export license may be  
18 granted by the Commission, and the Energy Research and  
19 Development Administration shall not distribute any source  
20 or special nuclear material under section 54 or 64 of the  
21 1954 Act until the Commission or the Administration, as  
22 the case may be—

23 "(1) has been notified by the Secretary of State  
24 that it is the judgment of the executive branch that the  
25 proposed export, exemption, or distribution will not be



1 inimical to the common defense and security, or that any  
2 export in the category to which the proposed export  
3 belongs would not be inimical to the common defense  
4 and security because it lacks significance for nuclear  
5 explosive purposes. In submitting any such judgment,  
6 the Secretary of State shall specifically address the extent  
7 to which the export criteria then in effect are met. In the  
8 event he considers it warranted, the Secretary may also  
9 address the following additional factors, among others:

10 “(A) that issuing the license, granting the ex-  
11 emption, or authorizing the distribution will mate-  
12 rially advance the non-proliferation goals of the  
13 United States by encouraging the recipient nation  
14 to adhere to the Treaty, or to participate in the un-  
15 dertakings contemplated by section 403 or 404 (a)  
16 of the Nuclear Non-Proliferation Act of 1977;

17 “(B) that failure to issue the license, grant the  
18 exemption, or authorize the distribution would other-  
19 wise be seriously prejudicial to the non-prolifera-  
20 tion objectives of the United States;

21 “(C) that the recipient nation or group of na-  
22 tions has agreed that conditions substantially identi-  
23 cal to the export criteria set forth in subsection 127  
24 a. will be applied to the proposed United States ex-  
25 port or distribution by another nuclear supplier na-



1           tion or group of nations and that in his judgment  
2           those conditions will be implemented in a manner  
3           acceptable to the United States;

4           the Secretary of State shall provide appropriate data  
5           and recommendations, subject to requests for additional  
6           data and recommendations, as required by the Commis-  
7           sion or the Administrator, as the case may be;

8           “(2) finds that the criteria in subsection 127 a. or  
9           their equivalent, and any other applicable statutory re-  
10          quirements, are met: *Provided*, That failure to meet the  
11          provisions of paragraphs 4 and 5 of that subsection shall  
12          not prevent continued cooperation with any group of  
13          nations under an agreement for cooperation as author-  
14          ized in accordance with section 124 of this Act if the  
15          Secretary of State notifies the Commission that such  
16          group of nations has agreed to negotiations as called for  
17          in section 404 (a) of the Nuclear Non-Proliferation Act  
18          of 1977;

19          “b. In the event the Commission, after receiving the  
20          executive branch judgment that the issuance of the proposed  
21          export license will not be inimical to the common defense and  
22          security, does not issue the proposed license because it is  
23          unable to make the statutory determinations required under  
24          this Act, the Commission shall publicly issue its decision to  
25          that effect, and shall submit the license application to the



1 President. The Commission's decision shall include an expla-  
2 nation of the basis for the decision and any dissenting or sep-  
3 arate views. If, after receiving the proposed license applica-  
4 tion and reviewing the Commission's decision, the President  
5 determines that withholding the proposed export would be  
6 seriously prejudicial to the achievement of United States  
7 nonproliferation objectives, or would otherwise jeopardize  
8 the common defense and security, the proposed export may  
9 be authorized by Executive order: *Provided*, That prior to  
10 any such export, the President shall submit the Executive  
11 order, together with his explanation of why, in light of the  
12 Commission's decision, the export should nonetheless be  
13 made, to the Congress for a period of sixty days of continuous  
14 session (as defined in subsection 130 (i) ) and shall be re-  
15 ferred to the Committee on International Relations of the  
16 House of Representatives and the Committee on Foreign  
17 Relations of the Senate, but any such proposed export shall  
18 not occur if during such sixty-day period either House passes  
19 a resolution stating in substance that it does not favor the  
20 proposed export. Any such Executive order shall be consid-  
21 ered pursuant to the procedures set forth in section 130 of  
22 this Act for the consideration of Presidential submissions;  
23 "c. (1) In the event that the Senate or the House of  
24 Representatives passes a joint resolution stating in substance  
25 that one or more additional export criteria are to be adopted



1 by the United States, the Commission or the Administra-  
2 tion, as the case may be, shall suspend licensing or au-  
3 thorizing any export that would be directly affected by the  
4 terms of such joint resolution for a period of thirty days of  
5 continuous session of Congress (as defined in subsection 130  
6 (i) of this Act) ;

7 “(2) Any such joint resolution reported by the Com-  
8 mittee on Foreign Relations of the Senate or the Commit-  
9 tee on International Relations of the House of Representa-  
10 tives shall be considered by the Senate or the House of  
11 Representatives, respectively, under procedures identical to  
12 those provided for the consideration of resolutions pursuant  
13 to subsections 130 (d) through (g) of this Act.”.

14 (b) Within one hundred and twenty days of the effec-  
15 tive date of this section, the Commission shall, after con-  
16 sultations with the Secretary of State, promulgate regulations  
17 establishing procedures (1) for the granting, suspending,  
18 revoking, or amending of any nuclear export license or  
19 exemption pursuant to its statutory authority; (2) for pub-  
20 lic participation in nuclear export licensing proceedings  
21 when the Commission finds that such participation will be in  
22 the public interest and will assist the Commission in making  
23 the statutory determinations required by the 1954 Act, in-  
24 cluding such public hearings and access to information as the  
25 Commission deems appropriate; (3) for a public written



1 Commission opinion accompanied by the dissenting or separate  
2 views of any Commissioner, in those proceedings where  
3 one or more Commissioners have dissenting or separate  
4 views on the issuance of an export license; and (4) for  
5 public notice of Commission proceedings and decisions, and  
6 for recording of minutes and votes of the Commission.

7 (c) The procedures to be established pursuant to sub-  
8 section (b) shall constitute the exclusive basis for hearings  
9 in nuclear export licensing proceedings before the Commission  
10 and, notwithstanding section 189 a. of the 1954 Act,  
11 shall not require the Commission to grant any person an on-  
12 the-record hearing in such a proceeding.

13 SEC. 305. Chapter 11 of the 1954 Act is amended by  
14 adding a new section 127 as follows:

15 "SEC. 127. CRITERIA GOVERNING UNITED STATES  
16 NUCLEAR EXPORTS.—

17 "a. The United States adopts the following criteria  
18 which, in addition to other requirements of law, will govern  
19 exports for peaceful nuclear uses from the United States  
20 of source material, special nuclear material, production or  
21 utilization facilities, and any sensitive nuclear technology:

22 "(1) IAEA safeguards as required by Article III  
23 (2) of the Treaty shall be applied with respect to such  
24 material or facilities proposed to be exported, to any  
25 material or facilities previously exported and subject to



1 the applicable agreement for cooperation, and to any  
2 special nuclear material used in or produced through the  
3 use thereof.

4 “(2) No such material, facilities, or sensitive nu-  
5 clear technology proposed to be exported or previously  
6 exported and subject to the applicable agreement for  
7 cooperation, and no special nuclear material produced  
8 through the use of such materials, facilities, or sensitive  
9 nuclear technology will be used for any nuclear explosive  
10 device or for research on or development of any nuclear  
11 explosive device.

12 “(3) Adequate physical security measures will be  
13 maintained with respect to such material or facilities  
14 proposed to be exported and to any special nuclear  
15 material used in or produced through the use thereof.

16 “(4) No such materials, facilities, or sensitive nu-  
17 clear technology proposed to be exported, no such ma-  
18 terials or facilities previously exported and subject to the  
19 applicable agreement for cooperation, and no special nu-  
20 clear material produced through the use of such material,  
21 will be retransferred to the jurisdiction of any other  
22 nation or group of nations unless the prior approval of  
23 the United States is obtained for such retransfer. The  
24 United States may approve such retransfer only if the  
25 nation or group of nations designated to receive such



1 retransfer agrees that it shall be subject to the conditions  
2 required by this subsection.

3 “(5) No such material proposed to be exported or  
4 previously exported and subject to the applicable agree-  
5 ment for cooperation and no special nuclear material  
6 produced through the use of such material will be re-  
7 processed, and no special nuclear material produced  
8 through the use of such material will be reprocessed, and  
9 no irradiated fuel elements containing such material  
10 removed from a reactor shall be altered in form or con-  
11 tent, unless the prior approval of the United States is  
12 obtained for such reprocessing or alteration.

13 “(6) No such sensitive nuclear technology shall  
14 be exported unless the foregoing conditions shall be  
15 applied to any nuclear material or equipment which is  
16 produced or constructed under the jurisdiction of the  
17 recipient nation or group of nations by or through the  
18 use of any such exported sensitive nuclear technology.”.

19 SEC. 306. Chapter 11 of the 1954 Act is amended by  
20 adding a new section 128 as follows:

21 “SEC. 128. ADDITIONAL EXPORT CRITERION AND  
22 PROCEDURES.—

23 “a. The United States adopts the following additional  
24 criterion as a condition of continued United States export of



1 source material, special nuclear material, production or utili-  
2 zation facilities, and any sensitive nuclear technology to non-  
3 nuclear-weapon states:

4 "No such export shall be made unless IAEA safe-  
5 guards are maintained with respect to all peaceful nuclear  
6 activities in, under the jurisdiction of, or carried out  
7 under the control of such state at the time of the export.  
8 The President shall seek to achieve adherence to the fore-  
9 going criterion by recipient non-nuclear-weapon states.

10 "b. The criterion set forth in subsection a. shall be  
11 applied as an export criterion with respect to any application  
12 for the export of materials, facilities, or technology specified  
13 in subsection a. which is filed after eighteen months from the  
14 date of enactment of this section, or for any such application  
15 under which the first export would occur at least twenty-four  
16 months after the date of enactment of this section, except as  
17 provided in the following paragraphs:

18 "(1) If the Commission or the Administration, as  
19 the case may be, is notified that the President has deter-  
20 mined that failure to approve an export to which this  
21 subsection applies because such criterion has not yet  
22 been met would be seriously prejudicial to the achieve-  
23 ment of United States non-proliferation objectives or  
24 otherwise jeopardize the common defense and security,  
25 the license or authorization may be issued subject to



1 other applicable requirements of law: *Provided*, That  
2 no such export of any production or utilization facility  
3 or of any source or special nuclear material intended for  
4 use as fuel in any production or utilization facility which  
5 has been licensed or authorized pursuant to this sub-  
6 section shall be made until the first such license or au-  
7 thorization with respect to each non-nuclear-weapon  
8 state which has failed to meet such criterion is submitted  
9 to the Congress (together with a detailed assessment of  
10 the reasons underlying the President's determination,  
11 the judgment of the executive branch required under  
12 section 126 of this Act, and any Commission opinion  
13 and views) for a period of sixty days of continuous ses-  
14 sion (as defined in subsection 130 (i) of this Act) and  
15 referred to the Committee on International Relations of  
16 the House of Representatives and the Committee on  
17 Foreign Relations of the Senate, but such export shall  
18 not occur if during such sixty-day period either House  
19 passes a resolution stating in substance that such House  
20 does not favor the proposed export. Any such license or  
21 authorization shall be considered pursuant to the proce-  
22 dures set forth in section 130 of this Act for the con-  
23 sideration of Presidential submissions;

24 “(2) If either House of Congress passes a resolu-  
25 tion of disapproval pursuant to paragraph (1), no fur-



1       ther export of materials, facilities, or technology specified  
2       in subsection a. shall be permitted for the remainder of  
3       that Congress, unless such state meets the criterion or  
4       the President notifies the Congress that he has deter-  
5       mined that significant progress has been made in  
6       achieving adherence to such criterion by such state or  
7       that United States foreign policy interests dictate recon-  
8       sideration, and neither House of Congress, pursuant to  
9       the procedure of paragraph (1), passes a resolution  
10      stating in substance that such House disagrees with the  
11      President's determination;

12           “(3) If neither House of Congress passes a resolu-  
13      tion of disapproval with respect to a license or authoriza-  
14      tion submitted pursuant to paragraph (1), the criterion  
15      set forth in subsection a. shall not be applied as an  
16      export criterion with respect to exports of materials,  
17      facilities and technology specified in subsection a. to that  
18      state: *Provided*, That the first license or authorization  
19      with respect to that state which is issued pursuant to  
20      this paragraph after twelve months from the elapse of  
21      the sixty-day period specified in paragraph (1) and  
22      the first such license or authorization which is issued after  
23      each twelve-month period thereafter shall be submitted  
24      to the Congress for review pursuant to the procedures  
25      specified in paragraph (1); *Provided further*, That if



1       either House of Congress passes a resolution of dis-  
2       approval during any review period provided for by this  
3       paragraph, the provisions of paragraph (2) shall apply  
4       with respect to further exports to such state.”.

5       SEC. 307. Chapter 11 of the 1954 Act is amended by  
6       adding a new section 129 as follows:

7       “SEC. 129. ACTIONS TRIGGERING IMMEDIATE TERMI-  
8       NATION OF SUPPLY.—

9       “(a) No nuclear materials and equipment or sensitive  
10       nuclear technology shall be exported to—

11       “(1) any non-nuclear-weapon state that, at any  
12       time after the effective date of this Act, is found by the  
13       President to have—

14       “(A) detonated a nuclear explosive device;

15       “(B) terminated or abrogated IAEA safe-  
16       guards;

17       “(C) materially violated an IAEA safeguards  
18       agreement; or

19       “(D) engaged in activities involving source or  
20       special nuclear material and having direct signif-  
21       icance for the manufacture or acquisition of nuclear  
22       explosive devices, and has failed to take steps which,  
23       in the President’s judgment, represents sufficient  
24       progress toward terminating such activities; or

25       “(2) any nation or group of nations that, at any



1 time after the effective date of this Act, is found by the  
2 President to have—

3 “(A) materially violated any guarantee it has  
4 given under an agreement for cooperation with the  
5 United States; or

6 “(B) to have assisted, encouraged, or induced  
7 any non-nuclear-weapon state to manufacture or  
8 otherwise acquire any nuclear explosive device;  
9 unless the President determines that cessation of such exports  
10 would be seriously prejudicial to the achievement of United  
11 States non-proliferation objectives or otherwise jeopardize  
12 the common defense and security: *Provided*, That prior to  
13 the effective date of any such determination, the President’s  
14 determination, together with a report containing the reasons  
15 for his determination, shall be submitted to the Congress  
16 and referred to the Committees on International Relations  
17 of the House of Representatives and the Committee on For-  
18 eign Relations of the Senate for a period of sixty days of con-  
19 tinuous session (as defined in subsection 130 (i) of the 1954  
20 Act), but any such determination shall not become effective  
21 if during such sixty-day period either House passes a resolu-  
22 tion stating in substance that it does not favor the determina-  
23 tion. Any such determination shall be considered pursuant  
24 to the procedures set forth in section 130 of this Act for the  
25 consideration of Presidential submissions.”.



## 1 CONGRESSIONAL REVIEW PROCEDURES

2 SEC. 309. Chapter 11 of the 1954 Act is amended by  
3 adding a new section 130 as follows:

4 "SEC. 130. CONGRESSIONAL REVIEW PROCEDURES.—

5 "a. Not later than the first day of session following the  
6 day on which any Presidential submission subject to the pro-  
7 cedures of this section is transmitted to the House of Repre-  
8 sentatives and the Senate, a resolution, as defined in subsec-  
9 tion (h), shall be introduced (by request) in the House by  
10 the chairman of the International Relations Committee, or  
11 by a Member or Members of the House designated by such  
12 chairman, and shall be introduced (by request) in the Senate  
13 by the chairman of the Foreign Relations Committee, or by  
14 a Member or Members of the Senate designated by such  
15 chairman.

16 "b. The resolutions introduced pursuant to subsection  
17 (a) shall be referred to the Committee on International Rela-  
18 tions of the House and the Committee on Foreign Relations  
19 of the Senate, respectively, by the Speaker of the House of  
20 Representatives or the President of the Senate, as the case  
21 may be.

22 "c. Such committees shall make their recommendations  
23 to the House and Senate, respectively, within forty-five cal-  
24 endar days of continuous session of Congress following the  
25 date of such resolutions' introduction: *Provided*, That if the



1 committee to which a resolution introduced pursuant to sub-  
2 section (a) is referred has not reported such resolution at the  
3 end of such forty-five-day period, such committee shall be  
4 deemed to be discharged from further consideration of such  
5 resolution and such resolution shall be placed on the appro-  
6 priate calendar of the House involved.

7 "d. When the committee has reported, or has been  
8 deemed to be discharged from further consideration of, such  
9 a resolution, it is at any time thereafter in order (even  
10 though a previous motion to the same effect has been dis-  
11 agreed to) for any Member of the respective House to move  
12 to proceed to the consideration of the resolution. The motion  
13 is highly privileged and is not debatable. The motion shall  
14 not be subject to amendment, or to a motion to postpone, or  
15 a motion to proceed to the consideration of other business. A  
16 motion to reconsider the vote by which the motion is agreed  
17 to or disagreed to shall not be in order. If a motion to pro-  
18 ceed to the consideration of the resolution is agreed to, the  
19 resolution shall remain the unfinished business of the respec-  
20 tive House until disposed of.

21 "e. Debate on the resolution, and on all debatable mo-  
22 tions and appeals in connection therewith, shall be limited  
23 to not more than ten hours, which shall be divided equally  
24 between individuals favoring and individuals opposing the  
25 resolution. A motion further to limit debate is in order and



1 not debatable. An amendment to, or a motion to postpone,  
 2 or a motion to proceed to the consideration of other business,  
 3 or a motion to recommit the resolution is not in order. A  
 4 motion to reconsider the vote by which the resolution is  
 5 agreed to or disagreed to shall not be in order.

6 “f. Immediately following the conclusion of the debate  
 7 on such resolution, and a single quorum call at the conclusion  
 8 of debate if requested in accordance with the rules of the  
 9 appropriate House, the vote on final approval of the resolu-  
 10 tion shall occur.

11 “g. Appeals from the decisions of the Chair relating  
 12 to the application of the rules of the Senate or the House  
 13 of Representatives, as the case may be, do the procedure  
 14 relating to such a resolution shall be decided without debate.

15 “h. For the purpose of subsections a. through g. of this  
 16 section, ‘resolution’ means a resolution of either House of  
 17 Congress, the matter after the resolving clause of which is  
 18 as follows: ‘That the                      does not favor the  
 19                      transmitted to the Congress by the President on  
 20                      , 19    .’. The blank spaces therein are to be  
 21 filled appropriately.

22 “i. For the purpose of this section—

23 “(1) continuity of session is broken only by an  
 24 adjournment of Congress sine die; and

25 “(2) the days on which either House is not in



1 session because of an adjournment of more than three  
2 days to a day certain are excluded in the computation  
3 of any period of time in which Congress is in continuous  
4 session.

5 "j. This section is enacted by Congress—

6 "(1) as an exercise of the rulemaking power of  
7 the Senate and the House of Representatives, respec-  
8 tively, and as such they are deemed a part of the rules  
9 of each House, respectively, but applicable only with  
10 respect to the procedure to be followed in that House  
11 in the case of resolutions described by subsection h. of  
12 this section; and they supersede other rules only to the  
13 extent that they are inconsistent therewith; and

14 "(2) with full recognition of the constitutional right  
15 of either House to change the rules (so far as relating  
16 to the procedure of that House) at any time, in the same  
17 manner and to the same extent as in the case of any  
18 other rule of that House."

19 SEC. 308. (a) Section 109 of the 1954 Act is amended  
20 to read as follows:

21 "SEC. 109. COMPONENT AND OTHER PARTS OF FACIL-  
22 ITIES.—

23 "a. With respect to those utilization and production  
24 facilities which are so determined by the Commission pur-  
25 suant to subsection 11 v. (2) or 11 cc. (2) the Commission



1 may issue general licenses for domestic activities required  
2 to be licensed under section 101, if the Commission deter-  
3 mines in writing that such general licensing will not be  
4 inimical to the common defense and security.

5       “b. The Commission is authorized and directed to deter-  
6 mine which component parts as defined in subsection 11 v.  
7 or 11 cc. of the 1954 Act and which other items or sub-  
8 stances are especially relevant from the standpoint of export  
9 control because of their significance for nuclear explosive pur-  
10 poses. Except as provided in section 126 b., no such  
11 component, substance, or item which is so determined by the  
12 Commission shall be exported unless the Commission issues a  
13 general or specific license for its export, after finding that  
14 (1) IAEA safeguards as required by Article III (2) of  
15 the Treaty shall be applied with respect to such component,  
16 substance, or item; (2) no such component, substance, or  
17 item will be used for any nuclear explosive device or for  
18 research on or development of any nuclear explosive device;  
19 and (3) no such component, substance, or item will be  
20 retransferred to the jurisdiction of any other nation or group  
21 of nations unless the prior consent of the United States is  
22 obtained for such retransfer; and after determining in writing  
23 that the issuance of each such general or specific license will  
24 not be inimical to the common defense and security.

25       “c. The Commission, within not more than one hundred



1 and twenty days after the date of the enactment of this sec-  
2 tion, shall publish regulations to implement the provisions of  
3 this section. Among other things, these regulations shall  
4 provide for the prior consultation by the Commission with  
5 the Department of State, the Energy Research and Develop-  
6 ment Administration, the Department of Defense, the  
7 Department of Commerce, and the Arms Control and Dis-  
8 armament Agency.

9 "d. The Commission shall not issue an export license  
10 under the authority of subsection b. if it is advised by the  
11 executive branch, in accordance with the procedures estab-  
12 lished under subsection 126 a., that the export would be  
13 inimical to the common defense and security of the United  
14 States."

15 (b) The President, within not more than one hundred  
16 and twenty days after the date of the enactment of this sec-  
17 tion, shall publish procedures regarding the control by the  
18 Department of Commerce over all export items, other than  
19 those licensed by the Commission, which could be, if used for  
20 purposes other than those for which the export is intended,  
21 of significance for nuclear explosive purposes. Among other  
22 things, these procedures shall provide for prior consultations,  
23 as required, by the Department of Commerce with the De-  
24 partment of State, the Arms Control and Disarmament



1 Agency, the Nuclear Regulatory Commission, and the  
2 Energy Research and Development Administration.

3 TITLE IV—NEGOTIATION OF FURTHER EXPORT  
4 CONTROLS

5 SEC. 401. Section 123 of the 1954 Act is amended to  
6 read as follows:

7 "SEC. 123. COOPERATION WITH OTHER NATIONS.—

8 No cooperation with any nation or regional defense orga-  
9 nization pursuant to section 53, 54a, 57, 64, 82, 91, 103,  
10 104, or 144 shall be undertaken until—

11 "a. the proposed agreement for cooperation has  
12 been submitted to the President, which proposed agree-  
13 ment shall include the terms, conditions, duration, nature,  
14 and scope of the cooperation; and shall include the fol-  
15 lowing requirements: (1) a guaranty by the cooperat-  
16 ing party that safeguards as set forth in the agreement  
17 for cooperation will be maintained with respect to all  
18 nuclear materials and equipment transferred pursuant  
19 thereto, and with respect to all special nuclear material  
20 used in or produced through the use of such nuclear ma-  
21 terials and equipment, so long as the material or equip-  
22 ment remains under the jurisdiction or control of the  
23 cooperating party, irrespective of the duration of other  
24 provisions in the agreement or whether the agreement



1 is terminated or suspended for any reason; (2) in the  
2 case of non-nuclear-weapon states, a requirement, as a  
3 condition of continued United States nuclear supply  
4 under the agreement for cooperation, that IAEA safe-  
5 guards be maintained with respect to all nuclear ma-  
6 terials in all peaceful nuclear activities within the  
7 territory of such state, under its jurisdiction, or carried  
8 out under its control anywhere; (3) except in the case  
9 of those agreements for cooperation arranged pursuant  
10 to subsection 91 c., a guaranty by the cooperating party  
11 that any material to be transferred pursuant to such  
12 agreement, and any special nuclear material produced  
13 through the use of any material, production facility, or  
14 utilization facility transferred pursuant to such agree-  
15 ment, and any sensitive nuclear technology transferred  
16 pursuant to such agreement, will not be used for any  
17 nuclear explosive device, or for research on or develop-  
18 ment of any nuclear explosive device, or for any other  
19 military purpose; (4) except in the case of those agree-  
20 ments for cooperation arranged pursuant to subsection  
21 91 c. and agreements for cooperation with nuclear-  
22 weapon states, a stipulation that the United States shall  
23 have the right to require the return of any nuclear mate-  
24 rials and equipment transferred pursuant thereto and  
25 any special nuclear material produced through the use



1       thereof if the cooperating party detonates a nuclear ex-  
2       plosive device or terminates or abrogates an agreement  
3       providing for IAEA safeguards; (5) a guaranty by the  
4       cooperating party that any material or any Restricted  
5       Data transferred pursuant to the agreement for coopera-  
6       tion and, except in the case of agreements arranged  
7       pursuant to subsection 91 c., 144 b. or 144 c., any pro-  
8       duction or utilization facility transferred pursuant to the  
9       agreement for cooperation or any special nuclear ma-  
10      terial produced through the use of any such facility  
11      or through the use of any material transferred pursuant  
12      to the agreement, will not be transferred to unauthorized  
13      persons or beyond the jurisdiction or control of the  
14      cooperating party without the consent of the United  
15      States; (6) a guaranty by the cooperating party that  
16      adequate physical security will be maintained with re-  
17      spect to any material transferred pursuant to such agree-  
18      ment and with respect to any special nuclear material  
19      used in or produced through the use of any material,  
20      production facility, or utilization facility transferred pur-  
21      suant to such agreement; (7) except in the case of  
22      agreements for cooperation arranged pursuant to sub-  
23      section 91 c., 144 b., or 144 c., a guaranty by the co-  
24      to the agreement for cooperation and no material used  
25      operating party that no material transferred pursuant



1 in or produced through the use of any material,  
2 production facility, or utilization facility transferred  
3 pursuant to the agreement for cooperation will be re-  
4 processed or otherwise altered in form or content with-  
5 out the prior approval of the United States or stored  
6 in any facility that has not been approved in advance  
7 by the United States; and (8) except in the case of  
8 agreements for cooperation arranged pursuant to sub-  
9 section 91 c., 144 b., or 144 c., a guaranty by the  
10 cooperating party that any special nuclear material,  
11 production facility, or utilization facility produced or  
12 constructed under the jurisdiction of the cooperating  
13 party by or through the use of any sensitive nuclear tech-  
14 nology transferred pursuant to such agreement for co-  
15 operation will be subject to all the requirements specified  
16 in this subsection. The President may exempt a pro-  
17 posed agreement for cooperation (except an agreement  
18 arranged pursuant to section 91 c., 144 b., or 144 c.)  
19 from any of the requirements of the foregoing sentence  
20 if he determines that inclusion of any such requirement  
21 would be seriously prejudicial to the achievement of  
22 United States non-proliferation objectives or otherwise  
23 jeopardize the common defense and security. Except  
24 in the case of those agreements for cooperation arranged  
25 pursuant to subsection 91 c., 144 b., or 144 c., any pro-



posed agreement for cooperation shall be negotiated by the Secretary of State, with the technical assistance and concurrence of the Administrator, and after consultation with the Commission shall be submitted to the President jointly by the Secretary of State and the Administrator accompanied by the views and recommendations of the Secretary of State, the Administrator, and the Director, who shall also provide to the President an unclassified Nuclear Proliferation Assessment Statement regarding the adequacy of the safeguards and other control mechanisms and the peaceful use assurances contained in the agreement for cooperation to ensure that any assistance furnished thereunder will not be used to further any military or nuclear explosive purpose. In the case of these agreements for cooperation arranged pursuant to subsection 91 c., 144 b., or 144 c., any proposed agreement for cooperation shall be submitted to the President by the Administrator or, in the case of those agreements for cooperation arranged pursuant to subsection 91 c. or 144 b. which are to be implemented by the Department of Defense, by the Secretary of Defense;

“b. the President has approved and authorized the execution of the proposed agreement for cooperation and has made a determination in writing that the performance of the proposed agreement will promote, and will



1 not constitute an unreasonable risk to, the common de-  
2 fense and security;

3 "c. the proposed agreement for cooperation (if not  
4 an agreement subjection to subsection d.), together with  
5 the approval and determination of the President, has  
6 been submitted to the Committee on International Rela-  
7 tions of the House of Representatives and the Committee  
8 on Foreign Relations of the Senate for a period of thirty  
9 days of continuous session (as defined in subsection 130  
10 (i)) : *Provided, however,* That these committees, after  
11 having received such agreement for cooperation, may by  
12 resolution in writing waive the conditions of all or any  
13 portion of such thirty-day period;

14 "d. the proposed agreement for cooperation, (if  
15 arranged pursuant to subsection 91 c., 144 b., or 144 c.,  
16 or if entailing implementation of section 53, 54a, 103, or  
17 104 in relation to a reactor that may be capable of  
18 producing more than five thermal megawatts or special  
19 nuclear material for use in connection therewith) has  
20 been submitted to the Congress, together with the ap-  
21 proval and determination of the President and any  
22 required Nuclear Proliferation Assessment Statement  
23 prepared by the Director of the Arms Control and Dis-  
24 armament Agency, for a period of sixty days of continu-  
25 ous session (as defined in subsection 130 (i) of this Act)



1 and referred to the Committee on International Rela-  
2 tions of the House of Representatives and the Committee  
3 on Foreign Relations of the Senate, but such proposed  
4 agreement for cooperation shall not become effective if  
5 during such sixty-day period either House passes a res-  
6 olution stating in substance that the Congress does not  
7 favor the proposed agreement for cooperation. Any such  
8 proposed agreement for cooperation shall be considered  
9 pursuant to the procedures set forth in section 130 (i) of  
10 this Act for the consideration of Presidential submission;

11 "e. following submission of a proposed agreement  
12 for cooperation (except an agreement for cooperation  
13 arranged pursuant to subsection 91 c., 144 b., or 144  
14 c.) to the Committee on Foreign Relations of the Sen-  
15 ate and Committee on International Relations of the  
16 House of Representatives, the Nuclear Regulatory Com-  
17 mission, the Department of State, the Energy Research  
18 and Development Administration, the Arms Control  
19 and Disarmament Agency, and Department of Defense  
20 shall, upon the request of either of those committees,  
21 promptly furnish to those committees their views as to  
22 whether the safeguards and other controls contained  
23 therein provide an adequate framework to ensure that  
24 the export of any nuclear materials or equipment as con-  
25 templated by such agreement will not be inimical to or



1       constitute an unreasonable risk to the common defense  
2       and security.”.

3       SEC. 402. (a) In addition to other requirements of law,  
4       no source or special nuclear material shall be exported under  
5       any agreement for cooperation (except an agreement for  
6       cooperation arranged pursuant to subsection 91 c., 144 b.,  
7       or 144 c. of the 1954 Act) for the purpose of enrichment  
8       (as described in paragraph aa. (2) of section 11 of the 1954  
9       Act) unless such enrichment is specifically permitted by the  
10      applicable agreement for cooperation;

11      (b) In addition to other requirements of law, no major  
12      critical component of any uranium enrichment, nuclear fuel  
13      reprocessing, or heavy water production facility shall be ex-  
14      ported under any agreement for cooperation (except an  
15      agreement for cooperation pursuant to subsection 91 c., 144  
16      b., or 144 c. of the 1954 Act) unless such agreement for  
17      cooperation specifically designates such components as items  
18      to be exported pursuant to the agreement for cooperation.  
19      For purposes of this subsection, the term “major critical  
20      component” means any component part or group of com-  
21      ponent parts which the President determines to be essential  
22      to the operation of a complete uranium enrichment, nuclear  
23      fuel reprocessing, or heavy water production facility.

24      SEC. 403. The President shall take immediate and vigor-  
25      ous steps to seek agreement from all nations and groups of



1 nations to commit themselves to adhere to the following  
2 export controls with respect to their peaceful nuclear activi-  
3 ties and their participation in international nuclear trade:

4 (1) No nuclear materials and equipment and no sensitive  
5 nuclear technology within the territory of any nation or  
6 group of nations, under its jurisdiction, or under its control  
7 anywhere will be transferred to the jurisdiction of any other  
8 nation or group of nations unless the nation or group of na-  
9 tions receiving such transfer commits itself to strict undertak-  
10 ings including, but not limited to, provisions sufficient to  
11 ensure that:

12 (a) no nuclear materials and equipment and no  
13 technology in, under the jurisdiction of, or under the  
14 control of such recipient, in the case of a non-nuclear-  
15 weapon state, is used for nuclear explosive devices for  
16 any purpose or for research on or development of nuclear  
17 explosive devices for any purpose, except as permitted  
18 by the Treaty;

19 (b) IAEA safeguards will be applied to all peaceful  
20 nuclear activities in, under the jurisdiction of, or under  
21 the control of such recipient, in the case of a non-  
22 nuclear-weapon state;

23 (c) adequate physical security measures will be  
24 established and maintained by such recipient on all of  
25 its nuclear activities;



1           (d) no nuclear materials and equipment and no  
2       technology intended for peaceful purposes in, under the  
3       jurisdiction of, or under the control of such recipient  
4       shall be transferred by the recipient to the jurisdiction  
5       of any other nation or group of nations which does not  
6       agree to stringent undertakings meeting the objectives of  
7       this section;

8           (e) such recipient will not assist, encourage, or in-  
9       duce any non-nuclear-weapon state to manufacture or  
10      otherwise acquire any nuclear explosive device.

11       (2) (A) No material within the territory of any nation  
12      or group of nations, under its jurisdiction, or under its control  
13      anywhere will be enriched (as described in paragraph aa.  
14      (2) of section 11 of the 1954 Act) or reprocessed, no irradi-  
15      ated fuel elements containing such material which are to be  
16      removed from a reactor will be altered in form or content, and  
17      no fabrication or stockpiling involving plutonium, U-233  
18      or uranium enriched to greater than 20 percent in the isotope  
19      U-235—shall be performed, except in a facility under  
20      effective international auspices and inspection, and any  
21      such irradiated fuel elements shall be transferred to such  
22      a facility as soon as practicable after removal from a reactor  
23      consistent with safety requirements, such facilities shall be  
24      limited in number to the greatest extent feasible and shall  
25      be carefully sited so as to minimize the proliferation risks



1 associated with such facilities. In addition, there shall be  
2 conditions to limit the access of non-nuclear-weapon states  
3 other than the host country to sensitive nuclear technology  
4 associated with such facilities;

5 (B) Any facilities within the territory of any nation or  
6 group of nations, under its jurisdiction, or under its control  
7 anywhere for the necessary short-term storage of fuel ele-  
8 ments containing plutonium, U-233 or uranium enriched to  
9 greater than 20 percent in the isotope U-235 prior to place-  
10 ment in a reactor or of irradiated fuel elements prior to trans-  
11 fer as required in subparagraph (A) shall be placed under  
12 effective international auspices and inspection; and

13 (C) Any international shipment of significant quantities  
14 of source or special nuclear material or irradiated material  
15 shall be conducted under international safeguards;

16 (3) Adequate physical security measures will be estab-  
17 lished and maintained with respect to all nuclear activities  
18 within the territory of each nation and group of nations,  
19 under its jurisdiction, or under its control anywhere.

20 SEC. 404. (a) The President shall initiate an immedi-  
21 ate program to renegotiate agreements for cooperation in  
22 effect on the date of enactment of this Act, or otherwise to  
23 obtain the agreement of parties to such agreement, to the  
24 undertakings that would be required for new agreements  
25 under this Act.



1       (b) The President shall annually review each of require-  
2   ments (1) through (8) set forth for inclusion in agreements  
3   for cooperation under section 123 a. of the 1954 Act and the  
4   export control goals set forth in section 403 to determine  
5   whether it is in the interest of United States non-prolifera-  
6   tion objectives for any such requirements or export controls  
7   which are not already being applied as export criteria to  
8   be enacted as additional export criteria and be subject to  
9   the procedures of section 128 of the 1954 Act.

10       (c) If the President makes such a determination to  
11   propose the enactment of any such requirements or export  
12   controls as additional export criteria or to take any other  
13   action with respect to such requirements or export control  
14   goals for the purpose of encouraging adherence by nations  
15   and groups of nations to such requirements and export con-  
16   trols, he shall submit such a proposal together with an ex-  
17   planation thereof to the Congress as part of the annual  
18   report required by section 601.

19       (d) If the Committee on Foreign Relations of the  
20   Senate or the Committee on International Relations of the  
21   House of Representatives, after reviewing the President's  
22   annual report and any accompanying proposed legislation,  
23   determines that it is in the interest of United States non-  
24   proliferation objectives to take any action with respect to such  
25   requirements or export control goals, it shall report a joint



1 resolution to implement such determination. Any such joint  
2 resolution shall be considered in the Senate and the House  
3 of Representatives, respectively, under procedures identical  
4 to those provided for the consideration of resolutions pursuant  
5 to subsection 130 (d) through (g) of this Act.

6 SEC. 405. Subject to the provisions of section 404 of  
7 this Act, the amendments to section 123 of the 1954 Act  
8 made by this Act shall not affect the authority to continue  
9 cooperation pursuant to agreements for cooperation entered  
10 into prior to the effective date of this Act.

11 SEC. 406. No court shall have any jurisdiction under  
12 any law to review the adequacy of the performance of  
13 any Nuclear Proliferation Assessment Statement called for  
14 in this Act.

15 TITLE V—UNITED STATES ASSISTANCE TO  
16 DEVELOPING COUNTRIES

17 SEC. 501. The United States shall endeavor to co-  
18 operate with other nations, international institutions, and  
19 private organizations in establishing programs to assist in  
20 the development of non-nuclear energy resources, and shall  
21 seek to achieve from all industrialized nations and groups of  
22 nations commitments to aid developing countries to meet  
23 their energy needs through the development of such resources  
24 and the application of non-nuclear technologies consistent  
25 with the economic position, material resources and environ-



1 mental protection of those countries. In providing such as-  
2 sistance to developing countries, the United States shall give  
3 priority to parties to the Treaty.

4 SEC. 502. (a) The United States shall initiate a pro-  
5 gram to cooperate with developing countries for the purpose  
6 of:

7 (1) meeting the energy needs required for develop-  
8 ment of such countries;

9 (2) reducing the dependence of such countries on  
10 petroleum fuels, with emphasis given to utilizing solar  
11 and other renewable energy resources; and

12 (3) expanding the energy alternatives available to  
13 such countries.

14 (b) Such program shall include cooperation in evaluat-  
15 ing the energy alternatives of developing countries, facilitat-  
16 ing international trade in energy commodities, developing  
17 energy resources, and applying suitable energy technologies.  
18 The program shall include both general and country-specific  
19 energy assessments and cooperative projects in resource ex-  
20 ploration and production, training, research and development.

21 (c) As an integral part of such program, Energy Re-  
22 search and Development Administration, under the general  
23 policy guidance of the Department of State and in coopera-  
24 tion with the Agency for International Development and



1 other Federal agencies as appropriate, shall initiate, as soon  
2 as practicable, a program for the exchange of United States  
3 scientists, technicians, and energy experts with those of  
4 developing countries to implement the purposes of this  
5 section.

6 (d) For the purposes of carrying out this section, there  
7 is authorized to be appropriated a total of \$10,000,000 to  
8 the Energy Research and Development Administration, in-  
9 cluding such sums which have been authorized for such pur-  
10 poses under previous legislation.

11 SEC. 503. Not later than twelve months after the date  
12 of enactment of this Act, the President shall report to the  
13 Congress on the feasibility of expanding the technical ex-  
14 change program established pursuant to section 502 (c) into  
15 an international cooperative effort to include a scientific  
16 peace corps designed to encourage large numbers of tech-  
17 nically trained volunteers to live and work in developing  
18 countries for varying periods of time for the purpose of en-  
19 gaging in projects designed to aid in meeting the energy  
20 needs of such countries through the search for and utilization  
21 of indigenous energy resources and the application of ap-  
22 propriate technology, including the widespread utilization  
23 of renewable and unconventional energy technologies. Such  
24 report shall also include proposals for other mechanisms to



1 conduct a coordinated international effort to develop, dem-  
2 onstrate, and encourage the utilization of such technologies  
3 in developing countries.

4 TITLE VI—EXECUTIVE REPORTING

5 SEC. 601. (a) The President shall review all activities  
6 of Government departments and agencies relating to pre-  
7 venting proliferation and shall make a report to Congress  
8 in January of 1979 and annually in January of each year  
9 thereafter on the Government's efforts to prevent prolifera-  
10 tion. This report is to include but not be limited to—

11 (1) a description of the progress made toward—

12 (A) negotiating the initiatives contemplated  
13 in sections 104 and 105 of this Act;

14 (B) negotiating the international arrange-  
15 ments or other mutual undertakings contemplated  
16 in sections 401 and 403 of this Act;

17 (C) promoting adherence to the Treaty, and  
18 discouraging or prohibiting nuclear exports to non-  
19 nuclear-weapon states that are not parties to the  
20 Treaty or have not entered into comparable agree-  
21 ments with respect to safeguards and forsaken the  
22 development of any nuclear explosive devices:

23 (D) strengthening the safeguards of the IAEA  
24 as contemplated in section 201 of this Act; and

25 (E) renegotiating agreements for cooperation



1 as contemplated in section 404a of this Act;

2 (2) an assesment of the impact of the progress  
3 described in paragraph (1) of the non-proliferation of  
4 goals of the United States; an explanation of the precise  
5 reasons why progress has not been on any particular  
6 point and recommendations with respect to appropriate  
7 measures to encourage progress; and a statement of  
8 what legislative modifications, if any, are necessary in  
9 his judgment to achieve the non-proliferation goals of  
10 the United States; and

11 (3) a determination as to which non-nuclear-  
12 weapon states with which the United States has an  
13 agreement for cooperation in effect or under negotiation,  
14 if any, have—

15 (A) exploded a nuclear devices of any kind;

16 (B) refused to accept the safeguards of the  
17 IAEA on all of their peaceful nuclear activities; or

18 (C) refused to give specific assurances that they  
19 will not engage in the development of any nuclear  
20 explosive device, and a classified section discussing  
21 any information available to the President on effects  
22 by non-nuclear weapon states to develop nuclear  
23 explosive devices.

24 (b) Within not more than one year after the date of  
25 enactment of this Act, the President shall submit a report to



1 the Congress containing an analysis of each civil agreement  
2 for cooperation negotiated pursuant to section 123 of the  
3 1954 Act, including a discussion of the scope and adequacy  
4 of the requirements and obligations relating to the safeguards  
5 and other controls contained therein.

6 SEC. 602. (a) The annual reports to the Congress by  
7 the Commission and the Energy Research and Development  
8 Administration which are otherwise required by law shall  
9 also include views and recommendations regarding the pol-  
10 icies and actions of the United States to prevent prolifera-  
11 tion which are the statutory responsibility of those agencies.  
12 The Administration's report shall include a detailed analysis  
13 of the implications of advanced enrichment and reprocessing  
14 techniques for the proliferation of nuclear explosive devices  
15 and of alternative nuclear fuel cycles which do not involve  
16 access to weapons usable materials. This part of the report  
17 shall include a comprehensive version which includes classi-  
18 fied information and a summary unclassified version.

19 (b) The reporting requirements of this chapter are in  
20 addition to and not in lieu of any other reporting require-  
21 ments under applicable law.

22 (c) The Department of State, the Arms Control and  
23 Disarmament Agency, the Department of Commerce, the  
24 Energy Research and Development Administration, and the  
25 Commission shall keep the Committee on Foreign Relations



1 of the Senate and the Committee on International Relations  
2 of the House of Representatives fully and currently informed  
3 with respect to their activities to carry out the purposes  
4 and policies of this Act and to otherwise prevent prolifera-  
5 tion.

6 (d) Any classified portions of the reports required by  
7 this Act shall be submitted to the Senate Foreign Relations  
8 Committee and the House International Relations Com-  
9 mittee.

10 SEC. 603. All orders, determinations, rules, regulations,  
11 permits, contracts, agreements, certificates, licenses, and  
12 privileges—

13 (1) which have been issued, made, granted, or  
14 allowed to become effective in the exercise of functions  
15 which are the subject of this Act, by (i) any agency or  
16 officer, or part thereof, in exercising the functions which  
17 are affected by this Act, or (ii) any court of competent  
18 jurisdiction; and,

19 (2) which are in effect at the time this Act takes  
20 effect;

21 shall continue in effect according to their terms until modi-  
22 fied, terminated, superseded, set aside, or repealed as the  
23 case may be, by the parties thereto or by any court of com-  
24 petent jurisdiction.

25 SEC. 604. Nothing in this Act shall affect the procedures



1 or requirements applicable to agreements for cooperation  
2 entered into pursuant to sections 91 c., 144 b., or 144 c. of  
3 the 1954 Act as it was in effect immediately prior to enact-  
4 ment of this Act.



Senator CHURCH. Our first witness this morning is Mr. Robert W. Fri, the Acting Administrator of the Energy Research and Development Administration.

Mr. Fri, we are glad to see you again, meeting at this early hour; I hope you do better with your text than I did with mine.

Mr. FRI. I will shorten my text and I will submit it for the record.

**STATEMENT OF HON. ROBERT W. FRI, ACTING DIRECTOR, ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION**

Mr. FRI. I appreciate the opportunity to appear before this subcommittee in connection with our pending nonproliferation legislation.

The State Department has submitted executive branch comments on the new version of S. 897 and subject to the remaining problems that are outlined in those comments, some of which could jeopardize our ability to negotiate tighter nuclear cooperation agreements. The administration, as you know, is prepared to support this bill.

Mr. Chairman, you asked me to comment on three primary areas of this bill, and I want to emphasize really two of them. The first, and one in which I will not go into great detail, is a question of how both S. 1432 and S. 897, in their entirety, relate to the current law and practice. My statement contains an annex which goes into that in some detail.

Dr. Nye, who will testify this morning, will cover that area in some detail in his prepared statement. I should perhaps say, however, before passing this point, that this bill is one part of an overall nuclear nonproliferation strategy and it is admittedly the part about controls, and in that sense of being one facet of a multifaceted strategy and the part dealing with controls does not necessarily contain some of the affirmative steps that I believe are part of the entire strategy and should be read in that context, although it does bring up a number of the issues of fuel assurance, spent fuel storage and the like which are an important part of our strategy.

The second area of our testimony you requested me to touch on have to do with cost impact of these bills on our domestic nuclear energy situation with respect to milling and mining of enrichment nuclear technology in other exports and spent fuel and nuclear waste. I will touch on those briefly.

First of all, I think the uranium mining and milling industry in this country is not likely to be significantly affected by these bills. The United States will probably be a net importer of uranium over time, and therefore, industry will be operating at essentially full capacity whether these bills are passed or not. Enrichment is a different story.

Both bills are aimed at assuring other countries that the United States will be a reliable source of nuclear fuel. To those nations or groups of nations, it appears policies designed to prevent proliferation, if U.S. enrichment services are procured by foreign customers there will be less pressure for construction of additional facilities abroad thus furthering our nonproliferation policy goal.

Additionally, of course, the export of U.S. enrichment services benefits the U.S. balance of payments.

We think these bills will promote the U.S. role as an assured supplier by clarifying the rules of the game under which exports are



licensed. We see the impact on our enrichment operations will generally be positive. As a result, we are going forward on the construction of a new centrifuge uranium enrichment facility at the site of our gaseous diffusion plant at Portsmouth, Ohio, which will essentially expand our capacity by about one-third.

If I might, I would like to digress for just a few moments on a matter related to the construction of that new plant and our role as a reliable supplier.

By letter of June 15, 1977, I sent to Senator Jackson, in his role as vice chairman of the Joint Committee on Atomic Energy, proposed revisions to ERDA's uranium enrichment services criteria. These criteria revisions, if adopted, would enable ERDA to offer new enrichment services contracts from capacity to be available from the planned centrifuge projects. The revisions would also enable ERDA to offer a variable tails assay option to its long-term fixed commitment uranium enrichment customers.

Now the existing uranium enrichment services criteria prohibit ERDA from making contractual commitments beyond what is called available capacity. Available capacity is presently construed by legislative history to consist of inventories of material available to us and the total physical capability of the three existing enrichment plants.

In order to offer new contracts, the criteria must be revised to recognize the availability of additional authorized capacity beyond the three existing plants.

In other words, we can negotiate contracts but we cannot sign them until those criteria are thus modified.

The variable tails option is a device which would allow holders of fixed-commitment contracts to vary the amounts of enriched uranium delivered to them under these contracts without changing the numbers of separate work units fixed in the contracts. It is kind of a complicated concept but it is one, a feature that is offered by other enrichers in other parts of the world, and we think we ought to do it to be competitive.

At any rate, by letter of August 2, Senator Jackson, as chairman of this committee, a jurisdictional question of the joint committees involved is a little complicated these days, advised me he had hoped this committee would be able to schedule a hearing on this matter in September.

Well, Mr. Chairman, usually I am requested to appear at hearings. But this time I am requesting a hearing be held at which I can appear. I think it is important that we have these revisions to the criteria made so that we can resume contracting for enrichment services and thus implement whichever nonproliferation bill is enacted.

So I would hope those hearings could be scheduled as soon as reasonably possible. I know the schedule of this committee is incredible just now, but I do think this is an important issue.

Well, returning to the bills under discussion today, S. 897 contains a provision—section 104(a)—for negotiating the establishment of an international nuclear fuel authority—INFA—as a device for adding a greater degree of fuel assurance to nonproliferation conditions.

I should note that another provision of the bill, section 104(b), states that the President shall implement such measures as are necessary to make available a large amount of enriched uranium for trans-



fer to an international stockpile. This would be uranium enriched to less than 20 percent, up to an amount sufficient to produce 100,000 megawatt-years of power from light water reactors. Under our current operating mode, this would require about 10 million separate work units, or SWU's, and about 16 million kilograms of natural uranium. At current average U.S. prices, this amount of enriched uranium would be worth at least \$1.5 billion.

Moving on to "reactor and nuclear technology and other export," it is possible that these bills could have a significant impact on our power reactor vendors. This impact could be favorable if the result, as we hope, is to reassure other countries of our reliability as a nuclear supplier. It obviously could be unfavorable if Congress allows those features of S. 897 to remain which would give a basis for concern to other countries that we are unlikely to remain a credible and reliable nuclear supplier.

Until the past several years when no U.S. power reactors have been sold abroad, U.S. reactor vendors historically maintained a market share of approximately 45 percent of the non-U.S. free world market. Selling nuclear reactors abroad is very significant economically. It is estimated that such sales will contribute some \$5 to \$10 billion foreign exchange to our balance of payments between now and 1985. In addition, it creates jobs here in the United States to manufacture reactor components for export.

I am hopeful if S. 897 is modified along the lines we are proposing we will see significant improvements over the status quo by selling out clear criteria and procedures for nuclear exports and making nuclear licensing more predictable and faster.

I should perhaps like to say a few words about spent fuel. We all recognize that with the prospective deferral of reprocessing makes critical demands on spent fuel disposed. We can anticipate that the subject of spent fuel disposition will figure importantly in our proposed international fuel cycle evaluation and I am pleased to see the subject given emphasis in the bills before you.

Several sections of the bill talk about creating the necessary facilities and certainly resolution of the spent fuel storage problem is important. Our utilities and foreign ones are facing increasingly severe shortage of spent fuel storage capacity and need relief in this area, particularly if they are to be discouraged from reprocessing. Thus, a significant part of our nonproliferation strategy is how the United States will handle its spent fuel and how we encourage other countries to handle theirs.

Finally, I should like to discuss an important new international development in reprocessing. Japan has a major fast breeder and advanced reactor program underway and she looks to the Tokai Mura reprocessing facility which has been under construction for several years as a potentially important source of plutonium for those ongoing efforts.

Japan has ratified the NPT and has a solid record in the non-proliferation area. Nevertheless, her request for U.S. approval to allow U.S. origin spent fuel to be reprocessed at the facility, has been the subject of the most careful and high-level review within our Government because the Japanese request has been the first we have received



since the President announced his policy last April favoring the general deferral of new commercial scale reprocessing plants.

I believe we have worked out a useful and mutually supportive interim accommodation with the Japanese on this issue and one that will be supportive to our nonproliferation objectives, and one which was signed yesterday by Ambassador Smith and myself and representatives of the Japanese Government.

In brief, the United States has given Japan the approval to employ a limited amount of U.S. fuel in the Tokai facility to verify its safety and reliability and to conduct experiments specifically designed to test out advanced intensive safeguards, techniques, and processes, including coprocessing, designed to avoid the production of pure plutonium. Only a 2-year authorization coincident with the term of the proposed international evaluation program has been given, and the character of the future arrangement will be reviewed by both governments after this interval.

Thus, Japan has agreed to offer Tokai as a test bed for evaluating some new techniques that have aroused some interest from a nonproliferation standpoint and given these considerations including the relatively limited quantities to be processed we have judged that safeguards can be effectively applied to this particular, limited operation. However, we do not regard this case as a precedent for other cases nor are we in any manner now agreeing that reprocessing plants as a general rule can be effectively controlled. Quite the contrary is true and we still believe they present very formidable nonproliferation challenges.

Within the context of this arrangement, the Japanese also have agreed to a number of additional points that we believe are very strongly supportive to nonproliferation. They have assured us of their desire to cooperate in the international fuel cycle evaluation program and they recognize the desirability of identifying fuel cycles that are as proliferation resistant as the once-through fuel cycle.

Japan also has agreed to perform coprocessing experiments during the next 2 years, and will convert the overall Tokai facility to coprocessing at the end of that period if our two governments agree that the conversion is technically feasible and effective.

Most importantly, the Japanese have informed us that they fully endorse the position, comparable to our own.

First, that plutonium poses a serious proliferation danger.

Second, that the recycling of plutonium in light-water reactors is not ready commercially and that the premature commercialization of recycling should be avoided.

Third, that any separation of plutonium for research and development on advanced reactors, should be at a rate not exceeding actual plutonium needs for such purposes.

Finally, that they intend to defer decisions favoring commercial use of plutonium in light-water reactors at least during the period of the proposed international evaluation program.

Last, the Japanese have indicated that they intend to take no major moves regarding additional reprocessing facilities during the period of the international evaluation, and that thereafter they will take the results of the evaluation into account in their decisions on this matter.



I believe the manner in which this matter has been resolved has been most encouraging, that we have removed a seriously divisive issue between our governments and that the results illustrate that industrialized states are, in fact, able to identify new ways to cooperate in exploring possible new solutions to the proliferation problem.

That concludes my statement, Mr. Chairman, and I will be pleased to answer questions at any time.

[The prepared statement of Mr. Fri follows:]

STATEMENT OF HON. ROBERT W. FRI, ACTING ADMINISTRATOR, ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Mr. Chairman and members of the subcommittee: I appreciate this opportunity to appear again before this Subcommittee in connection with pending non-proliferation legislation. This is a matter in which I have a deep and abiding interest. The Legislative and Executive Branches share a common goal, the strengthening of U.S. non-proliferation policies so as to restrain and, hopefully, prevent the proliferation of nuclear weapons, while still helping other nations meet their energy needs. The future security and peace of the U.S. and the entire world may well depend upon the legislation that emerges from this Congress.

On June 10, 1977, I testified before this Subcommittee on S. 1432 and made some comparisons with the old version of S. 897.

The State Department is submitting Executive Branch comments in detail on this new version of S. 897. Subject to resolution of a few remaining serious problems some of which could jeopardize our ability to negotiate tighter nuclear cooperation agreements, the Administration is ready to support this compromise bill.

I would however, like to stress that while not objecting to Congressional review of Executive Branch actions by appropriate procedures, the Administration does strongly believe that the use of the one-house resolution veto procedure in S. 879 is inappropriate. Because of constitutional reasons and because of the damage such a provision would do to our image as a reliable supplier, the Administration believes that the joint resolution mechanism should be substituted in the bill for all uses of the one-house resolution procedure.

In Dr. Nye's testimony and in our contacts with the respective Congressional Committees, representatives of State, ACDA and ERDA have commented in detail on aspects of S. 897 and how we believe that bill should be further improved to make it a viable bit of legislation. Dr. Nye has hit some of the highlights and I won't repeat them here. Rather, I shall try to direct my testimony to the specific issues that you requested that I comment on in your letter of August 24, 1977. Namely, I shall comment on how the bills relate to current law and practice, their probable impact on the domestic nuclear situation as it relates to uranium feed supply and enrichment and their implications for reactor and nuclear technology exports and finally the implications of the proposals before you from the standpoint of spent fuel and waste management.

As you know in commenting in the past, on the various nonproliferation bills that have been considered, I have felt it vital that we have some well defined criteria in mind in gauging the probable effectiveness of different approaches. I would like to recapitulate my views very briefly. First, in order to be effective in its non-proliferation efforts, I believe that the United States must be actively engaged in the international nuclear field and that this country must be perceived not only as a reliable supplier but also as a world leader that is prepared to factor the judgments as well as needs of other states into its efforts to develop a more effective global non-proliferation strategy.

We see major features of S. 897 that should restore our credibility as a supplier by underscoring our desire both to simplify the export licensing process and to place ample enrichment capacity on the line to meet foreign needs.

As I shall note below, there are supportive actions we can take in modifying our enrichment criteria that will reinforce these efforts. However, where we still have difficulties with S. 897, they relate to those provisions that may suggest to other states that we intend to act in a highly arbitrary manner in such areas as reprocessing, and approving storage and may seek to enforce our own preconceptions on other nations as to how the back-end of their fuel cycles should



be handled even before our proposed joint international fuel cycle evaluation program has been launched, let alone completed.

Second, as a major criterion I believe it must be stressed that we are not interested in additional controls for their own sake, when they are of limited utility and when they only serve to frustrate the independent conduct of other national programs without providing us or others with any real new reassurances from a non-proliferation standpoint.

Many nations with completely peaceful and reasonable interests in nuclear power can be expected to resent unnecessary external intrusions into the conduct of their nuclear programs if the contribution to non-proliferation is very doubtful. Similarly they can be expected to shift away from us and look to other suppliers if they judge that the complexities and uncertainties of dealing with the U.S. are simply too great.

Third, I believe that nations that meet our new non-proliferation constraints in our new or renegotiated agreements should be able to expect that if they meet our new conditions, and barring the unforeseen, we, in turn, will fulfill our obligations on a timely basis. I believe admonitions to this effect by the Committee to the Executive Branch and NRC in its report would be highly desirable.

Fourth, I believe our actions have to appropriately recognize that many nations view nuclear power as a crucial element in their energy mixes and several have on-going activities and frankly different perceptions than we do as to how non-proliferation interests may best be served. Thus, I am strongly of the view that we can best bring them along to our new perceptions in the non-proliferation area through persuasion rather than intimidation. Dr. Nye's comments on the "timely warning" criterion are particularly relevant here.

Finally, I see no embarrassment in acknowledging that our program of international nuclear cooperation not only is central to our non-proliferation effort, but also helps preserve our technological leadership, fosters closer political ties with friendly countries and benefits us economically. We feel very strongly that commercial and economic factors should not take precedence over non-proliferation considerations. However, in many cases we believe a prudent program of U.S. cooperation fosters not only non-proliferation but also foreign policy and sound economic objectives.

With these factors in mind, I should now like to comment on those specific areas that you specifically asked me to cover in my testimony.

The first area is how S. 1432 and new S. 897 in their entirety relate to current law and practice. In my view, the bills we are considering represent more than the establishment of non-proliferation policies in the abstract. They represent attempts to establish a coherent, rational combination of non-proliferation policies; initiatives to set up international cooperation in various areas to further these policies; and a logical system of agreements for cooperation, export criteria, and governmental export procedures, all designed again to further these policies. Every part of this combination is important. Of course, each aspect can be approached in a variety of ways and that is why we are now in the final steps of reconciling differing formulations.

Since Dr. Nye will cover this particular area in more detail, I will concentrate on the second area in Senator Church's letter of August 24, 1977.

The second area of testimony requested is the costs and impact of the bills on our domestic nuclear energy situation with respect to uranium mining, milling and enrichment; reactor and nuclear technology and other exports; and spent fuel and nuclear waste storage problems.

The uranium mining and milling industries are not likely to be effected significantly by these bills. The U.S. will probably be a net importer of natural uranium. Enrichment is a different story. Both bills are aimed at assuring other countries that the U.S. will be a reliable source of nuclear fuel to those nations or groups of nations that adhere to policies designed to prevent proliferation. If U.S. enrichment services are procured by foreign customers, there will be less pressure for construction of additional enriching facilities abroad, thus furthering our non-proliferation policy goals. Additionally, of course, the export of U.S. enrichment services benefits the U.S. balance of payments.

ERDA is going forward on the construction of a new centrifuge uranium enrichment facility at the site of our gaseous diffusion plant at Portsmouth, Ohio. The facility will have total enrichment capability of 8.8 million separative work units per year (a separative work unit or SWU is a measure of amount of physical effort required to separate the uranium-235 from the uranium-238). The total cost, projected in fiscal year 1978 dollars is estimated between 4.2 and 4.5 billion dollars.



Construction at Portsmouth is planned to begin near the end of 1978 with first production to become available in 1986 and full production to be reached in 1988.

The future availability of this new enrichment capacity will give ERDA the capability to resume contracting to furnish enrichment services for fuel for new power plants at home and abroad. The order books have been closed since the summer of 1974, due to capacity limitations. Also, the new facilities will allow long-term operation of the total U.S. enrichment complex in a manner which permits near optimum nuclear fuel cycle economics.

The projected increase in nuclear power plants world-wide will probably require additional U.S. enrichment capacity eventually.

I should like to digress for a few moments, if I may, to a related matter. By letter of June 15, 1977, I sent to Senator Jackson, as Vice Chairman of the Joint Committee on Atomic Energy, proposed revisions to ERDA's Uranium Enrichment Services Criteria. These Criteria revisions, if adopted, would enable ERDA to offer new enrichment services contracts from capacity to be available from the planned centrifuge projects. The revisions would also enable ERDA to offer a Variable Tails Assay Option to its long-term, fixed commitment uranium enrichment customers.

Specifically, the existing Uranium Enrichment Services Criteria prohibit ERDA from making contractual commitments beyond "available capability." Available capability is presently construed by legislative history to consist of inventories of material available or committed to ERDA and the total physical capability of the three existing ERDA enrichment plants, increased by the completed cascade improvement and cascade upgrading projects. In order to offer new contracts, the Criteria must be revised to recognize the availability of additional authorized capacity beyond the three existing plants.

The Variable Tails Option is a device which would allow holders of fixed-commitment contracts to vary the amounts of enriched uranium delivered to them under these contracts without changing the numbers of separate work units fixed in the contracts.

By letter of August 2, 1977, Senator Jackson, as Chairman of this Committee, advised me that he hoped this Committee would be able to schedule a hearing on this matter in September. Well, usually I have been requested to appear at hearings—this time I'm requesting that a hearing be held at which I can appear. It is important that these revisions to the Uranium Enrichment Criteria be made very soon so that ERDA can then resume contracting for enrichment services and thus implement whichever non-proliferation bill is enacted.

Returning to the bills under discussion today, S. 897 contains a provision (section 104(a)) for negotiating the establishment of an international nuclear fuel authority (INFA) as a new device for adding a greater degree of fuel assurance to non-proliferation conditions.

I should note that another provision of the bill (section 104(b)) states that the President shall implement such measures as are necessary to make available a large amount of enriched uranium for transfer to an international stockpile. This would be uranium enriched to less than 20 percent in the isotope 235 up to an amount sufficient to produce 100,000 MWe years of power from light water reactors. Under ERDA current operating mode, this could require about 10 million separative work units, or SWU's, and about 16 million kilograms of natural uranium. At current average U.S. prices, this amount of enriched uranium would be worth at least \$1.5 billion.

I should alert you that additional steps would have to be taken if we were actually to establish such a stockpile for this purpose. While offering this caution, I should like to stress that we recognize the importance of offering credible fuel assurance to countries which cooperate with us and share our non-proliferation concerns. The Administration is currently reviewing a variety of approaches in this regard, including among others, the concept of an international fuel assistance regime.

Moving on to "reactor and nuclear technology and other export," it is possible that these bills could have a significant impact on our power reactor vendors. This impact could be favorable if the result, as we hope, is to reassure other countries of our reliability as a nuclear supplier. It obviously could be unfavorable if Congress allows those features of S. 897 to remain which would give a basis for concern to other countries that we are unlikely to remain a credible and reliable nuclear supplier. Until the past several years when no U.S. power reactors have been sold abroad, United States reactor vendors historically maintained a market share of approximately 45 percent of the non-U.S. free world market.



Selling nuclear reactors abroad is very significant economically. It is estimated that such sales will contribute some \$5 to \$10 billion in foreign exchange to our balance of payments between now and 1985. In addition, it creates jobs here in the United States to manufacture reactor components for export. From these facts, it is obvious that maintaining a position as a reliable nuclear supplier has tangible benefits to the United States from a commercial point of view as well as serving to enhance our non-proliferation leverage. However, I should stress in the strongest terms that the U.S. does not wish to press the nuclear option on other states when the purchasing country might be better served by employing a non-nuclear approach toward its energy needs.

In stating this, I wish to emphasize our belief that there is a critical need for expanded cooperation with other countries, particularly developing countries, in examining the role that non-nuclear as well as nuclear technologies can play in national energy programs. We, therefore support the objectives of Title V of S. 897 which with the revisions detailed in the State Department letter providing Executive Branch comments, provides for such cooperative activity. I also wish to emphasize that, in the judgment of the Administration, and regardless of the commercial benefits, non-proliferation considerations must prevail over commercial factors.

I am hopeful that if S. 897 is modified along the lines we are proposing we will see significant improvements over the status quo by spelling out clear criteria and procedures for nuclear exports and making nuclear export licensing more predictable and faster.

I should like to say a few words about spent fuel. We all recognize that with the prospective deferral of reprocessing the manner in which spent fuel is disposed of can become highly critical. We anticipate that the subject of spent fuel disposition will figure importantly in our proposed international fuel cycle evaluation program and I was pleased to see the subject given emphasis in the bills before you. S. 897 (section 104(a)(3)) proposes the establishment of repositories under effective international auspices and inspection for the storage of spent nuclear reactor fuel.

S. 1432 (section 201(3)) talks about facilities under international auspices "for the storage of special nuclear material which is sensitive from the standpoint of preventing the proliferation of nuclear explosive devices." Resolution of the spent storage problem is important for two reasons. Our utilities and foreign ones are facing increasingly severe shortage of spent fuel storage capacity and need relief in this area particularly if they are to be discouraged from reprocessing. Thus, a significant part of our non-proliferation strategy is how the U.S. will handle its spent fuel and how we encourage other countries to handle theirs.

Finally, I should like to discuss an important new international development in reprocessing. Japan has a major fast breeder and advanced reactor program under way and she looks to the Tokai Mura reprocessing facility which has been under construction for several years as a potentially important source of plutonium for those on-going efforts. Japan has ratified the NPT and has a solid record in the non-proliferation area. Nevertheless, her request for U.S. approval to allow U.S. origin spent fuel to be reprocessed at the facility, has been the subject of the most careful and high-level review within our government because the Japanese request has been the first we have received since the President announced his policy last April favoring the general deferral of new commercial scale reprocessing plants.

I believe we have worked out a useful and mutually supportive interim accommodation with the Japanese on this issue and one that will be supportive to our non-proliferation objectives.

In brief the U.S. has given Japan the approval to employ a limited amount of U.S. fuel in the Tokai facility to verify its safety and reliability and to conduct experiments specifically designed to test out advanced intensive safeguards techniques and processes (co-processing) designed to avoid the production of pure plutonium. Only a two year authorization coincident with the term of the proposed international evaluation program has been given, and the character of the future arrangement will be reviewed by both governments after this interval.

Thus, Japan has agreed to offer Tokai as a test-bed for evaluating some new techniques that have aroused some interest from a non-proliferation standpoint and given these considerations including the relatively limited quantities to be processed we have judged that safeguards can be effectively applied to this particular, limited, operation. However, we do not regard this case as a precedent



for other cases nor are we in any manner now agreeing that reprocessing plants as a general rule can be effectively controlled. Quite the contrary is true and we still believe they present very formidable non-proliferation challenges.

Within the context of this arrangement, the Japanese also have agreed to a number of additional points that we believe are very strongly supportive to non-proliferation. They have assured us of their desire to cooperate in the International Fuel Cycle Evaluation program and they recognize the desirability of identifying fuel cycles that are as proliferation resistant as the "once through" fuel cycle.

Japan also has agreed to perform co-processing experiments during the next two years, and will convert the overall Tokai facility to co-processing at the end of that period if our two governments agree that the conversion is technically feasible and effective.

Most importantly, the Japanese have informed us that they fully endorse the position, comparable to our own—

That plutonium poses a serious proliferation danger;

That the recycling of plutonium in LWRs is not ready commercially and that the premature commercialization of recycling should be avoided;

That any separation of plutonium for research and development on advanced reactors, should be at a rate not exceeding actual plutonium needs for such purposes; and

That they intend to defer decisions favoring commercial use of plutonium in light-water reactors at least during the period of the proposed international evaluation program.

Last the Japanese have indicated that they intend to take no "major moves" regarding additional reprocessing facilities during the period of the international evaluation, and that thereafter they will take the results of the evaluation into account in their decisions on this matter.

I believe the manner in which this matter has been resolved has been most encouraging, that we have removed a seriously divisive issue between our governments and that the results illustrate that industrialized states are, in fact, able to identify new ways to cooperate in exploring possible new solutions to the proliferation problem.

As requested in Senator Church's letter of August 24, 1977, attached to the copies of this testimony is an analysis and comparison of the current law and practice with the sections of the bills which amend current law or practice with respect to exports.

I will be pleased to respond to your questions.

#### COMPARISON OF CURRENT LAW AND PRACTICE WITH S. 897 AND S. 1432, WITH RESPECT TO EXPORTS

Section 301 of S. 897 would amend sections 54 and 64 of the Atomic Energy Act by restricting the authority of ERDA to make "distribution" of special nuclear material and source material. The limitations would now be 500 grams of special nuclear material per year per recipient, and 3 metric tons of source material per year per recipient. Current law does not place quantity limitations on such distribution. Current procedure is to use this authority primarily when expeditious export of special nuclear material is required, usually in gram quantities, and only after consultation as appropriate with other agencies, e.g., NRC, State, ACDA. Section 501 of S. 1432 includes the limitation on distribution of special nuclear material only.

Section 301.(c) of S. 897 would add to the Atomic Energy Act a new section 111 authorizing NRC to license ERDA distribution of source and special nuclear material. Currently, NRC is not authorized to license such distributions. S. 1432 contained no comparable provision.

Section 302 of S. 897 amends section 57.b of the Atomic Energy Act. The substantive change contained in this amendment is that henceforth ERDA must, prior to granting an authorization under subsection 57.b(2), obtain the concurrence of State Department and consult with ACDA and NRC. A similar provision was contained in section 502 of S. 1432. Present procedure is for ERDA to consult with State, ACDA and NRC as well as with other agencies, such as DOD and Commerce when appropriate.

Section 304 of S. 897 adds to the Atomic Energy Act a new section 126, which sets forth procedures for NRC licensing of nuclear material and equipment and for ERDA "distribution" of source or special nuclear material. This section does



not change any current law, but for the first time it establishes specific procedures to be followed by the Commission and ERDA. Important matters contained in this section are: (1) NRC cannot issue a license nor ERDA make a distribution until it is approved by the Executive Branch; (2) it requires NRC and ERDA to consider certain specific criteria in determining whether to issue the license; (3) it permits the President to authorize an export by Executive Order notwithstanding the fact that the Commission does not approve the license, subject to certain stringent findings and the opportunity of Congress to review the President's decision; and (4) it requires NRC regulations for any hearings that may be held before the NRC in export licensing proceedings. S. 1432 contained comparable provisions in its section 503 but that section applied the criteria to ERDA "distribution" but not the procedure.

Section 305 of S. 897 amends the Atomic Energy Act by adding a new section 127 establishing criteria applicable to U.S. exports of source, and special nuclear material, production or utilization facilities, and sensitive nuclear technology. Current law requires only that export licenses not be inimical to the common defense and security and be subject to an applicable agreement for cooperation. Thus this section establishes new criteria for export licensing. A comparable section was included in section 503 of S. 1432. Most of these criteria are already being used in ERDA "distribution" procedures and procedures for the Executive Branch position on NRC export licenses.

Section 307 of S. 897 adds a new section 129 to the Atomic Energy Act establishing mandatory sanctions for certain actions by other countries. It also provides for Presidential exceptions unless either House disapproves. These actions would result in a termination of nuclear exports. No such provisions is included in current law. Similar language is included in section 503 of S. 1432 but requires a joint Congressional resolution to override a Presidential exception rather than a veto by either house.

Section 309 of S. 897 would add to the Atomic Energy Act a new section 130 establishing Congressional review procedures applicable to the President's submission to the Congress. Current law contains two provisions which are affected by this new section. These are sections 54 and 123 of the Atomic Energy Act. These current sections establish Congressional review procedures for new agreements for cooperation and for certain actions involving supply of nuclear material abroad. S. 1432 contains no provisions comparable to section 301 of S. 897.

Section 308.(a) of S. 897 amends section 109 of the Atomic Energy Act regarding the licensing of nuclear components, items and substances. Current law authorizes NRC to license the export of nuclear components when, in the judgment of the Commission, these constitute "production or utilization facilities", i.e., are important component parts especially designed. Current law does not authorize NRC to license items and substances which do not constitute such facilities or do not constitute source, special nuclear or by-product material. This section would also establish authority and procedures for NRC licensing of components, items or substances having special relevance for nuclear explosive purposes, and procedures for Commerce Department licensing of other nuclear related items. Section 504 of S. 1432 contains similar provisions.

Section 401 of S. 897 amends section 123 of the Atomic Energy Act by establishing new requirement for agreements for cooperation in the civil uses of Atomic Energy. Current law also contains requirements and procedures for such agreements. Important changes proposed by S. 897 include: (1) detailed enumeration of requirements for the agreements beyond the requirements now listed in section 123 of the Atomic Energy Act; (2) more detailed procedures regarding which agencies or departments of government are to participate in the negotiations and Congressional review of these agreements; and (3) more detailed procedures governing Congressional review of the agreements. S. 1432 contains similar provisions in section 401. Although not required by the current law, present procedure is for State to join ERDA in negotiation of agreements and for ACDA to play an important role.

Senator CHURCH. Under agreement with the Japanese, isn't it true they are putting that plant purely on Purex process, try it as a Purex-type process?

Mr. FRI. They will be conducting tests—

Senator CHURCH. The reprocessing is the kind we have objected to, isn't it, as posing a proliferation problem?



Mr. FRI. We think that is the most proliferation nonresistant form of reprocessing. They will be conducting reprocessing experiments at the site.

Senator CHURCH. Aren't we really just exchanging words here for a plant, they are going forward with their plant and doing what they intended to do and we have just found a face-saving way around it?

Mr. FRI. They are doing some things I think they had not intended to do. For example, they deferred construction of a plutonium conversion facility for these 2 years, so what they will wind up with is plutonium in a nitrate liquid form and have the oxide actually available to them. We will agree if they do in fact need plutonium for their advanced program to help them find that. They have agreed to run the coprocessing experiments and we have agreed to reexamine the situation at the end of 2 years, with a bias in the direction of converting the plant.

I think probably most importantly we have agreed mutually to conduct in connection with the operation of Tokai for the next 2 years, a series of technology programs, experiments, related to the safeguarding of such plants and, indeed, we sent a technical team over there last week to begin that process.

Judging by the telex we received, it was quite successful and enthusiastically received.

Senator CHURCH. That will be the same as the Barnwell facility that we have now agreed to permit the Japanese to do. Then why wouldn't it be good for us?

Mr. FRI. There are two reasons for that, Mr. Chairman. One we discussed before, that is the view the President has taken, in fact two Presidents have taken, on the desirability of the United States supporting the commercialization of reprocessing at this time, which Barnwell clearly is, and Tokai is not. It is a small facility. Japan in a joint communique agrees with us not to move for the commercialization of reprocessing.

The second is there will be 99 tons of spent fuel. That sounds like an old song. Ninety-nine tons of spent fuel processed through this plant in 2 years which is really quite a small amount compared to the 1,500-ton-a-year capacity at Barnwell and Barnwell could not really operate in this mode of storing the nitrate.

It would store nitrate for a short time, but you would have to convert it and handled in some ways at a very large cost.

Senator CHURCH. Have you offered the committee the specific recommendations for changes in S. 897?

Mr. FRI. The executive branch comments containing those specific recommendations were sent over by the State Department. We concur. I think Dr. Nye in his testimony touches on some of the key points that we are most concerned about.

Senator CHURCH. Fine, then why don't we go on with Dr. Nye's testimony.

#### STATEMENT OF DR. JOSEPH S. NYE, DEPUTY TO THE UNDER SECRETARY FOR SECURITY ASSISTANCE, DEPARTMENT OF STATE

Dr. NYE. Thank you. Mr. Chairman. I am pleased to have this opportunity to testify before you again and to save time, I will try to



focus my remarks on the most recently reported versions of the non-proliferation legislation.

The bill before you represents a compromise on the key points between nonproliferation bills submitted in the Senate and the legislation submitted by the President.

However, a few serious problems remain which could jeopardize our ability to negotiate sound nuclear cooperation agreements and to make other diplomatic steps in achieving our nonproliferation objectives.

Subject to satisfactory resolution of these problems, the administration is ready to support this compromise bill, subject to the changes suggested below as well as the technical suggestions in the executive branch comments attached to Secretary Vance's letter of September 12, 1977.

As you indicated in your introduction, Mr. Chairman, it is important this legislation be consistent with our overall nonproliferation strategy. This strategy places a high degree of emphasis on intensive diplomatic and technical cooperation with other nations. There are already some 20 countries with nuclear reactor programs and the number is likely to double over the next two decades. This is why the central long-term goal of our strategy is to build a broad consensus on political and technical means to make the commercial nuclear fuel cycle as proliferation resistant as possible in the face of technological change.

Our strategy cannot be based on domestic laws that prevent nuclear exports from the United States, for other countries could quickly step in to fill the order books. Nor do we have the leverage to coerce other nations to follow our policy.

In short, if we are to achieve our goals, we have no choice but to work closely with other countries to try to find mutually beneficial solutions to the security and energy problems we all share.

The Carter administration does not believe that nuclear isolationism is possible in today's world. Planning for the future of nuclear power must be an international effort involving all nations interested in nuclear power, consumers and suppliers alike.

This global situation is the reason for the four main factors of our international strategy; (1) effective and comprehensive safeguards; (2) self-restraint in the transfer of sensitive technologies; (3) creation of nonproliferation incentives through fuel assurances and assistance in the management of spent fuel; and (4) building consensus about the structure and management of the nuclear fuel cycle.

This fourth component is represented by the international nuclear fuel cycle evaluation that President Carter announced last April. Since then, we have had discussions with more than 30 countries that have a major interest in nuclear energy, including the seven London summit countries. We have received broad indication of interest in participation in the INFCE, including from the summit countries.

In October, we will be hosting an initial organizational conference. Among the topics which are likely to be discussed in the first INFCE meeting are: fuel availability; enrichment availability; security of supply and fuel assurances; spent fuel storage; reprocessing breeder reactors; improved efficiency of thermal reactors and advanced converter reactors; and alternative fuel cycles.

It is clear that there is presently a good deal of disagreement rather than consensus over the nuclear fuel cycle. We hope that INFCE will



help to encourage the deliberate evolution of a new consensus that can support the IAEA and its international safeguards system. Amidst the turmoil, we find some encouraging signs. For example, we are encouraged by the fact that in the Tokai agreement that Dr. Fri referred to the Japanese Government has associated itself with our views that recycling plutonium in thermal reactors is premature.

We feel the situation is well summarized by Rudolph Rometsch, Deputy Director General of IAEA. As he told "Nucleonics Week" this summer, what he sees—

Is much more serious attention being given to ideas for international fuel cycle management in the face of the U.S. attack on reprocessing. The IAEA official explained that as recently as 1 year ago it was hard to find either utility or government officials interested in ways to internationalize plutonium control and other aspects of the fuel cycle in order to make them more proliferation proof. Now "quite a number are willing to go a long way to make that possible," Rometsch said. He added that this may be "the most positive point, if properly exploited," to emerge from the renewed U.S. concern over proliferation.

In short, our efforts to develop a new consensus about a more proliferation resistant and safeguardable commercial fuel cycle cannot be achieved overnight. Our efforts will require patience and close cooperation with other countries. Our legislation must reflect the same qualities. It is in this policy context, Mr. Chairman, that I offer the following specific six comments on the legislation before you.

This new provision introduces a "timely warning" standard to govern U.S. approval for foreign reprocessing of U.S. origin fuel. The administration shares the view that timely warning continues to be an extremely important consideration. However, we believe that it would be counterproductive to define it too restrictively or to make it a single absolute standard intended to apply to all conceivable situations.

First, there is the question: Timely warning of what? There is timely warning of changed intentions, of diversion, of overt diversion; of assembly of a nuclear explosive; of the actual detonation of a single nuclear explosive device—no matter how crude.

There is also timely warning of a detonation of a deliverable nuclear weapon and timely warning of a militarily meaningful nuclear arsenal.

Clearly, these are different steps along the proliferation path and appropriate responses depend upon, among other things, the country involved, the size and scope of its nuclear activities, the nonproliferation obligations undertaken by its government, and the stability of its political-military relationship with potential adversaries.

Then there is the question: What constitutes timely warning? The response to this question depends upon the answer to the first question, in other words, timely warning of what?

But in all cases, more warning time is better than less. The longer the interval available for constructive effort—diplomatic and otherwise—the better the chance of influencing the course of events and bringing about a favorable outcome. Weeks are better than days, months better than weeks, and years better than months.

In view of the difficulty in interpreting the timely warning standard, the executive branch believes that it should not be the sole basis for determining whether or not to permit foreign reprocessing of U.S. origin fuel. For the same reasons, it should not be the sole basis for determining the acceptability of subsequent agreements for nuclear cooperation.



There is another reason for concern with the current version of section 303(b) of S. 897. If it were to become law, those holding to the stricter interpretation of timely warning would construe it as prohibiting foreign reprocessing of U.S. spent fuel under any conditions for an indefinite period.

It would appear that the United States had prejudged the outcome of the international Nuclear Fuel Cycle Evaluation—INFCE. But the INFCE program can be successful only with the participation of other nations, and their meaningful participation depends upon their perception that the program is to be an open and objective study.

Finally, the executive branch is concerned that implementation of the standard set forth in paragraph (2) of section 303(b) could lead to formal rulemaking and litigation, despite Congress intent to preclude this eventuality, as evidenced by its use of the phrase "in his view" when discussing the Administrator's authority to make arrangement for reprocessing.

We consider it crucial that subsection 303(a) (2) be revised to read:

In making his judgment, the Administrator will take into account such factors as the size and scope of the activities involved, the non-proliferation policies of the countries concerned and the probabilities that the arrangements will provide timely warning to the United States of diversions well in advance of the time at which the non-nuclear-weapon state could transform the diverted material into a nuclear explosive device. . . .

The second point I would like to touch on is one-House congressional veto. The executive branch does not object to congressional review of Presidential actions by appropriate procedures, but does strongly object to the use of the one-House resolution veto procedure in the Senate bill because of constitutional reasons and because of the damage such a provision would do to our image as a reliable supplier.

Such provisions as the one-House veto are unconstitutional in that they are contrary to the separation of powers doctrine and to article I, section 7 of the Constitution.

The President has on several occasions expressed his concerns, with the use of mechanisms other than the joint resolution, as the means of congressional review of executive branch actions.

We believe, therefore, that the joint congressional resolution procedure should be substituted in the bill for the one-House veto mechanism wherever it is currently used. In addition, one of the keystones of our nonproliferation policy is for the United States to be a reliable supplier of low enriched nuclear fuels to those nations which are making progress toward sound nonproliferation policies.

The recent past has shown us that some nations have chosen to develop indigenous enrichment and reprocessing facilities when they have felt threatened by the lack of assured supply. If either House of Congress can block other nations' fuel shipments, our potential reliability is diminished. Thus, the degree of congressional involvement can have exactly the opposite effect—the enhancement of proliferation—if our export controls are too uncertain and our behavior appears subject to change.

The third point I would like to cover is congressional review procedures in section 309.

Proposed section 130 of the Atomic Energy Act is new. The executive branch considers that the provisions of this section create such a



strong impetus in favor of overturning any Presidential submissions to the Congress that the section as drafted is unacceptable.

Section 130 requires, for any Presidential submission subject to its procedures, the immediate introduction in each House of a negative resolution by the chairman or designated Member of the International Relations Committee in the House and of the Foreign Relations Committee in the Senate.

This negative resolution is then referred to the respective committees. Within 45 days of continuous session, each committee must report its recommendations to the floor together with the negative resolution or be discharged from consideration thereof. If a committee reports a different resolution, for example, a favorable resolution, it is not meeting the requirements of this section.

The procedures in section 130 appear to make it difficult for the Congress to give any Presidential submission fair consideration. Therefore, the executive branch considers it crucial that section 130 as proposed in section 309 be revised so that the committees could report a resolution which either approves or disapproves of the Presidential waiver. Such a procedure would be designed to insure that the resolution would receive fair consideration by the Congress.

The fourth point I would like to cover is title IV, negotiation of further export controls agreements for cooperation, section 401.

On reconsideration of the conditions set forth in proposed section 123(a)(7) of the Atomic Energy Act, which parallels the proposal made in the administration bill, the executive branch has serious concern about the wisdom of the language as drafted. It should be specified that U.S. approval for alteration other than reprocessing refers to the alteration of weapons usable material or other nuclear material after irradiation and is not intended to apply to such activities as fabrication or conversion of low enriched uranium.

As a much more major point, the storage provision in the subparagraph as currently worded would require U.S. approval for any storage of material that is not weapons usable whether it is supplied for conversion, fabrication or reactor fuel prior to irradiation. The storage requirement would effectively prevent the recipient countries from managing their own nuclear fuel cycle by preventing them from moving supplied low-enriched uranium from location to location, notwithstanding the fact that such locations were subject to IAEA safeguards and adequate physical security requirements pursuant to other provisions in the agreement for cooperation. The executive branch recommends most strongly that the provision be revised so that it applies only to weapons-grade material.

The fifth point, subsequent arrangements, section 303(a). The responsibility for certain subsequent arrangements in S. 897 would be transferred from ERDA (the Department of Energy) to the Department of State. The executive branch considers this transfer of responsibilities both unnecessary and administratively inefficient. Since both S. 897 and S. 1432 require that prior to entering into any subsequent arrangement State Department concurrence be received, there is no necessity to transfer the full responsibility for these particular subsequent arrangements to State.

From an administrative standpoint, such a transfer does not make sense. ERDA maintains records relevant to U.S. nuclear exports.



When requests for retransfer approvals or approval of arrangements for storage or disposition of irradiated fuel elements are received, the technical data base for assessing and analyzing such requests is at ERDA.

If the Department of State were to have coordinating responsibility for such requests, the result would be that either State would have to duplicate the ERDA mechanism at additional expense, or the Department of State would serve merely as a mailbox for forwarding such requests to ERDA for analysis and technical checking, prior to return to State for circulation interagency.

Thus, either several bureaucratic steps have been incorporated, or expensive additional recordkeeping will be required. Since this would make the process more cumbersome, the executive branch favors leaving the responsibility for all subsequent arrangements in ERDA, but requiring that the Department of State provide its concurrence and that ERDA consult other concerned agencies prior to ERDA entering into the subsequent arrangement.

The sixth part and it is a strange one and let me mention it because it is a strange one, is Euratom.

The administration is satisfied with the language in S. 897 regarding our exports to Euratom. However, because of the importance of this issue, I would like to warn against any amendments that might alter the language of S. 897 to be consistent with H.R. 8638. Section 504(a) of H.R. 8638, the "Nuclear Antiproliferation Act of 1977" which was reported by the House Committee on International Relations, would create a new section 126 of the Atomic Energy Act. This section contains a provision (126[a][2]) which would have the practical effect of imposing a moratorium on U.S. peaceful nuclear exports to our European allies unless the current agreements between the United States and Euratom were renegotiated within 18 months. The administration is firmly opposed to this provision.

As the President stated in his message to Congress on April 27, for the near future, we should attempt

To tighten the conditions for U.S. nuclear cooperation through renegotiation of existing agreements . . . I believe that this approach will better meet our nonproliferation objectives than will the unilateral imposition of new export licensing conditions.

This concludes my testimony, Mr. Chairman. I am now prepared to answer your questions.

Senator CHURCH. It seems to me the suggestions you make for provisions in S. 897 are sensible.

The House measure you referred to contains a provision that, as I read it, would simply invalidate the agreement we have reached with the Japanese in the sense we could not continue to supply enriched uranium to Japan if it operated its reprocessing plant at Tokai Mura. Is that too drastic an interpretation to place on the language as contained in the House bill?

Dr. NYE. We have discussed that with Representative Bingham, Mr. Chairman, and he has assured us the intention was not to be as restrictive as appeared in the language and he intends to take action to insure the intentions are properly reflected in the language of the bill before it is passed by the House.

Senator CHURCH. It is hard for me to visualize how we can give any other country assurance in the future on future fuel supplies, in



light of our past history and in light of the fact policies change with Presidents and assurance today is subject to change tomorrow. That is true of any government, not simply our Government. So that I would think from the standpoint of countries interested in building nuclear plants who lack the complete fuel cycle, the only satisfactory assurance on this score would have to be an international one.

You are nodding your concurrence.

Dr. NYE. I am nodding my concurrence. I think you have put your finger on an extremely important point, Mr. Chairman. This is why Mr. Fri indicated in his testimony we believe the provisions for international fuel assurance system is very important, even if the major flows of fuel tend to come in bilateral relationships among countries, the availability of a backup, something analogous to the Federal Deposit Insurance Corporation in relation to the banking system, in turn where it suffers a breach of supply agreement, that sort of international arrangement I think is very important to provide the credibility for fuel assurances that are basically in a bilateral mode.

That is why we are working on ways or studying ways to implement this provision of the legislation now in the executive branch and what would be discussed as one of the major topics in the INFCE conference in October.

Senator CHURCH. We have Mr. Spurgeon M. Keeny with us this morning, who is Deputy Director, Arms Control and Disarmament Agency. Do you have a prepared statement?

Mr. KEENY. Yes, sir.

#### **STATEMENT OF SPURGEON M. KEENY, DEPUTY DIRECTOR, ARMS CONTROL AND DISARMAMENT AGENCY**

Mr. KEENY. Mr. Chairman, I am pleased to have an opportunity to comment on nonproliferation policy bills that have been referred to your committee.

Such legislation, when enacted, will be a critical component of our nonproliferation policy. In this connection, the administration appreciates the interest of many Members of the Senate on this subject and their active participation in the development of this legislation.

S. 897 has now been amended to adopt in several important respects some of the language of S. 1432, the original administration proposal. It now represents a clarification of our nonproliferation policy that strengthens that policy while making more predictable the terms of our nuclear exports.

This bill contains a number of desirable reforms, and it is important that such legislation—with the modifications requested by the administration—be enacted in the current session of the Congress. If such action is delayed, the uncertainties that have hung over our nuclear export policies in the past few years would continue. This could have a major adverse impact on our nonproliferation policy.

My agency agrees with the statements of the other administration witnesses today, and those which Secretary Vance recently sent this committee.

I would, however, like to comment briefly on four differences between the language of S. 897, as amended, and the administration position. We believe the arrangement in S. 897 could prove counterproductive in some ways in our overall proliferation efforts.



With regard to subsequent arrangements, the first of these differences relates to subsequent arrangements. S. 897 seeks to regulate, among other things, those provisions in our agreements for cooperation that cover retransfer and reprocessing of nuclear material exported by the United States or produced by use of U.S. exports.

We are in agreement with the requirements in subsection (b) (1) of section 303, which require advance notification to the Congress of certain proposed subsequent arrangements. We do, however, have serious problems with subsection (b) (2) of that section. This section prohibits any consent to reprocessing, or to a subsequent transfer to a nonnuclear weapons-state of recovered plutonium, unless, in the view of the decisionmaker, such transaction will take place under conditions designed to provide to the United States timely warning of diversion "well in advance of the time at which the nonnuclear weapon-state could transform the diverted material into a nuclear explosive device."

Timely warning is clearly an important aspect of effective safeguards. However, this provision, as now written, could present serious problems.

This administration considers that the spread of plutonium reprocessing is very undesirable, and I am confident that it will be extremely circumspect in considering consents for such reprocessing. Nevertheless, a legislative provision that can be construed as a flat, permanent prohibition on such consents has several serious disadvantages:

First, it would almost certainly make impossible the task mandated by another section of the bill, of persuading the European communities to give us a legal right of consent over the reprocessing of U.S.-origin fuel. They would know that when a U.S. consent was required, we would be compelled to withhold it.

Second, it could provide the basis for lawsuits, thus adding materially to the delays and uncertainties other recipient countries might have to suffer as the price of doing business with us.

Third, it could decrease our ability to persuade others that the international nuclear fuel cycle evaluation program is an objective study, since, by appearing to prejudge the outcome, it could encourage other participants to prejudge the outcome their own way.

Fourth, it would elevate one of the factors which should clearly be taken into account in an assessment of proliferation risk, to be the only controlling factor in each case, whereas in some cases it may not be the most important one.

Finally, unless a clear exception is made before enactment, it could jeopardize the arrangement with Japan with respect to the Tokai facility. If this settlement were invalidated by legislation, or by litigation based on that legislation, it would adversely affect our nonproliferation policy. It would foreclose an arrangement that, as Mr. Fri has reported, contains many elements in support of our nonproliferation policy and would have serious consequences for our relations with Japan, whose cooperation on our nonproliferation policy is indispensable.

For these reasons, the administration strongly opposes subsection 303(b) (2) of the bill. If this is not acceptable, we think that this provision should be modified along the lines described in Secretary Vance's comments. This modification would insure the "grandfathering" of the Tokai settlement and would prescribe "timely warning"



as only one of the considerations that must be taken into account in making decisions on subsequent arrangements regarding reprocessing.

Turning to other problem areas, if we hope to influence the rest of the world in our nonproliferation policies, other countries must have confidence that we will honor our agreements and be a reliable supplier. Our trading partners must have confidence in our agreements for nuclear export once they have been made. This confidence will not be bolstered by the provisions in S. 897 for expedited procedures and for congressional override by a one-House resolution.

These provisions would inject an undue degree of uncertainty into the export process. Lack of confidence may drive recipient nations to alternatives, such as indigenous enrichment and reprocessing facilities, that we are trying to discourage. I want to emphasize that we are not opposed to congressional review or expedited consideration of administrative actions. However, as presently drafted in S. 897, these provisions would contribute to uncertainty as to the prospects of dealing with the United States.

With regard to nuclear proliferation assessment statements, the administration believes that the nuclear proliferation assessment statements to be prepared by the Director of ACDA under S. 897 will prove to be a useful tool for the executive branch and the Congress in considering subsequent arrangements and agreements for cooperation.

At the same time, I am sure that the Congress shares the view of the administration that nuclear proliferation assessment statements should not be utilized in legal interventions in export licensing proceedings. The threat of such actions would add to the uncertainties faced by countries wishing to deal with the United States.

Section 406 of S. 897, as amended, is intended to avoid this risk, but it is not as comprehensive as we would like it to be. We believe that the more encompassing language found in S. 1432 should be adopted. This language would preclude legal actions with respect to whether an assessment statement is required in a particular case, or, if so, whether this requirement has been met.

We should not burden our agreements with foreign countries with unnecessary requirements. In this regard, there is not a persuasive reason why the United States should require others to obtain our advance approval for the storage of low-enriched uranium and spent fuel. This is also true for alterations of low enriched uranium, such as fuel fabrication.

We believe that the language of S. 897, as amended, contains overly broad requirements for prior U.S. approval of storage facilities and alteration.

In the renegotiation of our agreements for cooperation which would undoubtedly be criticized as unreasonable and as demanding unnecessary veto rights on foreign programs. Accordingly, we believe the language of S. 897, as amended, should be modified to require prior approval for storage facilities only for weapons-usable nuclear material and reprocessing or other alteration only for weapons usable or irradiated nuclear material.

In summary, Mr. Chairman, we think that this legislation is a major contribution to our nonproliferation policy and that it is important that the legislation be enacted promptly with the modifications that the other witnesses and I have discussed.



This concludes my statement. I will be pleased to answer any questions.

Senator CHURCH. The various amendments you have suggested here fall within the jurisdiction of the Foreign Relations Committee. The record we make here should be the one that might be helpful to the Foreign Relations Committee in its own assessment of the bill, these proposed amendments, and I think Dr. Smith would like to ask some questions to establish that record.

But before he does that, I have a question or two about the negotiations for international nuclear fuel authority, upcoming negotiations, the London talks.

One thing that has concerned me about the London talks is that they have been confined to the countries, to the seller countries, and I am wondering if our chances for success might not be improved if we were to conduct these talks, try to move these talks into perhaps the IAEA or bring them under the auspices of some organization that reaches out and encompasses the consumer countries, the customers, proposed customers, who will have to accept these various restrictions. What is your feeling about that?

Dr. NYE. I think the general point you make, Mr. Chairman, is correct; that in the long term it is absolutely essential we avoid any north-south, rich-poor split. What we are trying to work for is to develop a consensus between all countries with an interest in nuclear energy. That is the reason why the international nuclear fuel cycle evaluation program was constructed and countries so invited to bridge that north-south split.

As to the suppliers' conference, there have been discussions within the suppliers' group of the possibility of opening up and broadening the group. I think this is a long-term, multiterm objective of the group. The feeling is we still have some work to be done on the guidelines of the suppliers' group.

But we are very concerned in the supplier's group that it not be regarded as a commercial cartel or secret cartel because in fact it is a group of countries which are pledging not to commercially undercut the obligations they are undertaking in the hearings of the charter of the IAEA, so over the longer term we would hope to be able to open up the guidelines for appearances by any State that is interested to appear, and to regard the London suppliers' groups as a group which is supportive of the IAEA. I think our longer term objectives are similar to what you said.

There is a problem of making sure we finish up some of the work that is now underway before expanding the group.

As you know, when the numbers in any group get too large, it is difficult to get business done.

Senator CHURCH. What do you gentlemen think about the provision in the bill which would establish a certain amount of enriched uranium over the national stockpile? I think you said, Dr. Fri, you referred to that as amounting to \$1.5 billion worth of enriched uranium, and that allocation that is being made in the bill really before we know what the framework will be for an international system to the extent the countries that would be interested in stockpiling—I suppose I am asking you whether you think that is premature.



Mr. FRI. Let me start out by responding to that in two ways. One is I think the bill recognizes the establishment of an international fuel authority or some variant of that that provides a kind of insurance function that Dr. Nye spoke of in his testimony, is a relatively long-term proposition and would involve the fuel cycle evaluation program.

But I think it is terribly important that from the very start all of the countries concerned, including the United States, understand this business of fuel cycle evaluation has got to be more than just words.

Of course, we all supported, and all of that, but some earnest of our intent would be useful as well, before the notion of putting up a certain amount of reserve, a certain amount of fuel of the U.S. stockpile as a potential contribution to this and doing that up front I think is a form of earnest that is valuable.

So I support it. I think there are then other things that have to be done. But I think that is a good earnest.

Senator CHURCH. Could we make such a large commitment and still honor new contracts for domestic and foreign—

Mr. FRI. That is my point. I recall the bill as drafted calls for up to that amount, but even if it takes the full amount it is a feasible amount which we will have by the end of 1979, something close to 40 million in the stockpile and this is an amount we believe, in fact we are going to probably suggest we run our enrichment plants slightly below in 1979 to keep from building up a full stockpile that we absolutely have to have.

I think this is something we have to have.

Senator CHURCH. In the London talks, have you proceeded far enough to have made any assessment of how willing other suppliers are going to be to enter into an international arrangement and comply with common guidelines in regard to their sales of reactors to other countries?

Dr. NYE. Yes, we have, Mr. Chairman. There has been a good deal of consensus in the London group. The most recent evidence of that was the announcement by the Federal Republic of Germany, I believe it was on June 17, of their sense to not transfer technologies in the future, which followed the announcement the French made the previous December. There is a general feeling during this period when we are trying to develop proliferation fuel cycle, it includes all supplier states to exercise similar self-restraints. So we feel we have been able to reach a degree of consensus on that point, while at the same time we used the evaluation program to develop the long-term consensus of the fuel cycle.

Senator CHURCH. I take it that excepts both the French sale of the processing facilities to Pakistan and the German sale of a complete fuel cycle to Brazil?

Dr. NYE. That is correct. Both Governments made it clear these were policy decisions which were not retroactive but for the future.

Senator CHURCH. All right. Dr. Smith, you have some questions?

Dr. SMITH. Yes, Mr. Chairman. First of all, in this international nuclear fuel cycle evaluation proposed in the Government Affairs bill, should that be negotiated under the auspices of the IAEA or some other international agency, such as the Nuclear Energy Authority, to



give the recipient states some voice in how this thing would be structured.

Dr. NYE. Our intention is to have the discussion of it launched in the fuel cycle evaluation Conference which will be held here in October. That would include both suppliers and consumers, recipients, as well. So we do feel recipient voices should be heard on that.

Dr. SMITH. Isn't the INFCE program mainly a technical evaluation as opposed to a management or negotiation assessment?

Dr. NYE. I think if you look at the eight points which I have listed in my testimony, where I had touched on a variety of things which will be discussed at INFCE. This is after consultation with a good number of governments and you will see some of those points are more technical, others are more institutional.

But we think both are necessary in the INFCE program.

Dr. SMITH. Should the regional fuel cycle center concept be considered as part of the negotiations for international nuclear fuel—

Dr. NYE. That is indeed one of the concepts that will be discussed at the INFCE meeting. I have given a breakdown of the headings that will be included. That is one of the concepts.

Dr. SMITH. One of the things that seems to be a potential problem for an INFA concept, if INFA were to transfer fuel, we had transferred to INFA for the fuel bank, they would be required to meet our expert criteria plus those that were different from all of the other supplier countries—

Dr. NYE. Not necessarily. It depends how the charter of INCA is written. One might write it in such a way if a country was in conformance with certain agreed nonproliferation criteria, agreed in advance, written in the charter, that would be the condition upon which the Administrator, or Administrators of INCA would be able to release supply. But these are the kind of things which might be negotiated.

Mr. Fri might want to comment further on that. The terms of that particular condition. But I think that question remains open.

Mr. Fri. That is right. First of all, one should not draw this bill so tightly there is only one way to do—INCA, it is up to some negotiation with suppliers and consumers alike. But I think, Mr. Smith, you put your finger on an important point and that is once you have transferred these materials to an INFA or some other organization and ones who have set these criteria under which they may be transferred, in the event some bilateral arrangement evaporates for other than proliferation agreements, then that agency by its very essence is going to go ahead and retransfer that material.

There is going to be somebody around who doesn't like that very much or who would not have somehow shattered the bilateral in the first place. But it seems to me that is one of the assurances in the system, that is the price one has to pay; how one grasps those criteria in that mechanism is the heart of making the INFA concept work.

Dr. SMITH. If the INFA is perceived by the consumer nations as a supplier-organized structure, would that make any less concern about the supply of enriched fuel for the reactors and abate their interest in seeking a complete fuel cycle capability on a national basis.

Mr. Fri. Let me answer that question. A fuel assurance is a fuel assurance only in the eye of the customer. It is not—there is not such



a thing really as fuel assurance in the eye of the supplier. So going back to your first point, I think it is crucial the consumer nations, some of which happen to be suppliers, be in the forefront of developing this concept, so that when it is done, it looks like a duck to the people who want to buy ducks. It is just that simple.

Dr. SMITH. Mr. Fri. in your statement, you said the administration desired to simplify the export licensing process. How in your view would S. 897, as reported, simplify that process?

Mr. FRI. Admittedly, S. 897 is tough reading, and I think the comments made by Dr. Nye and Mr. Keeny straighten some things out to making a workable bill. But the heart of this enterprise is the six criteria plus the one additional appearance criteria of safeguards in which you come to the criteria about which exports are judged and the procedure by which the NRC applies. I would regard those as major steps forward in making those, making the process more reliable. The NRC is presently operating without criteria except those which it may impose on itself without statutorily condoned procedures and therefore that process is subject to all kinds of interruptions. That is the whole guts of the whole thing. There is a lot of language in here on nonnuclear energy cooperation, improving the IAEA, timely warning—which we would like to see straightened out—which makes it look, I think, a lot more complicated than it is. But for 95 percent of the exports what you are talking about are those six criteria, are they met in the procedure by which one judges whether they are met.

In a few pages of S. 897 it lays that out to be quite acceptable.

Dr. SMITH. In the bill as reported by the Government Affairs Committee, there are 23 separate determinations and findings which must be made by the executive branch which require the rulemaking procedures and thus possible litigation. It is questionable whether a foreign nation will perceive us as being a timely supplier of those things for which they have negotiated for the export with that type of encumbered process. The question is really how does the bill give our customers any assurance through the process that we will be able to export within a reasonable period of time by accepting a bilateral agreement of cooperation?

Mr. FRI. I would like to support any injunction Congress puts in the bill to point out—the vast majority of the licenses are subject to a relatively straightforward procedure coordinated by the Secretary of State; let these fellows do the criteria; the NRC takes a look at that; it is its own judge of the nature of the public hearing if any is required.

There is a statutory standard for when that hearing is required which I think is not too loose, and they make a decision. In most cases those decisions would be in the affirmative and that is that.

It is the troublesome cases, the retransfers and cases, where a nation is not adhering to some of the key criteria or some peculiar arrangement where all of these other features come into play, and admittedly, they have safeguards to make sure we handle those few cases wisely.

But the vast majority will go through a fairly simple process. I think, however, we have to earn the reputation as a reliable supplier, which can't be done by statute. Run the system for a few years and prove we can, in fact, issue noncontroversial licenses quickly and most licenses are in fact noncontroversial.



Senator CHURCH. Any procedure that requires 23 different decisionmaking steps or that many findings or determinations doesn't strike me as being very simple and straightforward. Aren't you concerned about many of those findings being susceptible to challenge by litigation in the courts?

Mr. FRI. In the first place, some of the key areas of the NRC procedure, the bill does establish NRC with a good foundation for setting its own rules, but I would like to see this 23-step procedure and see exactly what we are talking about. I cannot visualize most licenses would ever go through a 23-step procedure.

I can, if you start with the initial, new contract for negotiation, take the most tortuous path through this bill, you could wind up with 23 steps, but there are not going to be very many of those.

Senator CHURCH. There are some who look at this bill who say it is in fact a moratorium in disguise, that its practical effect will be to dry up further sales of American reactors to foreign countries. I do not know if that is a fair assessment, but I have heard the argument. You obviously don't take that view.

Mr. FRI. I think we could get into some real difficulties with this timely warning provision, construed too rigorously and to the exclusion of other considerations. I concur with my colleagues that the one-House veto system leaves something to be desired.

Senator CHURCH. Who do you regard that as such a serious impediment? Wouldn't the one-House veto have to be exercised within a certain length of time?

Mr. FRI. Oh, yes.

Senator CHURCH. So most of it would involve how much delay?

Mr. FRI. Not so much the delay. It is a question of whether setting aside the constitutional point, which is a serious one—

Senator CHURCH. We have lived with that one for quite a while.

Mr. FRI. I think the question of whether the judgment of one House of Congress should overturn the judgment of the President—we are not talking about an administrative determination or some agency—we are talking about a determination of the President that would be overturned by a one-House veto.

I regard it as more appropriate for both Houses of Congress to act in these matters. In fact, in one section of the bill, I can't remember whether the President takes it both ways to sustain an action, requires a joint action by the House and Senate, and to disapprove the same action requires a one-House action. It hardly seems fair, much less constitutional.

Senator CHURCH. Life is not fair.

Mr. FRI. That is what I keep telling my sons, but they keep coming back to me, Mr. Chairman, and sometimes they change my mind.

Senator CHURCH. Dr. Smith, do you have any further questions?

Dr. SMITH. After the bilateral agreements have been renegotiated, do you have an estimate of how long it would take approximately to complete procedures for an export license in the bill as you want it modified, with the suggested changes in S. 897?

Mr. FRI. How long would it take to process a license?

Dr. SMITH. Yes. Do you know what the current timetable is?

Mr. FRI. The current timetable is everything is pretty well frozen up. It usually takes in the neighborhood of, what, 30 to 60 days to put



together the executive branch position and transfer to the NRC. I really can't establish a standard for the NRC. It is a crazier procedure today. I would think the whole thing would be 4 months?

Dr. SMITH. Would you shorten or lengthen the process?

Mr. FRI. The issue is if it is a reasonable period of time, if it is predictable. The great inquiry here is you put something into the process, it may take 2 months and it may take 18 months; if everybody knows it is going to be 18 months when you kick that off at the time, whether it is 4 or 5 or 3 or 6 is less important than if it is pretty much predictable. That is what I think you get into this provision for 95 percent of the licenses.

Dr. SMITH. Dr. Trabandt has done a very thorough analysis of how one gets through the process after the 18-month period, when the initial criteria are imposed. He might point out what some of the pitfalls of that process are.

Dr. TRABANDT. Mr. Chairman, this is perhaps indicative of concern previously expressed, but it would be interesting to have the witnesses indicate how they would see this go in a time fashion, but after 18 months for any export and additional criteria applies which is IAEA safeguards for peaceful nuclear activities in a recipient country must be applied. If they are, then that criteria is satisfied. If they are not, then there is an exemption. If there is a Presidential determination provided that first license under the exemption is subject to a one-House veto which is subject to a 60-day layover. If there is a one-House veto, there are no further exports of any nuclear items for the remainder of that Congress unless again the weapons state satisfies the criteria or there is a Presidential determination. The second Presidential determination then is also subject to a one-House veto. So it becomes very circular in terms of the procedure. Even if there is not a one-House veto, each subsequent 12-month period, each license for that country must be submitted to Congress, and that becomes subject to a one-House veto. So a veto, that is it for the Congress. So if not vetoed every 12 months, the license comes up for a 60-day review.

Mr. FRI. The first license.

Dr. TRABANDT. The first license. In that 12-month period, and that is subject to Presidential determination. So it does not appear that is is very predictable procedure for those countries which do not immediately agree to application of all IAEA safeguards to all peaceful nuclear activities whether or not we export the material.

Mr. FRI. Let me come at that in three ways. Maybe my colleagues want to answer additionally; I think that is a good point.

The safeguards criteria is met by the NPT party or a country not a party to the NPT who adheres to it anyway. Maybe this is something you could get with parties who don't want to sign the NPT for some reasons. So to start with, most of the people with whom we deal are parties to the NPT, so that is all taken care of, that criteria is met. That is my first point.

Most of the licenses don't have to go through all of these conferences. So we are talking about people who are not after 18 months—

Dr. TRABANDT. Could you give us examples of countries which would not satisfy the criteria?

Mr. FRI. Brazil, Spain, India.



Dr. TRABANDT. Israel.

Mr. FRI. Brazil adheres in effect but is not a party to the NPT, so they would in fact—

Dr. TRABANDT. Would it be fair to say controversial exports would probably fall under this category?

Mr. FRI. Very likely. The second part of the answer is it is really a question for the Congress and that is, is it sufficient for the executive branch in the cases of these people who do not adhere, to simply report to the Congress periodically, we are working on it, and continue to push the export licenses through the system? Or, does the Congress wish to have some kind of action-forcing event that allows the Congress to look at these controversial cases periodically or exercise its judgment as one of the coequal branches of the Government?

We are left with the very strong impression that the latter is preferred by a number of Members of Congress. But, of course, if we are wrong, we will be, I suppose quite delighted to be wrong having finally arrived at the point where there has to be some action-forcing event. So it is a question of how do you go about doing it.

We elected this one, the first license for reasons of simplicity, believe it or not, if there is no license the whole thing doesn't have to come up at all and that will be years for these countries in which there is no license.

Second, only the first license in the course of the year is subject to this treatment. So once the issue is looked at for a year, it is not looked at repetitively every time you export something to that country in the course of a year. It seems like a simple way to have an action-forcing event.

I take this time to make the point while there are apparent complexities (a) the complexities tend to revolve on the tough cases and the points of this bill we are trying to work out are the procedures that would allow the executive and legislative branches of the government to get their hands on a decision without looking at every piece of paper that went by. That is, I think, not a bad way to head.

Dr. SMITH. The bill does not give any preference or even acknowledge any preferred status to signatories of the NPT. It seems we are not living up to that basic agreement in some sense by putting those people who have conformed to that general policy—or would you endorse such a provision in the bill—

Dr. NYE. I think it is worth noticing the very provision we are discussing brings about a change in policy which means non-NPT parties have to adhere to something NPT parties adhere to which is full scope safeguards. Past policy has allowed a non-NPT party to receive exports without putting all of its facilities under safeguards. This bill requires the non-NPT party to adhere to the same standards that all of its facilities are under export, so de facto has the effect of removing that discriminatory feature.

I think it is also worth pointing out the particular emphasis and special treatment given the comprehensive safeguards as compared to some of the other export conditions and again going back to the previous interchange, for exactly that reason, that we believe comprehensive safeguards is a very crucial part of a valid export policy meeting our nonproliferation obligations.



So I think the last two interchanges are related to each other. Mr. Smith's question helps to explain why we do feel the full scope safeguard situation has to be treated very seriously. It is also worth noting, the major countries which are export partners which would not fit within the criteria of the bill are relatively small. The argument the full scope safeguard provisions is going to lead is a moratorium is not a very convincing argument.

So I think it has to be put in perspective.

Senator CHURCH. I must say if it takes a statute to get us to adhere to the letter and the spirit of the Nonproliferation Treaty, I am for the statute. If we who initiated that treaty, sought to make it a principle of international policy to prevent nuclear weapons proliferation and then abandon our own treaty by agreeing to supply nuclear reactors to countries which refuse either to become partners to the treaty or to submit to international inspection of their facilities, I think that was one of many decisions that has caused the world to look with scepticism at the United States when it professes to be so concerned about proliferation. So in that sense, I think this bill would help to reaffirm the decision of the Congress that we shall insist in the future, countries, even though they may not be formally party to the NPT, will accept the same inspection and control.

I strongly support that effort. But you know, it is pretty difficult to get the world greatly excited about problems of nuclear reactors and what might contribute to nuclear proliferation of weapons, where we continue to maintain 10,000 nuclear warheads, and that is really the crux. Until we begin to make progress with the Soviet Union in reducing these enormous nuclear arsenals, the rest of the world is not going to be too impressed with our concern about some third government obtaining 12 bombs and in a sense all of our discussions about this bill and negotiations for the establishment of an international system miss the mark.

The real signal the world is waiting for and has not gotten is the signal that we are prepared to reduce the number of weapons because we understand they are not contributing to our security but just to our evergrowing insecurity.

Dr. NYE. Mr. Chairman, the President, as you know, did propose a serious reduction in a number of forces and also the comprehensive test ban negotiations are related to our proliferation concerns.

Senator CHURCH. Yes, and I wholly support the administration position on the comprehensive test ban and I am sure the President is very sincere in his hopes of reducing the number of weapons. As you know, those negotiations have stalemated—have not yet been put back on the track again.

I think that covers the questions this morning, gentlemen. Your proposed amendments strike me as being constructive. I hope in the Foreign Relations Committee we can get them favorably considered. We might want to talk about that informally.

Does staff have any further questions?

Dr. TRABANDT. No, sir.

Senator CHURCH. If not, the hearing is recessed until tomorrow.

[Whereupon, at 9:50 a.m., the hearing was recessed, to reconvene Wednesday, September 14, 1977, at 8 a.m.]



The first of these is the fact that the  
economy is not a static entity, but a  
dynamic one, constantly changing and  
developing. This is due to the fact that  
the economy is not a closed system, but  
an open one, constantly interacting with  
the rest of the world.

The second of these is the fact that the  
economy is not a homogeneous entity, but  
a heterogeneous one, consisting of many  
different sectors and industries. This is  
due to the fact that the economy is not  
a single entity, but a collection of many  
different entities, each with its own  
own characteristics and needs.

The third of these is the fact that the  
economy is not a static entity, but a  
dynamic one, constantly changing and  
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# NUCLEAR NON-PROLIFERATION POLICY ACT OF 1977

WEDNESDAY, SEPTEMBER 14, 1977

U.S. SENATE,  
SUBCOMMITTEE ON ENERGY RESEARCH AND DEVELOPMENT,  
OF THE COMMITTEE ON ENERGY AND NATURAL RESOURCES,  
*Washington, D.C.*

The subcommittee met, pursuant to notice at 8 a.m., in room 3110, Dirksen Office Building, Hon. Frank Church presiding.

Present: Senators Church, McClure, and Domenici.

Also present: Ben Yamagata, counsel; Willis Smith, counsel; and Charles Trabandt, counsel for the minority.

Senator CHURCH. Dr. Hendrie, I understand you have a statement, and then Commissioner Kennedy, and you have a joint statement, and Commissioner Gilinsky also has a statement.

Dr. HENDRIE. Yes, sir.

Senator CHURCH. All right. Well, let's proceed through those statements then.

**STATEMENT OF DR. JOSEPH HENDRIE, CHAIRMAN, NUCLEAR REGULATORY COMMISSION; ACCOMPANIED BY VICTOR GILINSKY, COMMISSIONER; RICHARD T. KENNEDY, COMMISSIONER; PETER BRADFORD, COMMISSIONER; AND CARLTON STOIBER, GENERAL COUNSEL'S OFFICE**

Dr. HENDRIE. All right, sir.

I should say, sir, that with us at the table this morning is Mr. Carl Stoiber of the General Counsel's Office to help us with the fine details of this legislation, and the other Commissioners who have joined me this morning.

We are pleased to have the opportunity of appearing before this morning to discuss proposals for comprehensive nuclear nonproliferation legislation.

My initial statement on the proposed legislation represents the views of all the Commissioners. As you have noted, at the end of this statement, there is a separate statement on behalf of myself and Commissioner Kennedy. And then Commissioner Gilinsky would like to have an opportunity to contribute his own views on aspects of the legislation.

As you know, various bills on the vital subject of nuclear nonproliferation have been considered and refined by several committees of the Senate and House of Representatives during the past 21½ years.

Although this is the first time I have personally testified on such proposals, the Nuclear Regulatory Commission has played an active



role in the development of nonproliferation legislation and has presented testimony on several pending bills.

That testimony has supported the view that a soundly drafted enactment could make a significant contribution to advancing U.S. nonproliferation objectives. The Commission continues to support the need for sound nonproliferation legislation.

More specifically, the Commission has been an active participant in the development of the two bills being considered by the subcommittee in this week's hearings.

The Commission assisted in drafting and strongly supported the administration's proposal embodied in S. 1432, entitled the Nuclear Non-Proliferation Policy Act of 1977, and submitted to the Congress by President Carter on April 27.

During the late spring and throughout the summer, Commission personnel also participated in discussions between the administration and representatives of House and Senate committees for the purpose of achieving a coordinated approach to the two pending nonproliferation bills.

The version of S. 897, the Nuclear Non-Proliferation Act of 1977, which was reported by the Government Affairs Committee on July 29, embodies a compromise proposal developed during those discussions.

In keeping with your request that I limit these remarks, and with the time available this morning, I shall address only a few of the more important features of these complex legislative proposals.

With respect to the Commission's views on more detailed aspects of the legislation, I would urge members of the subcommittee to give careful attention to the analysis of S. 897 submitted by the Department of State on behalf of the agencies which have participated in the development of this legislation, including the Nuclear Regulatory Commission.

At the outset, I would like to reemphasize the general observation which the Commission has previously made in appearance before the Congress that the effectiveness of proposed nonproliferation legislation should be judged by the extent to which it enhances the U.S. position in this important area of national security.

A sound U.S. nuclear export policy must serve three objectives. First, it should be designed to assure that U.S. exports will be used for their intended peaceful purpose and are not diverted to any military use.

Second, it should promote an international system which restrains the spread of nuclear explosive capability derived from nuclear material of any origin.

Third, it should offer a reliable and predictable source of nuclear supply for peaceful purposes to nations that have given binding nonproliferation assurances and accepted adequate safeguards.

In our view, S. 897, as reported by the Government Affairs Committee, generally meets these objectives, and the Commission would support its enactment if the few, but important, remaining problems with the bill can be satisfactorily resolved.

Again, because of limited time, I would refer the committee to the administration's detailed comment letter.

These problem areas basically turn upon an important point which the President made in submitting his own version of this legislation; namely, that essential efforts to restrain proliferation of nuclear ex-



plosives can best be pursued by means of negotiation and cooperation with our nuclear trading partners.

One problem with the bill is contained in section 401 which would establish new guarantees to be sought from U.S. nuclear trading partners during the process of renegotiating existing agreements for cooperation, as mandated by the bill.

One of those provisions, set forth in proposed section 123(a) of the Atomic Energy Act, would require all U.S. agreements for cooperation to contain provisions granting a right of prior approval to the United States for storage facilities which are to receive U.S.-supplied material.

Other nations may be unwilling to accept restraints on their domestic nuclear fuel cycle which would prevent them from transferring low-enriched uranium between facilities, even when such facilities are subject to IAEA safeguards and have adequate physical security arrangements.

In the Commission's view, such a requirement would not be of major consequence for nonproliferation purposes, but could be viewed as imposing an unnecessary burden on a country's nuclear power program. Thus, we believe that the provision should be amended to apply only to weapons-grade material.

I will postpone discussion of a second substantive problem; namely, the provision concerning definition and application of a "timely warning" standard for reprocessing approvals, until my separate remarks.

I would now like to turn briefly to the three subjects in S. 897 which were specifically referred to the Subcommittee on Energy Research and Development.

The first of these areas deals with the important issue of providing assurance to our nuclear trading partners that the United States will be a reliable supplier of nuclear services.

As the Commission has noted in prior testimony, this factor is essential to enable the United States to effectively implement its non-proliferation policy.

In this regard, section 102 concerning expansion of U.S. domestic enrichment capabilities and section 103 which mandates a 12-month study of the need for such domestic expansion are each crucial elements for U.S. policy in this area.

Also, section 105, which would give congressional support to the initiative already underway to conduct an international nuclear fuel cycle evaluation should be enacted.

With regard to section 104, which would establish an International Nuclear Fuel Authority, the Commission notes just that the proposal may have prematurely focused on only one approach to developing international mechanisms for nuclear fuel supply.

Obviously, the ramifications of such a program are far-reaching and should be fully explored before any alternative is selected.

We believe that further negotiations and discussions, perhaps in the context of the international nuclear fuel cycle evaluation, would be helpful in framing an acceptable and workable approach to international fuel supply problems.

Second, the Commission wholeheartedly supports the proposal in section 202 of the bill to develop a safeguards and physical security



training program for nations or groups of nations developing a nuclear industry.

Third, the Commission also supports the objectives of title V of the bill, which authorizes the establishment of various programs for cooperation with less-developed nations in the development of non-nuclear energy sources.

The Commission supports the policy of assisting other countries to fulfill their energy needs. However, the Commission is mindful that several programs similar to this have already been undertaken by agencies of the U.S. Government as well as international organizations.

Therefore, any legislative proposal in this area should be carefully tailored so that any new programs would not duplicate efforts already underway.

Finally, I would like to briefly note the Commission's general agreement with provisions of the bill which would specifically affect its own export licensing activities. Most of these provisions are contained in title III of the bill.

We believe that the consultative role provided the Commission in the areas of technology transfer, section 302, and subsequent arrangements, section 303, are appropriate and workable.

The NBC already participates in the interagency consultative process in a variety of areas, and we would expect to participate fully in the consideration of these important matters before decisions are taken on appropriate U.S. Government action.

The export licensing procedures set forth in section 304 are also acceptable to the Commission. The Commission supports the provision in this section which would require the NRC to receive the coordinated views of the executive branch before licensing an export. This approach conforms to our current practice.

We would note that the executive branch has been very helpful and forthcoming in providing the Commission with information necessary to fulfillment of our licensing responsibilities.

I might note in this connection, that the Commission is currently reviewing its procedures for dealing with classified information that might be applicable to export licensing matters to assure that we can be fully informed in coming to decisions on these licenses as well as conforming fully with the Sunshine Act.

On several previous occasions the Commission has expressed its view that specific export licensing criteria, to give greater definition to the determination which the NRC must make under the statutory "common defense and security" requirement would be a desirable feature of nonproliferation legislation.

The six immediately applicable criteria contained in S. 897 as part of a new section 127 of the Atomic Energy Act provide that definition in a manner which is workable. Thus, the Commission supports adoption of those criteria in their present form.

We have noted in earlier testimony that the Commission approves the procedure of permitting the President to review any negative licensing determinations from the overall perspective of U.S. national security.

We believe the Presidential review provisions in section 304(a) are tailored to permit this desirable result without detracting from the Commission's responsibility to make an independent determination on pending export licensing applications.



With respect to section 308(a) of the bill, we would like to make clear our interpretation of the language that calls for NRC export licensing of "items or substances, especially relevant from the standpoint of export control because of their significance for nuclear explosive purposes."

We do not interpret this language as intending to transfer jurisdiction from the Department of Commerce to the NRC of items or substances of a general purpose nature which are predominantly used for ordinary commercial purposes, but which could also be used in connection with or in support of the manufacture of nuclear explosive devices.

This interpretation will minimize potential confusion as to which Federal agency has licensing jurisdiction over a particular commodity, and is generally preferable from the standpoint of the overall administration of the U.S. export control program.

The Department of Commerce has assured us that they will consult with the NRC in cases involving proposal reports of particular types or forms of items or substances, otherwise of a general purpose nature, which NRC may identify as being particularly sensitive for nuclear explosive purposes.

In addition, Commerce will consult with the NRC whenever the department has reason to believe that a particular proposed export may be used for or in support of the manufacture of nuclear explosives.

We also note, as a technical matter, that section 308 establishes a slightly different standard for disapproving nuclear export license applications than that established in section 126.

This inconsistency, perhaps the result of inadvertence, could easily be cured by making proposed section 109(d) read that NRC will not issue component export licenses except in accordance with the procedures set forth in proposed section 126(a) of the Atomic Energy Act.

Finally, because of NRC's expanded licensing activities in the component field and additional consultative role under other portions of the bill, I should indicate that the Commission may need to seek additional resources by way of funding and personnel authorizations to meet its increased responsibilities.

In conclusion, Mr. Chairman, the Commission believes that it has and will continue to make a constructive contribution to the achievement of United States nonproliferation goals. We believe that the framework provided by S. 897, with the changes suggested by the executive branch, can assist us in making that contribution. Therefore, we would urge prompt action on this important legislative initiative.

Senator CHURCH. Now you have a joint statement in which Commissioner Kennedy will participate?

Dr. HENDRIE. Yes, sir. Would you like me to go ahead?

Senator CHURCH. Yes, please. And then we would like to hear from Commissioner Gilinsky before we ask you questions.

Dr. HENDRIE. Fine. Having stated the full Commission's views on the legislation being considered by the subcommittee, I would like to offer a few additional remarks of my own, which Commissioner Kennedy has indicated also reflect his views.



As I noted earlier, Commissioner Gilinsky will give his personal views in a moment.

At the opening of these remarks I noted the President's statement when submitting the administration's proposed nuclear export legislation that achievement of the Nation's nonproliferation objectives could best be achieved through the processes of cooperation and negotiation with our nuclear trading partners.

Apropos of that approach, I would add the thought that unilateral measures which could call into question the reliability of the United States as a supplier of nuclear commodities would be damaging to the ultimate attainment of our nonproliferation goals.

Some of the earlier versions of S. 897 suffered greatly from this unilateral approach. Although most of these undesirable features have been eliminated from the current version, a few provisions remain which should be amended.

The first of these difficulties is contained in section 303(b) of the bill pertaining to negotiation of subsequent arrangements, such as fuel contracts and the like.

With specific regard to subsequent arrangements for the reprocessing and retransfer of U.S.-supplied material, section 303(b) (2) would prohibit such an arrangement unless the Secretary of State could certify that—

Such reprocessing or transfer will take place under conditions that are designed to ensure reliable detection of any diversion and which would provide timely warning to the United States of such diversion well in advance of the time at which the non-nuclear-weapons state could transform diverted material into a nuclear explosive device.

As drafted this provision could appear to prejudge the results of the ongoing International Fuel Cycle Evaluation, which must secure the participation of our key nuclear trading partners if it is to be successful.

While the timely warning standard embodied in this provision of the bill is an important consideration in this country's nonproliferation efforts, the mechanism proposed in S. 897 lacks necessary flexibility.

If applied in the manner set forth in the bill, it might well result in an unwarranted suspension of nuclear fuel shipments to important allies of the United States.

If the provision were redrafted to clarify the fact that "timely warning" is one of several factors to be evaluated in making a judgment about subsequent arrangements, and that there must be some flexibility in determining what period of time affords sufficient assurance under that standard, the provision would be more acceptable.

I would also like to make a brief comment on the concept of nuclear fuel assurances. I strongly support inclusion in this legislation of provisions designed to enhance U.S. reliability as a fuel supplier.

In this connection, I believe that the Nation's reputation as a reliable nuclear fuel supplier would probably be enhanced more by ensuring that obligations already undertaken in current fuel supply contracts and agreements for cooperation were strictly adhered to, than by developing complex arrangements which may not in the final analysis prove workable.



We appreciate the opportunity to have presented these additional separate views to the subcommittee.

I believe you would like to have Commissioner Gilinsky speak.

Senator CHURCH. Yes. Thank you very much.

Commissioner Gilinsky, please.

### STATEMENT OF VICTOR GILINSKY, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Mr. GILINSKY. Thank you very much, Mr. Chairman. I should like to thank you for giving me this opportunity to add a comment of my own to the Commission's statement on S. 897.

I feel obliged to address two provisions of the bill before you: the "timely warning" standard to be applied to safeguards over plutonium in section 303(b)(2), and the exemption of Euratom from certain re-transfer controls.

The "timely warning" standard is under strong attack as being unnecessary, unworkable, overly rigid, and unrealistic. Yet this same idea lies at the heart of the safeguards system on which we have relied for protection since American materials, equipment, and technology first went abroad under the atoms for peace program.

Safeguards are supposed to deter countries from breaking promises not to use nuclear material and facilities for explosive purposes. They are an alarm that warns of illicit activity.

To be effective the warning has to come in time for us to do something about it. The idea of deterrence through timely warning is the explicitly stated objective of the so-called "blue book" safeguards of the IAEA which police the Nonproliferation Treaty.

Under this system, as under the U.S. bilateral safeguards which preceded it, records are kept of all nuclear materials going into and coming out of civilian power reactors throughout most of the world, and verified by an international inspectorate.

The idea is simply that the disappearance of any of this material will be reported to the international community in plenty of time to allow for appropriate counteraction. Thus timely warning is essential to effective safeguard.

Problems arise as we move to the use of plutonium or other nuclear explosive materials. The inspection safeguards on which we have relied for so long to back up assurances of peaceful intent are in this area falling hopelessly behind the technology to which they are being applied.

This is because once the relatively difficult process of plutonium separation is complete, the bomb-ready material is vulnerable to swift appropriation for use in a previously prepared weapon. The warning time we can count on collapses practically to zero.

The bill before the committee attempts to correct this safeguards deficiency. Section 303(b)(2) would allow U.S. approval of certain foreign activities involving nuclear explosive material derived from our exports, primarily plutonium, only if we can count on getting warning of attempts to misappropriate it well enough in advance to do something about it. It is entirely reasonable to apply this classic alarm standard to plutonium.



Should the Congress decide not to do so, or to apply it in some cases and not in others, it should be clear that in so doing it is dropping the requirement for effective safeguards, relying instead solely on promises that U.S. materials will not find their way into nuclear weapons.

Retention of international inspectors in this case can provide little more than cosmetic comfort. There is no deterrent function they can perform should promises be abandoned in the face of real or concocted security threats.

The House Committee on International Relations noted in its report on the bill that warning times for safeguards over plutonium should not be allowed to deteriorate below those now in effect for light water reactors.

I find myself in agreement on this point. Timely warning is central to safeguards, and we would retreat from our existing warning margins at our peril.

Unfortunately, in the past, ambiguities and inconsistencies have crept into the application of safeguards to nuclear explosive material. If our exports are to be protected from misuse we are going to have to state the rules clearly and apply them consistently.

Needless to say, this may not go down well with some of our close friends and allies with whose cooperation we are launching the international fuel cycle evaluation, and this is for us the most painful aspect of the situation.

I do not, however, share the view that this legislation would prejudge the results of that evaluation. I think it will have the opposite effect.

A hold on further commitment to current reprocessing technologies which cannot meet the timely warning standard will act as a powerful incentive to come up with some workable combination of technologies and safeguards that will meet it.

In any case, we surely do not have to wait to reaffirm our insistence on effective safeguards over U.S. exports.

Far from being overly rigid, the bill permits a number of exceptions to accommodate our close allies. Currently operating commercial reprocessing facilities are to be exempted from the timely warning standard. This would include plants in Britain and France and possibly some others.

And U.S. approval for reprocessing can be obtained where there is an agreement to apply timely warning safeguards "within a reasonable period of time."

And of course, Euratom is exempted altogether from immediate application of U.S. reprocessing controls.

I must say I am troubled by these exemptions because they sacrifice uniformity and consistency in our nonproliferation policies. They suggest that when the choice appears to lie between allowing our friends to reprocess and effective safeguards, we choose reprocessing.

We are then left with the problem of what to do about those countries outside the circle of our special friends who are also thinking about getting into the reprocessing business.

I would also like to draw the committee's attention to a specific problem that is a consequence of the bill's exemption of Euratom from U.S. retransfer controls.



Under current agreements with a number of countries, and also Euratom, plutonium produced in U.S. supplied fuel can be exported essentially free of U.S. control. It need only go to countries with "appropriate" agreements for cooperation with the United States, and these include a good many on our proliferation worry list.

This means that plutonium produced and separated in any of these countries, including the Common Market countries, can end up almost anywhere in the world without our having any real say in the matter.

While the bill apparently corrects the retransfer situation with regard to those agreements where firm controls are now lacking, it specifically exempts Euratom.

Presumably the exemption is intended to allow only for transfers within the Common Market. If so, the bill should make this clear.

The way it now appears, Euratom could be a conduit through which plutonium produced in U.S. supplied fuel could flow unhampered to much of the rest of the world.

Thank you, Mr. Chairman.

Senator CHURCH. Now Mr. Bradford has presented the committee with a letter, and I would ask that his letter be included in the record.

[The letter referred to follows:]

U.S. NUCLEAR REGULATORY COMMISSION,  
Washington, D.C., September 13, 1977.

HON. FRANK CHURCH,  
*Chairman, Subcommittee on Energy Research and Development, Committee on Energy and Natural Resources, U.S. Senate, Washington, D.C.*

DEAR MR. CHAIRMAN: While I have no specific points of disagreement with Chairman Hendrie's statement on behalf of the Commission on S. 897, I have been a Nuclear Regulatory Commissioner only for a month, and I still have much to learn about the export licensing process. Therefore, I want to note for your record that I may well develop other thoughts on this general subject in the future, and I would not want to be limited to the Commission comments presented today.

Because the "timely warning" section—Section 303(b) (2)—of the bill has been a point of contention within the Commission, I have paid special attention to it in the last two weeks. While I respect the need for flexibility in negotiations, I do not understand how this term can be criticized simultaneously for vagueness and for inflexibility. As a general principle, I feel that safeguard concepts for which no adequate substitute exists should be written into the law, at least until an adequate substitute becomes available. I am not satisfied that an adequate substitute for the relatively mild timely warning requirement in this legislation exists. Until the same end can be reached by other means, I think that the law should include Section 303(b) (2) as written.

Sincerely,

PETER A. BRADFORD, *Commissioner.*

Senator CHURCH. And I take it, Commissioner Bradford, that you are in genreal agreement with Commissioner Gilinsky with respect to retransfer?

Mr. BRADFORD. With reference to effective timely warning standards, yes, Sir.

Senator CHURCH. We face something of a quandry in that matter because there are so many countries and governments in Western Europe who are really set upon the course of reprocessing and are committed to the breeder, and they are simply moving in a direction that differs from the current objective of the United States.

I think that all of us would agree that if the rest of the world is going to move into a plutonium era, then the obvious need is to establish adequate international controls, including a kind of reprocessing that would minimize the danger.



I have always thought that is a negotiable objective, but we have just faced the moment of truth with Japan in this reprocessing plant. And in the moment of truth we have gotten away from the declared policy of the United States because we are faced with the reality that the Japanese Government is committed to a different course; that as they see the solution of their energy problems, it depends completely upon full utilization of the fuel cycle which means reprocessing and ultimately a breeder.

As far as I can determine, that is also the view of the British Government, the French Government, the German Government, the Italian Government, and it has apparently been adopted by the Soviet Union.

So we face a quandry in this connection. Clearly the timely warning test cannot be met by conventional reprocessing, can it? The Purex method is—

Mr. GILINSKY. I would say it would be difficult, if not impossible.

Senator CHURCH. So if the timely warning test remains in the law, it would mean that the United States could not supply enriched uranium to any country that reprocessed and uses the Purex method?

Mr. GILINSKY. Senator, first of all, there are a number of exemptions in the bill.

Senator CHURCH. I know, but the exemptions, leaving the exemptions aside, they are confined to Euratom and what else?

Mr. GILINSKY. The intent would be to set up a design standard for this technology. Now it doesn't mean that you are foreclosing the option of using plutonium. I would say far from it, or the breeder for that matter.

But you are saying that if this is to be done, it has to be done in a manner that secures the plutonium and possible use for weapons in the same way as the safety standards for reactors. You would say that there are certain safety standards.

Senator CHURCH. In other words, if the reprocessing plant were to be designed in such a way as to blend the plutonium back with uranium oxide, refabricate the fuel in such a way that it would make it unusable for weapons purposes, this would meet the standard?

Mr. GILINSKY. Well, I would say probably not. But I think some further complications—

Senator CHURCH. What would meet the standard then? If full processing won't, what will?

Mr. GILINSKY. I can't tell you at this point, Senator. I know you, yourself, have put forward a proposal that would involve coprocessing and further irradiation of the fuel. Perhaps that would do it. I really couldn't say at this point, but I think that is one of the things—

Senator CHURCH. You would also have to have the reprocessing plant under IAEA inspection, wouldn't you?

Mr. GILINSKY. I would say that would be a necessary but not a sufficient condition, sir.

Senator CHURCH. Well now if IAEA inspections plus coprocessing, plus irradiation of the full-processed fuel, those three requirements are insufficient, then what?

Mr. GILINSKY. I didn't say they were insufficient. The irradiation is an interesting idea. I just am not in a position to evaluate it at this point. And it is certainly one of the things that I think ought to be looked at very carefully.



It is an evaluation that we are undertaking, and certainly it is in our own evaluations. I think the point of the policy with this technology is we don't have the answers in this area.

And if we allow countries to make further commitments in this case using our own fuel, the fuel we have supplied, then I think the option of finding safer ways to use this material will have been foreclosed. I think we are really at a critical point where quite a number of countries are on the verge of making further commitments, and those commitments are made using our technology.

I think it is going to be very difficult, if not impossible, to recapture the situation.

Senator CHURCH. Your argument appeals to me. That if we forego the timely warning test, we may lose the last real opportunity to move the world in the direction we hope to see it go. Reprocessing services would be available under the terms of the bill. The exceptions cover all existing reprocessing plants. I understand they are grandfathered in.

Mr. GILINSKY. I believe that is so.

Senator CHURCH. And the exceptions extend to Euratom even if it were to deal with a new reprocessing plant. Is that your understanding?

Mr. GILINSKY. There are a number of immediately applicable criteria in the bill, one of them requiring U.S. approvals for reprocessing of U.S. supplied fuel. Euratom is exempted from that for an 18-month period which can be extended by the President. So for the time being Euratom is exempted and none of this really applies—

Senator CHURCH. What I am trying to get at is this: If we were to eliminate the timely warning standard; that is, if we retain it, that would mean that other suppliers, European suppliers, for example, or sellers of nuclear plants could offer reprocessing services. We don't offer any reprocessing services even though we could make certain to our own satisfaction that our own reprocessing would meet the standards that we would like to see the world impose. But President Carter's decision is not to go forward with the reprocessing in this country, so we are not offering reprocessing. European countries do, and may be offering more reprocessing in the future. The Japanese under the terms of the new agreement between our two countries will commence their reprocessing plant and start operations. That is a demonstration plant, and likely to lead to a commercial-sized plant in due course.

Are we working ourselves into a position where other countries will choose to deal? When the Japanese or the Europeans—well, let's say with the Europeans rather than with us because by dealing with them they not only get their nuclear plants built but they get the reprocessing services as well?

Mr. GILINSKY. Let me say they can't offer reprocessing services for U.S.-supplied fuel without our approval. Now it is up to us to decide.

Senator CHURCH. If this bill contains an exemption for Euratom for the next 18 months, what does that exemption mean? I thought that we had no such understanding with Euratom, that they could not supply reprocessing except with our approval.

Mr. GILINSKY. Well, this test would not apply—this statutory test. But when the Japanese fuel moves to Britain and France, we have to supply our approval.



Senator CHURCH. Because we supplied the fuel in the first place?

Mr. GILINSKY. Yes.

Senator CHURCH. Dr. Hendrie, what do you have to say about the argument that if we don't continue to insist upon a timely warning standard, then we have lost the leverage we need to move the world toward an international system of effective inspection and control, including the kind of reprocessing that we were discussing a few minutes ago?

Dr. HENDRIE. Senator, my view differs a little bit from my colleague. It is that the timely warning standard is indeed a very important one from the standpoint of safeguards, and there is no suggestion in my remarks, or I believe in the executive branch remarks, that the timely warning standard be ignored. The point we make is that to establish it as a single and overriding standard may simply turn out to be hopelessly inflexible and force us to conclusions that would prevent our being able to approve the use of the U.S. fuel and materials abroad.

If it were to do that, the effect might indeed be to lock into place a reprocessing industry as it now stands in Europe and perhaps Japan as the only places where fuel could be reprocessed and under the exemptions be free of these requirements.

I think Commissioner Gilinsky's point that holding people's feet to the fire with regard to looking very intensively for reprocessing methods and fuel cycle systems that do give adequate warning and are otherwise easier to safeguard than the present systems is a very important one. Our difference lies, not that we disagree with the importance but that we disagree on whether a timely warning should be locked into the process as a sole standard for approval of these things.

Senator CHURCH. Well, if timely warning had been locked into the law, then it would not have been possible for us to have entered, to have legally entered into the agreement we just signed with the Japanese. Isn't that so?

Dr. HENDRIE. I believe that is correct.

As far as I know, that is correct and it is precisely because I think that would have been very unfortunate a posture for the United States, to be unable to negotiate with the Japanese, that I believe timely warning ought to be one of several factors taken into account.

Senator CHURCH. You see the administration has really been placed in—well, the timely warning has been the basis for the whole Carter program against the breeder reactor. All of it based upon the notion that the breeder won't give us a reprocessing which is part of the breeder cycle, won't give us a timely warning—a possible diversion. That is the danger.

So that is the whole rationale. We are trying to persuade the world not to move to the breeder and to reprocessing and having made that the basis for the argument, the administration now comes up and says well the first thing you want to do—in changing this bill, is relax the timely warning standards. It is very difficult for me to swallow it both ways.

Senator McClure.

Senator McCLURE. Just a couple of questions, because I think your statements have covered it rather extensively, and I notice we do have a couple of other witnesses in the hour remaining to us.



The concern I have is to two primary concerns. One, what happens to existing agreements if, as a matter of fact, we can't renegotiate? It is very much in the suggestions which I approve. If, as a matter of fact, we can get agreements in these matters, what happens if we don't get agreement? What would be your view, Mr. Hendrie, for instance, if under the provisions that we renegotiate existing contracts or existing agreements and we fail to get it in the existing agreements, what happens?

Does this bill in your view force an abrogation of those agreements?

Dr. HENDRIE. That is a good question, Senator. A moment, please, while I check with counsel. I am getting some help on details.

Mr. Stoiber has told me and rather than repeating what I think is accurate information may I just ask Mr. Stoiber to answer for me?

Senator McCLURE. Yes.

Mr. STOIBER. Senator, my reading of the statute is that it does not intend in any way to abrogate agreements already negotiated and in force between the United States and recipient nations. What it would do is to state in the section calling for renegotiation several provisions which we would hope to achieve with new negotiations. It would then provide a reporting provision by which the President would come back to the Congress annually and indicate what progress has been made in securing the additional provisions in that section. Congress would then have an opportunity to review that report and determine whether or not it felt the progress was sufficient to continue the nuclear relationship between the recipient country and the United States.

If Congress thought progress was being made and the negotiations were going forward in good faith, then it would not be an abrogation. Congress therefore would have the final say under the bill.

Senator McCLURE. So Congress could abrogate the agreement on an annual basis?

Mr. STOIBER. Congress always has the power to withdraw its support of treaty relationships with other nations.

Senator McCLURE. I understand that. But what I am concerned about is what that does to our posture under international agreements and whether or not there is any predictability of certainty in those agreements that will lead to a continuation of the relationship. And the second question is somewhat related to that. And that is whether or not the, I think, 23 separate procedural steps that are required under the bill become so cumbersome that they almost force every nuclear customer in the world to seek another supplier, both because of the time that is consumed and the uncertainty that is subjected because of each of those procedural steps. Again I am in favor of the theory of this but how practical is it in application? Is there a time link? Can we establish time limits on these actions? Can we provide certainty to the outcome of the actions so that we can induce nuclear customers around the world to voluntarily come in under these arrangements? Or are we making it so uncertain and so cumbersome that they will seek a supplier with a more certain and less cumbersome supply mechanism?

Dr. HENDRIE. Well, Senator. I don't know how you judge the present situation. I am not sure that you are regarding this as entirely satisfactory. But at least in its way it works.



The bill, so far as I understand it, does not make any notable changes in what we are now doing. The executive branch still has to form its opinion, and coordinate its opinion among the several agencies involved. On our side we receive at one time then the executive branch collected views and we go ahead and apply the criteria which the bill lists, which is rather similar to the procedure we do now but simply defines and makes explicit those criteria in a very helpful way, and we approve or disapprove.

Now really the new steps which the bill introduces are a subsequent possibility of an override by the President, and in turn then an oversight review by the Congress of that override. But I expect those provisions wouldn't be normal parts of most licensing cases. So I think the procedure laid out by the bill is not that different from what we are doing and I see no reason for it to bog us down.

With regard to setting times, the time varies considerably for license action. We have taken a look at some of the recent cases. The time varies from 3 to 4 months for a fairly minor export license case to 9 months and more for a major one.

The bulk of that time is on the executive branch review side, and in a minor case it may take 3 months altogether. The NRC action will typically come with 1 week or 10 days of receiving the executive branch views.

For a facility, clearly a major action, the overall time will run 9 months to 1 year. But again the NRC at times will be 1 or 2 months after receipt of the executive branch views.

The fact that the export licenses cover a broad range of items, from a really minor amounts of byproduct material and minor sorts of things all the way up to whole facilities, whole fuel-cycle factories in principle at least means that a single set of required times just won't fit each set of times appropriate for licensing a facility would be unreasonably long and quite inappropriate for simple licensing for materials.

Senator McCLURE. What is a reasonable time, even for a relatively major action?

Dr. HENDRIE. Well, I expect on the NRC side that except in rather extraordinary cases 2 months covers us for everything.

Senator McCLURE. I understand that some decisions have been pending for over 2 years. Not just in NRC, of course.

Dr. HENDRIE. Well, if the case is in the executive branch and those views have not been formally transmitted—

Senator McCLURE. You have no view as to whether the administration's executive branch is reasonable in their time limits?

Dr. HENDRIE. That might be presumptuous, sir. And when you are talking to other people—

Senator McCLURE. I will be presumptuous for you or not. It seems to me there have been unreasonable time delays up until now and that is one of the reasons I am concerned. It has something to do with our credibility as a supplier and that in turn has a great influence on whether we have on international agreements.

If as a matter of fact we are going to be somewhat summarily disregarded as a supplier, then we have very little influence over the supply mechanism.



Dr. HENDRIE. I think that is correct.

Senator McCURE. What is a weapon's grade material? How do you define that so that you could make a differentiation between a weapon's grade material and the material which is not weapon's grade, whether it be in the timely warning or otherwise?

Dr. HENDRIE. Well, as a general proposition, getting the fissionable isotopic component of a fuel mix at or above is about 20 percent gets one into a category where I believe at least a crude sort of weapon might be fabricated. So for my purposes weapon's grade material is 20 percent enriched and above.

Senator McCURE. It is possible to fashion a crude, not too efficient bomb out of the used fuels and commercial process. Now is that a weapon's grade material?

Mr. GILINSKY. Yes, it is, Senator. I mean if you are speaking simply about pure plutonium, which is highly irradiated and in a commercial reactor, there is no question that is material from which you can fashion a highly powerful weapon.

Senator McCURE. Again I have absolutely no hesitancy in saying it is desirable that we get those under control and it is desirable that we get the arrangements made with other countries that are both suppliers and users to agree. But how far we can move unilaterally without their agreement I question, hence my concern.

And, finally, the House measure has a provision in it concerning the components which might be used without regard to the fact that they might possibly be used for something else and would put the NRC in a key role in the export of what would otherwise be classified, what might otherwise be classified as purely industrial or technically equivalent of components.

I am troubled to know how you would determine in advance how those materials or components might be used to determine whether the NRC ought to be involved in it.

Dr. HENDRIE. The intention, Senator, is to allow the commission to form a list of materials and items that seem to be particularly sensitive with regard to weapons capability. And our intention would be to keep this list fairly circumscribed on other materials and materials that have general commercial uses.

Senator McCURE. Well, how about a sophisticated computer?

Dr. HENDRIE. I would regard that as an item in normal commercial trade which does have possible—depending on the type of computer and who it is going to—application to weapons development. I would regard that as a license action on which we would probably consult with the Commerce Department but it would be a Commerce Department license.

Senator McCURE. I refer to page 26 of the House report, and read this. In regard to Section 506: Licensing of Component Items and Substances, and I will just read, it is very short.

This section closes an important loophole in the Atomic Energy Act of 1954 by amending section 109 of that act to require an NRC license for any export which could be used in a nuclear facility regardless of the particular end use for which it was originally signed.

It was this loophole which permitted export of sophisticated computers for use in an unsafeguarded South African uranium-enrichment facility without an NRC license, simply because the computers were not specifically of a design for use in nuclear facilities.



This amendment provides that all such exports must be fully licensed whether they come under peaceful use assurances. It seems to me that is a naively simplistic assumption that you can determine in advance where the computer is going and how it is going to be used, and in advance require an assurance that they will never use it for any other purpose.

Dr. HENDRIE. Well, I think you touch upon a problem, indeed, Senator. With a sufficiently broad sweep of interpretation as to what items and substances might have applicability to weapons capability, I wouldn't be surprised if you could sweep a fair part of international commerce under this provision. It is our clear intention in agreement with the Commerce Department that will not occur.

Senator McCLURE. It doesn't sound like that is what the House intends should occur.

Dr. HENDRIE. Well, the language you read does raise that sort of question.

Senator McCLURE. I am troubled by it because I understand what they are getting at, but I don't see how you can get there from here just by simply saying you've got the responsibility.

Dr. HENDRIE. Well, it means the Commission has the problem in forming a list of items and substances which, as I say, I hope will be a fairly limited list.

Senator McCLURE. You could have a heavy truck that might be used to transport components subject to such licenses?

Dr. HENDRIE. I wouldn't think so.

Mr. GILINSKY. In some of these cases I would imagine the end is indeed specified. In other words it is indicated that the computer would be used for a nuclear plan. In some cases it might be an integral part of the nuclear plan system, control system or whatever. And there I think the matter would be with a good deal of clarity.

Senator McCLURE. It doesn't require much imagination on my part to assume that if they find difficulty on that score they simply specify a different end use.

Mr. GILINSKY. Well, I am not sure what the rules are in Commerce and how strictly they were enforced.

Senator McCLURE. I think certainly if it is a component in a plant and there is a discreet list of equipment going into that plant, it would be subject to this requirement. That causes me no trouble. If people desire to make this work, of course, it will work. But if you desire to subvert it, it seems to me it would be rather simply to subvert it.

Dr. HENDRIE. That is so.

Senator McCLURE. Thank you. I have no further questions.

Senator CHURCH. Thank you very much.

Senator DOMENICI, do you have any questions?

Senator DOMENICI. I want to say to you, Mr. Chairman, that I apologize for not having participated more in these rather urgent meetings. I hope that the chairman understands that there are three other committees meeting at the same time.

Senator CHURCH. Surely.

Senator DOMENICI. Let me ask three or four questions if I could.

We have, as I understand it, some indication of real concern as to whether or not the United States can act as a reliable nuclear supplier under this act. In particular, there is concern about the act not assur-



ing a customer that an export license would be issued even if the customer agreed to our new export conditions and honors its agreement. It is contended that the act sets up a maze of Presidential exceptions and congressional reviews which would consume years before the outcome on the issuance of a license is known.

Now, with reference to the provision on page 65, which says: No such materials or technology proposed to be exported, or previously exported and subject to applicable agreement or cooperation, and no special nuclear material produced through the use of such material, facilities or sensitive nuclear technology will be used for any nuclear explosive device or for research on a development of any nuclear device.

Now it appears to me that there is almost no way for you to make the findings required to be certain that any particular proposed exports will not be used for any of these things.

What does a paragraph like that do?

Dr. HENDRIE. Well, there are other sections from which we require from the licensee a pledge to observe that criteria. And indeed the Nation's adherence to the nonproliferation treaty I think fills that need.

Mr. GILINSKY. May I comment on that, Senator? The problem we have gotten into in the past is that our agreements excluded non-military uses.

Senator DOMENICI. Say that again.

Mr. GILINSKY. Our agreements with our trading partners excluded nonmilitary—it excluded military uses of nuclear energy or peaceful uses and, unfortunately, ambiguities crept in when the countries started talking, ourselves included, about peaceful explosions. And we know what happened in India, where a question of whether a contract was violated or not turned on whether you called the device peaceful or non-peaceful. And this is really designed to obtain unambiguous assurance that all explosive devices are included in the pledges that restrict the use to peaceful uses.

Senator DOMENICI. But I think this bears in a major way on whether we will be able to act as a reliable supplier. Is this not a finding that must be made by the Nuclear Regulatory Commission?

Mr. GILINSKY. Yes.

Senator DOMENICI. And are not findings challengeable. And wouldn't that possibility in and of itself create a great delay in terms of contentions about the literal interpretation of that paragraph?

Mr. GILINSKY. I would think that if we had agreements on this point that would satisfy the matter. The problem is that we also deal with countries who have not signed the nonproliferation treaty, and, therefore, they are not strictly speaking excluding all explosive uses of nuclear energy in their activities and with whom we do not have an explicit bilateral arrangement on this point. This is a matter that is being corrected but it is not entirely corrected.

Senator DOMENICI. I don't want to belabor this point, but if I understand your interpretation, an unequivocal agreement on this point would satisfy the findings. Is that what you are saying?

Mr. GILINSKY. That is my understanding. Also, you mentioned a reliable supplier. Certainly we want to be a reliable supplier to those countries that agree to accept a degree of discipline in the use. We are



not to be a nuclear patsy here, and the two go together. The acceptance of a degree of discipline in the use of this material and the use of these facilities and the other side of it being that if you do accept the discipline then you can be assured that you will have access to the materials and facilities.

Senator McCURE. As I understand your answer is that if they agree, if the agreement provides, that is a sufficient basis for your finding and the only required basis for your finding.

Mr. GILINSKY. For that provision.

Senator McCURE. Would that also apply to the next subsection?

Mr. GILINSKY. Well, let me say—I have to qualify this.

Senator CHURCH. Gentlemen, we are running out of time, and we have two more witnesses and I have to be out of here by 10 o'clock.

I think that on this particular point, Senator Domenici and Senator McCure, it is a good point you make. The administration has suggested that in the report that accompanies the bill the Senate should make clear that this finding is adequately made, based upon reasonable evidence that the purchasing country will not—

Senator McCURE. What is reasonable evidence is a matter of fact and that would be subject to challenge.

Senator CHURCH. I suppose there is no way you can get away from that but the proposed statement in the report would make clear that an agreement by the country, a commitment, an unqualified commitment by the country would be acceptable reasonable evidence that would satisfy the statute.

Mr. GILINSKY. May I make one point, Senator?

Quite apart from any pledge, if the United States has evidence that the country is engaged in a weapons program, it is very clear that the executive branch is not going to recommend to us the export in that area. To continue, obviously if there is a common defense of security finding that overlays this entire area.

Senator CHURCH. All right.

Senator DOMENICI. What the Chairman said is still right as to this paragraph. Are you saying that if you have other evidence of an ongoing program that is inconsistent, you are covered somewhere else in the act?

Mr. GILINSKY. That is right. That is my understanding.

Senator CHURCH. The determination has to be well grounded on the evidence, all of the evidence.

Senator McCURE. I have one concern of which I hope we will cover before we finish that, and that is who makes the determination and is that challengeable in every export action by intervenors in that action?

Mr. STROBER. I think that your concern is not warranted. I may be the only person in the room who has litigated cases involving intervenors in nuclear export matters, so I know whereof I speak. The bill is helpful because section 126 provides that procedures which the Commission is to develop in its regulations are to be the sole basis, the exclusive basis for any challenge of export licensing action. That gives NRC an opportunity to provide by rule that only intervenors with very clear interests in the subject matter shall be able to challenge export actions, even before the Commission. The courts are also very circumspect about allowing people with very remote interests to intervene in these kinds of matters.



Senator McCLURE. Mr. Chairman, I am aware of the necessity of going on but I feel just one sentence further—That is true within the internal processes of the agency but not following the agency action.

Mr. STOIBER. I believe impact would be the same on legal challenges in the courts.

Senator McCLURE. You are satisfied that intervenors could not challenge the finding of the NRC?

Mr. STOIBER. No. I think there is an opportunity for challenge, but this bill does not create any greater opportunity for challenge than exist now.

Senator McCLURE. It gives a greater opportunity for challenge because it sets up new criteria which must be met, new findings that must be met.

Mr. STOIBER. Not really. Intervenors can now challenge our finding on the common defense and security requirement which is even less precise and less certain than the new criteria.

Senator McCLURE. But harder to establish and this is much easier to establish.

Senator DOMENICI. I have no further questions, Mr. Chairman.

Senator CHURCH. All right. I observe in passing that we are currently providing 90 percent of the free world's enrichment services but this percentage is likely to drop sharply in the next 10 years. And as it drops, so will our capacity to influence the shape of the future and in attempting to deter proliferation of nuclear weapons. So time is running out on us. We had better be right on this bill. We may not have another chance.

What new enrichment services are likely to be developed by other countries in the new few years?

Are you aware of other countries developing nuclear enrichment services, nuclear energy plants?

Dr. HENDRIE. Well, let's see. I believe there is a French diffusion plant coming along and a centrifuge plant. There are possibilities in Europe; in fact, some are underway.

Senator CHURCH. You mentioned South Africa. Does South Africa have a centrifuge plant? Does it have an enrichment requirement?

Dr. HENDRIE. I believe there have been reports in South Africa that have said that they have a gas nozzle enrichment process which in a way, I guess, is a centrifugal separation process. I don't believe we know very much about it, or its effectiveness, and I don't believe the process is in full operation.

Senator CHURCH. Thank you very much.

Because of the shortness of time I am going to ask Dr. Gerald Tape and Mr. Stathakis if they would come up together.

Dr. Gerald Tape was a commissioner on the Atomic Energy Commission from 1963 to 1969, was U.S. Ambassador to the International Atomic Energy Agency from 1972 to until 1977. He has been the President of the Associated Universities, Inc. since 1969.

Mr. Stathakis is chairman of the Committee on Nuclear Export Policy from the Atomic Industrial Forum. He was a member of the panel of experts who wrote the OPA report on nonproliferation policy. Mr. Stathakis is also vice president for General Electric.



Gentlemen, I wonder if you both would summarize your statements so we will have some opportunity to question you, otherwise our 35 minutes will expire. We have to complete this hearing by 10 o'clock.

**STATEMENT OF DR. GERALD F. TAPE, PRESIDENT, ASSOCIATED UNIVERSITIES, INC., WASHINGTON, D.C.**

Dr. TAPE. Thank you, Mr. Chairman. May I first state that I am appearing before you really as an individual and not in any capacity with the Associated Universities, Inc.

I would like, if you would permit as you indicated, to place my statement in the record and to summarize very briefly therein and then perhaps digress and try to answer some of the other questions and points that have been raised during the hearings yesterday and today.

Had this hearing been held a month or two ago and I had the opportunity to appear then I think I would have been here urging your more favorable consideration for S. 1432 than 897. To me that bill is a much more orderly bill. It moves through in a way that I think our potential trading partners could understand what we are trying to achieve.

And some of the questions that you have raised this morning would indicate that I think it is subject to querulous tampering in the sense of procedures and other delays that might occur. However, the day is the day. It is my general belief that listening to testimony of others that S. 897 perhaps will be the basis for the consideration of the Senate and, therefore, what might be done there.

I perhaps will sound somewhat stronger than some of the other witnesses you have heard. In fact, my reading of S. 897 and my study of it, I come out with a feeling that it is a bad bill.

Now basically I am doing that from the point of view of my international experience, technical experience and what does it look like vis-a-vis the potential trading partner. If I were a foreigner and even if I knew English perfectly, I would find myself standing up shrugging my shoulders and saying, I don't see how I can predict the future if I am going to be cooperating with the United States.

So I think it is important, Mr. Chairman, that in the markup of the bill you do everything you can to try to put it in a context and format, a tone, if you will, which will indicate to these potential partners that indeed the United States has been responsible, a credible supplier. There may have been problems over the past few years. We are going to rectify those. And as Commissioner Gilinsky said a few minutes ago for those who indeed respect the nonproliferation objectives and join us in a full cooperative way, we want to be a credible, responsible supplier.

In that connection the first step in my view, Mr. Chairman, would be that you take the administration's recommendations that have been forwarded to the committees, because many of the points raised there I think are very vital. And I would argue that as a minimum should be incorporated in the revised bill.

Second, I would hope that the drafters in their revision would look very carefully at some of the points that have been raised. Namely, the various pitfalls, if I may call it that, the delays, the possibilities where it is precise and misunderstandings and so on, and again try to get the



tone, one of not heavyhanded U.S.-dominated leverage but one of full international cooperation. Because as you said earlier, we have a dilemma. Others don't agree with us in every case. The only possible solution is an international consensus.

In that connection, Mr. Chairman, some of the questions raised here have to do with delays even on the part of the executive branch or the Nuclear Regulatory Commission. It is a small point but I think the bill could be helped by some admonitions on the part of the Congress to the executive branch and to NRC that as was earlier said when the terms of the agreement are indeed being met that there should be an expeditious handling of these requests.

The exception, the exception is perhaps the most troublesome aspect. On the one hand we would like to have all our partners and believe that the world would be better off if indeed they were all nuclear proliferation treaty parties and these various restraints and various objectives were fulfilled by all of our partners.

On the other hand we are fully aware that there are cases as you heard yesterday from Dr. Nye, nonnuclear proliferation treaty parties may very well remain nuclear proliferation treaty parties, and the issue before us is will we refuse all future cooperation with such parties, which in my view will either drive them toward other national suppliers, or if those national suppliers observe and respect our goals will it drive that country to either developing an indigenous capacity or accelerating its already indigenous capacity. And those I think are very, very tricky political judgments which I would hope the administration and the Congress would recognize that we need some flexibility and some care in making those decisions.

Unfortunately, the countries involved are some of the most sensitive and in some of the most sensitive areas in the world and they tend to be caterers of a country, and as a consequence they can be some of our most important cases. In that respect, Mr. Chairman, I find that some exceptions from a rigid adherence to the policy as set down in the goals and criteria, some exceptions on occasion may be more vital to non-proliferation than a rigid go-no-go type treatment.

So I would urge some flexibility. I think the bill does have that. The fact that the President does have a role in being able to make exceptions to otherwise routine findings and the Congress has a chance to review.

A question was raised this morning I think by Senator McClure on the question of renegotiation and factors associated with that. I think, Senator, that the threat of renegotiation and in the eyes of many of our partners the fact that we are not producing as they at least had perceived that we would produce—and I am careful to say as they had perceived—has given us considerable problems in the last few years and certainly has given rise to uncertainties with respect to credibility.

Associated with that was our ability to insure low, enriched uranium on a timely schedule for many. We didn't have the capacity. So I believe that the credibility theme is perhaps one of the major aspects in how the world looks at us, in terms of whether we are indeed going to fulfill the nonproliferation policy in an orderly and reasonable way or not.



I, myself, although I understand the President is very keen on the renegotiation, it is my understanding that for agreements now in force with very few exceptions, the agreement in force, side agreements that may have been arranged in addition to those letters exchanged and so on, the upgrading of the meaning of peaceful nuclear explosive is not a peaceful explosive, it is a nuclear explosive. The fact that safeguards and agreements with the IAEA now clarify those issues, and many of those already exist in the totality.

So where the legislation says renegotiation, renegotiation or otherwise, I would underline the otherwise, because it seems to me that the administration, the executive branch and the Congress should be satisfied by the collective agreements that exist between two nations rather than just simply, let's renegotiate to put it into one tiny package that has to do with the present commitments.

There are some exceptions, Senator, and I make no bones about it. It would be well to get those tidied up, too, but let's not waste what brownie points we have for what amounts to very little gain.

Going back to the concept of the international fuel authority, or international supply, these questions have been asked. I think there is an exceptionally good concept. I myself believe that it warrants considerable study. I have some difficulties with it because I think very little and it is imprecise in our understanding.

For example, if we go ahead as we are and increase our nuclear capacity, why isn't the United States a good, credible supplier that can deliver as we have in the past? So why do we need it?

Well, one can argue we need it because the administrations change, ideas change, they need some assurance that we will continue in that. And I think that is good. On the other hand, I think the United States has to come to grips with what is the international fuel supply serving in the foreign policy field. If it truly should serve our nonproliferation objectives, and I think it should, then in a way I don't see that we need this international body. On the other hand, if we turn around and start using it as an instrument of foreign policy and unrelated to nonproliferation fields, then we may be suspect. And here is where I think political considerations have to be made we respect to foreign policy.

And then the whole problem, how do we do it? How do we set it up? Who finances it? Who runs it? And so on. I prefer to see the bill push the concept and leave open the details of how it might be achieved. But I think it should be pursued.

I myself would not stop with just fuel assurance. I would like to see the same international considerations on the back end of the fuel cycle. And I believe indeed that the international fuel cycle evaluation program, which is underway, will address that.

I was pleased to hear Dr. Nye say yesterday that reprocessing will be one of a number of elements considered in that study. I think that by spring had we come out and said that reprocessing was an alternative which we want to study and make sure of just as much as the proliferation resistance concepts, our reception in the international community would have been quite different.

Mr. Chairman, I might stop there. I think if you will permit me a little bias, having served as U.S. representative to the IAEA I visualize that the IAEA can play a strong role in many of these inter-



national activities. I think—it is basically a technical body. I recognize that is not immune to political factors that is working in the international environment. Except for its safeguards role, it really is not an operating body. It is more of an information body and a deliberative body in international cooperation.

On the other hand, it has experience, it has history and it has a demonstrated capability of working in the international nuclear field. I am pleased that I learned yesterday that they will be participating in this international nuclear fuel cycle evaluation program meeting here in October. I think they can serve a number of roles to bringing parties together which then might give rise to another organization which would do a job.

One may even visualize an operating subsidiary, let's say, of the IAEA. It might handle things of this order or it might become a part of the agency itself. I think you know that the agency was involved and do a multinational regional reprocessing study. It did indeed look in a preliminary basis on plutonium materials control and handling recognizing the fact as we heard this morning that plutonium is a material that needs extra sensitive attention.

Unfortunately, from my point of view the administration's position on no-rate processing and no plutonium, or at least the inferment in that has in effect a soft pedal, but I think it should be back in those discussions.

And thank you, Mr. Chairman, why don't I stop there.

Senator CHURCH. That is a good place to stop because I am in full agreement with what you have said.

Dr. Stathakis?

Mr. STATHAKIS. Just Mr. Stathakis.

Senator CHURCH. We are happy to see you, Mr. Stathakis.

#### **STATEMENT OF GEORGE J. STATHAKIS, CHAIRMAN, COMMITTEE ON NUCLEAR EXPORT POLICY, ATOMIC INDUSTRIAL FORUM**

Mr. STATHAKIS. Thank you, Mr. Chairman. I will try to summarize my remarks very briefly.

I would like to point out in the beginning here that I have today two colleagues with me from General Electric, Mr. Kerr and Mr. Dankmeyer.

I would also like to add to your introduction, Sir, by pointing out that I have been involved in the nuclear export business for over 20 years and in efforts involving more than 20 countries.

I am in complete agreement with the primary goal of the nonproliferation measures proposed in the Congress; namely, to avoid the spread of nuclear weapons and in particular to minimize the possibility that nuclear power development will contribute to weapons proliferation.

But I continue to believe that these legislative proposals, including S. 897 and S. 1432, will not achieve these objectives and are much more likely to reduce U.S. influence in this vital area.

I believe that the United States can do more to control proliferation by reinvigorating its leadership in nuclear technology than by entering a new period of virtual isolation.



The primary interest of most nations today, particularly those with little or no fossil fuel reserves, is not in atomic weapons but in nuclear energy and the relief it can bring from energy imports.

Our participation, that is, the U.S. participation in the international nuclear market today is sharply diminishing. The U.S. share has declined in the past 5 years from about 90 percent to approximately 40 percent today.

This is not because our products lack competitiveness. Rather, we are facing a crisis of confidence. Customer nations that have committed themselves to U.S. nuclear technology now see their energy future confused because of changing U.S. nuclear policies which appear to many of these countries as unfair, arbitrary and inconsistent with past practice. This uncertainty tends to divert customer nations to non-U.S. suppliers who give stronger supply assurances.

Actions taken in the name of nonproliferation that have the effect of reducing our nuclear technological leadership are self-defeating. They only weaken this country's ability to influence nonproliferation arrangements at the international level.

The proposed Nuclear Nonproliferation Act, S. 897, represents an effort to deal with some of these realities of the international nuclear situation, and it does attempt to balance the need of the executive branch for flexibility to negotiate toward achievement of our nonproliferation objectives and to avoid counterproductive action. And it balances that against the desire by Congress to establish appropriate criteria and congressional controls.

I believe that a clear understanding of a lot of these problems has emerged over the last 2 years or so as the deliberations on this legislation has gone on.

However, the essential difficulty in reconciling these divergent needs is obvious in the extraordinary complexity, indeed, paralyzing dichotomy, of the proposed legislation.

For example, under S. 897, the executive branch makes the finding of whether an export license would be "inimical to the common defense and security."

If the executive branch determines that it is inimical, the NRC may not issue the license. But if the executive branch says it is not inimical and the NRC does not issue the license, the executive branch can issue the license, and in this event the Congress can overrule that decision.

This complex relationship between executive action and congressional review which applies to a number of matters under S. 897 would in my opinion create great uncertainty as to whether a particular license would ever be issued, and leave user nations with little faith in U.S. supply credibility.

I think the bills thus represent an attempt to legislate the results of matters which must be negotiated with other nations. Or stated differently, they attempt to impose on other nations a U.S. determined set of solutions to weapons proliferation concerns.

Other nations, particularly some of our important allies, do not share the U.S. Government's view on the most effective means of achieving nonproliferation objectives or on the proper balance between energy supply and weapons proliferation concerns.

I would just like to point out that there is in effect today an elaborate nonproliferation framework which has been built up over many



years in which Dr. Tape played a key role, as you know. And I think that some of the legislation that is being proposed could have a tendency to even destroy the present regime, and will not certainly add anything to it.

I would say that with regard to substantive policy on nuclear exports, my personal view is that Congress should limit its role to the establishment of goals for these negotiations and the requirement for periodic reviews of progress.

If the executive branch does not pursue these negotiations diligently, a result which seems most unlikely today, or if the efforts fail, Congress can then decide what further legislative steps might be appropriate.

In brief summary then, it is my opinion that the serious deficiencies of the proposed legislation, after such protracted and dedicated effort, demonstrate the impossibility of legislating international acceptance of our nonproliferation policies. That acceptance can only be achieved by agreements negotiated with user and other supplier nations.

The proper role of Congress in that process, it seems to me, is to establish goals and criteria toward which the executive branch should move with periodic reports of progress to Congress, and the establishments of a straight-forward licensing procedure which insures that the provisions of agreements for cooperation are being observed.

I believe this would greatly enhance U.S. credibility and participation in the worldwide supply of nuclear energy for peaceful purposes and thus significantly increase our ability to achieve the nonproliferation goals which are so vital to world peace.

Thank you, Mr. Chairman.

Senator CHURCH. Thank you very much for summarizing your statement. The entire statement will appear in the record along with the entire statement of Dr. Tape.

[The prepared statements of Dr. Tape and Mr. Stathakis follow:]

STATEMENT OF DR. GERALD F. TAPE, PRESIDENT, ASSOCIATED UNIVERSITIES, INC.,  
WASHINGTON, D.C.

The legislative proposals under consideration are S-897 (as reported by the Senate Committee on Governmental Affairs) and S-1432, both entitled "The Non-Proliferation Act of 1977". Their objective is to provide for U.S. civil nuclear cooperation with other nations under conditions which will prevent, or at least discourage, nuclear weapon or other nuclear explosive proliferation. Agreements for such cooperation must rely on responsible actions by all parties; they will of necessity require constraints and incentives.

The question before us is: Will these bills, if passed into law, further U.S. objectives for non-proliferation, or, at the opposite extreme, might they be counterproductive by reducing U.S. influence, thereby increasing the risk of proliferation?

This Subcommittee and other Committees of the Senate have already received testimony on S-897 and S-1432. While there is unanimity on the objectives, the debate generally has centered on how best to achieve those objectives. Differences, where they exist, arise from different initial assumptions, different points of view especially on the role of nuclear energy, and different judgments. Before specifically addressing the bills under consideration, I wish to set forth some of the considerations that have led me to my conclusions. My views are considerably influenced by my background and experience in atomic energy, both in technical matters and in international affairs.

The foundation for the U.S. program of cooperation in atomic energy has four elements: (1) the Atomic Energy Act of 1954, as amended; (2) the International



Atomic Energy Agency; (3) the Non-Proliferation Treaty; and (4) the economic, technical and diplomatic resources applied by the U.S.

Our future actions in achieving non-proliferation goals should build upon and strengthen the institutions and mechanisms we now have. If they are destroyed, there is no way that they can be replaced by something better. The international character of the problem underscores the requirement for bilateral, multilateral and international consultations and agreements; solutions must be mutually acceptable. Unilateral actions by one government, especially those that tend to alter or expand previous agreements or understandings, will be perceived as a breach of faith and in the long run will be counterproductive.

Because the U.S. has been a longtime world leader, especially in the nuclear field, it is tempting to take the position that we know what is best for the world and for the various nations therein. But there now are other industrialized nations sophisticated in nuclear technology, and modern communications and routine dissemination of information have made many developing nations knowledgeable. There are differences among nations in economic conditions, in levels of development, in national security needs and in cultural backgrounds. National sovereignty exists and cannot be ignored. I have upon occasion asked myself what our reactions would be to some of our U.S. positions if the roles were reversed, that it, if we were the seeker of assistance and not the supplier. We need to consider our policies from both points of view.

In my view, an NPT party non nuclear weapon state (NNWS) desiring to obtain a nuclear power plant and associated fuel supply services would be prepared to accept stringent proliferation controls provided it has firm assurances that the continued fulfillment of the agreement on its part would result in essentially routine export of the called for materials and services as needed over the life of the agreement. The case is less clear for a non-NPT party NNWS and will have to be considered on a case by case basis. The basic issue, however, is whether or not the U.S. will fulfill its obligations under the agreement and not use subsequent agreements and export licenses to "up the ante". The answer to this question will be a major factor in determining whether or not the U.S. will be a responsible and credible partner. If the answer is ambiguous, the potential customer will seek cooperation elsewhere or, in the extreme, may initiate or accelerate his own indigenous developments. Either of these latter courses would erode the U.S. role as a strong non-proliferation force. Thus any process of implementation that is subject to uncertainty, delay, interference, etc., will be suspect.

In my view, the Non-Proliferation Act of 1977 should reassure our cooperating partners that the U.S. is a responsible supplier and that, in turn, it expects the agreement nation to maintain effective non-proliferation measures. The Act should clearly indicate with respect to

I. Agreements for cooperation and their implementation: That we support strongly the IAEA and the NPT; that we will honor past agreements for cooperation, but will seek the nation's assurance through modified agreements or other means to remove ambiguities vis-a-vis certain generally accepted current constraints, e.g., no PNE's, physical security, etc.; that we will in new agreements for cooperation establish criteria more realistically reflecting generally accepted non-proliferation constraints and, short of unforeseen events that could affect the national security interests of the U.S., would anticipate essentially routine processing of export licenses as long as the conditions of the agreement continue to be met satisfactorily; and that we will consider exceptions but only if such will enhance the non-proliferation objectives of the U.S.

II. Assurances of supply and service: that we will aggressively seek to provide assured nuclear fuel (enrichment services) supply through expansion of U.S. production and through international cooperation, including the possible establishment of international mechanisms of supply; that we will aggressively, through international cooperation, seek more acceptable proliferation-resistant systems (reactors and associated fuel cycles); and that we will aggressively, through international cooperation, develop and provide for an interim solution to the back end of the fuel cycle, including possible multinational/international mechanisms for spent fuel storage and sensitive nuclear materials control.

Most of the above elements are contained in the bills before us; however, the bills are quite different in presentation, preciseness, procedural complexities and potential snags. In my opinion, S-897 is not a good bill; I fear that it will turn potential future customers away from cooperation with the U.S. Such an event would not only be detrimental to U.S. non-proliferation interests but would have many other effects, such as the impact on U.S. industry, loss of exports, etc.



I find S-897 confusing, especially with respect to what a cooperating partner can expect and the hurdles he must overcome. In its order of presentation, it addresses subsequent arrangements, export licensing procedures and criteria, additional export criteria, termination of exports and, finally, the negotiation of the basic agreements for cooperation.

In addition to the normal time-consuming bureaucratic determinations, there are the 60 day Congressional review for the Agreement for Cooperation, and the 15 day review for each subsequent arrangement. With respect to the issuance of export licenses, there is no admonition for timely action by NRC, and, in the event that NRC cannot arrive at a decision but a Presidential determination is made to proceed, there must be further Congressional review with the possibility of a veto. There are additional instances, generally connected with exceptions, for which delays will be commonplace. Also, there are instances where actions of the Administration can be overturned by a vote of either House.

To list another procedural matter that can do nothing but convey to our partners a negative tone and therefore a discouraging approach, Section 309 calls for a new Section 130 in the Act that inter-alia would require a resolution to be introduced on any Presidential submission subject to the procedures of this section and that such resolution shall be introduced in a negative form, that is, disapproving the President's action.

Mr. Chairman, there are far too many built-in deterrents to effective cooperation. The probability of delay and ultimate veto is too high for most potential customers to accept, especially when such can arise after the basic agreement has come into force. How can a customer be assured that extraneous factors will not influence continuing cooperation?

S-897 tends to prejudice future determinations. The introduction of the concept of "timely warning" as a condition for obtaining U.S. approval for reprocessing will, in the eyes of the most technically informed, be construed as legislating against future reprocessing now. It is a most objectionable condition and, in my view, unacceptable.

While the concept of an international assurance for fuel supply is a good one, it needs to be examined in considerable detail. In a sense, it is contradictory. If the INFA is based on non-proliferation policies that are consistent with U.S. policies, why should a customer be concerned that it would be cut off from U.S. supply? It would appear that such concern would arise only if the U.S. uses nuclear fuel supply as an instrument to promote other foreign policies. We can't have it both ways; if nuclear fuel supply is used to support constructive non-proliferation policies, it can't also be used to support other, especially unrelated, foreign policy objectives. Study the concept, yes. But let's not try to define the outcome in this bill.

In sum, I fear that a potential cooperating nation, after studying S-897, would conclude that its future nuclear imports would be more assured by a supplier other than the U.S. I might add that any financial inducements resulting from U.S. supply, such as a lesser cost of acquisition and favorable financing, would have little impact on the final decision, since political factors and government credibility are of overriding importance.

Let me now turn to S-1432. Although there are some changes I would recommend, they are minor compared to changes required for S-897. In the organization of S-1432, the initiatives are generally set apart from the proposed legislative changes in the Atomic Energy Act.

Chapter I, U.S. Initiatives for International Cooperation, recognizes that U.S. policies can be only as strong as internationally accepted commitments.

Chapter II, U.S. Initiatives to Strengthen the IAEA, reinforces U.S. initiated programs already underway to augment and strengthen IAEA activities, especially safeguards. It also recognizes that training is needed for national programs as well as for the IAEA.

Chapter III, U.S. Initiatives for Assuring Adequate Nuclear Fuel Supply, addresses major deficiencies that have existed in the U.S. program in recent years; namely, inability to make hard commitments for enrichment services and inability to provide timely export licenses due to indecision, chiefly on the future of reprocessing of fuel of U.S. origin or fuel utilized in U.S. supplied reactors. This Chapter is firm in its approach to assured enrichment services, vague as to assured supplies of source material, and, while firm on no reprocessing now, defers the question of the future handling of back end of the fuel cycle pending the NFCEP.

Chapter IV, Agreements for Cooperation, is the heart of the legislation. Section 401 sets forth conditions for new agreements as they should be incorporated.



into Section 123 of the Atomic Energy Act. The new conditions that may cause concern are essentially extensions of NPT constraints to any NNWS and the added constraint of no reprocessing or storage of sensitive weapons grade materials without U.S. approval.

Until recently I have argued that application of full scope safeguards should not be a condition for continuing cooperation under new or old agreements. Many non-NPT party NNWS are states that we would like to discourage from developing their indigenous capabilities, and increasing safeguards coverage should be encouraged. Given the possibility of exception by the President for such special cases, I now support inclusion of the full scope safeguards condition for the standard agreement, recognizing that this should lead to "routine" negotiations of the agreement and follow-on actions.

The added constraint for all NNWS including NPT parties is the insistence by the U.S. of approval for reprocessing or for storage of spent fuels of U.S. origin or utilized in reactors of U.S. origin or their derived sensitive nuclear materials. The basic difficulty stems from the present U.S. policy calling for an indefinite deferment of all reprocessing, the uncertainties associated with the disposition of irradiated fuel and the possible need to import larger quantities of uranium to meet on-going fuel requirements in the future. The open endedness and the unilateral aspect of this condition makes for great uncertainty, an intolerable situation for plant operators.

Section 403 calls for an immediate program to renegotiate agreements for cooperation or otherwise to obtain the agreement of the parties to undertakings that would be required under the Act. I stress otherwise to obtain agreement. It is my belief that, with few exceptions, most of the conditions are already covered in the U.S. bilaterals, side documents or related letters. I firmly believe that a hard line renegotiation effort to bring all existing bilaterals and international agreements into uniformity with new criteria would provide little, if any, real reduction of non-proliferation risk and could damage U.S. credibility as a responsible partner in cooperation. The important point is not renegotiation of an agreement in form, but a clear recognition of all of the commitments by the parties.

I would like to digress from the bill for a moment and note that achievement of non-proliferation goals is not just a technical matter. There are many nations that have the technical capability and the resources to construct a nuclear explosive. Their decision to do so or not to do so is a political one. It is in the political arena that diplomacy can work; and I am happy to say that it does work.

Returning to S-1432, Chapter V, Clarification of Export Functions, follows naturally from the foregoing sections. Once the agreements for cooperation are binding, as long as the recipient country is fulfilling its obligations, I would anticipate an essentially routine issuance of the export license. To be sure, a determination is needed that nothing unusual has occurred such that the export would be inimical to the national security interests of the U.S.

The criteria in the bill bridge the old and the new. They collectively cover constraints that we seek today. New agreements will be more restrictive; as old agreements are renegotiated, they may be more restrictive. Provision is made (Section 127 d.) to upgrade the export criteria at such time as renegotiation and international agreements will permit. This is an orderly approach.

A non-proliferation bill is needed—a good one that will encourage nations to cooperate in achieving mutually acceptable non-proliferation goals. A bill that is negative in tone and heavy handed and that exposes the cooperating nation to successive possible rejections will discourage cooperation with the U.S. and we will lose our influence.

Administration witnesses have testified that, subject to certain significant modifications, they could support an amended S-897. I agree with the modifications they have proposed and would insist upon their acceptance as a minimum. Even with such modifications, I remain concerned that S-897 will discourage cooperation with the U.S. Further improvement could be made by the introduction of positive statements emphasizing that the thrust of the bill is to simplify procedures for NPT parties. Also, a statement admonishing the Administration and the NRC to be expeditious in the handling of licenses that fully conform to criteria is another example of a more positive approach.

The handling of Presidential exceptions in S-897 is so complex and subject to so many examinations that one gets the impression the bill is trying to discourage the processing of any exception. If so, this is unfortunate. The exception



may be the most constructive action we could take in slowing down a non-NPT party NNWS from more fully developing its indigenous nuclear capabilities. A positive approach to cooperation, even though the terms might be less than we would normally require, could very well have greater non-proliferation significance than for a routine case. I urge the Committee to examine and, if possible, remove some of the endless steps for Congressional review and possible veto in such cases.

And lastly, the bottom line for decision-making is economics. No matter how hard we strive for environmental controls and non-proliferation controls on energy producing systems, there is an ultimate trade-off between risk and benefit. Not all nations agree with us that the risks associated with reprocessing, with the separation of plutonium and with its use in breeder reactors are so large that such activities should be referred. Their evaluations of risks and benefits differ from ours. They see the supply of nuclear materials capable of being used in a nuclear explosive as more likely coming from unsafeguarded facilities, such as a dedicated production reactor, a large research reactor or an isotope separation plant, rather than from safeguarded nuclear power plants and associated fuel cycle facilities. We must take their views into consideration; consultations must continue. Prudence and caution are in order; experience and realism are essential. Let's not, in an overly zealous pursuit of non-proliferation goals, "price" the U.S. out of the non-proliferation market.

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STATEMENT OF GEORGE J. STATHAKIS, CHAIRMAN, COMMITTEE ON NUCLEAR EXPORT POLICY, ATOMIC INDUSTRIAL FORUM

My name is George Stathakis. I am a Vice President of the General Electric Company and General Manager of its Nuclear Energy Programs Division. I appreciate the opportunity to comment on the nuclear non-proliferation measures, S. 897 and S. 1432, currently being considered by the Senate. I am appearing today as Chairman of the Atomic Industrial Forum's Committee on Nuclear Export Policy.

The Atomic Industrial Forum is a not-for-profit trade association dedicated to the development of nuclear energy for civil purposes. The membership comprises some 625 organizations, of which about one-sixth are located in countries outside the United States. Included in the Forum's membership are manufacturers, electric utilities, architect-engineer-constructors, mining and milling companies, universities, labor unions, law firms, financial institutions, service organizations, government agencies and consultants.

In various positions with General Electric, I have been intimately involved in the nuclear export business over the last twenty years, in efforts involving twenty countries. During the last two years I served on the Advisory Panel for the report entitled "Nuclear Proliferation and Safeguards" prepared by the Congressional Office of Technology Assessment.

I am in complete agreement with the primary goal of the nonproliferation measures proposed in the Congress—to avoid the spread of nuclear weapons and in particular to minimize the possibility that nuclear power development will contribute to weapons proliferation. But I continue to believe that these legislative proposals, including S. 897 and S. 1432, will not achieve these objectives and are much more likely to reduce U.S. influence in this vital area.

In my view the U.S. can do more to control proliferation by reinvigorating its leadership in nuclear technology than by entering a new period of virtual isolation. The primary interest of most nations today, particularly those with little or no fossil fuel reserves, is not in atomic weapons but in nuclear energy and the relief it can bring from energy imports.

Since an international capability for supplying nuclear power already exists, any action by the United States to limit its use or influence its manner of deployment in the cause of non-proliferation can only be successful in cooperation with the other supplier nations. Failure to achieve such cooperation, particularly in the critical area of assured fuel cycle services, will eventually eliminate U.S. nuclear suppliers from the international nuclear market.

Today U.S. participation in the international nuclear market is sharply diminishing. The U.S. share has declined in the past five years from about 90 percent to approximately 40 percent today. This is not because our products lack competitiveness. Rather, we are facing a crisis of confidence. Customer nations that have committed themselves to U.S. nuclear technology now see their energy future confused because of changing U.S. nuclear policies, which appear to many of



these countries as unfair, arbitrary, and inconsistent with past practice. This uncertainty tends to divert customer nations to non-U.S. suppliers who give stronger supply assurances.

Actions taken in the name of non-proliferation that have the effect of reducing our nuclear technological leadership are self-defeating. They only weaken this country's ability to influence non-proliferation arrangements at the international level. In my view, the U.S. Government could best contribute to international control of proliferation by taking constructive steps that include:

Providing guaranteed enrichment, reprocessing and other fuel-cycle services to user nations on a fair and nondiscriminatory basis; cooperating with other nations in placing the sensitive aspects of the commercial fuel cycle under more effective safeguards or international control; continuing to encourage other nations to sign the NPT and strengthen the IAEA; and following consistent nuclear export policies, in cooperation with other supplier nations.

During the two years of intensive effort by the Congress to develop controls over nuclear exports to further non-proliferation objectives, all have gained increased understanding of the great complexity of the problem. Most of us would now agree that the early legislative proposals were simplistic and that the most restrictive controls over nuclear exports are not necessarily the most effective in furthering our non-proliferation goals. It is now generally recognized that there is a fine line, beyond which controls can cause loss of U.S. credibility as a supplier, development by other nations of indigenous enrichment and reprocessing facilities and a deterioration of the fabric of the existing non-proliferation regime.

Furthermore, the line is not in the same place for all nations. Differing regional security problems, energy resources and needs, states of industrial development, and provisions of existing agreements are some of the important factors which must be considered.

There also has emerged a clearer understanding of other fundamentals—the international character of the problem, the existence of the weapons proliferation problem wholly apart from nuclear power, and the positive and negative impacts of nuclear power on weapons proliferation.

The proposed Nuclear Non-Proliferation Act, S. 897, represents an effort to deal with these realities. It attempts to balance the need of the Executive Branch for flexibility to negotiate toward achievement of our non-proliferation objectives, and to avoid counterproductive action against the desire by Congress to establish appropriate criteria and Congressional controls.

The essential difficulty in reconciling these divergent needs is obvious in the extraordinary complexity, indeed paralyzing dichotomy, of the proposed legislation. For example, under S. 897, the Executive Branch makes the finding of whether an export license would be "inimical to the common defense and security." If the Executive Branch determines that it is inimical, the NRC may not issue the license. But if the Executive Branch says it is not inimical and the NRC does not issue the license, the Executive Branch can issue the license, but in this event the Congress can overrule that decision. This complex relationship between Executive action and Congressional review, which applies to a number of matters under S. 897, would create great uncertainty as to whether a particular license would be issued, and leave user nations with little faith in U.S. supply credibility.

Much could be done to simplify and increase predictability, at least as to reactor exports, if two basic principles were followed. First, the substantive requirements should be set forth in the agreement for cooperation and subsequent changes in such requirements would accordingly require amendments to such agreement. Second, the export license procedures should be designed to confirm that the individual transaction conforms to the requirements of the agreement for cooperation.

A fundamental point which S. 897 and S. 1432 seems to miss is that more effective non-proliferation policies can only be achieved by new international agreements and that such agreements require negotiations conducted by the Executive Branch with other nations. The outcome of this process cannot be dictated by U.S. legislation.

In view of the nuclear capabilities of other supplier nations and the energy needs of most of the world, it is generally recognized that nuclear export policies can only be effective if they are reasonably acceptable to user nations and are followed by other supplier nations. The legislative proposals currently being considered by the Congress are deficient in both respects. The energy needs of user nations are not effectively recognized, and inadequate provision is made to



take into consideration the views of other supplier nations. In my view, the Administration's decision to defer reprocessing, plutonium use and breeder development suffers from the same fundamental defects.

These bills thus represent an attempt to legislate the results of matters which must be negotiated with other nations—or stated differently, to impose on other nations a U.S.-determined set of solutions to weapons proliferation concerns. Other nations, particularly some important allies, do not share the U.S. Government's views on the most effective means of achieving non-proliferation objectives or on the proper balance between energy supply and weapons proliferation concerns.

There is in effect today an elaborate non-proliferation framework—consisting of international agreements and institutions—which the U.S. played a major role in establishing. Even though it does not provide absolute protection against the spread of nuclear weapons, the existing regime has, in my view, had remarkable success—the number of nations which have chosen to develop nuclear weapons is much smaller than was generally assumed twenty years ago. In addition, it represents a foundation of institutions, agreements and good faith on which future policies can be built.

The existing framework is, however, inherently fragile. Its vitality depends on the willingness of nations to make and keep promises which limit their sovereignty and substantially affect their national defense. The unilateral abrogations of agreements for cooperation, as contemplated by S. 897 and S. 1432, will weaken and may destroy this regime.

The new export criteria under these bills would apply to future exports, under existing agreements for cooperation as well as to exports under new agreements. Although these criteria reflect extended discussions between the Administration and the Congress, they do not represent the results of negotiations with either other supplier or user nations.

New conditions which would be effective immediately include the application of safeguards and other U.S. controls to any fuel burned in a U.S. reactor (so-called "derived material") and an absolute U.S. veto over reprocessing. In view of the President's policy decisions to defer reprocessing and plutonium use in the U.S., increased U.S. controls, particularly over derived material, raise very fundamental issues for user nations striving for greater energy independence.

It is evident from the actions of other governments that, through new international agreements and amendments to existing agreements, much can be done to reduce the risk that nuclear power development will lead to weapons proliferation. But achieving such agreements requires flexibility to accommodate the views of other nations. The legislating of detailed criteria for exports, particularly under existing agreements for cooperation, hardly provides the needed flexibility. Nor, as explained above, is the desired flexibility achieved by the opportunity for the President to grant exceptions, because of the very limited circumstances under which he could act and the fact that his action would be subject to Congressional review and veto.

The reported agreement with Japan for the startup of the Tokai Mura reprocessing facility is a good example of the importance of flexibility and compromise in reaching international agreements in this sensitive area.

With regard to substantive policy on nuclear exports, my personal view is that Congress should limit its role to the establishment of goals for these negotiations and the requirement for periodic reports of progress. If the Executive Branch does not pursue these negotiations diligently (a result which seems most unlikely today) or if the efforts fail, Congress can then decide what further legislative steps might be appropriate.

The proposed legislation appears to recognize the need for incentives to persuade other nations to accept significant foreign control over vital energy sources. The commitments in S. 897 to provide needed enrichment capacity for nations that adhere to policies designed to prevent proliferation, although in need of strengthening, are positive steps. But the absence of comparable commitments with respect to spent fuel storage, recovery of energy equivalents from spent fuel and waste disposal is a serious deficiency. If the U.S. wishes other nations to forego indigenous facilities, it must provide meaningful guarantees not only as to the supply of fresh fuel but also the disposition of spent fuel. U.S. efforts to establish an international fuel authority and the international fuel cycle evaluation would hardly constitute a meaningful guarantee for user nations.



Under S. 897, U.S. approval of reprocessing in a non-weapons state is effectively barred by a timely warning standard that cannot be met with existing technology. Such as absolute prohibition would be particularly offensive to allies such as Japan and West Germany and would seem to prejudice the outcome of the fuel cycle evaluation study which the U.S. and other nations have agreed to conduct.

In brief summary, it is my opinion that the serious deficiencies of the proposed legislation, after such protracted and dedicated effort, demonstrate the impossibility of legislating international acceptance of our nonproliferation policies. That acceptance can only be achieved by agreements negotiated with user and other supplier nations. The proper role of Congress in that process, it seems to me, is to establish goals and criteria toward which the Executive Branch should move, with periodic reports of progress to Congress, and the establishments of a straightforward licensing procedure which ensures that the provisions of agreements for cooperation are being observed. This would greatly enhance U.S. credibility and participation in the worldwide supply of nuclear energy for peaceful purposes and, thus in my opinion, significantly increase our ability to achieve the nonproliferation goals which are vital to world peace.

Senator CHURCH. Of course, I agree with you when you say that international acceptance of our nonproliferation objectives is a matter that would have to be negotiated. It cannot be unilaterally imposed.

This bill can establish a national policy, but unless we can secure international cooperation, I am afraid that our standards can be quickly undermined by the refusal of other supplier countries to buy our product, and then we would soon face the situation where in order to obtain the business we would be looking for excuses to disregard our own standards. That becomes the situation in the absence of international agreement.

So we will certainly take into consideration your suggestions. The bill is a complicated piece of legislation, and I am aware of the fact that we have a letter from the Westinghouse Electric Corp. which contains the following paragraph:

We have viewed with deep concern dramatic decline in U.S. nuclear reactor export sales in recent years. Other countries have become strong competitors, and indeed they have now captured the majority of the world market. As a case in point, we have not secured a new export reactor order in the last 18 months.

So we do face stiff competition which underscores the importance of attempting to work this out on an international basis.

Senator McClure, do you have any questions?

Senator McCLURE. Only this question. I would share your comments, and I fully support the statements from both witnesses that international cooperation is required. We cannot do this unilaterally.

Whether the strong position that has been enunciated by the administration comes from some degree of feeling of arrogance or power on the part of the United States or simply a feeling of urgency about the problem, it cannot mask the fact that we can't achieve it without the agreement of other nations.

I think we all share those goals. How then do we achieve them? And I am concerned about the issue that was raised very forcefully and I think effectively in regard to the credibility of the U.S. policy.

Dr. Tape, I think you mentioned the fact that it isn't so much how we view it as it is how they view the procedures that we have established.

It seems to me that in that context we have to more than just say that we don't intend that the congressional review and veto will become obstructive, we must assure that it cannot be obstructive of agreements once reached.



I have a concern about the abrogation of present agreements, because certainly if we abrogate present agreements by congressional action or otherwise, we have thrown great doubt on the credibility of any future agreements.

Dr. TAPE. That is one of the arguments that is thrown around in terms of we need to have more concern about nonproliferation and tighter agreements and so on, is our fear of future abrogation of, let's say an NPT party from the NPT treaty.

I, myself, recognize that that is a possibility. On the other hand, I believe that as we move ahead with time and the country is more and more dependent on nuclear power for its electrical energy, the price of abrogation which would carry with it sanctions of cutoff of supply, and as near as I can tell essentially all of the supplier nations really feel strongly about that, that is not a trivial matter.

And yet, on the other hand, we turn around and sort of casually say, well, we are going to change the agreements we have already made unilaterally. And we say, no, not really unilaterally, we are going to negotiate.

But in the eyes of the other party because we are supplying the materials they need, they look upon that as a unilateral action because they have no choice at this time.

Therefore, looking downstreams 3, 4 years, 5 years hence, you know how you would behave with respect to certain suppliers. If you feel you had not been fairly treated, you would find another supplier.

Senator McCLURE. This also interrelates with other U.S. policy. And I don't mean to broaden this discussion at this point, but I was in Japan at the time of the announcement of a soybean embargo and experienced firsthand the reaction of people within the Japanese Government at that time.

I know the reaction of our own wheat growers in this country when the United States reverts policy in midstream on wheat exports. And I can tell you that that was a major factor in the last elections across this country as wheat growers registered their lack of credibility in U.S. policy by their votes.

So taking domestic or international examples either one, credibility does become essential to the willingness of people to conform to U.S. policy and rely upon it.

Mr. STATHAKIS. I think the passing of the legislation in the present form would be considered as an abrogation of existing treaties and agreements of cooperation. I don't think there is any question about that.

Senator McCLURE. It seems to me that inherent in it by its procedures is both the possibility of administrative and congressional abrogation of existing contracts and agreements. It may not be the intention, but that is the way I read it.

Mr. STATHAKIS. That is right.

Senator McCLURE. And we must set up mechanisms in which future agreements can be entered into with the understanding they will become credible agreements until they are changed pursuant to the terms of the agreement.

I thank you both for your testimony.

Senator DOMENICI. Mr. Chairman, I just have two questions, one of Dr. Tape, and then one of Mr. Stathakis.



Dr. Tape, am I correct that Australia and a few other countries have, in the last 10 years, become large suppliers of nuclear material, and that in the last 10 years various other industrial societies have become large suppliers of technology? In other words, has the supply potential for countries that might be our potential partners grown?

Dr. TAPE. Senator, in my written statement I noted that one of the major changes in recent years has been that there are many, or that there are more nuclear industrially sophisticated nations, France, Germany, Japan, England, and so on.

Senator DOMENICI. All right. You said it better than I asked it.

Dr. TAPE. With respect to Australia, it is not so much in equipment, but just recently you may have noted that they will probably become a very important supplier of the raw material, uranium ore. And in this connection, they share our nonproliferation goals and I am sure would like to pursue the same goals that we would, and this would be helpful.

Senator DOMENICI. Now it would appear to me that if the facts are as you describe them, this committee ought to be fairly interested in how those supplier nations are proceeding. Are they equally committed to nonproliferation?

Wouldn't it be idiocy for us to be off on a good policy with a completely different implementation scheme than our competitors?

Dr. TAPE. Senator, I think that is right. And let me hasten to say if the administration and the President really are pursuing that course that is among the suppliers and were to explore common avenues in which these nonproliferations objectives could be achieved, as was testified yesterday, consideration of expanding the group that would be discussing those so that there would be recipients or customers as well as supplier nations are in order, I believe that the international fuel cycle evaluation program which the administration has launched will help this.

So moving in that direction, but still out of that comes the international negotiation and a commonality of purpose which we all can achieve which I think is the thrust of your first question.

Senator DOMENICI. Let me briefly conclude. I know this could go on with a whole series of questions. It does appear to me that it is important to know what other supplier nations are doing to effectuate nonproliferation, while still remaining nuclear suppliers.

Now I don't want you to answer now, but I think it would be relevant for us to see some specifics on how the other industrial nuclear supplier nations are reaching accord for export licenses. Are their procedures more or less cumbersome than ours? I personally would like to have that information with a few examples that you might give.

Dr. TAPE. I will do that.

Senator DOMENICI. My last question of you, Mr. Stathakis, concerns our chairman's statement that Westinghouse hasn't sold any reactors for 18 months.

Senator CHURCH. Yes, Westinghouse. It may be a special problem that Westinghouse has.

Senator DOMENICI. That is what I was going to ask. Is that a corporate problem?

Mr. STATHAKIS. I wouldn't want to speak for Westinghouse, sir, but that is not a corporate problem as far as I know. I don't believe any U.S. supplier has received orders over the last 2 years of any significance.



Now there are letters of intent or declarations of intent, but in terms of actually moving ahead with new solid order in the international market, I think it has essentially been zero for everybody.

And of course, this is not true with some of the other supplier nations.

Senator DOMENICI. That was going to be my question. Have other supplier nations received orders during the 18 months that ours have received none?

Mr. STATHAKIS. Yes, other supplier nations—you may have read in yesterday's paper that France signed a deal with Iran for \$3 billion for two nuclear powerplants to be built in Iran over the next several years, as an example.

It is true that the total world market has been down somewhat as a result of the recession period of 1974-75. But in spite of that, other supplier countries, suppliers have been able to obtain some significant business.

Senator DOMENICI. Mr. Chairman, I wonder if I might ask if you concur on the need to have our staff attempt to get us information on orders during that 18-month period?

Senator CHURCH. I think we might get hold of the American sales over the years, compare it with the foreign sales.

Senator DOMENICI. I would appreciate that.

Mr. STATHAKIS. We could certainly supply that information from the Atomic Industrial Forum, if you wish, Mr. Chairman.

Senator CHURCH. Fine. We will have the staff pursue that.

The hour of 10 has arrived. I just want to conclude with this observation. For years now any number of American have expressed deep concern about the tremendous conventional arms buildup in the Middle East, President Carter among them. He has declared it to be his policy to try to reduce the volume of potential arms being sold to those governments.

It has been exceedingly difficult to accomplish this objective despite the many good intentions that have been expressed because every time it comes to a given arms sale the bottom line argument is that if we don't do it, someone else will.

I hope we can find a way to avoid that predicament in the sale of nuclear reactors. It is clear that unilateral policy will hinder that, and we are already moving in that direction quite rapidly.

So much depends upon the outcome and success of the upcoming negotiations. I hope this legislation can be helpful to the United States and not be damaging to us in our efforts to secure these international agreements.

We will try to write it in such a way that it will be helpful.

Thank you very much.

[Whereupon, at 10 a.m. the committee adjourned subject to the call of the Chair.]



My dear Sir,  
I have the honor to acknowledge the receipt of your letter of the 10th inst. and in reply to inform you that the same has been forwarded to the proper authorities for their consideration.  
I am, Sir, very respectfully,  
Your obedient servant,  
J. H. [Signature]



## APPENDIX

### TEXT OF MEMO SUBMITTED BY SENATOR MCCLURE

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The following subparagraphs provide a listing of excerpts from official documents which clearly demonstrate that CRBRP is R&D and not commercialization.

1. Proposed Final Environmental Statement for LMFBR, WASH-1535, December 1974.

"The construction and operation of the Demonstration Plant [Clinch River] will help provide the technical, economic, safety, and other information needed by utility companies in deciding *whether or not to commit to construction of LMFBRs.*" Vol. I, p. 22-7.

2. Report to the ERDA Administrator on Proposed Final Environmental Impact Statement for the LMFBR Program. (June 20, 1975) Prepared by the ERDA Internal Review Board.

If ERDA carries the research, development, and demonstration effort to completion, *the decision on commercialization must be made by other regulatory agencies.*

p. 4 (emphasis added).

*ERDA must reserve itself to a judgment as to whether the cost-benefit analyses of the LMFBR Program warrants "a continuation of the Program to the point of commercialization."* This must then be followed by an industry determination of the value of commercialization. p. 28 (emphasis added).

*As energy technologies mature, relatively reliable information concerning their economies and environmental significance will be developed. This information is deemed to be critical to future decisions concerning the allocation of development priorities among the various technologies, including the breeder reactor, and to the eventual decision concerning their commercial development.*

p. 35 (emphasis added).

3. ERDA Administrator's Findings on the LMFBR Proposed Final Environmental Statements, (June 30, 1975) (Robert C. Seamans, Jr. Administrator)

The Administrator has made it clear that *a decision to construct and operate the Clinch River Breeder Reactor Plant would not constitute an irreversible commitment to commercialization* and that NRC *would not be* in any way bound by any determination which ERDA might eventually make *regarding the desirability or likelihood of commercial LMFBRs.* More specifically, the Administrator found that:

- (1) *Continuation of the research, development, and demonstration program does not prejudice any decision concerning commercialization of this technology;*

- (2) *Specifically, I do not find that the completion of the Clinch River Breeder Reactor (CRBR) project, an integral part of the program, is tantamount to widespread commercialization; and*

- (3) *NRC . . . would be in no way bound by an . . . ERDA recommendation that the technology was ready for commercial use.* Pages 8 and 9.

The Administrator also found that "demonstration activities" must be "directed to resolve . . . technical, environmental, and economics issues" and that these issues must be "*resolved before a final decision concerning the acceptability of commercial deployment is made.*" p. 7 (emphasis added).

I find that *continuation of the LMFBR Program at this time would not lead inexorably or irresistibly to a "full breeder economy,"* if further work were to demonstrate that the problems of the breeder cannot be resolved, p. 6 (emphasis added).

4. Final Environmental Statement for the LMFBR Program, ERDA-1535 (December 1975).



In the case of plant experience, it is believed that *three years of operation* after criticality of either the Clinch River Breeder Reactor Plant (CRBRP) or a larger LMFBF is necessary to develop the necessary confidence in the safety, reliability and maintainability of a breeder reactor system.

The program in effect is structured to supply sufficient information for the Administrator to be able to make his determination on the acceptability of the LMFBF technology for widespread deployment by 1986.

Vol. I, pp. S-1, 2 (emphasis added). And see ¶ 10 of the Administrator's Findings below.

5. ERDA Administrator's Findings on the LMFBF Program Final Environmental Statement (December 31, 1975) (Robert C. Seamans, Jr., Administrator).

The FES options for research activities concerning the LMFBF were considered in "meeting the requirement for operation of a LMFBF demonstration or large prototype plant in a utility environment for sufficient assurance of the technical feasibility, economic competitiveness and environmental acceptability of a LMFBF economy prior to any irreversible commitment to widespread commercial development." ¶ 5 (emphasis added).

In my judgment, the CRBR offers the most timely and cost-effective construction, licensing and operating experience essential to the successful completion of the LMFBF Program. ¶ 6.

The plan for the LMFBF Program, if "vigorously pursued," would provide sufficient information "as early as 1986 to resolve the major uncertainties affecting widespread LMFBF technology deployment and therefore to permit an ERDA decision on commercialization of that technology. . . . It should be emphasized also that following an ERDA decision on commercialization, the utility industry and the public would have to determine the extent, if any, the LMFBF technology would be commercially deployed." ¶ 10 (emphasis added).

In this connection, I do not find that implementation of the LMFBF Program . . . would constitute an irreversible use in 1986 . . . The level of program involvement of the industrial sector would be minor compared to the investment required to place LMFBF technology in widespread use. ¶ 11 (emphasis added).

6. Nuclear Breeder Subcommittee Report, Cong. Rec., E 745, 748 (Feb. 19, 1976) (emphasis added).

With regard to the subject of LMFBF commercialization, the Subcommittee examined the issue of whether or not proceeding with the LMFBF R&D program now, specifically with the CRBR project, represents an irreversible commitment to commercialization. It was found that any judgment on whether or not a technology option is exercised (i.e., a number of plants of that type are built) will depend on the relative technical and economic merits of that option in comparison with other available options. The decision on exercising an option will rest primarily with the utility industry, rather than the Government, and it was therefore reported that proceeding with the current LMFBF Program does not present a commitment to commercialization, nor does it prejudice any decision concerning the eventual commercialization of the technology.

The Subcommittee concluded that "vigorous pursuit of LMFBF development at this time, including construction of demonstration plants is essential to provide adequate information on which to base future decisions concerning commercialization of breeder technology."