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Recent U.S. Efforts to Control Nuclear Proliferation

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NOTES

RECENT U.S. EFFORTS TO CONTROL NUCLEAR PROLIFERATION

I. INTRODUCTION

The explosion of a nuclear device by India on May 18, 1974, initiated a new wave of concern for the prospects of limiting the proliferation of nuclear weapons.[1] Subsequent developments such as the Nixon proposal to provide nuclear materials to Egypt and Israel[2] and the announcement by West Germany of its intentions to sell Brazil a plutonium reprocessing facility[3] increased fears in the United States that the number of countries possessing nuclear weapons would continue to grow at the expense of world peace and security.[4] Apprehension is likely to continue since the development of an atomic bomb blueprint by a Princeton undergraduate, using publicly available information, demonstrated to the world—and to the agent of Pakistan who tried to obtain the report—the relative simplicity of designing an atomic bomb.

The United States government has stepped up its activity and interest at executive, legislative, diplomatic, and administrative levels in an effort to control the spread of nuclear weapons.[5] Increased risks of nuclear war and terrorist blackmail justify this stimulated activity and call for stronger concerted action in the face of worldwide diffusion of nuclear material and technology. Present trends in nuclear energy technology test not only the United States' position as the leader in this field but also the ability of one nation to control nuclear proliferation.

Some critics of United States nonproliferation policy have argued that the possession of nuclear weapons by other nations might have a stabilizing effect.[6] Former Secretary of State Kissin-

1. M. GUHIN, NUCLEAR PARADOX—SECURITY RISKS OF THE PEACEFUL ATOM 25-29 (1976); H.R. REP. No. 1613, 94th Cong., 2d Sess. 30 (1976).

2. M. GUHIN, *supra* note 1, at 29-35.

3. H.R. REP. No. 1613, 94th Cong., 2d Sess. 30 (1976).

4. Ribicoff, *A Market-Sharing Approach to the World Nuclear Sales Problem*, 54 FOREIGN AFF. 763 (1976).

5. *See* B. RATHER, NUCLEAR SAFEGUARDS AND PROLIFERATION: A SELECTED BIBLIOGRAPHY, (Cong. Research Serv. Mar. 15, 1976).

6. Lefever, *Undue Alarm Over Nuclear Spread?*, Wall St. J., Oct. 15, 1976, at 12, col. 4.

ger, in 1957, wrote that Soviet aggression would be deterred if our European allies obtained nuclear weapons and that "the diffusion of nuclear weapons technology will be to our net strategic advantage."[7] Future members of the nuclear weapon club would not possess sophisticated weapon delivery systems, a fact which would severely limit their ability to use nuclear weapons.[8] Others argue that if smaller powers engage in a nuclear war it need not develop into a global disaster and might even serve to promote disarmament through greater awareness of the danger.[9]

Arguments discounting the need to control nuclear proliferation are usually overshadowed, however, by concern over the grave consequences of increased membership in the nuclear weapon club. Proliferation is regarded by most to be a serious danger.[10] In a world of frequent armed conflict, the threat of nuclear weapons use appears very real. The risk of a nuclear disaster increases in proportion to the number of countries accumulating a nuclear weapon arsenal.

II. SCIENTIFIC BACKGROUND

The material, equipment, and technology used in the production of electric energy by nuclear power reactors is much the same as that needed for the production of an atomic bomb. Improved technology, the free circulation of information concerning nuclear weapon design, and access to plutonium, a by-product of nuclear power reactors, has made the development of a nuclear explosive device easier.

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7. H. KISSINGER, NUCLEAR WEAPONS AND FOREIGN POLICY 198 (1957). The validity of this statement vis-a-vis the Soviet Union may still hold: "The potential nuclear-weapon states would form a nuclear ring, and not necessarily a friendly one, around the USSR. Countries that now or will in a few years have the capability of going nuclear include Japan, South Korea, and Taiwan to the east; Pakistan, Iran, Israel, and Egypt to the south; Yugoslavia, Italy, Switzerland, West Germany, and Sweden to the west; and Canada to the north. If many, or any, of these countries decided to go nuclear, the security of the USSR would very clearly not be enhanced." W. EPSTEIN, THE LAST CHANCE—NUCLEAR PROLIFERATION AND ARMS CONTROL 226 (1976).

8. H. KISSINGER, *supra* note 7, at 197.

9. H. KAHN, ON THERMONUCLEAR WAR 491-92 (1961).

10. "Nuclear proliferation is the greatest danger facing the world today. The more I get into it the more certain I am that that is the truth." *Nuclear Reduction, Testing and Non-Proliferation: Hearing on S. Con. Res. 69 Before the Subcomm. on Arms Control, International Organizations, and Security Agreements of the Senate Comm. on Foreign Relations,* 94th Cong., 2d Sess. 2 (1976) (statement of Sen. Symington).

Plutonium or highly enriched uranium may be used as the explosive component in a nuclear fission (atomic) bomb.[11] Neither plutonium nor highly enriched uranium[12] occur in nature—sophisticated processes must be utilized in order to isolate them. Once special nuclear material (plutonium or highly enriched uranium) is isolated, the construction of an atomic bomb—as opposed to the more complex hydrogen bomb—is relatively simple. Plutonium compressed or imploded quickly through the use of chemical explosives will produce a nuclear explosion.

Modern breeder reactors utilize plutonium as part of their basic fuel and create more plutonium than they consume. This type of reactor magnifies the problem of controlling critical stages in the nuclear fuel cycle because of the increased supply of plutonium and the breeder reactors' popularity with nations of all economic situations.[13] If fast-breeder reactors come into usage as expected, the amount of private sector plutonium in existence will approach 1,600 metric tons by the year 2000.[14] In comparison, only 5-10 kilograms of plutonium would be needed to equal the explosive impact of the atomic bombs dropped on Hiroshima and Nagasaki during the Second World War.[15]

As national economies throughout the world suffer from the effects of paying huge sums for foreign oil, the impetus to develop alternative energy sources becomes more powerful. Nuclear energy appears as a desirable alternative to many developing countries and is necessary for industrial powers such as Japan to maintain their level of economic development.[16] Some nations see the breeder reactor as a way to achieve energy independence: it was precisely this rationale which allowed India to justify a chemical reprocessing capability and thus obtain access to plutonium.[17]

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11. Willrich, *Worldwide Nuclear Industry* in INTERNATIONAL SAFEGUARDS AND NUCLEAR INDUSTRY 45, 55 (M. Willrich ed. 1973).

12. Enriched uranium is uranium in which the concentration of uranium-235 has been increased to facilitate nuclear fission.

13. Address by Nuclear Regulatory Commissioner Victor Gilinsky at M.I.T. (Nov. 1, 1976).

14. M. GUHIN, *supra* note 1, at 21-22, *citing* U.S. ATOMIC ENERGY COMMISSION, DRAFT 1 GENERIC ENVIRONMENTAL STATEMENT MIXED OXIDE FUEL: RECYCLE PLUTONIUM IN LIGHT WATER-COOLED REACTORS 22-23 (1974).

15. Willrich, *supra* note 11.

16. Sato, *Japan's Response to Nuclear Developments: Beyond "Nuclear Allergy,"* in NUCLEAR PROLIFERATION AND THE NEAR-NUCLEAR COUNTRIES 227, 237 (O. Marwah & A. Schulz eds. 1975).

17. Gilinsky, *supra* note 13.

III. INTERNATIONAL FRAMEWORK FOR PROLIFERATION CONTROL

Two entities are the pillars of international proliferation control: the International Atomic Energy Agency[18] (IAEA), and the Treaty on the Non-Proliferation of Nuclear Weapons[19] (NPT). The Statute of the International Atomic Energy Agency, a treaty with over 100 parties, sets up a safeguards system whereby any country, whether or not a party to the NPT, may voluntarily submit to inspections, audits, facility design approval, and deposit of nuclear materials with the IAEA.[20] No effective sanctions exist under the IAEA to deter nations from diverting nuclear material to a military purpose other than detection and announcement to the world community.[21] In reality, the IAEA safeguards system is nothing more than an early warning system which is designed to detect the diversion of nuclear material from civilian use to military or explosive use. There is no known plan for concerted action by the nations alerted to deal with a discovered diversion.

In 1963, IAEA safeguards began to apply to United States transfers of nuclear assistance which were formerly controlled by bilateral safeguard agreements.[22] Recently the United States has consented to IAEA safeguards over civilian nuclear facilities within the United States.[23] The United States has given support to the IAEA by predicating economic and military aid to foreign nations on their participation in the IAEA safeguards system.[24] Pending legislation in Congress gives increased financial support to the IAEA as well as incentives to other nations to encourage their participation in the IAEA safeguards system.[25]

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) complements the IAEA by imposing treaty obligations on non-

18. Statute of the International Atomic Energy Agency, *done* Oct. 26, 1956, 8 U.S.T. 1093, T.I.A.S. No. 3873, 276 U.N.T.S. 4.

19. Treaty on the Non-Proliferation of Nuclear Weapons, *opened for signature,* July 1, 1968, 21 U.S.T. 483, T.I.A.S. No. 6839 [hereinafter cited as Non-Proliferation Treaty].

20. Szasz, *International Atomic Energy Agency Safeguards,* in INTERNATIONAL SAFEGUARDS AND NUCLEAR INDUSTRY 73, 74-88 (M. Willrich ed. 1973).

21. *Id.* at 88. *See* Dagenais, *Atomic Safeguards and the Strategy of Treaty Deterrence,* 8 CORNELL INT'L L. J. 211 (1975).

22. Gorove, *Transferring U.S. Bilateral Safeguards to the International Atomic Energy Agency: The "Umbrella" Agreements,* 6 DUQ. U.L. REV. 1, 2 (1967).

23. 18 INT'L ATOM. ENERGY AGENCY BULL. 76 (1976).

24. International Security Assistance and Arms Export Control Act, Pub. L. No. 94-329, § 305, 90 Stat. 755 (1976).

25. H.R. REP. No. 1613, 94th Cong., 2d Sess. 32-33 (1976).

nuclear weapon states to accept safeguards and by prohibiting the transfer of special fissionable material (*e.g.*, plutonium) to any non-nuclear weapon state without IAEA safeguards.[26] In consideration for foregoing the development of nuclear weapons, the non-nuclear weapon nations receive aid and cooperation in peaceful atomic endeavors[27] and a promise by the nuclear weapon states of sincere efforts to effect nuclear disarmament.[28] However, like the IAEA safeguards system which it backs up, the NPT does not provide for the imposition of sanctions against violators.

Various weak points of the NPT indicate the need for action by the world community[29] and particularly by the nuclear weapon states and the nuclear exporter states. The United States and the Soviet Union were heavily criticized by participants in the 1975 NPT Review Conference for failing to live up to the duty imposed by Article VI of the NPT to negotiate an end to the nuclear arms race and to pursue complete nuclear disarmament.[30] Article X(I) allows parties to withdraw from the NPT upon three months notice if their supreme interests are jeopardized. This provision recognizes the underlying security problems not solved by the NPT. Article III allows nuclear sales to non-signatories in which only the material transferred, and not the importer nation's entire nuclear program, is subject to safeguards.[31] As evidenced by India's nuclear explosive program, the danger in this situation lies in the ability

26. Non-Proliferation Treaty, *supra* note 19, art. 3; Szasz, *supra* note 20, at 75-76.

One commentator has observed that:

> The NPT has been unanimously viewed as a discriminatory treaty, even by the superpowers themselves. Actually, the concept of non-proliferation is in itself discriminatory; some countries will preserve the fantastic privilege of possessing a nuclear arsenal, a majority of countries will give up that privilege for twenty-five years. In that sense, the NPT is ultimately a contract between two groups of countries representing two levels of technological and economic development and two levels of strategic power.

P. Lellouche, Draft Proposal for Revision of the Non-Proliferation Treaty 4 (April 1975) (unpublished manuscript—Program for Science and International Affairs, Harvard Univ.).

27. Non-Proliferation Treaty, *supra* note 19, arts. 4(2) and 5.

28. *Id.*, art. 6.

29. *See* F. BARNABY & R. HUISKEN, ARMS UNCONTROLLED 186 (1975).

30. W. EPSTEIN, *supra* note 7, at 199.

31. *Nuclear Reduction, Testing and Non-Proliferation: Hearing on S. Con. Res. 69 Before the Subcomm. on Arms Control, International Organizations and Security Agreements of the Senate Comm. on Foreign Relations*, 94th Cong., 2d Sess. 20 (1976) (statement of Adrian Fisher, chief U.S. negotiator of the NPT).

of a nation to build up nuclear capabilities with safeguarded material and subsequently duplicate that capability in unsafeguarded plants with material not obtained from a NPT party.[32]

Finally, the control of international proliferation is inhibited by the failure of the NPT to secure the signatures of certain technologically-sophisticated states. Non-signatories include insecure states which are confronted with powerful neighbors (*e.g.*, Argentina, Brazil, Chile), and states facing a hostile world community (*e.g.*, South Africa).[33]

IV. RECENT EXECUTIVE ACTION

The proliferation problem has become a full-scale public concern in the United States, as was demonstrated by the injection of the issue into the 1976 Presidential campaign. The final positions of President Carter and former President Ford were very similar.[34]

In a nuclear policy statement issued shortly before the election, President Ford sought to control the export of nuclear fuel facilities by deferring the commercialization of chemical reprocessing and assuring supplies of nuclear fuel to customer nations.[35] Calling on the world to join in a cooperative effort, Ford specifically asked nuclear supplier nations to avoid the export of reprocessing and enrichment facilities for three years.[36] Ford criticized Congress for not authorizing earlier expansion of United States uranium enrichment facilities and urged immediate action to increase the United States' limited uranium enrichment capacity (which has been totally committed to existing customers since 1974).[37] For nations willing to accept safeguards, the statement promised nuclear fuel at fair prices and "binding letters of intent for the supply of nu-

32. *Id.*

33. *See generally* Marawah & Schulz, *Introduction* to NUCLEAR PROLIFERATION AND THE NEAR-NUCLEAR COUNTRIES 7 (O. Marawah & A. Schulz eds. 1975).

34. *Behind U.S. Crackdown on Spread of Nuclear Know-How,* U.S. NEWS & WORLD REP., Nov. 8, 1976, at 68; King, *Carter Stealing Initiatives,* NUCLEAR ENGINEERING INT'L, Oct. 1976, at 4; Keatley, *And a Strategem for Upstaging Carter,* Wall St. J., Oct. 6, 1976, at 22, col. 4.

35. Presidential Nuclear Policy Statement, *reprinted in* 75 DEP'T STATE BULL. 629, 632 (1976) (policy statement issued by President Gerald Ford on Oct. 28, 1976) [hereinafter cited as Policy Statement]. *See* Metz, *Ford's Nuclear Policy: An Industrial Bailout,* Wall St. J., Oct. 6, 1976, at 22, col. 4.

36. Policy Statement, *supra* note 35, at 632.

37. *Id.* at 634. *See* COMMUNICATION FROM PRESIDENT FORD ON THE NUCLEAR FUEL ASSURANCE ACT OF 1975, H.R. DOC. NO. 94-202, 94th Cong., 1st Sess. (1975).

clear fuel to current and prospective customers."[38] The nuclear policy statement threatened "drastic sanctions" against diverters of nuclear material for explosive use,[39] promised increased support for the IAEA, and indicated the need to establish plutonium storage facilities under international control.[40] In a post-election address to the nuclear industry, a high State Department official reiterated Ford's major points and emphasized that United States policy should be to place non-proliferation objectives above commercial goals in the supply of nuclear materials.[41]

On May 13, 1976, at the United Nations Conference on Nuclear Energy and World Order, Jimmy Carter set forth major proposals to limit the proliferation of nuclear weapons.[42] Carter stated that nuclear disarmament and a *comprehensive* nuclear test ban by the United States and the Soviet Union would prove their good faith to the non-nuclear weapon nations and provide the necessary atmosphere for adherence to the NPT.[43] A voluntary moratorium by all nations on the purchase or sale of uranium enrichment and chemical reprocessing plants was called for by Carter, who said it is "absolutely essential" to stop the sale of these plants whether or not an agreement has been completed for such sale.[44] He proposed centralized multinational facilities serving groups of nations with uranium enrichment, chemical reprocessing, fuel fabrication, and fuel storage services located together in order to minimize the risks of diversion and environmental contamination.[45] Carter called for a reevalution of the decision to engage in chemical reprocessing of spent nuclear fuel,[46] stressed the necessity of assuring customer nations an enriched uranium fuel supply,[47] and noted the need for progress in permanent nuclear waste disposal.[48] According to Carter, the United States chemical reprocessing plant in Barn-

38. Policy Statement, *supra* note 35, at 634.
39. *Id.* at 636.
40. *Id.* at 635.
41. Irving, *U.S. Nuclear Cooperation Policies, reprinted in* 75 DEP'T STATE BULL. 687, 689-90 (1976) (address delivered to the Atomic Industrial Forum by Asst. Sec. of State Irving on Nov. 15, 1976).
42. Carter, *Three Steps Toward Nuclear Responsibility,* BULL. ATOM. SCIENTISTS, Oct. 1976, at 8.
43. *Id.* at 11.
44. *Id.* at 12.
45. *Id.* at 12-13.
46. *Id.* at 13.
47. *Id.* at 12.
48. *Id.* at 13.

well, South Carolina, could become the first multinational chemical reprocessing facility under IAEA control, and could blend natural uranium with the reprocessed plutonium to make non-weapons-grade fuel.[49]

On April 7, 1977, President Carter announced significant changes in domestic nuclear policies aimed at decreasing the risk of nuclear proliferation.[50] Carter withdrew support for the Clinch River fast-breeder reactor program and the Barnwell, South Carolina, chemical reprocessing plant in an effort to "defer indefinitely" the use of plutonium as fuel.[51] The policy decision was restated several weeks later in The National Energy Plan:

> It is the President's policy to defer any U.S. commitment to advanced nuclear technologies that are based on the use of plutonium while the United States seeks a better approach to the next generation of nuclear power than is provided by plutonium recycle and the plutonium breeder. The U.S. will defer indefinitely commercial reprocessing and recycling of plutonium. The President has proposed to reduce the funding for the existing breeder program, and to redirect it toward evaluation of alternative breeders, advanced converter reactors, and other fuel cycles, with emphasis on nonproliferation and safety concerns. He has also called for cancellation of construction of the Clinch River Breeder Reactor Demonstration Project. . . .[52]

This represents a drastic change from Carter's earlier position advocating multinational reprocessing and storage facilities (see Carter's United Nations address, *supra*). Congress, however, has demonstrated substantial resistance to the elimination of the breeder reactor program. The revival of the breeder reactor program may salvage the Barnwell reprocessing plant, since the plant would provide fuel for a breeder reactor.

On April 27, 1977, Carter proposed the Nuclear Non-Proliferation Policy Act of 1977. In his accompanying message to Congress, Carter emphasized several differences from previous proposals.[53] Recipients of United States nuclear material under future agreements for cooperation would be required to have all of

49. *Id.*

50. *Carter Proposes to Ban the Use of Plutonium*, Wall St. J., April 8, 1977, at 2, col. 2.

51. *Id.*

52. Executive Office of the President—Energy Policy and Planning, *The National Energy Plan* XX (1977).

53. 2 NUCLEAR REG. REP. (CCH) ¶ 20,053, at 16,337 (1977).

their nuclear activities under IAEA safeguards. Old agreements would be renegotiated in an attempt to conform with new export conditions. Incentives such as uranium resource assessment, spent fuel storage, and guaranteed supplies of low enriched (non-weapon-grade) uranium would be provided to discourage other countries from obtaining enrichment and reprocessing facilities.[54]

Under Carter's plan, an international Nuclear Fuel Cycle Evaluation Program would be established to develop energy systems which do not use or produce weapons-grade radioactive material.[55] Such a program holds great promise of an effective technological solution to the proliferation problem.

The Administration's proposal would cut off nuclear supplies and aid to those nations violating IAEA safeguards or detonating a nuclear device, and it would require future agreements for cooperation to impose conditions allowing the United States to approve the disposition of the nuclear material after transfer to the recipient country.[56] Under the Nuclear Explosive Proliferation Control Act, the President would be given final authority to approve nuclear exports, but under the new proposal the executive branch would be given authority to disapprove an export if it found that such export would be inimicable to the common defense and security[57] (see section VII, "Recent Administrative Action"). Apparently Carter intends to wield a strong hand in non-proliferation matters, both domestically and internationally.

V. Recent Congressional Action

The 94th Congress (sitting during 1975 and 1976) greatly increased its attention to the problems of nuclear nonproliferation, but passed only one law on the subject of nuclear export policy.[58] Section 305 of the International Security Assistance and Arms Export Control Act adds section 669 to the Foreign Assistance Act of 1961.[59] This section was added in order to cut off military and economic aid to those countries who deliver or receive enrichment or reprocessing materials or technology without IAEA safeguards

54. *Id.*
55. *Id.* at 16,339.
56. *Id.*
57. *Id.* at 16,338.
58. Bauser, United States Nuclear Export Policy: Developing the Peaceful Atom as a Commodity in International Trade, 18 Harv. Int'l L.J. 227.
59. International Security Assistance and Arms Export Control Act, Pub. L. No. 94-329, § 305, 90 Stat. 755 (1976).

(or multilateral supervision and management). The President may override the effects of the amendment if he certifies to Congress that (1) the termination of assistance would adversely affect vital United States interests, and (2) he has been assured that the country in question will not acquire or develop nuclear weapons or assist other nations in doing so. Congress reserves for itself the power to cut off economic and military aid to those countries posing the threat of nuclear weapon development.

In 1976 the Joint Committee on Atomic Energy reported favorably on the Nuclear Explosive Proliferation Control Act (Act).[60] The stated purpose of the bill is:

> 1. To establish a comprehensive proliferation control policy of the United States which includes major proposed initiatives on the part of this Government with other nuclear supplier states and other countries of the world to strengthen, standardize and make more effective the international regimes for safeguarding and controlling the export of nuclear material, facilities, components and technology which could be of significance from the standpoint of the proliferation of nuclear explosives; and
> 2. To clarify and strengthen the [nuclear export] criteria which this Government will itself apply, pending further international agreements.[61]

Under the Act, the United States would give increased moral and financial support to the IAEA, urge wide adherence to the NPT, and declare United States intentions to become a reliable supplier of nuclear fuel services.[62] Establishment of a nuclear exporters agreement (or cartel) and nuclear fuel cycle centers under international control would be authorized in furtherance of United States non-proliferation policy.[63]

Of particular interest are the provisions in the Act which would have the United States open negotiations with other nations aimed at setting up procedures to deal with violations of the NPT or its principles. Subsection 5(a)(4) calls for international agreement on

60. H.R. REP. No. 1613, 94th Cong., 2d Sess. 1 (1976). The bill has been reintroduced in the 95th Congress by Rep. Price of Illinois as H.R. 17. *See* 123 CONG. REC. H78 (daily ed. Jan. 4, 1977).

61. H.R. REP. No. 1613, 94th Cong., 2d Sess. 15-16 (1976). *See* Nuclear Explosive Proliferation Control Act, H.R. 17, 95th Cong., 1st Sess. §§ 1-2 (1977); H.R. REP. No. 1613, 94th Cong., 2d Sess. 1-2 (1976).

62. H.R. REP. No. 1613, 94th Cong., 2d Sess. 16 (1976).

63. *Id. See* Nuclear Explosive Proliferation Control Act, H.R. 17, 95th Cong., 1st Sess. § 5 (1977); H.R. REP. No. 1613, 94th Cong., 2d Sess. 3-5 (1976).

"procedures to be followed in the event that any nation violates the principles of the [NPT], whether or not such nation is a party to the [NPT]. . . ." Similarly, subsection 5(a)(5) calls for an international agreement to establish procedures for the recovery of nuclear material diverted by any nation, group, or person in violation of NPT principles.

These enforcement provisions are likely to attract a good bit of attention, especially because they stand out from those portions of the Act which merely restate policy already enunciated by United States officials. They would begin the process of arming the international proliferation control regime with much needed enforcement sanctions. The strength or form of control procedures remains uncertain and the question arises whether any procedure might be rendered ineffective by the same political conflicts that now inhibit United Nations Security Council action.

The clarification and strengthening of United States nuclear export criteria under the Act would be accomplished by amending the Atomic Energy Act to require consultation and greater cooperation between various government agencies before export licenses or agreements for cooperation would be approved. Agreements for cooperation would still be negotiated by the Secretary of State,[64] submitted to the President, and then approved by Congress. Under the Act, the Administrator of the Energy Research and Development Agency (ERDA) would jointly negotiate the agreements and render technical assistance; the Nuclear Regulatory Commission would consult on such agreements; the Director of the Arms Control and Disarmament Agency would render its views on the proposed agreement; and the appropriate congressional committees would have access to the views of the Nuclear Regulatory Commission on the adequacy of safegards in the proposed agreement.[65] Thus, full consideration would be given to nuclear proliferation factors and safeguards.

All future agreements for cooperation would forbid the recipient country to use the transferred material for development of *any* explosive device and require the recipient country to consult with the United States concerning changes in the safeguards clauses.[66] Export control over nuclear material and technology is also tight-

64. Exec. Order No. 10841, 3 C.F.R. 375 (1959-1963 Compilation), *reprinted in* 42 U.S.C. § 2153 (1970).

65. H.R. REP. No. 1613, 94th Cong., 2d Sess. 17 (1976).

66. Nuclear Explosive Proliferation Control Act, H.R. 17, 95th Cong., 1st Sess. §§ 8(b)-(c); H.R. REP. No. 1613, 94th Cong., 2d Sess. 5-6 (1976).

ened by requiring the exchange of information and opinions between certain government agencies. The principles governing nuclear exports would require a complete range of safeguard guarantees by the recipient countries.

Perhaps the most onerous requirements for the corporate exporter and the recipient country to accept are those which prohibit chemical reprocessing of fuel used or produced by the exported material and technology without United States approval.[67] Such provisions would serve non-proliferation, but would also put the United States exporters in a less competitive position due to the recipient's probable aversion to extra conditions and restrictions. The conflict between non-proliferation goals and a healthy United States export market demonstrates the real problems facing most non-proliferation schemes.

Like the amendment to the Foreign Assistance Act, the proposed proliferation control legislation would allow the President final authority to approve an export if withholding such export would prejudice United States non-proliferation goals or the common defense and security.[68]

VI. The Reaction of Industry to Recent Non-Proliferation Trends

The conflict inherent in striving to control nuclear proliferation while the United States' position in the world nuclear industry declines is fully appreciated by the United States nuclear industry. Industrial spokesmen support United States non-proliferation objectives[69] but fear the economic consequences of recent proposals. The industry places part of the blame for the halving of the United States' share of the total world nuclear export market on uncertain export policies, although increased competition from West Germany, France, Canada, Japan, and Sweden is also deemed a significant factor.[70]

Opposition to the export of chemical reprocessing technology has been attacked by some industry advocates as hypocritical interfer-

67. *Id.* § 15(a)(5); H.R. Rep. No. 1613, 94th Cong., 2d Sess. 11-12 (1976).

68. *Id.* § 14; H.R. Rep. No. 1613, 94th Cong., 2d Sess. 8-10 (1976).

69. Atomic Industrial Forum's Committee on Nuclear Export Policy, U.S. Nuclear Export Policy 1 (July 21, 1976) (the Committee is composed of individuals employed by major atomic corporations) [hereinafter cited as Atomic Industrial Forum Policy Statement].

70. *Id.*

ence in the legitimate economic interests of foreign nations.[71] Doubts expressed by Ford and Carter that chemical reprocessing of nuclear fuel is economical have been challenged.[72] Carter's call for a three-year moratorium on the export of reprocessing and enrichment technology has been similarly criticized:

> [The moratorium] is still bound to sound a trifle presumptuous to industrial countries with little or no indigenous fuel resources, especially coming from a country which ran out of enrichment capacity two years ago, has totally failed to establish any commercial reprocessing capacity, and whose leading exporter of reactors [Westinghouse] has even failed to supply its contractual commitments of uranium ore.[73]

The nuclear industry also warns the United States Government against applying negative sanctions to uncooperative nations since this would encourage development of indigenous fuel facilities[74] at a much greater total cost.[75] Nuclear Regulatory Commissioner Victor Gilinsky criticized the Atomic Industrial Forum's sublimation of the proliferation risk in its statement on U.S. nuclear export policy. Gilinsky said the statement misrepresented the ease and practicality of obtaining weapons-grade plutonium from a normally operating power reactor.[76]

At least two United States nuclear industry proposals would be entirely consonant with non-proliferation goals: the provision of nuclear fuel services to other nations and the maintenance of consistent export procedures and requirements.[77] These policies would

71. "[T]he greater irony is that the countries complaining most about the spread of reprocessing knowhow are those who have so far dismally failed to provide reprocessing, spent fuel storage, or waste disposal facilities for the large numbers of nuclear power reactors already operating in their own countries." Smith, *Hang-up on Export of Reprocessing Knowhow Hard to Justify,* NUCLEAR ENGINEERING INT'L, Sept. 1976, at 5.

72. "All the objective studies and assessments of reprocessing and plutonium recycle we have seen to date have shown quite unequivocally that these phases of the fuel cycle are not only economic but that they represent as much as one third of total available fissile fuel resources. Try telling the Japanese that they do not need that extra 30 per cent of nuclear fuel supply! " Smith, *Ford Statement Comes 20 Years Too Late,* NUCLEAR ENGINEERING INT'L, Dec. 1976, at 3.

73. *Id.* at 3-4.

74. Atomic Industrial Forum Policy Statement, *supra* note 69, at 1.

75. Smith, *supra* note 71, at 5.

76. Gilinsky, Plutonium, Proliferation and Policy 9 (Nov. 1, 1976) (speech delivered at M.I.T.). *See* Atomic Industrial Forum Policy Statement, *supra* note 69, at 2.

77. *Id.* at 2-3.

encourage nuclear energy trade and at the same time help control the spread of nuclear weapons.

VII. RECENT ADMINISTRATIVE ACTION

On June 21, 1976, the Nuclear Regulatory Commission issued its first written opinion on an export matter, demonstrating the important and direct relationship between export policy and nonproliferation policy. In *Westinghouse Elec. Corp.*,[78] the Commission approved the export of a nuclear reactor to Spain—a country which has not signed the NPT. Shortly thereafter, an export application to sell special nuclear material (fuel) to India was approved in the case of *Edlow Int'l Co.*[79] Both export applications prompted a vigorous dissent by Commissioner Victor Gilinsky who feels IAEA safeguards are inadequate to meet the proliferation threat where a nation has not signed the NPT or made similar assurances.

Pursuant to the Atomic Energy Act,[80] the Commission considered four factors in the *Westinghouse* export application: "(1) whether an agreement for cooperation would apply; (2) whether the applicant is a foreign or alien corporation; (3) whether the export would be inimical to the common defense and security of the United States; and (4) whether the export would be inimical to the health and safety of the American public."[81] Only the third factor—whether the export would be inimical to the common defense and security of the United States—emerged as a major issue dividing the Commission. On the basis of information furnished by the State Department, the majority found IAEA safeguards adequate in light of the peaceful use guarantee Spain has given for all material irradiated in reactors supplied by the United States. The majority stated that either the United States (in the case of United States fuel governed by the United States-Spain Agreement for Cooperation[82]) or the IAEA (in the case of non-United States fuel governed by the IAEA/United States/Spain Trilateral Agree-

78. 2 NUCLEAR REG. REP. (CCH) ¶ 30,080 (1976).

79. *Id.* ¶ 30,085 (1976).

80. 42 U.S.C. § 2011 *et. seq.* (1970), *as amended by* Act of Aug. 17, 1975, Pub. L. No. 73-377, § 2, 88 Stat. 473 *and* Act of Dec. 31, 1975, Pub. L. No. 94-197, 89 Stat. 1111.

81. Westinghouse Elec. Corp., 2 NUCLEAR REG. REP. (CCH) ¶ 30,080, at 27,446 (1976). *See* 42 U.S.C. § 2133 (1970).

82. Agreement for Nuclear Cooperation, March 20, 1974, United States-Spain, 25 U.S.T. 1063, T.I.A.S. No. 7841.

ment[83]) must approve the safeguards against diversion before fuel may be reprocessed.[84] "Constructive diplomacy" was found the better way to improve proliferation control in comparison to unilateral action which would hurt the United States' position as a reliable supplier of fuel and decrease United States influence over foreign nonproliferation guarantees. The Commission soundly reasoned that a change in the supply conditions for this reactor would not affect the practice of the other eight reactors in Spain supplied by the United States or the reactors supplied by other countries.[85]

Dissenting, Commissioner Gilinsky distrusted the quality of IAEA safeguards covering non-United States fuel which could be used in the power reactor in question. He insisted the United States could maintain control over the spent fuel by requiring Spain to use only fuel governed by the United States-Spain Agreement for Cooperation.[86] Fearing the development of a reprocessing capability by Spain and the resultant stockpiling of plutonium, Gilinsky plainly doubted the ability of the IAEA to detect or prevent a diversion to explosive use. Gilinsky was also skeptical of the ability of the IAEA to properly supervise a potential Spanish reprocessing safeguards scheme.[87]

Edlow International Company's application for the export of special nuclear material (uranium fuel) to India raised issues similar to the Westinghouse export application. The Commission approved the export application because, under the United States-India Agreement for Cooperation, India can only use the transferred material at its Tarapur power station. The United States retains the right to repurchase any special nuclear material produced.[88] Gilinsky again objected because of India's impending chemical reprocessing capability, her nuclear explosive program, and her failure to sign the NPT.[89]

The supplying of nuclear material and technology to nonsignatories to the NPT (such as India and Spain) puts the United States in a difficult situation. If the United States supplies fuel to

83. Agreement for the Application of Safeguards, Dec. 9, 1966, IAEA-Spain-United States, 17 U.S.T. 2351, T.I.A.S. No. 6182.

84. Westinghouse Elec. Corp., 2 NUCLEAR REG. REP. (CCH) ¶ 30,080, at 27,451 (1976).

85. *Id.* at 27,452-53.

86. *Id.* at 27,459.

87. *Id.* at 27,461.

88. Edlow Int'l Co., 2 NUCLEAR REG. REP. (CCH) ¶ 30,080, at 27,487-88 (1976).

89. *Id.* at 27,488.

these nations, it contributes to the risk of diversion to explosive use and possibly discourages signing of the NPT. But if the United States denies fuel or technology to any nation, it will force many nations to recognize the insecure status of an increasingly important fuel supply, and thus encourage them to remedy the situation by developing enrichment and reprocessing capabilities.

VIII. Recent Diplomatic Efforts

Recent activities at all levels of the federal government point out the need for increased diplomatic activity aimed at stronger international agreements dealing with nuclear weapon proliferation risks. Groundwork for an effective international proliferation control regime has already been accomplished. The success of this control regime will doubtless depend on the strength and coordination of international action in the next decade.

Through an exchange of letters on January 27, 1976, ambassadors from Britain, Canada, Japan, the Soviet Union, the United States, and West Germany agreed to impose stricter nuclear export controls.[90] After the sale of reprocessing equipment to Brazil by West Germany,[91] the United States had requested the secret meetings in London which led up to the agreement. Nuclear fuel, reactors, uranium enrichment plants, and chemical reprocessing plants were covered by the seven-nation agreement which attempted to make uniform the export policies of the nations involved. The supplier nations agreed to mutual consultation on proposed nuclear exports and to uniform export policies in order to minimize competition for nuclear sales.[92] Recipients of nuclear material and technology will have to provide physical security for material received and must assure the exporters that no nuclear explosions of any type will be attempted with the imports. IAEA safeguards would be applied to all nuclear material (instead of just fuel) to prevent reproduction or re-export of nuclear plants outside the safeguards realm.[93] Reportedly, the multinational reprocessing center concept, which would enable closer and easier supervision of the plutonium separation process, was rejected, despite United States' support.[94] The London Nuclear Suppliers' Conference met

90. Keesing's Contemporary Archives 27,626 (Mar. 12, 1976).
91. *Id.*
92. *Id.*
93. *Id.*
94. *Id.*

again in secret during June 3 and 4, 1976, and was joined by representatives from East Germany, Italy, The Netherlands, and Sweden.[95]

In the recent past, increased competition to sell nuclear facilities has not been conducive to an adequate safeguards system with highly regulated access to plutonium. In their readiness to make a nuclear sale, some nations tend to minimize safeguards or sell reprocessing facilities despite a serious risk of proliferation. Brazil, for example, came to the United States with its reprocessing plant order but was turned away (some say by indecision) into the eager arms of German industrialists.[96] Similarly, Libya's leader, Col. Moamar Khaddafi, was turned down by India and France in his request for a nuclear power reactor, whereupon the Soviet Union agreed to build the nuclear plant for the volatile Khaddafi in exchange for Mediterranean naval bases and access to Libyan oil.[97]

In order to meet the threat posed by economic, political, and ideological competition, a nuclear exporters cartel has been suggested.[98] The cartel or market-sharing arrangement would assure nuclear exporters a certain share of the export market in return for a promise not to sell enrichment or reprocessing facilities.[99]

Legal objections to, and the practical difficulties inherent in, a nuclear suppliers market-sharing cartel appear almost insurmountable. First, determination of a nation's fair market share of the nuclear export market would prove extremely difficult, especially in light of suspicions that the United States is seeking to shore up its deteriorating market position.[100] Second, a nuclear suppliers cartel would, arguably, violate section one of the Sherman Antitrust Act unless held exempt as governmental action.[101] However, where United States security objectives are concerned, United States policy opposing cartels has not been very strong.[102]

95. KEESING'S CONTEMPORARY ARCHIVES 27,816 (July 9, 1976). Belgium, Czechoslovakia, and Poland reportedly were ready to join the nuclear suppliers group.

96. *International Proliferation of Nuclear Technology: Oversight Hearings on Nuclear Energy Before the Subcomm. on Energy and the Environment of the House Comm. on Interior and Insular Affairs,* 94th Cong., 1st Sess. 110 (1975).

97. *Cordial Entente: Libya-Soviet Union,* TO THE POINT—INT'L, Jan. 10, 1977, at 22.

98. Mandelbaum, *A Nuclear Exporters Cartel,* BULL. ATOM. SCIENTISTS, Jan. 1977, at 42; Ribicoff, *A Market-Sharing Approach to the World Nuclear Sales Problem,* 54 FOREIGN AFF. 763 (1976).

99. Mandelbaum, *supra* note 98, at 43.

100. Ribicoff, *supra* note 98, at 43.

101. *Id.* at 780.

102. *Id.*

Finally, if a cartel were set up and did overcome legal objections it still might stifle competition to develop safer and more productive nuclear power systems. Once a particular nation's share of the world nuclear market was determined, how would a particular corporation's share be alloted within the national share?

IX. Conclusion

The proliferation of nuclear weapons poses a serious threat to world peace and security. Like many threats, proliferation will only arouse concerted and decisive opposition as the problem becomes more immediate. For the present, economic and political motives conflict sharply with the goal of stopping the spread of nuclear weapons. The energy crisis of recent years has created a desire by most nations to obtain an independent energy supply, including nuclear reactors. Increased use of nuclear energy will undoubtedly create a greater risk of nuclear weapon proliferation, yet there are steps which can be taken to minimize the risks involved.

The United States cannot act alone through export policy to stop the spread of nuclear weapons. Unilateral action will defeat both economic and non-proliferation goals by sending nuclear customers to other suppliers and by furthering an atmosphere of unreliability sufficient to prompt development of indigenous nuclear fuel services by the non-nuclear weapon nations. Support of all nations should be sought and channeled through the IAEA. The London group of nuclear suppliers should affiliate themselves closely with the IAEA. It is conceivable that the group could become a component of the IAEA, much as the Security Council is now a component of the United Nations. The IAEA, the nuclear exporters, and concerned nuclear importing nations should establish a set of powerful sanctions to apply to those countries breaching the NPT, IAEA safeguard agreements, or any law in obtaining nuclear material for explosive purposes. Procedures for applying such multilateral sanctions should be thought out well in advance, as a crisis may not allow time for deciding if a nuclear boycott, a complete economic boycott, or intervention would be appropriate.

Large multinational fuel centers to enrich and reprocess nuclear fuel and to store and treat radioactive material would help centralize the safeguards system and make the monitoring task much easier. These multinational fuel centers could be supervised by the IAEA whether they are located in the United States or at various locations throughout the world. An international control regime with powerful political and trade sanctions would be in a strategic

position to enforce the NPT and the IAEA safeguard agreements.

The IAEA and its supporters could further their nonproliferation goals by developing and instituting safe and effective nuclear waste disposal methods. By helping solve the environmental threat posed by nuclear energy, the IAEA could furnish an attractive alternative to national stockpiling of nuclear material and thereby gain greater control over the nuclear fuel cycle risks. Multinational waste disposal centers would further demonstrate the utility and safety of concerted control efforts at the international level.

Public concern in the United States over the safety risks, including weapons proliferation, have helped put the United States in a less prominent leadership position in nuclear matters. Greater competition from other industrialized nations (both those with and without nuclear weapons) also helped diminish the United States position of leadership. While the anti-nuclear sentiment may be based on entirely rational fears, it must be recognized that the inhibiting effect on the United States' domestic nuclear industry will probably not further international control of the proliferation threat.

Reservations expressed by Ford and Carter over the economic value of chemical reprocessing may not find support in light of the rising price of uranium and recent studies presenting the economic aspects of reprocessing. Some nations may demand reprocessing strictly to lessen their dependence on the nuclear suppliers. From a United States perspective, the best way to meet this demand is to encourage the construction of large facilities such as the one at Barnwell, South Carolina, which could be located in various regions around the world under IAEA control. Individual reprocessing plants serving each nation would clearly be the least attractive alternative, considering the ulterior motives of some nations requesting reprocessing plants.

The Nuclear Explosive Proliferation Control Act allows the United States to support and participate in the type of control regime which will minimize the risk of nuclear weapon proliferation. By encouraging agreements with other nuclear suppliers, the bill reaffirms the United States' policy of limiting the spread of nuclear weapons. It provides for the flow of information during nuclear export negotiations and decisions resulting in agreements for cooperation, insuring closer scrutiny of United States nuclear relationships with other nations. Most importantly, the Nuclear Explosive Proliferation Act or any similar comprehensive legislation would point out the need for international agreement to control the supply of weapons-grade nuclear fuel.

The groundwork for effective proliferation control has already been established. Prevention of diversion by terrorists can be accomplished through tighter physical security measures and stockpiling of special fissionable material only under IAEA control. Prevention of diversion by national governments is probably a more difficult task but will be accomplished, if at all, through greater international cooperation. An effective international control regime must have power over the supply of special nuclear material, especially at the enrichment and reprocessing stages. Enrichment and reprocessing under international auspices would allow the IAEA to supply the nuclear fuel needs of the world without a great risk of diversion to military use.

Organizing, policing, and financing a nuclear suppliers market-sharing cartel would constitute a near-impossible task because of the wide political and economic differences among the supplier nations. One positive aspect of such a cartel—the elimination of safeguards as an item of competition—may be instituted by international agreement outside the context of a market-sharing cartel.

The Nuclear Non-Proliferation Policy Act of 1977 proposed by the Carter Administration contains many proposals which would be extremely effective if adopted by all of the nuclear supplier nations. Unfortunately, the continuing worldwide energy crisis will likely force many nations to disregard the serious environmental and proliferation risks of nuclear technology. The National Energy Plan recognizes but does not appreciate the fact that many nations in the world do not have a vast supply of natural fuel sources such as coal to fall back on. With this in mind, the United States should prepare for the continued and expanded use of plutonium as a nuclear fuel by other nations.

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