The original documents are located in Box 25, folder "Nuclear Policy Statement - Meeting with the President, July 29, 1976 (1)" of the James M. Cannon Files at the Gerald R. Ford Presidential Library.

[July 1976]

THE WHITE HOUSE
WASHINGTON

1. Convey the importance of Bob Fri as the leader of the review team on Nuclear Policy.

2. Direct all departments and agencies to cooperate with Fri on this important policy issue.

3. Emphasize that Bob Fri will make sure all departments and agencies involved are consulted and kept informed.

MEETING WITH THE PRESIDENT
Thursday, July 29, 1976
11:45 a.m.
Cabinet Room
Re: Nuclear Policy Review Team
30 minutes

Deadline - for Adm to Comm
By end of August

Pastore - wide permission to
move legislation this session -
w/ Admin
w/ P can accept

THE WHITE HOUSE

WASHINGTON

July 27, 1976

TO: Jim Cannon
Jim Connor
Jim Lynn
Brent Scowcroft

FROM: Bob Fri

Attached for your information are my notes for my brief remarks at the meeting with the President on the nuclear policy review, now set for Thursday at 11:30.

NOTES FOR MEETING
WITH THE PRESIDENT

1. Product of the review

   - o Decision memorandum for the President with agency views and EOP staffing
   - o Depending on decisions, possibly a message on nuclear policy

2. Approach to the review (present thinking)

   - o Focus on two key areas domestically and internationally
     - Closing the fuel cycle
     - Plutonium management
   - o Early evaluation of two issues
     - Domestic interest in recycle, taking into account international implications
     - Waste management initiatives
   - o Need to synthesize issues and options into a decisionable framework, which requires
     - Involving agency staff
     - Early circulation of issue papers

3. Composition of full-time team

4. Arrangements

   - o Early interviews at senior level
   - o Contact point for paper and people

5. Characterizing the study

   - o Anderson letter
   - o Need to control expectations

] - check against [July 1976]

Fri meeting on Thursday

Vice P
Lynn (Mitchell
Scowcroft
Cannon
Connor
} 4

Fri
Key members

Scowcroft
~~Brent~~ + Cannon
Fri
Andrews Letter Release

Vice President.
~~[illegible]~~ Ellsworth - Defs
Robinson - State
~~[illegible]~~ IKLE - ACDA
Seamans - ERDA
Rowden - NRC
~~Train - EPA~~
Jellinek ~~Peterson - CEQ~~
Kleppe - Int
Richardson - Commerce
~~Zarb. - FEA~~
} 10

Fri - ~~Getting~~ Traveling secretarial help

Press Plan
In response to a question

[July 1976]

ADMINISTRATION REVIEW OF NUCLEAR POLICY

Question

Rumors (and press stories) are indicating that President Ford has directed a major review of U.S. nuclear policy on a crash basis that has set up a new group in the White House (headed by ERDA Deputy Administrator Bob Fri on a full-time basis) to do the job. Is this true? Will there be a report to the President? Will major new proposals be forthcoming soon?

Answer

Assurance of safe, reliable, and environmentally acceptable nuclear power is a high priority of the national energy program. International policy of the United States further pledges that we shall discourage proliferation of nuclear weapons capability. A number of specific measures have already been taken toward this end.

Nuclear policy is under continuing review. However, the President wishes to evaluate this subject comprehensively, and so has directed a concerted review of our policy objectives and options relating to nuclear matters, including exports, nuclear fuel reprocessing, and waste management. Nuclear policy engages domestic and international responsibilities of several Federal departments and agencies, and advisory bodies to the President, all of whom will be consulted during the review

A review group has been formed, under full-time direction of Robert W. Fri. Mr. Fri normally serves as Deputy Administrator of the Energy Research and Development Administration. His appointment to this temporary duty reflects the President's intent that all affected agencies are fully involved at the highest level.

The interagency review group will report in early fall.

Question

Which agencies will be consulted in this review of nuclear policy?

Answer

Among the departments and agencies with obvious interests in the review are: the Department of State; the Energy Research and Development Administration; the Nuclear Regulatory Commission; the Department of Defense; the Department of Commerce; the Environmental Protection Agency; the Council on Environmental Quality; the Federal Energy Administration; the Arms Control and Disarmament Agency; and the Department of Interior. Each of them will be consulted. Other agencies may be involved in the review as their interests become known.

Question

Why isn't this study being done by the Energy Resources Council (ERC)?

Answer

The nuclear policy issues covered by the review involve a variety of objectives including but not limited to energy. Because a comprehensive approach is considered necessary, none of the existing policy groups by themselves (e.g., NSC, Domestic Council, EPB or ERC) were ideally suited to conduct the review. However, all the existing policy groups -- as well as the agencies that have some responsibility relating to nuclear policy -- will be involved.

File
Nuclear
Policy

FOREIGN AFFAIRS

AN AMERICAN QVARTERLY REVIEW

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The Italian Crisis—Guido Carli and Sergio Segre.

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1976

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A MARKET-SHARING APPROACH TO THE WORLD NUCLEAR SALES PROBLEM

By Abraham A. Ribicoff

AN unanticipated development in the world nuclear marketplace has suddenly transformed the problem of nuclear proliferation from a potential to an immediate danger. The recent decisions by West Germany and France to sell nuclear fuel facilities to Brazil and Pakistan, respectively, mark the first sharp divergence by major industrial nations from long-established U.S. nonproliferation policy. The cornerstone of this policy has been the general practice of exporting power reactors and low-enriched uranium fuel, neither of which can be applied directly to weapons-making, and of not exporting nuclear fuel plants capable of enriching uranium and reprocessing plutonium in a form suitable for direct use in atomic bombs.

The United States failed to anticipate these sales and has been ineffective in seeking to persuade Germany and France not to proceed with them. This indicates a serious weakness in the execution of American nonproliferation policy, which if left uncorrected, could result in the rapid spread of nuclear weapons material and capability around the world.

II

U.S. exports of nuclear technology, equipment and material currently dominate 70 percent of the world market. We require the customer nations to pledge that our nuclear assistance will be used for peaceful purposes, the most important of which is generating electricity. The turbines of the average nuclear power plant sold today generate one billion watts of electricity, enough to serve a city of one million people. The nuclear core of the power plant generates 500 pounds of plutonium a year, which if separated from spent fuel, is enough bomb material to devastate several cities of that size.

As the principal developer and promoter of nuclear power plants,

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Abraham A. Ribicoff has been Senator from Connecticut since 1962. He was Secretary of Health, Education and Welfare, 1961–62, and before that a Member of Congress. This article is drawn from hearings before the Senate Committee on Government Operations, of which Senator Ribicoff is Chairman.

Paul L. Leventhal, Counsel to the Government Operations Committee, provided research and assistance in the preparation of the article.

the United States has sought to keep the plutonium generated by these plants out of the hands of our customers by refusing to sell them reprocessing plants or technology. Such plants are used to chemically separate plutonium—readily usable in a weapons development program—from the "ashes" of the reactor fuel. The policy has also reflected the fact that there has been no commercial justification for such plants because there is no present need to recycle plutonium as reactor fuel.

In addition, at what is sometimes called the "front end" of the nuclear fuel cycle, the United States has all along refrained from sharing the plants or technology for the enrichment of uranium. The degree of enrichment required to fuel the American-designed light water reactor is low, but a uranium enrichment plant is capable of producing weapons-grade uranium.

Over the past few years, however, several U.S. actions have served to undermine the influence of this policy, and to encourage the export of reprocessing and uranium enrichment plants:

First, the United States abandoned its initial policy to provide complete fuel cycle services with the reactors that we sell. The original regulations of the Atomic Energy Commission provided for the reprocessing of the spent fuel of all reactors sold abroad, and for the disposal of highly radioactive wastes, in AEC facilities. However, this policy was implemented only for research reactors, not power reactors, thereby making clear to purchasers of nuclear power plants that the spent fuel was theirs to keep.[1]

Second, the United States failed to increase the capacity of its uranium enrichment plants to keep pace with worldwide demand for reactor fuel, thereby casting doubt as to our traditional role as a reliable supplier. In 1974, the AEC, shortly before it was abolished, announced it would not be able to accept uranium enrichment orders for nuclear power plants sold after that year. West Germany, France and other European countries had by then already entered into substantial programs for uranium enrichment, and the American failure to increase our own enrichment capacity contributed further to the diversification of available sources not only of domestic uranium enrichment services, but for the possible export of plants and technology.

Third, the United States has sold substantial amounts of plutonium and weapons-grade uranium to advanced industrial nations, even to the apartheid government of South Africa, while refusing to export

[1] U.S. Energy Research and Development Administration, *Final Environmental Statement, U.S. Nuclear Power Export Activities,* Washington, April 1976, p. 14–5.

such material to developing nations.[2] Although the material sold has been intended for research and development purposes, this export policy strikes some Third World nations as galling.

Fourth, although the United States had taken the lead in getting the Treaty on the Nonproliferation of Nuclear Weapons (NPT) that came into effect in 1970, it set a bad example by agreeing to engage in nuclear trade with nations that had refused to ratify the NPT and were thus under no treaty obligation not to produce nuclear weapons (or to accept safeguards on all their nuclear activities). Of the 29 U.S. agreements for nuclear cooperation with other countries, no less than 13 are with non-NPT nations.[3] This policy represents a form of "tunnel vision" in which the United States focuses on getting agreement for safeguards—applied through the International Atomic Energy Agency (IAEA)—on specific exported equipment and material, but not on *all* activities in a recipient nation.[4]

Fifth, although U.S. trade with non-NPT nations has been limited to sales of reactors and low-enriched fuels, we did not originally seek commitments from France and West Germany to follow the same policy. This could have been made a condition of their obtaining our technology, equipment and fuel for the development of their own nuclear industries. Now they are free to offer plutonium reprocessing and uranium enrichment plants to non-NPT nations as an incentive to buy U.S.-design reactors made in West Germany or France.

Sixth, although the United States has been the world's leading nuclear-technology nation, we have not developed—even within our own country—material-accounting and physical security safeguards

[2] For data on U.S. exports of plutonium and high-enriched uranium to specific countries, see correspondence between David Lilienthal and Glenn Seaborg submitted for the record by David Lilienthal, and subsequent data submitted for the record by Secretary of State Kissinger, *Hearings of the Senate Committee on Government Operations, the Export Reorganization Act of 1976,* Washington: GPO, January and March, 1976 (hereafter referred to as Senate Government Operations Committee Hearings), in press.

[3] *United States Agreements for Cooperation in Atomic Energy,* an analysis prepared for the Senate Committee on Government Operations by Dr. Warren H. Donnelly, Senior Specialist—Energy, Congressional Research Service, Library of Congress, Washington: GPO, 1975, p. 55, Table II—List of Agreement Nations and Their NPT Status.

[4] The most current example of this problem is the pending application by General Electric to export two power reactors of nearly 1,000 megawatts electric (MWe) each to South Africa, a non-NPT nation. The reactors would be safeguarded by the IAEA, but other nuclear activities in South Africa would not, including a uranium enrichment plant. The United States is heavily involved in the South African nuclear program, having exported computers for use in the unsafeguarded enrichment plant and having committed itself to provide enrichment services for power reactors of up to a maximum capacity of 2,000 MWe, regardless of which nation supplies them. France and Germany are competing strongly for these reactor sales in the hope that the United States will be blocked at home from proceeding with the exports.

The United States also has supplied South Africa about 200 pounds of weapons-grade uranium as fuel for a safeguarded research reactor (the equivalent of 10 bombs) and is committed to supply an additional 100 pounds.

capable of reducing risks of diversion, theft and sabotage to acceptable levels. Yet the United States accepted less rigorous IAEA safeguards and bookkeeping systems demanded by West Germany and Japan as the price of winning widest possible adherence to the NPT.[5] Nuclear material accounting is particularly primitive, and several experts consider it not difficult to divert small, but strategically significant, amounts of weapons-grade material under the measurement and bookkeeping systems presently used by the United States and the IAEA. These experts also believe that should reprocessing and enrichment plants proliferate on a national basis, the IAEA will be unable to apply safeguards capable of detecting a diversion of weapons-grade material in time to prevent fabrication of nuclear weapons.[6] Under these circumstances, there can be no mutual trust in the international nuclear community if national production and stockpiling of plutonium is permitted to proceed.

Seventh, the United States did not rebuke India when it set off a nuclear explosion in 1974, utilizing plutonium from a Canadian-supplied research reactor that, in turn, used U.S.-supplied heavy water. The reactor predated the IAEA and had never been placed under the Agency's safeguards. Canada relied on a peaceful-use clause in its agreement with India, but India refused to accept Canada's assertion that a nuclear explosion was a non-peaceful application of its nuclear assistance. The United States now has an agreement with India requiring "civil use" of two U.S.-supplied power reactors. But the export of heavy water had been made before negotiation of the agreement and was not included in it, apparently at India's insistence. The Indian explosion, therefore, was deemed not to be in violation of the civil-use provision.

In response to the Indian explosion, Canada cut off nuclear exports to India, a move that was expected to be only temporary because it was not joined by the United States. But Canada recently surprised the international community by announcing that it would continue its nuclear boycott until India agreed to accept IAEA safeguards on,

[5] Robert Pendlay and Lawrence Scheinman (with collaboration of Richard W. Butler), "International Safeguarding as Institutionalized Collective Behavior," *International Organization,* Summer 1975, pp. 612–16.

[6] For authoritative discussion of safeguard problems, see General Accounting Office report, *Role of the International Atomic Energy Agency in Safeguarding Nuclear Material,* ID 75-65, July 3, 1975; unclassified digest of GAO report, *U.S. International Nuclear Safeguards—Are They Being Effectively Exercised?* ID 76-21, February 9, 1976; Remarks of Victor Gilinsky, Commissioner, Nuclear Regulatory Commission, at the Conference on Nuclear Safeguards, Atomic Industrial Forum, April 12, 1976 (NRC press release S-5-76); Response of Lawrence Scheinman, International Affairs Division, Energy Research and Development Administration, to my questions for the record, Senate Government Operations Committee Hearings; *Nuclear Weapons Proliferation and the International Atomic Energy Agency,* a report prepared for the Senate Committee on Government Operations by Warren H. Donnelly, Washington: GPO, 1976.

and to make a no-explosion pledge with respect to, all Canadian nuclear assistance—past, present and future. Canada, therefore, becomes the first nuclear supplier to place itself at a commercial disadvantage by cutting off exports in an effort to curb weapons proliferation—an example that serves to discredit U.S. nonproliferation policy.

The United States, for its part, has not generally made known our export to India of heavy water for use in the Canadian-supplied reactor. Instead, the State Department is maintaining normal nuclear relations with India and is seeking to continue supplying enriched uranium fuel to the two power reactors, over objections raised in an environmental suit and by several Members of Congress. Continued U.S. inaction establishes a precedent that may encourage other non-NPT nations to set off peaceful nuclear explosions (PNEs).[7]

The loss of the original American monopoly in nuclear technology was probably inevitable. But the United States now finds itself at a competitive disadvantage, in a rapidly proliferating world, for reasons largely of its own making. The sum total of these recent developments has greatly weakened American leverage, increased the incentives for others to engage in sensitive export activities, and left IAEA safeguards in an unsatisfactory position. It is against this background that the West German and French sales were made.

While both the West German sale to Brazil and the French sale to Pakistan are expressly subject to IAEA safeguards, neither France, Pakistan nor Brazil are signatories of the NPT and the very existence of enrichment and reprocessing capacity in Third World countries is a profoundly dangerous development. The agreements do provide for the extension of IAEA safeguards to any domestic copy of the imported plants, as well as to the imported plants themselves, and the French and Germans assert that the safeguards will thus be sufficient to prevent the recipient nations from building an unsafeguarded plant or from diverting weapons quantities of material from a safeguarded fuel plant. However, such a presumption goes beyond what can be reasonably expected under safeguards and is disputed by a growing number of independent experts and government officials familiar with the situation.[8]

Unless a way can be found to bring about the cancellation of the ill-advised exports of fuel facilities to Brazil and Pakistan, other

[7] It is speculated in arms control circles that India is subtly blackmailing the United States by reason of 1,000 pounds of plutonium that have accumulated in the spent fuel of these power reactors—plutonium over which India can take control if it deems the United States to be in abrogation of its fuel-supply agreement. At the very least, the United States should consider exercising an option to buy back the plutonium generated by these power reactors.

[8] See sources cited in footnote 6, above, particularly Gilinsky.

Third World countries are likely to order them. Germany is now known to be negotiating such a transaction with Iran, which as a party to the NPT views the withholding of any nuclear assistance as a violation of its right, under the Treaty, to access to peaceful nuclear technology on a nondiscriminatory basis.[9] Furthermore, unless a way can be found to make clear to non-NPT nations that the United States will react adversely to any additional nuclear explosions, such explosions may become an attractive way for developing nations to seek prestige abroad and greater support at home.

Some developing nations now seeking to establish nuclear programs, complete with their own fuel facilities, must be considered as potential nuclear-weapons countries either because they have refused to ratify the NPT—Argentina, Brazil, India, Pakistan, South Africa, Egypt and Israel—or because of national security considerations that could override their obligations under the NPT—South Korea, Iran, Libya and Taiwan. To give a sense of the quantitative dimensions of the problem, by 1990 nuclear power plants in the less-developed countries may be generating 30,000 pounds of plutonium a year—the equivalent of 3,000 atomic bombs.[10] Plutonium is also extremely toxic: government safeguards specialists estimate that between 10 and 100 *grams* of plutonium oxide powder, dispersed through a ventilation system, is sufficient to kill thousands of occupants of a large office building.

Little time remains to correct the present dangerous situation. But there may still be time so long as most of the plutonium produced in civilian power reactors remains unseparated from spent fuel, and if the capacity to enrich uranium can be harnessed and internationally controlled.

In essence, an international system must be devised that encourages the sale of reactors to meet legitimate energy needs without proliferating the capability and material to develop nuclear weapons. Although

[9] Article IV of the Treaty states that: "Nothing in this Treaty shall be interpreted as affecting the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination and in conformity with Articles I and II of this Treaty." On the other hand, Article I of the Treaty obligates the United States, as a nuclear weapon state "not in any way to assist, encourage, or induce any non-weapon state to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices. . . ." In any event, it is reasonable for the United States to make clear to other supplier nations that the Treaty does not require them to do foolish things that will increase proliferation, when effective alternatives are available. For further discussion of this point, and a general analysis of U.S. obligations under the NPT, see testimony of Adrian S. Fisher, a principal U.S. negotiator of the Treaty, Senate Government Operations Committee Hearings, *op. cit.*

[10] Richard J. Barber Associates, Inc., *LDC Nuclear Power Prospects, 1975–1990: Commercial Economic and Security Implications* (ERDA-52), Washington, 1975, Figure V-1. This table is reproduced in *Facts on Nuclear Proliferation—A Handbook*, prepared for the Senate Committee on Government Operations by the Congressional Research Service, Library of Congress, Washington: GPO, 1975, p. 198.

the United States does not have the leverage that it had in the recent past to bring about such a system, it still retains considerable influence and power to attain nonproliferation objectives.

The key to solving the proliferation problem is to prevent the spread of national capabilities to produce nuclear explosive materials. The spread of nuclear technology may be inevitable, but it is needlessly hastened in the developing world by supply arrangements with industrial nations. It is incumbent upon the industrial nations, therefore, to bring the dangerous elements of the nuclear fuel cycle—uranium enrichment and plutonium reprocessing—under meaningful international control.

III

The greatest obstacle today to achieving this control is the projected shortage of enriched uranium, which encourages the export of enrichment and reprocessing plants, presumably to ensure an adequate fuel supply for nuclear power plants.

The present U.S. approach to dealing with this shortage of enriched uranium is to permit a consortium of three American corporations, Uranium Enrichment Associates, to build a gaseous diffusion plant in Dothan, Alabama, with participation by French, German, Iranian and Japanese commercial interests as well. In addition, the U.S. government is apparently, though not formally, committed to expanding the capacity of one of three government-owned enrichment plants for production of commercial reactor fuel.[11]

Assuming congressional approval of, and foreign participation in, the plan—and these are by no means assured—the price paid for increasing the reactor fuel supply will be to permit a major expansion of private control over the production of nuclear energy. Advocates of this approach state that it will promote interdependence among the major nuclear nations—Iran being included on the basis of its intention to develop a large nuclear power industry—which, in turn, will serve to promote nonproliferation objectives. However, there appear to be no firm commitments on the nonproliferation front.

For example, are each of the participating supplier countries prepared to agree not to export nuclear fuel facilities on a national basis as a condition of their participation in the U.S.-sponsored enrichment venture? Or are they planning to use the additional supply of enriched uranium from the United States to meet domestic needs, while con-

[11] U.S. Energy Research and Development Administration, *Expansion of U.S. Uranium Enrichment Capacity—Final Environmental Statement* (ERDA-1543), Washington, 1976, and *Nuclear Fuel Cycle; A Report by the Fuel Cycle Task Force* (ERDA-33), Washington, 1975. These and similar documents are available from the National Technical Information Service, Washington.

tinuing to offer enrichment and reprocessing plants with the reactors that they sell abroad? Without firm nonproliferation commitments from the parties to this multinational venture, it must be assumed that the other suppliers, particularly France and Germany, are not prepared to alter their present dangerous export policies.[12]

The best course would be to place the question of building a multinational enrichment plant in the United States on the agenda of the nuclear suppliers conference, which is to resume in London this June.[13] The *governments* should work out nonproliferation commitments that will be binding on the *commercial* interests of all parties as a condition of proceeding with this venture.

The basic commitment should be an agreement among the parties that the increased supply of enriched uranium provided by this plant would be used to the degree necessary to supply fuel for sales of exported reactors by the participating countries, and that these countries would refrain from providing enrichment and reprocessing plants with reactor sales, or otherwise. (A parallel undertaking should be sought from potential suppliers not participating directly in the Dothan plant.) Each nation's export program, therefore, would be limited to the number of reactors for which long-term fuel commitments can be provided.

With respect to Iran, a recipient nation, there should be a binding commitment to use the enriched uranium domestically and not to build or to import an enrichment or reprocessing plant. Iran, in turn, would have to be assured a reliable supply of uranium in order to forego proceeding with its own fuel facilities. There is no reason such assurances cannot be given by the United States and the other suppliers on condition that Iran continues to live up to its NPT commitments to place all nuclear activities under IAEA safeguards and not to develop a nuclear explosion program.

IV

Perhaps even more important from a nonproliferation perspective is the question of reprocessing the plutonium that will be generated by power reactors as part of the spent fuel. This problem is compli-

[12] For details of German nuclear export policy see the translation of an article from the March 15, 1976, issue of *Der Spiegel*, "Booming Business or Business with the Bomb?" *Congressional Record* of April 26, 1976, pp. S5873–79. For French nuclear export policy, see Jean Sauvagnargues, *France's Policy on Exporting Nuclear Material and Technology*, Statement before the National Assembly Foreign Affairs Committee, April 8, 1976.

[13] The original members of the suppliers conference were the United States, the U.S.S.R., the United Kingdom, France, the Federal Republic of Germany, Japan and Canada. For the resumed talks this June, the Netherlands, Sweden, Belgium, Italy, East Germany and Poland have also been invited.

cated by the fact that no steps have been taken to implement Article 12(A)(5) of the IAEA statute authorizing the Agency to regulate reprocessing and to require deposit with the Agency of any plutonium in excess of the commercial needs of a country—that is, in excess of what is needed for recycling as reactor fuel.

The IAEA is not prepared to implement this provision without the strong backing of the major supplier nations. The United States, therefore, has an opportunity to use the proposed multinational enrichment venture as a lever for moving under multinational auspices the "back end" of the nuclear fuel cycle as well, i.e., the reprocessing of plutonium and the permanent disposal of highly radioactive waste by-products that cannot be reclaimed from spent reactor fuel.[14]

In this regard, the United States should propose that the plutonium reprocessing plant now in final stages of construction at Barnwell, South Carolina, be made available as a multinational facility for servicing the spent fuel of foreign reactors as well as our own. I wish to stress that this is *not* a proposal for immediate reprocessing of spent fuel—a step that should not be taken until there is a real commercial need for recycled plutonium and until safeguards have been upgraded sufficiently to prevent the resulting weapons-grade material from being diverted by nations or stolen by terrorists. The pending decision of the Nuclear Regulatory Commission on whether to approve the use of plutonium as a reactor fuel involves a landmark consideration of these difficult questions.[15]

Rather, the Barnwell plant can be used initially as a spent-fuel storage area to be managed and safeguarded by the IAEA pursuant to Article 12 of the Agency statute. As an incentive for nations to deposit their spent fuel at Barnwell, the United States and the other parties to the multinational enrichment plant can offer to replace the unseparated plutonium in the deposited spent fuel with an equivalent

[14] While the proposals in this article do not deal specifically with the question of permanent waste disposal—a question which is indeed vital—it is my strong hope that the type of multinational cooperation here advocated would lend itself to early common resolution of the technical and practical problems involved. In the meantime the plan I am proposing would at least prevent waste by-products from being scattered, and would put most or all of them under IAEA control.

[15] Opposition to plutonium recycle is broadly based. Environmental arguments are summarized in J. Gustave Speth, Arthur R. Tamplin and Thomas B. Cochran (of the Natural Resources Defense Council), "Plutonium Recycle: The Fateful Step," *Bulletin of the Atomic Scientists*, November 1975, pp. 15–22, and economic objections in Marvin Resnikoff, "Is Reprocessing Cost-Justified?" *Environment*, July–August 1975. Last fall, National Public Radio disclosed what was apparently the authentic text of an internal report of the Edison Electric Institute, a trade association representing privately owned utilities, which stated: "The U.S. utility industry should regard reprocessing and recycle of plutonium and uranium as matters both of marginal economic interest or value and not clearly central to the economic viability or public acceptance of nuclear power. Indeed they may be negative on both counts." NPR Press Release, September 24, 1975.

amount of low-enriched uranium fuel suitable for use in reactors, but unsuitable for use as weapons material. The unrecovered plutonium would be held as a potential long-term fuel resource, and any out-of-pocket cost of supplying the substitute enriched uranium could be underwritten by the participating governments.

Such an agreement should not be as hard to achieve as it may appear at first glance. There is already a multinational arrangement for spent-fuel reprocessing among the three principal European suppliers—Great Britain, Germany and France. The resulting joint company, United Reprocessors, will be used for allocating reprocessing contracts on a rotating basis among the British Windscale plant, the French La Hague plant and the projected German PWK/KEWA plant. This approach to eliminating competition in the supply of reprocessing services has been approved by the Commission of the European Economic Community as an acceptable form of industrial concentration, compatible with the anti-cartel laws of the Treaty of Rome. The arrangement includes the use of a single transporter, Transnucleare, to handle all transportation of plutonium serviced by United Reprocessors.[16]

The arrangement has not been implemented yet because of technical difficulties encountered at the British plant and siting problems with the German plant. There is time, therefore, for the United States to explore whether the Barnwell plant, itself delayed because of strong opposition by environmentalists to the start-up of actual commercial reprocessing, can be tied into the Anglo-French-German cooperative effort on a storage-only basis.

I propose that the United States place the highest priority on achieving such an arrangement for enrichment and spent-fuel storage at the suppliers meeting because it could provide the needed connection between the front and back ends of the nuclear fuel cycle. This connection could then provide the basis for meaningful ground rules among the suppliers to provide complete nuclear fuel services on a cheap, reliable, nondiscriminatory basis to their reactor customers in lieu of exporting enrichment and reprocessing plants. The dangerous open-ended nuclear fuel cycle will at last have been safely closed.

V

Specifically, the suppliers are now in a position to arrange cooperatively for the supply of enriched uranium from the proposed multinational facility to be built in the United States and from two

[16] For details of this arrangement, and on nuclear market-sharing in general, see the testimony of Lawrence Scheinman, Senate Government Operations Committee Hearings, *op. cit.*

other multinational enrichment projects now under construction in Europe. One venture, URENCO, a consortium of British, Dutch and German companies, involves the construction of centrifuge plants in Almelo, Holland, and Capenhurst, England. The other venture, EURODIF, involves the construction of a gaseous diffusion plant in Tricastin, France, by a consortium of French, Belgian, Italian, Spanish, Japanese and Iranian interests. These plants are scheduled to be in full production by the early 1980s.[17] The Soviet Union could be a participant as well because its enrichment capacity is now second only to that of the United States.

The American objective should be an arrangement that invites the widest possible international participation in these enrichment ventures by user nations which, in return for obtaining low-enriched uranium under the most favorable terms, would be prepared to deposit their spent fuel under IAEA control at the reprocessing plants affiliated with United Reprocessors or a successor company that includes participation of the Barnwell plant in the United States. And there would be the added incentive, as discussed above, that part of the uranium enrichment services will be provided to customer nations as a credit for the plutonium contained in the spent fuel that they deposit.

With this type of coordination among the suppliers, it should be possible to reach several nonproliferation objectives.

First, without fear of being placed at a competitive disadvantage, each supplier can agree to delay the start of reprocessing until there is a clear commercial need for recycled plutonium and until the political and technical systems have been established for preventing diversion of plutonium by nations or theft by terrorists.

Second, although uranium enrichment will be available under multinational auspices, individual customers should be able to enter into bilateral fuel contracts with individual suppliers. This eliminates the possibility that a customer nation could be cut off from reactor fuel by a single-minded supplier cartel. Sufficient diversity of supply can be built into the multinational system to prevent such a contingency.

Third, any stockpiles of highly enriched uranium or separated plutonium at these multinational plants can be placed under the management and control of the IAEA. Such a system will deny sovereignty over commercially produced weapons-grade material to all

[17] Estimates of world enrichment capacity can be found in ERDA-1543, cited in footnote 11, and in a report of the Organization for Economic Cooperation and Development and other international agencies, *Uranium: Resources, Production and Demand,* Paris: OECD, 1976, p. 66.

nations, not just to customer nations. This provides an element of symmetry that is important to nations of the Third World and essential for winning their assent to such a system.

Fourth, these cooperative arrangements over existing enrichment technology can be extended to new technology as it is developed—particularly the use of lasers to separate the fissionable isotope of uranium 235 from natural uranium 238. Laser isotope separation, as this new technology is called, is particularly sensitive from the proliferation standpoint because, once developed, it can be employed on a small scale to produce significant amounts of weapons-grade uranium. It is essential, therefore, that institutional arrangements be made now among the suppliers that can be applied to promote multinational utilization, and to prohibit national export, of this dangerous technology.

Fifth, under a multinational system in which spent fuel is deposited with the IAEA in return for equivalent low-enriched uranium, nations unwilling to participate in the system would identify themselves as having nuclear weapons intentions and could be isolated by participating nations. If all major suppliers could be brought into the system, then a ban on the export of fuel facilities to individual nations is possible, as well as a ban on all nuclear assistance to nations that refuse to ratify the Nonproliferation Treaty or to enter into comparable commitments with the IAEA regarding universally applied safeguards and a ban on nuclear explosions.

VI

Is it practical to assume that such a cooperative system can be achieved through a conference of fiercely competitive suppliers? I believe that it is possible, but only if sufficient incentives can be provided by the United States to win the participation of all the other suppliers.

The problem is that the more the other suppliers cooperate in providing fuel services for exported reactors, the more they are promoting the traditional incentive to buy American reactors—that is, the reliable supply of cheap nuclear fuel. Why should the Germans and the French give up the "sweetener" they are now using to promote the sale of their reactors—namely enrichment and reprocessing plants—in order to help promote the "sweetener" for American reactors—namely cheap fuel?

The heart of the problem, therefore, is the underlying competition to sell reactors. If the United States can devise a plan for eliminating the dangerous element of this competition that leads to the sale of fuel

facilities, the international nuclear fuel cycle can yet be brought under effective control. If such a plan cannot be devised, the prospect is for the continued sale of nuclear fuel facilities, the proliferation of weapons-grade material and a high risk of worldwide nuclear anarchy and violence.

The institutions and commercial base already exist, as indicated above, for establishing cooperative arrangements among the suppliers to provide complete fuel services for the reactors that they sell abroad. What is still needed, however, is a political system for ensuring that no supplier is placed at a commercial disadvantage by offering fuel instead of fuel facilities to potential reactor customers.

The suppliers conference, which was convened last year at the initiative of the United States in response to India's peaceful nuclear explosion of 1974, provides a suitable forum for taking positive steps to establish such a system. Thus far, however, the conference has been used primarily for negative purposes—that is, to seek to negotiate voluntary restrictions on the types of nuclear items to be exported as well as to establish criteria that prospective customers would have to meet to ensure that these exports and any indigenous nuclear activities will not be applied to any kind of nuclear explosion program. Meaningful restraints have not been agreed to, however, because of the commercial considerations noted above.

I propose that at the suppliers meeting the United States, in order to help overcome these commercial obstacles, offer to enter into positive arrangements to share the world reactor market on an equitable basis. Unless the United States is prepared to enter into such an arrangement—and implicitly to accept a smaller share of the world reactor market as the price of achieving nonproliferation objectives—the other suppliers will continue to suspect that our nonproliferation proposals are designed to promote the sale of American reactors and to preserve American domination of the nuclear marketplace.

I make this proposal fully aware of the complex legal, technical and political problems that it raises. I do not believe, however, that these problems are of such a magnitude that they cannot be overcome in the overriding interest of preventing the global spread of nuclear weapons capability. In fact, this proposal is based on the assumption that all of the major suppliers share a deep concern about proliferation and are prepared to deal with it effectively if their legitimate desire to preserve tens of thousands of jobs and billions of dollars in prospective reactor sales can be satisfied.

Let us examine various options for putting a market-sharing arrangement into effect, and then address the major objections that

might be urged against such an arrangement.

One possible approach would be to divide the world into regions and to allocate different regions to different supplier nations. Article 6 of the IAEA statute divides the world into regions for the purpose of determining representation on the Board of Governors, and this breakdown could serve as the basis for a regional approach to market-sharing.

This would probably be the most objectionable method of allocating the reactor market. Sharp variations in demand for nuclear power plants among the various regions would place some suppliers in a much stronger commercial position than others. Furthermore, this approach would recall the "spheres of influence" of a past imperialist era, which would be objectionable to many nations of the Third World. Generally, there would be serious political and legal difficulties in placing particular customer nations in the position of having to deal exclusively with, and accept the reactor technology of, particular supplier nations, solely on the basis of a regional division of the reactor market. Customers may have a strong preference between the two types of reactors sold today—the light water and heavy water reactors, and the fuels that these reactors require, enriched uranium and natural uranium, respectively. The preference of parties to the Nonproliferation Treaty would seem to be guaranteed by Article IV, giving them access to nuclear technology on a nondiscriminatory basis.

Another approach would be to divide the market on the basis of long-term projections of the type and size of reactors that will be sought by each potential buyer. The supplier would then be in a position to agree on which supplier would provide which type and size of reactor, perhaps with limited competition permitted between suppliers in providing certain categories of reactors to preserve a degree of diversity in the market. Any such competition, however, would be limited by a particular supplier's ability to fulfill a certain number of orders at a time and to provide complete fuel services for each reactor sold.

The main problem with this approach is that there is simply not enough diversity (or evenness of appeal) in the sizes and designs of reactors. The number of categories of marketable reactors appears to be limited today by the fact that only the larger size reactors—in the area of 1,000 megawatts electric (MWe)—have sufficient economies of scale to operate efficiently. Smaller reactors are deemed by U.S. manufacturers to be too costly in relation to the electricity they produce, and are not being offered for sale. Currently, the French are seeking to sell what they claim to be an efficient barge-mounted

nuclear power plant of 100 MWe capacity. Until this can be demonstrated, however, the economy-of-scale disadvantage of smaller nuclear power plants may serve to limit the number of orders for such reactors from the developing countries, many of which do not have the electrical grid systems or the power needs to justify the purchase of 1,000 MWe facilities.

A third possible approach might be based on agreed minimum sales for each supplier country, or an agreed quantitative sharing of reactor orders. Under this approach, each supplier would be guaranteed a minimum number of reactor sales a year, or a pro rata share of the reactor market, based largely on the supplier's actual productive capacity. Ideally, the market would be divided in such a way that each supplier would be able to sell the maximum number of reactors which it is able to produce and for which complete fuel services can be provided. If the market could not support the maximum capacity of each supplier, sales quotas would be cut back generally in proportion to each supplier's productive capacity as a percentage of the total capacity of the suppliers.

Orders could be placed by the purchasing countries through the IAEA, which would forward them to the suppliers group along with the purchaser's preference of reactor type and manufacturer. A problem with this approach might be the inability of the suppliers group to match the purchaser nation's choice of reactor and manufacturer, particularly if a certain supplier nation's quota for a given year had been filled by the time the order was placed.

The minimum-sales approach may be the most feasible form of market-sharing, however, because it appears to permit the greatest flexibility in matching reactor orders and reactor sales. Much of the uncertainty could be eliminated if reactor orders for a given year had to be placed with the IAEA on a quarterly, semiannual or annual basis, thereby permitting the orders to be divided among the suppliers *en bloc* rather than as orders are received throughout the year.

A greater problem may be encountered when negotiating the formula that would determine what each supplier's minimum annual sales should be. If productive capacity alone is to be the determining factor, the U.S. quota would be about half the market, based on present U.S. capacity to produce as many essential components of a nuclear power plant as all the other suppliers combined.[18] These com-

[18] Barber Report, *op. cit.*, Figure IV-4, U.S. Production and Demand Requirements for Major Nuclear Power Plant Equipment, and Figure IV-5, Heavy Equipment Production Requirements, Capacities, and Capacity Utilization in Japan. These tables are reproduced in *Facts on Nuclear Proliferation, op. cit.*, pp. 202–203.

ponents are the steel pressure vessel surrounding the reactor, the turbine generator and, in the case of the pressurized version of the light water reactor, the steam generator.

However, it does not take much productive capacity to corner the lion's share of today's world nuclear market. The industrial nations have passed the peak of their domestic reactor programs, and the developing nations, which were expected to comprise the next generation of reactor customers, have been slow in placing orders because construction costs have become prohibitively high and commercial application to meet their still limited energy needs is too low.[19]

As a result, only 18 orders were placed for nuclear power plants outside the United States last year.[20] Of these, just four, or 22 percent, were placed with United States companies, compared with six, or 33 percent, placed with German firms; five, or 28 percent, with the Soviet manufacturer, and one each with companies in Switzerland, Sweden and Japan. Thus, the U.S. share of reactors to be built abroad was far smaller than our traditional 70 percent share.

However, when viewing the world market from the perspective of how many reactors were *exported* by each supplier, as distinguished from those built domestically, then the total number of orders was reduced to eight, of which the United States had four, or 50 percent of the market. Germany was in second place with three export orders. The remaining export order was placed with Switzerland. These were all firm orders. However, letters of intent or similar commitments were received by Germany for export of eight additional reactors and by France for two reactors.[21]

[19] For further details, see Barber Report, *op. cit.*, Chapter II: Comparative Costs: Nuclear vs. Conventional Power; also, International Atomic Energy Agency, *Market Survey for Nuclear Power in Developing Countries*, 1974 ed., Vienna: IAEA, 1974. (The Barber Report contends that the IAEA estimates are overly optimistic.)

[20] Testimony of Dwight Porter, Westinghouse Electric Corporation, Senate Government Operations Committee Hearings, *op. cit.*

[21] The complete data, as furnished by the State Department, for nuclear power plants outside the United States either contracted for or announced for contracting during 1975, are as follows:

Customer	*No. of Nuclear Power Units*	*Supplier*
Spain	2	Westinghouse (U.S.)
Spain	2	General Electric (U.S.)
Spain	1	Kraftwerk (Germany)
Brazil	2	Kraftwerk (Germany)
FRG (Germany)	3	Kraftwerk (Germany)
Luxembourg	1	Brown, Boveri (Switzerland)
Sweden	1	ASEA (Sweden)
Japan	1	Mitsubishi (Japan)
Soviet Union	5	Soviet manufacturer

In addition to the above firm commitments, there are a number of projects for which a letter of intent or a similar commitment has been made or which has been announced at a governmental level. These include the sale by France of two reactors to Iran, the sale by Germany of two reactors to Iran and the sale by Germany of up to eight reactors to Brazil, two of which are included in the above total.

It should be apparent, therefore, that the other suppliers, particularly West Germany and France, will not find acceptable a market-sharing arrangement with the United States having a 50 percent share based on productive capacity. They will want an arrangement that more closely approximates the actual shares of the present export market.

If market-sharing is to work, the United States will have to accept a compromise that will leave it with a smaller share of the market than it has capacity to fill. This will be a bitter pill for the American nuclear industry because it has been looking to the export market to make up for sharply declining reactor sales at home. Only seven new orders were placed in 1975 for reactors to be built in the United States, compared with 27 in 1974 and 36 in 1973.

The United States has as legitimate an interest in preserving the tens of thousands of jobs and billions in revenues connected with its nuclear industry as do Germany and France with respect to theirs. The negotiation of market shares, therefore, can be expected to be very difficult, but no less worthwhile because of the difficulty. It is better that the energies of our diplomats be expended in this manner, to eliminate the sale of enrichment and reprocessing plants, than in negotiating safeguards agreements that many experts believe will serve to promote the sale of these plants without providing adequate protection against diversion of weapons-grade material.

If the United States is prepared to make commercial concessions, bearing in mind, as discussed above, that past policy errors contributed to the present dangerous situation, and if the other suppliers, particularly Germany, are prepared to forego some of the fruits of unrestricted competition in the interest of curbing the spread of nuclear weapons, I believe that the negotiation of an equitable market-sharing system can be achieved.

VII

It is clear that complex problems are raised by the concept of market-sharing. A principal advocate, Dr. Lawrence Scheinman of the Energy Research and Development Administration (ERDA), states that "a number of the traditional arguments against market-sharing remain nothing more than untested hypotheses and do not qualify as unassailable reasons against even consideration of the concept."[22] Yet Dr. Scheinman does identify three basic arguments against market-sharing, and they should be addressed in this article.

[22] See footnote 16 above. Dr. Scheinman's ideas on market-sharing have been helpful in framing some of the proposals in this article.

The first argument is that reactor market-sharing is contrary to United States anti-cartel policy and in violation of antitrust laws. It is clear that export cartels relating to United States exports come under the general prohibition of section 1 of the Sherman Act which expressly covers restraint in trade with foreign nations. The Supreme Court has held that any scheme of market division among competitors is illegal per se, and a lower Federal court has held that an international cartel arrangement providing for a worldwide division of a market is a per se violation.[23]

At the same time, there is a long history of antitrust waivers in areas affecting national security. The federal government has not directly and actively participated in an international cartel. Nevertheless, exemptions under the antitrust laws for certain private companies to participate in cartels, decisions not to prosecute U.S. companies participating in cartels, and other qualifications have led to a U.S. policy of less than inflexible opposition to international cartels, especially in situations where overriding national objectives are at stake.

With respect to United States participation in a cartel-type arrangement for sharing the world reactor market to attain nonproliferation objectives, three basic questions as to the applicability of antitrust law would seem to apply.

First, if the United States should enter into such an international agreement that could be deemed a violation of section 1 of the Sherman Act, and the U.S. government then directed private industry to conform with the market-sharing arrangement, could the members of that industry be in violation of the law?

Second, if in such a situation private industry entered into a voluntary agreement to conform with the market-sharing arrangement, could the members be in violation of that law?

And, *third,* even if participation by private industry might be a violation of section 1, are there any statutory exemptions from the operation of the antitrust laws which are applicable?

A persuasive argument can be made that an official directive by the executive branch of the government, mandating the participation of an industry in a market-sharing arrangement, would be tantamount to governmental action itself. Thus, the issue here for a court to decide

[23] The following discussion of cartel and antitrust implications is drawn largely from the following two reports prepared for the Senate Government Operations Committee: Daniel Hill Zafren and Moses L. Perry, Jr., *United States Antitrust Law Implication of an International Scheme of Market-Sharing of Nuclear Enrichment or Reprocessing Equipment (A Suppliers' Cartel),* Washington: Library of Congress, Congressional Research Service, American Law Division, April 27, 1976, 18 pp.; and Raymond Ahearn, *Precedents for United States Involvement in International Cartels and Participation in Intergovernmental Commodity Agreements,* Washington, Library of Congress, Congressional Research Service, Economics Division, April 21, 1976, 14 pp.

would be whether the government, acting within a sphere in which it is believed to be competent, can give immunity under the antitrust laws by compelling or authorizing conduct that possibly otherwise would be prohibited by those laws.

If the agreement (containing authority for a government directive to the industry) was submitted as a treaty to the Senate, and the Senate gave its advice and consent, there would appear to be an absolute defense against antitrust litigation, although this has not been definitively passed upon by the courts. However, if there was no "official" mandate or authorization directed at private industry, but some voluntary arrangement or agreement within the industry to enter into a market-sharing arrangement requested by the executive, it is questionable that such activity would be exempt from the antitrust laws, even if assurance to that effect had been given by the executive.

Congress, in other words, must be a party to the agreement. In the absence of the establishment of some "legislative action," a voluntary arrangement might be subject to antitrust attack as well as involve some possible constitutional problems. It is reasonable to assume, however, that Senate approval of a treaty or congressional approval of an executive agreement would constitute such "legislative action" as to satisfy legal and constitutional requirements.[24]

The second argument is that the other nuclear supplier countries would reject a market-sharing arrangement.

It can be argued in response that market-sharing is quite compatible with the way Europeans do business. To some extent, indeed, the Europeans have been responding to the way Americans do business. Although American anti-cartel policy is based on the principle of fostering competition and world trade, many important sectors of the American economy are either effectively monopolized or subject to what economists call "imperfect competition" among a few giant corporations. Our European trading partners feel, with some reason, that nuclear power has been such an area, in which they have been exposed to dealing with large U.S. corporations to their detriment.

Would the French and the Germans be agreeable, therefore, to engaging in a market-sharing arrangement with the still formidable U.S. nuclear industry? To some extent they already do. The two predominant U.S. nuclear companies, Westinghouse and General Electric,

[24] An alternative legal approach might be to invoke the provision in the Defense Production Act authorizing the President to approve "voluntary agreements to help provide for the defense of the United States." At the very least, this provision—as well as the recent International Energy Agreement between the United States and other OECD members—offers relevant precedents for congressional action either directly through legislation or through approval of a treaty or an executive agreement.

are deeply involved in the European nuclear program. As noted above, the transfer of their technology provided the basis of the French and German nuclear industries.[25] The closeness of commercial ties between the U.S. and European nuclear industries would seem to offer a strong potential for successful market-sharing if agreement could be reached at the government level in the suppliers meetings.

And the reach of the U.S. nuclear industry extends beyond Europe to Canada and Japan as well. Between 20 and 30 percent of the return on sales of the Canadian CANDU heavy water reactor flow back to Canadian General Electric Company and Westinghouse of Canada. Both General Electric and Westinghouse own substantial shares of Japanese fuel fabrication plants, and they each license Japanese reactor manufacturers as well.[26]

Closer ties to all of these foreign companies in the form of market-sharing might prove attractive to our own companies. In return for giving up a portion of the world reactor market, Westinghouse and General Electric could be called upon to supply a greater share of the principal components in foreign-exported reactors, to augment the limited productive capacity of foreign companies. It is not unusual today to find the pressure vessels used in European reactors an export item from the United States. The U.S. companies might find more of this business coming their way under a market-sharing arrangement and, therefore, may not have as much to lose as would appear at first glance.

The third basic argument against market-sharing is that the recipient countries of the Third World would view it as a nuclear cartel and refuse to do business with it.

Aside from figuring out what the alternative source of supply would be if all the major suppliers were included in the arrangement, a recipient nation would also have to consider whether the *actual* economic and political features of the arrangement warrant the stonewall

[25] Today, the principal German domestic reactor is virtually identical to the General Electric reactor, while their principal export reactor is of Westinghouse design. The standard French reactor for both domestic use and export is based on blueprints provided by Westinghouse, and about a third of the components are provided by Westinghouse as well. General Electric owns 8 percent of a principal German reactor manufacturer, 20 percent of a German fuel fabrication plant, and licenses several European companies to design and construct nuclear reactors and fabricate fuel. Westinghouse owns 15 percent (until recently 49 percent) of the principal French reactor manufacturer, 34 percent of a French fuel fabrication plant, 100 percent of a Belgian reactor manufacturer, 40 percent of a Belgian fabrication plant, 51 percent of Italian reactor and fuel fabrication companies, has similar holdings in Germany and Sweden, and licenses several other European companies for reactor and fuel production. Testimony of George J. Stathakis, General Electric Company, and Dwight J. Porter, Westinghouse Electric Corp., Senate Government Operations Committee Hearings, *op. cit.*

[26] See Barber Report, *op. cit.*, Appendix C, for a detailed discussion of U.S. nuclear industry involvement worldwide.

treatment. A properly designed market-sharing system would have two key elements to help promote reactor sales to the Third World.

First, reactor fuel services would be priced as cheaply as possible and made readily available on an assured nondiscriminatory basis. *Second,* symmetry would be built into the system to keep special privileges of the supplier countries to a minimum and to promote maximum involvement of the recipient countries. The manner in which potential weapons-grade material is handled is essential to both key elements of market-sharing.

If enrichment, reprocessing and fabrication of reactor fuel are concentrated in large multinational plants in the supplier countries, economies of scale can be achieved that should keep down the price of fuel and ensure a reliable supply. Reliability of supply can be further assured by providing that no multinational plant can withhold a fuel shipment from any customer nation unless the nation diverts spent fuel or other material in violation of IAEA safeguards or sets off a nuclear explosion. The only grounds for cutting off fuel would be nuclear-related, thereby ensuring that fuel could not be withheld by a single-minded cartel for political purposes.

True symmetry can be achieved in a market-sharing arrangement only if commercially produced plutonium is kept under strict international control. If the recipient countries are to be denied access to separated plutonium, why should the supplier nations have access to it before it is commercially needed as a reactor fuel?

Apart from the serious environmental and cost problems of reprocessing, it now appears that plutonium will not be required commercially until such time as the breeder reactor achieves commercial application—probably at least 10 to 20 years from now.[27] The wisest course, therefore, may be for the suppliers to agree to delay plutonium reprocessing, as discussed above.[28]

Such evenhandedness by the suppliers would go far toward reassuring the recipient nations without in any way crippling the present commercial nuclear program. The safest place for plutonium is in the highly radioactive and inaccessible spent fuel, and this should be

[27] While the article does not address in detail the question of possible export of breeder reactors—which France is now ahead in building—there appear to be strong reasons for a general moratorium on such exports, which would not only require plutonium as fuel but generate large additional quantities in operation. See testimony of Dr. Hans Bethe (Nobel laureate and a staunch nuclear power advocate), Senate Government Operations Committee Hearings, *op. cit.*

[28] A less satisfactory option would be to proceed with reprocessing of plutonium in multinational plants under IAEA custody and immediately to mix the plutonium with natural uranium for use as a diluted "mixed-oxide" reactor fuel that is unsuitable for direct use in weapons. Unlike low-enriched uranium, however, a mixed-oxide fuel can be chemically separated to produce weapons-grade material—in this case plutonium. For this reason, production and use of mixed-oxide fuel should be avoided, particularly in nations not possessing nuclear weapons.

shipped back to the original fuel supplier for safe storage under IAEA custody, as provided in Article 12 of the IAEA statute.

VIII

The question remains of what happens if France and West Germany, in particular, refuse to participate in a reasonable market-sharing arrangement. The United States would then be confronted with the difficult problem of how to deal with allies that refuse to act like allies. We should become very emphatic that this is a matter of far greater potential consequence for U.S. and world security than even the Arab oil embargo.

U.S. nonproliferation policy has been ineffective in eliminating dangerous competition from the world nuclear marketplace because of the basic premise that the policy can be executed on an evolving basis—that the French and Germans can *eventually* be brought around to seeing things our way. This is a dangerous premise, and the sudden escalation of nuclear competition—as evidenced by the fuel-cycle sales to Brazil and Pakistan and the negotiations for a similar transaction with Iran—indicates that a quantum shift in U.S. dealings with France and West Germany is in order.

At the very least, the United States should enter the next round of supplier negotiations prepared to propose multinational arrangements for closing the commercial nuclear fuel cycle and for making all weapons-grade material generated by the fuel cycle unavailable to any nation on a sovereign basis. The United States should also make clear that it would view with the gravest concern the continuation of the present export policies of West Germany and France.

Unfortunately, there are no indications from the State Department that the United States is prepared to act boldly. There is no official support for market-sharing arrangements; nor is there any sign that the United States is prepared to express strong displeasure with the export policies of our allies. In fact, on the subject of unfair competitive practices by West Germany and France, the State Department is prepared only to say, "It is our intention to explore carefully with our partners *whether such practices do exist,* and to seek means to overcome them."[29]

If this is to be our posture as the supplier talks resume, it is difficult to see how we can hope to persuade others of the depth of U.S. concern and the need for corrective measures. Our nonproliferation policy is at risk of being bankrupted by the complacency and the defeat-

[29] Emphasis supplied. State Department response to my letter to Secretary Kissinger, Senate Government Operations Committee Hearings, *op. cit.*

ism of our negotiators. It may be that only an act of nuclear violence by a nation or terrorist group will be sufficient to put some teeth into U.S. nonproliferation efforts. By then, however, it is likely to be too late to establish an effective nuclear world order.

How far should the United States be prepared to go to win participation by France and Germany in multinational arrangements for preventing the spread of uranium enrichment and plutonium reprocessing plants? There should be sufficient economic incentives to win their participation. But if these do not suffice, the United States should be prepared to use other forms of leverage.

The implied threat to use such leverage must be credible. And there is at least one credible nuclear leverage still available to the United States, namely a cutoff of enriched uranium fuel to supplier nations that refuse to join in meeting basic nonproliferation objectives.

The two most troublesome nuclear suppliers, France and West Germany, are developing their own multinational uranium enrichment capability, as noted above. However, these facilities will not be in full production until the early 1980s, and an analysis of current data prepared at my request by Dr. Warren H. Donnelly of the Congressional Research Service, Library of Congress, indicates that for the next five to ten years, the French and West German nuclear programs will need continued access to U.S. uranium enrichment capacity just to supply their domestic needs, not to mention providing enriched fuel for the reactors they wish to export.[30] This continued need gives the United States a powerful lever to move our two allies with us toward the

[30] *Analysis of Uranium Enrichment Needs of France and West Germany.* The principal sources of this data are the report of the OECD *et al., op. cit.,* and a table prepared by ERDA: *Current and Anticipated Foreign Enrichment Production Capacity and Separative Work Requirements,* Senate Government Operations Hearings, Export Reorganization Act of 1975, p. 916. Based on these materials the assessment is approximately as follows:

In 1976, just to provide replacement fuel for the enriched uranium consumed in their nuclear power plants, France and Germany each will require about 1.3 million separative work units (SWU), which is the basic measurement unit for uranium enrichment. At most, France has a 400,000 SWU per year capacity at the small enrichment plant that she uses for her weapons program. When EURODIF comes into full production by the early 1980s, France will be entitled to only 40 percent of its 10 million SWU total enrichment capacity, the rest being committed to the other parties in the multinational venture. France, at that time, will need between 4 and 6 million SWU to keep her own reactors running. As late as 1985, French enrichment requirements will be some 7.6 million SWU, which will not be filled by its 40 percent share of EURODIF's 10.5 million SWU capacity projected for that year.

Germany, on the other hand, has no weapons-enrichment capacity to draw from, and by the time its multinational enrichment venture, URENCO, begins producing 2 million SWU a year in 1981, it will be entitled to only about 30 percent of that total. Germany, however, will need nearly 4 million SWU in 1981 to run its domestic reactors. By 1985, it will require 6.6 million SWU to run domestic reactors in Germany, more than twice Germany's share of URENCO's projected output for that year.

According to present projections, in 1985, France will be obtaining 72 percent of her electricity from nuclear power plants, while Germany's electricity will be 42 percent nuclear.

shaping of a sane, coherent and effective world policy for nuclear export control on terms fair to all.

If the United States should cut off enriched uranium to France and Germany, the only alternative supplier would be the Soviet Union. The United States has not determined whether the Soviet Union would cooperate in an embargo of reactor fuel shipments to France and Germany in order to achieve nonproliferation objectives. Even if the Soviet Union would not cooperate in such an effort, it seems unlikely that France and Germany are prepared to rely solely on the Russians. Furthermore, the French and German governments would have to explain to their own people why defiance of the United States on nonproliferation policy warrants reliance on the Soviet Union for a vital fuel.

A cutoff of nuclear fuel by the United States should be unnecessary once France and Germany are convinced that we are prepared to act in order to attain our nonproliferation objectives. If the threat is credible, it should not be necessary to carry it out.

I concede that this can be viewed as pressuring our allies. But the question is, "At what price the alliance?" Is allowing the world to head toward nuclear hell a fair price? By the year 2000, nuclear power plants may be generating between one and three million pounds of plutonium a year—the equivalent of hundreds of thousands of Nagasaki bombs. It is simply unrealistic to assume that any safeguards regime can, by means of timely detection, prevent the rapid spread of nuclear weapons from that amount of material if national production and stockpiling are allowed to proceed. The State Department must consider these figures, and the terrifying dilemma that they represent, when determining what pressures should be brought to bear to win French and German cooperation.

IX

With the cooperation of our allies, an integrated worldwide nuclear market can be established such as I have proposed. It would then become possible to develop a broad consensus in favor of effective sanctions against nations that choose to operate their nuclear programs outside the system. Nations that insist on operating unsafeguarded reactors and fuel facilities, and on developing nuclear explosion programs, will identify themselves as having nuclear-weapons intentions. Nuclear-trade and general-commercial embargoes can be imposed against these nations to isolate them from the world community. Such embargoes, if applied universally to cover all high-technology items—including non-nuclear items that play an essential role in weapons-

related nuclear technology—would make it extremely difficult for less-developed countries to develop a nuclear-weapons capability.[31]

The strong consensus underlying an integrated market approach to controlling nuclear proliferation would also permit a more effective system of IAEA safeguards than is now possible for detecting diversions and weapons activities.

A final word of caution. Any market-sharing arrangement must be closely and effectively regulated. The multinational corporations involved would have not only a tight grip on a vital energy source, but access to atom bomb material as well. National governments should make the decisions governing the nuclear energy supply, and they should delegate effective powers to the IAEA, far greater than that Agency now exercises, to take universal custody of, and ensure the peaceful use of, actual or potential weapons-grade material.

It is essential that we win the cooperation of our allies, France and West Germany, if the atom is to be controlled for peaceful purposes. Without their cooperation, the prospect is for a world of nuclear anarchy, which in turn can only lead to widespread nuclear violence.

I am convinced that nuclear proliferation can be controlled if we have the will and the wisdom to do so.

[31] As an example, there are now 127 companies—51 of them in the United States, the balance all in West Germany, Great Britain, France or Japan—that market products and services for nuclear fuel reprocessing. Items include cranes, data loggers, dissolving tanks, glove boxes, periscopes, remote handling devices and systems, shipping casks, valves, pipefittings and gaskets. These could be made subject to IAEA safeguards when imported for use in a reprocessing plant or could be embargoed to nations that refuse to accept safeguards. *Countries and Industrial Companies Capable of Supplying Items, Services and Assistance for Nuclear Fuel Reprocessing,* Congressional Research Service, Library of Congress, 1976, 7 pp.

An even more extensive embargo on *all* technology items may have to be imposed in the event that a country is suspected of, or detected, secretly building a research reactor capable of producing enough plutonium for two bombs a year. Plans for such a facility, a relatively simple graphite-moderated, natural uranium reactor (not requiring expensive and difficult enrichment) are available in public print. The reactor could be built and put into operation in about four years at a cost of about $13 million, using components that, with the exception of the uranium, are freely available on the world market. Even the natural uranium, where available domestically, can be mined and milled with moderate effort. *On the Construction of Plutonium-Producing Reactors by Small and/or Developing Nations,* a report prepared for the Congressional Research Service, Library of Congress by John R. Lamarsh, Washington, 1976, 26 pp.

THE WHITE HOUSE

WASHINGTON

July 22, 1976

New file

Fri

Study

MEMORANDUM

TO: Jim Cannon
Jim Connor
Jim Lynn
Brent Scowcroft

FROM Bob Fri

Subject Items for meeting at 4:30 pm, July 23

The following are items I would like to cover at our meeting.

Q&A

Tab A is the Q & A I propose to use to explain the existence of the Nuclear Policy Study Group. It is intended to address four issues: (1) why do the study; (2) why do it with a special team; (3) why have me run it; and (4) what are our expectations for the study.

We should agree on the Q & A at our meeting.

Congressional

It appears an early step should be to contact John Anderson. There are two basic approaches for doing so:

1. I (or someone) could see him informally to explain what we are doing and to seek his help in holding off precipitous action pending the President's decision.

2. Jim Cannon could respond to his letter using the line taken in the Q & A.

   a. Pro

      1) Shows we take the problem seriously
      2) Confirms existence of the study, but short of announcing it from the White House.

3) Allows us to get the story straight without waiting for a question. This might lift any cloud of "secrecy" surrounding the effort.

b. Con

1) Could raise level of interest and expectations above an acceptable level.

We should agree on the approach. I favor option 2, but am not yet fully acquainted with all the history bearing on the problem.

ERC

The role of the ERC, and specifically of Elliot Richardson, is not clear to me. I do not believe this study should be run through the ERC. However, Richardson should be closely tied to the study. There are two options:

1. Maintain preferentially close contact with Richardson throughout the study. For example, if I meet with senior people from key agencies as a group (eg, Robinson, Seamans, Rowden), Richardson would come.

2. Have him sit with the Steering Committee. The rationale would be that NSC and the Domestic Council are so represented, so why not the ERC?

Either option is acceptable from the study standpoint. I need your guidance. In any event, Jim Connor should inform Richardson of the study.

Meeting with the President

I agree such a meeting is desirable, possibly essential. It would be brief and should cover:

1. How the study came about
2. A short statement of priority by the President
3. Possibly a quick rundown by me of the team composition and timetable.

We should decide when to proceed. I will be prepared anytime from Tuesday on. sunday preferred

Study Team

I have the following full-time team members:

Jack Flynn	(ERDA)	
Harold Bengelsdorf/		
Jerome Kahan	(State)	International
Rod Weiher	(OMB)	Waste
Dennis Spurgeon	(ERDA)	Reprocessing

Study Outline

At Tab B is my one-day view of the study. I would appreciate your reactions. This would, incidentally, be the basis for my comments at a meeting with the President.

TAB A

ADMINISTRATION REVIEW OF NUCLEAR POLICY

Question

Rumors (and press stories) are indicating that President Ford has directed a major review of U.S. nuclear policy on a crash basis that has set up a new group in the White House (headed by ERDA Deputy Administrator Bob Fri on a full-time basis) to do the job. Is this true? Will there be a report to the President? Will major new proposals be forthcoming soon?

Answer

Assurance of safe, reliable, and environmentally acceptable nuclear power is a high priority of the national energy program. International policy of the United States further pledges that we shall discourage proliferation of nuclear weapons capability. A number of specific measures have already been taken toward this end.

Nuclear policy is under continuing review. However, the President wishes to evaluate this subject comprehensively, and so has directed a concerted review of our policy objectives and options relating to nuclear matters, including exports, nuclear fuel reprocessing, and waste management. Nuclear policy engages domestic and international responsibilities of several Federal departments and agencies, and advisory bodies to the President, all of whom will be consulted during the review.

To coordinate the work, a review group has been formed, under full-time direction of Robert W. Fri. Mr. Fri normally serves as Deputy Administrator of the Energy Research and Development Administration. His appointment to this temporary duty reflects the President's intent that all affected agencies are fully involved at the highest level.

The interagency review group will ~~conduct its work through mid-September. If appropriate, recommendations will be forwarded to the President for his consideration~~ report to the President early fall. Given the group's broad charter, it is not possible now to predict what recommendations might be developed.

TAB B

NUCLEAR POLICY STUDY

Study Purpose

To develop and present to the President by August 30, decision options for a comprehensive and consistent nuclear policy, with special emphasis on the following areas, and the linkages among them:

- U.S. policy on nuclear exports and safeguards to reduce the potential for weapons proliferation.

- U.S. policy with respect to reprocessing of spent fuel from commercial power plants to recover plutonium and unused uranium, and the commercial demonstration of technology.

- The adequacy of U.S. plans for the safe handling and storage of nuclear wastes, particularly assurances that repositories will be available for long-term storage of long-lived and high-level wastes.

Nuclear Policy Objectives

It appears that the broad nuclear policy objectives on which the study should focus are:

1. Non proliferation--that is, spread of nuclear weapons among nations

2. Avoidance of diversion of material for terrorist or related purposes.

3. Provision of adequate nuclear power, domestically, but also elsewhere.

4. Minimization of adverse environmental (public health) effects

5. Reasonable U.S. export position

Considerations in Developing Study Approach

I intend on Monday to develop our initial study plan. In doing so, the following considerations are shaping my thoughts.

1. Five full-time team members with access to support from all interested agencies.

2. Full communication with affected agencies throughout the study to avoid surprises (but not necessarily disagreements)

3. Attention to views outside the Administration, both to account for responsible opinion, and to assess and enhance acceptance of the product.

4. Recognition that a major--if not the major--problem for the study team is to evaluate critically and to synthesize the issues and options already identified in many quarters. The multitude of ideas in the nuclear policy area is a major obstacle to decision making. One of the team's primary tasks is to draw the issues and options together, assess them, and structure them so that a comprehensive and coherent set of policy decisions is possible. (In this regard, the nuclear policy memorandum to the President is an excellent start, as is much of the other material already provided me).

5. The need to surface two issues for serious discussion, if not resolution, fairly early in the study.

   a. How rapidly should the U.S. develop a reprocessing industry for domestic reasons? A conservative posture domestically (i.e., don't rush into it) would appear to open up a set of foreign policy options that an aggressive domestic policy would assist in evaluating the international options.

very important

Pls get true copy of latest nuclear policy memo President made decision on.

b. Is a major waste disposal initiative--beyond our already vigorous policy--needed? An early discussion of this issue (which, as a result of the OMB work, is already well along) would give us time at the end of the study to concentrate on the right options.

6. Partly as a result of my conversation with Chuck Robinson, I believe that our evaluation of international options would benefit if we can "keep our eye on the plutonium." That is, the effectiveness of our policy internationally can best be assured if we understand what it produces in terms of such factors as:

a. The amount, location, and physical nature (i.e., oxide or in fuel rods) of plutonium worldwide.

b. Its ownership

c. The controls imposed on it.

Somewhat to my surprise, I have yet to find that anyone has tried this analysis. I believe we should try, qualitatively at least. I'm looking for someone who can do it.

Subject

THE WHITE HOUSE

WASHINGTON

ACTION

Nuclear Policy Review

July 26, 1976

MEMORANDUM FOR: THE PRESIDENT

FROM: JIM CANNON

SUBJECT: LETTER TO CONGRESSMAN JOHN ANDERSON ON NUCLEAR POLICY REVIEW

Enclosed for your consideration is a proposed letter to Congressman John Anderson which would inform him of your recent decision to have a concerted Administration review of critical nuclear policy matters.

Brent Scowcroft, Jim Lynn, Jim Connor and I believe that information on the review and on Bob Fri's temporary, full-time assignment to lead the review must be made public as soon as possible. Word of the review is beginning to get around and Bob Fri's absence from ERDA is the subject of increasing speculation.

Also, the Joint Committee on Atomic Energy(JCAE) will hold hearings this Wednesday, during which the JCAE will try to delay indefinitely an unacceptable Nuclear Export Reorganization Bill which is being pushed hard by the Senate Governament Operations Committee (Ribicoff, Percy, Glenn). Bob Fri is to appear for ERDA and he undoubtedly will be questioned about his new temporary assignment. If he is free to respond to questions about the review effort, the JCAE will have a good basis for delaying the bill.

We believe that a letter to John Anderson -- which he would release to the Press -- is the best way of getting information out in this case. Anderson is an appropriate addressee because he has recently written to me of his concerns about nuclear policy and he has also publicly criticized the Administration for not being serious enough about nuclear fuel reprocessing and proliferation problems.

A letter would be preferable to a White House announcement since it would get information out -- with credit to you

for the initiative -- while reducing the potential for charges that you are merely (a) seeking publicity for the review effort as a way of countering Jimmy Carter's recent nuclear policy statement, or (b) trying to undermine chances for the Ribicoff-Glenn-Percy bill. Also, releasing the information via a letter rather than a formal announcement might help in heading off excessive expectations about the outcome of the study.

Recommendation

That you sign the attached letter to John Anderson (Tab A).

THE WHITE HOUSE

WASHINGTON

Dear John:

Recently, you have expressed your view that greater attention is needed to a number of important nuclear policy matters, including nuclear exports and fuel reprocessing. You have also suggested the possibility of using domestic reprocessing facilities to serve both domestic and foreign needs and to further worldwide efforts to control proliferation.

The matters you have identified are of continuing importance to this Administration and we have taken a number of steps to deal with them, all with the objective of providing safe, clean, economic and properly safeguarded nuclear power here and abroad. We are looking forward to more progress. For example, the passage of the Nuclear Fuel Assurance Act will be an important step toward the expansion of capacity in the United States to produce enriched uranium for nuclear power plants. This will help us maintain the influence associated with the U.S. role as a leading world supplier of nuclear fuel and equipment for peaceful purposes and thus contribute substantially to our non-proliferation objectives.

In addition, the departments and agencies have been examining additional options within their areas of responsibility that might contribute further to the achievement of our nuclear policy objectives. For example, we have been working with foreign nuclear suppliers and customers to strengthen controls against the diversion of nuclear materials. We are also proceeding with actions to resolve remaining questions with respect to domestic reprocessing and nuclear waste management.

Because nuclear policy issues are of such great importance, I believe they should be treated comprehensively. Accordingly, I have recently directed that a special concerted review be undertaken of our various nuclear policy objectives and options, particularly with respect to exports, reprocessing and waste management. In view of your special interest, I

wanted you to know of this decision. The review will involve both domestic and international aspects. All Federal departments and agencies, as well as the policy groups in the Executive Office, that have responsibilities relating to nuclear policy will be involved in the review.

Mr. Robert W. Fri, who normally serves as Deputy Administrator of the Energy Research and Development Administration, has agreed to accept the responsibility for full-time leadership of the review effort. Mr. Fri's appointment to this temporary duty reflects my intent that special attention be given to this comprehensive review of nuclear policy issues.

I expect that the review group will complete the principal part of its work by early fall. If the group concludes that additional actions are warranted, I will review those recommendations carefully and, where appropriate, will follow up with proposals to the Congress.

I look forward to working with you as the review progresses.

Sincerely,

The Honorable John B. Anderson
U.S. House of Representatives
Washington, D. C. 20515

THE WHITE HOUSE

WASHINGTON

July 28, 1976

MEETING WITH BOB FRI AND HEADS OF AGENCIES
CONCERNED WITH NUCLEAR POLICY
Thursday, July 29, 1976
11:45 A.M. (20 minutes)
The Cabinet Room

From: Jim Cannon
Brent Scowcroft B.S.

I. PURPOSE

To formally advise the agency heads of your decision to undertake a comprehensive review of nuclear policy, to seek cooperation in the review, to introduce Bob Fri as the review team leader and to make clear the importance you ascribe to the review.

II. BACKGROUND, PARTICIPANTS AND PRESS PLAN

A. Background

On July 19, you approved recommendations (memo at TAB A) from Brent Scowcroft, Jim Lynn, and Jim Cannon that a concerted effort be undertaken to review nuclear policy options.

Since your decision, Bob Seamans has agreed to make Bob Fri available on a full-time basis to lead the review effort. Bob Fri moved to the Executive Office Building and began work on the review last Thursday. He will briefly outline the study following your remarks.

Questions have been raised by one or two agency heads as to why the review is not being conducted by an existing policy group (e.g., NSC, Domestic Council, or ERC). Agencies have been told that the policy issues cut across domestic and national security areas and involve issues other than energy, and, therefore, the establishment of a special, temporary review group is necessary.

In a related development, the JCAE succeeded yesterday in delaying the Nuclear Export Reorganization Bill that is being pushed by Ribicoff, Percy and Glenn. In so doing, however, Senator Pastore asked Administration witnesses (ERDA, State, et. al.) to work with the JCAE and Senate Government Operations Committee to come up with an alternative bill.

B. Participants. See TAB B.

C. Press Plan. White House Photographer.

III. TALKING POINTS

° While we have made some good progress in the nuclear area over the past two years, we are still faced with several critical policy issues -- particularly with respect to nuclear exports, proliferation, reprocessing of nuclear fuel and management of nuclear wastes.

° Because these policy issues are so interrelated and involve the interests of all your agencies, I decided that it was time for a high-level, comprehensive review.

° Bob Fri has agreed to take on the important assignment, for the next few weeks, of leading the review. I am sure that the selection of someone at Bob's level and special competence will give you some idea of the importance that I attach to this study.

° I place the highest priority on this review, and I ask that all of you cooperate fully with Bob and his team in this spirit. He will be asking both for input and staff assistance, and he plans to work closely with you so that everyone's views will be taken into account.

° I would like all possible initiatives considered within the context of the review. Not all the initiatives considered will be adopted and some may turn out to be inappropriate for a public message.

° I understand that Senator Pastore asked yesterday for help from several of your agencies in drafting a bill dealing with nuclear exports. I think it is important that we work with his committee.

However, Bob's effort should be the channel for this cooperation, and I am asking him to take on this responsibility in full coordination with you.

° I would like to have Bob outline for you his plan for proceeding with the review.

(A copy of your July 27 letter to John Anderson, informing him of the review, is attached at TAB C.)

AGENCIES

Secretary Rumsfeld
Secretary Richardson
Charles Robinson, Deputy Secretary of State
William Fisher (for Secretary Kleppe), Assistant Secretary of Interior
James Liverman (for Administrator Seamans), Assistant Administrator of ERDA
Russell Train, Administrator of EPA
Steven D. Jellinek (for Chairman Peterson), Staff Director of CEQ
Marcus Rowden, Chairman of NRC
John A. Hill (for Administrator Zarb), Deputy Administrator of FEA
John Lehman (for Director Ikle), Deputy Director of ACDA

REVIEW TEAM

Robert W. Fri - Director
Jack Flynn
Harold D. Bengelsdorf
Rodney Weiher
Dennis R. Spurgeon
Jerome Kahan
John Boright

WHITE HOUSE STAFF

Jim Connor
Jim Cannon
Jack Marsh
Brent Scowcroft
Jim Mitchell (for Jim Lynn)
Glenn Schleede
Dave Elliott