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THE WHITE HOUSE  
WASHINGTON

1976 OCT 18 PM 4 02      October 18, 1976

MEMORANDUM FOR:

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JIM CONNOR  
JIM MITCHELL  
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DAVE ELLIOTT  
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FROM:

GLENN SCHLEEDE

SUBJECT:

FACT SHEET - NUCLEAR POLICY STATEMENT

Here is draft #2 of the Fact Sheet. It incorporates voluminous comments received on draft #1 and adopts a new structure -- focusing more on the policy decisions and implementing actions that are likely to be reflected in the statement.

I assume that we should proceed with the same type of agency review as with the last version.

I plan to cover the domestic agencies tomorrow morning.

Attachment

cc: Jim Shuman  
Margaret Earl  
Hugh Loweth  
Joe Kearney  
Jim Nix



107817

Office of \_\_\_\_\_

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THE WHITE HOUSE

FACT SHEET

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FACT SHEET

## THE PRESIDENT'S STATEMENT ON NUCLEAR POLICY

I. THE PRESIDENT'S ACTION

The President today issued a warning to all nations interested in nuclear energy that international cooperative action must be taken now to control the access to sensitive nuclear technology and to plutonium produced in commercial nuclear power plants if we are to preserve the benefits of peaceful nuclear energy. As a part of a comprehensive statement on nuclear policy, he announced:

- . A new attitude and new policy of greater restraint on reprocessing of nuclear fuel -- which results in separated plutonium.
- . New steps, building on the initiatives undertaken over the past two years, to achieve agreement worldwide on further actions that are needed to prevent the diversion or theft of nuclear materials that could be used to make nuclear explosives.
- . Specific actions and schedules to assure that a repository is available for the long-term storage of nuclear wastes by the time it is needed in the mid-1980's.

The President also announced that he would send to the new Congress the legislative proposals and funding requests needed to carry out his new policy decisions.

II. BACKGROUND

A. Objectives. During the past two years, the President has taken a number of actions to:

- . Assure that the benefits of peaceful uses of nuclear energy will be available in the U.S. and to our trading partners, while avoiding the proliferation of nuclear explosives capability.
- . Maintain the role of the U.S. as a reliable and competitive supplier of nuclear fuel and equipment for peaceful purposes.
- . Use diplomatic efforts and our role as the principal world supplier of nuclear reactors and fuel to encourage other nations -- suppliers and customers -- to avoid actions that would contribute to proliferation.
- . Reduce uncertainties that have hampered U.S. utilities in considering the use of nuclear power for new plants.

B. Accomplishments. Specific actions and accomplishments during the past two years include:

- . In the Fall of 1974 at the UN General Assembly, the U.S. called attention to the need for additional actions to control proliferation. (State verify)
- . In late 1974, began bilateral discussions with major nuclear suppliers, resulting in a series of meetings of all suppliers beginning in April 1975 and culminating in January 1976 in an understanding on stringent guidelines for exports of nuclear fuel, equipment and technology to guard against proliferation.
- . In June 1975, the President proposed to Congress the expansion of capacity in the U.S. to enrich uranium needed for fuel for nuclear power plants here and abroad, and thus maintain the U.S. role as a reliable supplier.
- . In the Fall of 1975 at the UN General Assembly, the U.S. made clear its opposition to the spread of nuclear fuel reprocessing and called for action on alternatives (State please verify).
- . The embargo on U.S. export of sensitive uranium enrichment and reprocessing technology has been strictly maintained.
- .. In both public and private statements strongly opposed the export by other suppliers of uranium enrichment or reprocessing technology and facilities. The U.S. welcomed the decisions by South Korea and Taiwan to forego the acquisition of such facilities.
- .. With strong U.S. leadership and encouragement, the number of nations signing the Nonproliferation Treaty (NPT), whereby non-nuclear nations foreswear the acquisition of such weapons has increased to over 100. Notably, Japan, West Germany and Italy have completed their approvals.
- . In \_\_\_\_, 1976 concluded agreement with the IAEA providing for inspection of civilian nuclear facilities in the U.S.
- . In \_\_\_\_\_ 1976, proposed to IAEA and selected supplier nations the concept of international storage of separated plutonium.

- . In February 1976, the President announced a plan to strengthen the International Atomic Energy Agency (IAEA) safeguards activities through an additional U.S. contribution to that agency.
- . During 1976, completed negotiations of agreements for nuclear cooperation with Israel and Egypt, which agreements provide rigorous new safeguards conditions. Agreements will be submitted to the new Congress for approval.
- . In the summer of 1976, The President ordered that a thorough review be undertaken of U.S. nuclear policy and options with particular attention to reprocessing, waste management, nuclear exports and nonproliferation to see whether additional actions should be taken.

As a result of the recent policy review, discussions with members of Congress, and progress in consultations with other nations, the President decided on the new actions announced today.

The 14 nations meeting in London in November for the nuclear suppliers conference have agreed to consider the new proposals.

### III. SUMMARY OF THE PRESIDENT'S STATEMENT

The President's Statement on nuclear policy covered the points summarized below.

#### A. Benefits and Risks of Nuclear Energy. The President:

- . Stated his continuing concern about plans of other nations to export sensitive nuclear technology and facilities and over the spread of the capability to obtain plutonium -- which can be used readily to make nuclear explosives -- through the chemical processing of "spent" nuclear fuel from nuclear reactors used for research and for producing electricity.
- . Underscored the risks of nuclear proliferation and the need for all nations, particularly the nuclear supplier nations to prevent the spread of technology, facilities and capability to build nuclear explosives.
- . Reaffirmed the need for the U.S., even with strong energy conservation efforts, to increase its use of nuclear energy along with coal to meet the energy needs of an expanding economy in the years ahead -- at least until advanced and more acceptable energy sources are available.
- . Noted that other nations have expanded their use of nuclear energy and many nations must continue to do so to supply their growing energy needs and reduce or avoid excessive dependence on imported oil or other fossil fuels.



B. Major Policy Decisions. The President:

- . Announced a major change in attitude and policy toward reprocessing of nuclear fuel in the U.S. and abroad. Specifically:
  - Past U.S. Policy assumed that spent fuel would be reprocessed to obtain unused uranium and plutonium which would be recycled as new nuclear fuel, and that the high level wastes would be solidified and stored in a Government-owned repository.
  - The recent review demonstrated that reprocessing and recycling is not the only option and that a decision on whether or not to proceed with those steps can be delayed.
  - Henceforth, U.S. Government policy will assume that reprocessing and recycling will proceed only if uncertainties with respect to safety, safeguardability, environmental acceptability and energy and economic benefits are satisfactorily resolved.
  - Non-proliferation objectives will take precedence over economic and energy benefits if a choice must be made.
- . Called for a world-wide moratorium on the export of reprocessing and uranium enrichment technology and facilities until uncertainties about reprocessing and recycling of plutonium can be resolved and a more effective system of proliferation controls is established.
- . Called for major international efforts to prevent nuclear proliferation and announced steps to be undertaken by the U.S. to urge other nations to delay action on reprocessing and step up non-proliferation activities.
- . Stressed that other nations are increasing rapidly the capacity to provide nuclear fuel and equipment for world markets and pledged renewed efforts to maintain the ability of the U.S. to be a reliable and competitive supplier of reactors and fuel, particularly to strengthen our ability to influence others to adopt our non-proliferation objectives.
- . Recognized and pledged support for the right of each nation to ensure that it can meet its future energy needs economically and reliably.
- . Announced that the Federal Government will have available by the time it is needed in the mid-1980's a repository for the long-term storage of nuclear wastes-- either in the form solidified wastes from reprocessing if reprocessing proceeds, or as spent fuel elements.

C. Proposed Actions to Achieve World-wide Support for an Effective System to prevent Proliferation. The President proposed the following actions internationally during the moratorium:

1. All Nations interested in nuclear energy should agree to:

- . Defer decisions on reprocessing and join in defining and carrying out the experiments and evaluations necessary to determine whether reprocessing should proceed.
- . Explore the possibility of a limited number of multi-national nuclear fuel service centers and waste repositories.
- . Explore and define the concept of international storage, probably under the control of IAEA, for spent fuel and excess plutonium.
- . Strengthen physical security measures for all nuclear facilities.
- . Strengthen the IAEA.
- . Explore the feasibility of assuring a reliable energy supply for nations accepting non-proliferation controls.
- . Expand cooperative efforts in developing non-nuclear energy resources as an alternative to nuclear power.

2. Nuclear Supplier Nations should agree to:

- . Withhold or cancel proposed exports of reprocessing or uranium enrichment technology.
- . Withhold the export of nuclear reactors and fuel unless the importing nation agrees to accept binding and effective controls against proliferation including, as a minimum, those in the 1976 nuclear supplier guidelines.
- . Provide to their customer nations accepting non-proliferation restraints with uranium enrichment and reprocessing services instead of facilities and technology, so that nuclear fuel supply is assured.
- . Agree on sanctions that would be imposed against nations that violate nonproliferation agreements.

3. Nuclear Customer Nations should agree to:

- . Forego the acquisition of reprocessing and uranium enrichment technology and equipment.
- . Accept rigorous safeguards to prevent proliferation, including:
  - Adherence to the Nonproliferation Treaty (NPT) or, pending completion of adherence process, accept controls and inspection applicable all nuclear facilities.
  - Agreement to place all spent fuel and, when available, excess plutonium in the proposed international storage regime.

D. U.S. Actions in Support Policies. The President announced the following U.S. actions in support of his new nuclear policies.

1. Domestic Nuclear Activities.

- . Executive branch agencies are to redirect policies and programs to fit the new policy that reprocessing and recycle will proceed only if uncertainties are resolved, including:
  - \* Encourage industry to proceed immediately with the expansion of spent fuel storage facilities, thus assuring utilities that they need not be concerned about shut down of reactors because of delays in decisions on reprocessing.
  - ERDA is define, in close cooperation with the NRC, the experiments and evaluations needed to complement NRC activities (particularly with respect to the Generic Environmental Statement on Mixed Oxide Fuel - GESMO) to resolve uncertainties with concerning the necessity and desirability of reprocessing and recycle.
  - ERDA is to identify the R&D efforts needed to investigate alternatives to reprocessing (such as two-stage use of fuel elements); reprocessing to recover energy value without separating out plutonium; and extended storage of spent fuel elements or disposal of elements as wastes.
  - ERDA is to develop program proposals to cover the above actions.

- . The Federal Government will assure the availability of a long-term high-level nuclear waste management facility when it is needed in the mid-1980's, and such a facility will be able to accommodate either solidified waste from reprocessing or spent fuel elements.
- . The U.S. will maintain its role as a reliable and competitive supplier of nuclear fuel and equipment for peaceful purposes. As one step, legislation will be submitted to the new Congress to expand uranium enrichment capacity in the U.S., including the expansion of the the Government-owned plant at Portsmouth to fill existing orders and privately owned capacity to fill new orders.
- . No change will be made in the Breeder Reactor program since a decision on commercialization, which would require plutonium, is not scheduled until 1986.

## 2. U.S. Exports of Reactors and Fuel.

- . The Secretary of State, with assistance of other agencies where appropriate, is to:
  - Apply the following new criteria in judging whether or not to enter into new or expanded nuclear cooperation with a non-nuclear weapon nation:
    - . Adherence to the NPT.
    - . Acceptance of safeguards requirements to all nuclear facilities pending adherence.
    - . Agreement to forego or postpone indefinitely the establishment of national reprocessing or uranium enrichment activities.
    - . Willingness to participate in an international spent fuel or excess plutonium storage program.
  - Initiate no negotiations towards agreements not meeting these criteria without Presidential approval.
  - Enter negotiations with current nuclear trading partners to conform existing agreements with the new supplier guidelines and the above criteria.

- . The President plans to request legislation needed to improve existing law with respect to nuclear exports, recognizing the need to (a) insist on agreement to rigorous controls and (b) maintain the U.S. role as a stable, reliable and competitive supplier in order to achieve nonproliferation goals.
  - . The U.S. Government will impose sanctions against any nation violating a nuclear non-proliferation agreement.
3. U.S. Actions to Encourage Essential World-wide Controls. The President:
- . Pledged additional resources, beyond those proposed in February 1976, to strengthen the role and capabilities of the IAEA.
  - . Invited participation of the IAEA and other nations in U.S. experiments and evaluations to resolve uncertainties about reprocessing and recycle, and in waste management program.
  - . Announced willingness to enter into negotiations with consumer nations adopting restraints either to purchase their spent reactor fuel or exchange it for fresh, low-enriched fuel of equivalent value--to help ensure against economic or energy disadvantage to those nations accepting controls.
  - . Agreed, in principle, to place excess spent fuel and civilian plutonium in an internationally controlled storage regime.
  - . Pledged binding commitments to customers accepting controls of an assured supply of uranium enrichment services.
  - . Pledged that the U.S. seeks no economic advantage over other suppliers .
  - . Directed the Secretary of State to enter into bilateral and multilateral discussions with the objective of securing agreement to the overall program of world-wide policies and actions to prevent proliferation.
  - . Directed the Secretary of State and Administrator of ERDA to identify actions that could be taken to assist other nations in developing non-nuclear energy resources as an alternative for nuclear power.

IV. CONTEXT OF THE PRESIDENT'S STATEMENT: STATUS OF AND CONCERNS ABOUT COMMERCIAL NUCLEAR POWER

Principal facts about the status of commercial nuclear power, current concerns, and the U.S. role in world nuclear affairs are described below.

A. Status of Commercial Nuclear Energy

- . The use of nuclear energy in the U.S. There are 62 commercial nuclear power plants licensed to operate. Nuclear plants now supply about 9% of the nation's electrical energy requirements. Another 175 have been approved for construction, are under construction, have been ordered, or are publicly announced. From \_\_\_ to \_\_\_ plants (mostly of the 1000 megawatt size range) are expected to be operating by the 1985-87 time period, and \_\_\_ to \_\_\_ by 1990-92. By 1985, about 20% of the nation's electricity will be supplied by nuclear power.
- . The use in other countries. Other countries now have a total of \_\_\_ commercial nuclear plants in operation and by 1985 about \_\_\_ countries are expected to have a total of about \_\_\_ plants in operation.
- . Energy needs. Even with greatly expanded conservation efforts, the U.S. will have to increase its use of both coal and nuclear energy for at least the next 25 years to meet the demands for energy for a growing economy.
- . Other technologies. The Government and industry are making major investment in energy conservation R&D and in development of advanced technologies such as fusion, solar energy and geothermal energy. But, there is a long way to go and technological breakthroughs are needed before any of these sources can be expected to be a major source of safe, reliable and environmentally acceptable electrical energy that people can afford.

B. Concerns about Commercial Nuclear Power.

- . Nuclear proliferation abroad. The threat of increased nuclear proliferation abroad is accentuated by the spread of capability to recover plutonium from "spent" fuel elements from nuclear power and research reactors in a step called "reprocessing." (See description of the nuclear fuel cycle at Appendix A.) Developers of nuclear power have intended that separated plutonium

be recycled as reactor fuel. However, the existence of separated plutonium increases the risk that it might be clandestinely diverted for use in making nuclear explosives or subject to theft. Availability of separated plutonium shortens the time from abrogation of safeguards to construction of an explosive.

- . Controls to prevent proliferation. The Spread of the capability to make nuclear weapons has been a concern since the advent of nuclear power and major efforts have been made, with strong U.S. leadership, to curb proliferation. Concerns have grown as the use of nuclear energy has increased and as additional nations have sought the capability to reprocess nuclear fuel to obtain plutonium or sought technology to produce highly enriched uranium -- either of which can be used in nuclear explosives. Existing physical security to prevent theft of plutonium is not considered adequate in some countries and safeguardability of commercial-scale reprocessing plants is not yet demonstrated.
- . Reprocessing in the U.S. Efforts by Industry to proceed with commercial scale spent fuel reprocessing in the U.S. have been stalled by uncertainties concerning economics, safeguardability, safety, environmental acceptability, technology performance in large plants, and regulatory requirements. While reprocessing technology is available and has been demonstrated, industry has not yet constructed and operated, in a commercial setting, reprocessing and associated conversion and nuclear waste packaging facilities.
  - Opponents of domestic reprocessing believe energy and economic benefits are outweighed by problems that might result from significant quantities of separated and recycled plutonium.
  - Proponents maintain that there are large economic benefits (\$18 billion through the year 2000), and energy resource savings from reprocessing; that reprocessing is essential for the U.S. to take advantage of nuclear breeder reactors; and that other uncertainties can be resolved.
- . Nuclear Waste Management. The U.S. Government has the responsibility for providing a repository for the long-term storage or disposal of high-level nuclear wastes. Even though a repository is not needed until the mid-1980's and the technology for managing wastes is available, concern has been expressed that plans and programs have not been put in place to achieve that objective.

- Nuclear Power Plant Safety. Even though commercial nuclear power plants have an excellent 18-year record of safety, there are some who are still concerned that plants are not safe enough.

C. U.S. Influence in World Nuclear Affairs.

- The U.S. has been the principal world supplier of nuclear reactors and fuel for peaceful purposes and has used this role as the basis for encouraging other nations -- both suppliers and customers -- to adopt rigorous safeguards to prevent diversion of nuclear materials for use in explosives and effective physical security measures to prevent theft and sabotage.
- Several other nations -- principally France and Germany -- have become suppliers of nuclear reactors and uranium enrichment services to produce fuel for reactors. In some cases, these suppliers -- unlike the U.S. -- have offered to export uranium enrichment and reprocessing technology and facilities.

The U.S. role as a supplier in world markets -- and, therefore, our ability to influence others to adopt our non-proliferation objectives -- is declining,

- The U.S. share of reactor sales to foreign markets has declined from 80% in \_\_\_\_\_ to 55% in \_\_\_\_\_.
- U.S. capacity to provide uranium enrichment services has been fully committed since mid-1974 and no new domestic or foreign orders are being signed.
- Congress adjourned without approving legislation authorizing the requested expansion of capacity in the U.S. for enriching uranium.
- Suppliers from other nations are filling the gap. Significant enrichment capacity exists in the USSR and Western Europe and more is being planned. France recently announced that, in the absence of U.S. expansion, a consortium would build a major new uranium enrichment plant to serve the growing world market.





V. BACKGROUND INFORMATION ON CHANGE IN U.S. POLICY AND ATTITUDE ON REPROCESSING AND RECYCLE AND DETAILS OF NEW PROGRAM

A. Previous Policy and Actions on Reprocessing and Recycle.

- For years, U.S. nuclear policy has assumed that "spent" fuel removed from commercial nuclear light water reactors (LWR's) would be reprocessed through physical and chemical processes to:
  - Recover valuable uranium and by-product plutonium which could then be reused("recycled") as fuel in LWR's -- thus extending the energy output from uranium by about 30%.
  - Remove the radioactive wastes, which would be converted to a solid form and packaged for ultimate disposal.
  - Recover plutonium for use as fuel in breeder reactors, if and when breeders become commercial. Breeder reactors are expected to extend the use of our domestic uranium resources by 500 years or more.
- U.S. policy has assumed that private industry has the responsibility for financing, building, owning and operating commercial reprocessing facilities.
- U.S. Government responsibility has been limited to R&D and small scale demonstration of reprocessing technologies. Basic technologies were developed in AEC (now ERDA) programs for producing nuclear materials for weapons activities, and for handling spent fuel from naval nuclear reactors and research reactors. There are significant differences in technology for reprocessing spent nuclear fuel from commercial power plants.
- ERDA has continued to support R&D on the chemistry of reprocessing, on control of radioactive discharges from reprocessing plants and on safeguard technologies for use in reprocessing and recycle facilities.

B. Current Status of spent fuel reprocessing in the U.S.

- In the U.S., there currently are no commercial reprocessing facilities in operation:
  - A small reprocessing facility built by the Nuclear Fuel Services Company in West Valley, New York, operated from 1966 to 1972 when it shut down for plant expansion. Due in part to changing regulatory standards of NRC since that time, this plant is not expected to be started up again.

- A plant was built at Morris, Illinois, by the General Electric Company using a technology different from that developed by AEC(ERDA) and from the NFS facilities. Before starting up the plant, GE concluded that it would not work as planned and thus it will not be used to reprocess spent fuel.
- The Allied General Nuclear Services(AGNS) company has completed one major element -- a separations facility where spent fuel is physically chopped up and then chemically reprocessed, and a uranium conversion facility as part of a major reprocessing complex at Barnwell, S.C., at the boundary of an ERDA installation. AGNS has already invested approximately \$270 million in this complex. Two major additional elements are needed to complete the complex: a waste solidification and packaging facility estimated to cost \$\_\_\_ million; and a facility to convert liquid plutonium to a solid oxide estimated to cost \$\_\_\_ million.
- The independent Nuclear Regulatory Commission(NRC) now has under review the issue of whether reprocessing and recycle should be permitted in the U.S. This review is being conducted in the context of the NRC's evaluation of their Generic Environmental Statement on Mixed Oxide Fuel(GESMO).

The experimental program announced by the President is expected to complement the NRC's ongoing GESMO evaluation.

### C. Problems and Uncertainties Associated with Reprocessing

At this time, the principal problems and uncertainties associated with reprocessing and recycle involve:

- The effectiveness of techniques for reducing to a minimum the risk of theft or diversion of plutonium that is separated out during reprocessing are presently uncertain.
- The performance of technologies used to solidify the waste products of reprocessing -- preparing the wastes for ultimate disposal -- have not been demonstrated on a large scale.
- The costs of reprocessing, recycle and waste solidification -- which will affect the economic benefits of reprocessing -- are not clearly understood. Specifically:
  - Increased capital and operating cost due to required domestic safeguard measures are not yet known.
  - Performance of large scale waste solidification technologies and spent fuel separation technologies have not been

demonstrated on a large commercial scale.

- The requirements that NRC might establish for reprocessing, if it approves reprocessing in the U.S. have not been determined.

- . These uncertainties are delaying or preventing private firms from investing in the planning, design and construction of facilities that would be needed if reprocessing proceeds.

#### D. Alternatives to Proceeding with Reprocessing Now

- . If reprocessing and recycle of plutonium are not pursued / now or in the future in the U.S., nuclear power plants can still operate and make significant contributions to U.S. energy supplies. A nuclear fuel cycle different from that previously assumed would be involved; e.g.:

- Spent fuel discharged from nuclear plants would be stored temporarily in special facilities either at nuclear plant sites or in central storage complexes. Adequate facilities for this are not now available and would thus have to be constructed by industry.
- . If reprocessing and recycle is approved at a future date, spent fuel in temporary storage could then be reprocessed and the plutonium and unused uranium recycled to produce energy.
- . If reprocessing is not approved, spent fuel could be delivered directly to permanent waste disposal sites.
- Alternative technologies could prove to be feasible, permitting the extraction of some of the remaining energy content from fuel elements. Considerable additional R&D would be needed to test the feasibility of such an approach.

#### E. Relationship between Domestic Reprocessing and Our World-wide non-Proliferation Objectives

- . The U.S. cannot proceed with the commercial development of reprocessing and recycle facilities in the face of present uncertainties associated with reprocessing and, at the same time, expect other nations to recognize the sincerity of U.S. concerns about the risks of separated plutonium.

- . Yet, there are reasons-- important to other nations and the U.S. -- that justify proceeding with some reprocessing experiments and evaluation, complementing the NRC work. Specifically:
  - The need to resolve uncertainties about reprocessing and recycle (listed earlier) including safeguardability and economics.
  - If reprocessing is eventually approved, the U.S. should be prepared to provide reprocessing services and fuel exchange, thus reducing the incentive for spread of small scale facilities.
- . The U.S. will invite IAEA inspection and consider foreign nation participation in any experimental reprocessing activities.

F. Details of Actions to Implement Changes in Domestic Policy on Reprocessing.

- . Principal actions to implement the changes in policy on reprocessing announced by the President include the following:
  - ERDA is to identify, evaluate and recommend to the President by November 30, 1976, for consideration in his 1978 Budget, proposed activities which will be required to adequately resolve the uncertainties in the economics, safeguards and waste technologies associated with reprocessing. This review will cover:
    - . Additional information required to reduce uncertainties and facilitate decisions in the U.S. on reprocessing and recycle on a timely basis.
    - . Cost effectiveness of alternative programs involving both the U.S. Government and private industry which could develop required information in a timely manner. Alternative approaches to be reviewed include:

- scaling up of existing ERDA experimental facilities to investigate safeguards and waste solidification technologies.
- design, licensing and construction of commercial scale waste solidification and plutonium conversion facilities, including the potential addition of facilities at the site of the existing AGNS spent fuel separations facility at Barnwell, South Carolina.
- ERDA is to include in its evaluation of any approach that might involve the existing AGNS facility:
  - . A full assessment of the advantages and disadvantages -- from the standpoint of the national interest of proceeding at the site of the AGNS facility.
  - . Alternative approaches which would minimize the total cost of proceeding at that site.
  - . Terms of any potential cooperative arrangements with the AGNS organization must avoid absorbing risk already taken by AGNS and preclude any legitimate concern about a potential "bailout" for the investors. Possible arrangements are to include consideration of:
    - Cost sharing by AGNS in any additional facilities.
    - Actions to be taken by AGNS in support of U.S. non-proliferation objectives.
    - Reasonable protection for AGNS investors for any additional investments made in support of Government objectives -- if a decision is made not to permit proceeding with reprocessing.
- ERDA is to consult with the independent NRC to help assure that NRC and ERDA activities are coordinated and mutually supportive.
- ERDA and State Department are to recommend by November 30, 1976, specific criteria to support non-proliferation objectives that should be applied to any foreign participation in U.S. experimental program relating to reprocessing.
- State Department and ERDA are expected to open discussions expeditiously with other nations to determine their interest in participating in any such ERDA-sponsored activities.

- ERDA is to recommend to the President by November 30, 1976:
  - . A proposed program to assess the feasibility of alternative technologies for obtaining energy and economic value from spent fuel.
  - . Actions needed by the Federal Government, if any, to encourage private industry to proceed with added spent fuel storage capacity to accommodate fuel which will have to be stored until a decision is made on reprocessing or until the throw-away cycle or alternative technologies are available.
- ERDA and State, in developing non-nuclear energy program, are to recommend to the President by November 30, 1976, alternative approaches for assisting developing nations that foreswear acquisition of nuclear explosives.
- . Details of actions to be taken during FY 1977 or FY 1978 to implement the changes in domestic policy on reprocessing are to be worked out in time for:
  - Submission of any necessary legislation early in 1977.
  - Providing for FY 1977 or FY 1978 Federal funding requirements in the President's new budget.
- . Nothing in this program changes the Government policy that all steps in the light water fuel cycle, if performed on a commercial scale, will be the responsibility of private industry -- except long-term nuclear waste management, which would continue to be a Federal responsibility

VI. BACKGROUND INFORMATION AND DETAILS OF PROGRAM TO ENCOURAGE NEW ATTITUDE AND TO REDUCE THE THREAT OF PROLIFERATION ABROAD

A. Previous Actions Taken by the U.S. to Control Proliferation Abroad

Since 1953, when President Eisenhower proposed creation of the IAEA, the U.S. has been a leader in efforts to control the spread of nuclear weapons, while helping to meet the legitimate peaceful nuclear energy needs of other countries.

In addition to its work to obtain treaties limiting the testing of nuclear weapons, the U.S. has:

- . Led in negotiating the Non-Proliferation Treaty (NPT) which now has over 100 adherents, wherein non-nuclear weapons nations forswear the acquisition of such weapons and accept IAEA safeguards over all their nuclear facilities
- . Encouraged the development of strong international safeguards and inspection capability through the IAEA to guard against the diversion of nuclear materials and effective international physical security standards to protect against theft and sabotage.
- . Established and maintained a role as the world's principal supplier of nuclear fuels and equipment for peaceful purposes and used this role as the basis for urging other nations to join with us in adopting rigorous controls against the potential for misuse of nuclear materials.
- . Entered into thirty "Agreements for Nuclear Cooperation" with nuclear trading partners (28 with individual nations, plus IAEA and Euratom), which agreements include political commitments and technical controls to prevent the diversion by nations of nuclear materials for nuclear explosives or any military purpose.

Within the past two years the Administration has taken major steps to strengthen efforts worldwide to control proliferation. Principal actions are listed on pages 1-2 of this Fact Sheet.

B. Details of Actions to Encourage Development of Effective Controls

- . Worldwide Moratorium on Export of Enrichment and Reprocessing Technology and Facilities
  - The U.S. adopted such a moratorium in 1972.
  - The proposed international moratorium of at least three years would:
    - . Allow the supplier nations to develop new, common export criteria and means to assure long-term fuel supply outlined below.
    - . Permit time to resolve uncertainties about reprocessing.

. International Plutonium and Spent Fuel Storage Regime

- Under this proposal, Article XII, Section 5 of the IAEA statute would be activated to establish a regime for international custody over all plutonium and spent fuel which is excess to current, economically justified civil requirements.
- The U.S. is prepared, in principle, to place its excess civil plutonium and spent fuel in such a regime and to participate in a special grant to IAEA, along with other member states, to activate such a regime.

. Assisting other Nations in Meeting Energy Requirements

- Establish or strengthen programs to assist nations that accept restraints and forswear nuclear explosives in evaluating their current and future energy requirements and in developing energy alternatives, non-nuclear as well as nuclear, to meet requirements.

. Strengthening the IAEA Safeguards System

- Continue developing programs with the IAEA for special technical contributions-in-kind.
- Explore with member nations and the IAEA staff other ways to strengthen the safeguards mission, including the provision of additional personnel.
- Consistent with the experimental nature of the U.S. program, develop with the IAEA a system of adequate safeguards for reprocessing facilities, in the event reprocessing is approved.
- Dedicate resources from two ERDA laboratories in the U.S. for technical support of the IAEA safeguards mission and invite other countries to make similar dedications.
- Seek measures to ensure that international safeguards are effective as they apply to all nuclear facilities.

. Criteria for Nuclear Cooperation with Other Nations

Criteria would include:

- NPT adherence or IAEA safeguards over all national civil nuclear programs (research and operating activities and facilities).



- Agreement to place all excess spent fuel and, when available, plutonium in the proposed international storage regime when established.
- Agreement to postpone plans to enrich uranium or reprocess spent fuel until such time as a clear economic justification exists and to do so only in binational or multinational facilities.

These criteria would be the norm for all new, proposed Agreements for Cooperation. The Secretary of State is to open discussions with the other nuclear suppliers to shape common guidelines so that they conform with these principles. With respect to countries that are current recipients of U.S. nuclear supply, Secretary of State is to enter into negotiations with the objectives of conforming these agreements to agreed international guidelines, and to seek through diplomatic initiatives to obtain their acceptance of the new criteria just outlined.

• Incentives to Nations to Cooperate in Establishing the Proposed New Non-Proliferation Regime.

The U.S. is prepared to:

- Assure enrichment services, subject to capacity limits.
- Consider cooperative arrangements to cover fuel for reactors sold by nations other than the U.S.
- Negotiate to obtain from recipient nations rights of disposition over their spent fuels, assuring them reimbursement or fresh low-enriched fuel of equivalent value, where such arrangements would significantly advance non-proliferation objectives.
- Devise and support new programs to develop indigenous non-nuclear energy resources in energy poor countries.

• Sanctions

- Any spread of nuclear explosive capability will be viewed with the utmost gravity.
- Any national violation of the NPT or U.S. nuclear safeguards agreement will cause the U.S. at a minimum to cut off immediately nuclear cooperation with the violating country and review its relationships with the country involved.

- Beyond this, violation of any nuclear safeguards agreement will cause the U.S. to initiate consultations with the IAEA and other countries with regard to suspending assistance in nuclear programs and possibly other programs.

. Consultations

The Secretary of State is to initiate intensive consultations with other nations with regard to:

- Obtaining a three-year moratorium on the export of sensitive nuclear technologies.
- Establishing an international storage regime for spent fuel and excess plutonium.
- Strengthening the common non-proliferation criteria under which all nuclear materials and facilities are exported.
- Developing a common policy on fuel cycle exports, to remove competitive incentives which can undermine our common non-proliferation efforts.
- Strengthening the safeguards capability of the IAEA, especially through increasing the number and technical expertise of safeguards inspectors.

II. BACKGROUND INFORMATION AND DETAILS OF THE PRESIDENT'S PLAN FOR DEALING WITH COMMERCIAL HIGH-LEVEL NUCLEAR WASTES

A. Nuclear Waste Requiring Long-Term Management

U.S. commercial nuclear power reactors "burn" enriched uranium fuel and produce in spent fuel rods a mixture of plutonium, slightly enriched uranium and waste products. Certain of these waste products are highly radioactive and could constitute a hazard for hundreds of thousands of years if they escaped to the biosphere.

- . If spent fuel rods are reprocessed, the wastes would be separated from the uranium and plutonium (which could be saved and recycled as fuel), put into solid form in metal canisters, and sent to a repository for permanent disposal.
- . If there is no reprocessing, the spent fuel rods themselves must be disposed of in a repository.

Under either alternative, management of nuclear wastes is required to provide for permanent disposal and isolation from the environment for centuries.

B. The Nuclear Waste Problem and Alternatives for Dealing With it that have been Considered

The principal problem in safely managing the waste is confining the radioactivity rather than finding enough storage space, since recent calculations indicate the total volume of solidified high-level wastes produced by commercial nuclear power in the U.S. through 2000 will be equivalent to a cube only 70 feet on each side.

A wide variety of methods for permanent disposal of these wastes have been considered:

- . Experts have concluded that the most practical method is geologic storage in repositories in stable formations deep underground.
- . Other methods under study, but which are not practical at present, are deep geologic disposal under the oceans floor, transmutation and shooting into space.

While technology or means for nuclear waste disposal and management have been developed and demonstrated on a small scale, we do not yet have available a repository for nuclear waste disposal. Most spent fuel rods are continuing to be stored safely in temporary storage basins at reactor sites.

Considerable public concern has been expressed that the Federal Government has not yet demonstrated that it can fulfill its responsibility to provide a repository for safe disposal of nuclear waste. Thus, the nuclear waste "problem" is to demonstrate that the technology is available, that an acceptable site can be found, and that a coordinated program within the Federal Government can be established to assure that a facility will be available, when needed, generally agreed to be by 1985.

C. The Federal Government's Waste Management Responsibility

Because of the limited incentives for private parties to engaged in commercial storage of these wastes, the need to contain wastes over centuries, and the environmental risks involved, the Federal Government has assumed the responsibility for long-term disposal of high-level wastes. Private industry is responsible (subject to regulation) for packaging and delivering the waste in a prescribed form to a Federal repository.

D. Principal Actions that Must be Taken by the Federal Government to Implement a Sound Waste Management Program -- and the Status of those Actions

. Generic Environmental Impact Statement (GEIS).

Because the program to build and operate a repository will represent a "major Federal action with potentially significant environmental impact," the ERDA is required to prepare a generic environmental impact statement (GEIS) on waste management.

- The GEIS will examine the impacts of all the major waste management alternatives.
- Statement will cover all types of nuclear wastes from the light water reactor fuel cycle.
- Other environmental impact statements (EIS's) will be required when (i) regulations are proposed, and (ii) when construction funds are requested from Congress.

Status - ERDA has been at work for some time. No major problems are anticipated in completing the statement by late 1977. All of the relevant agencies have been cooperating in its development. A final statement is expected in late 1977.

. General Environmental Standards

The Atomic Energy Act, as amended, requires the EPA to issue general environmental standards for releases to the biosphere from nuclear facilities, including waste management facilities. These standards will provide a numerical limit to long term radiation releases outside the boundaries of the repository that can be tolerated -- above the natural background radiation. The standards need to be available as early as possible during the process of locating and constructing the repository.

Status - EPA will propose the general standards for high level waste in 1977 and publish them in final form by mid-1978, in time for the Nuclear Regulatory Commission (NRC) to issue its regulations and prior to starting construction.

. Licensing of Waste Repository

The Energy Reorganization Act of 1974 requires that high-level commercial waste repositories be proposed for licensing by the NRC. The NRC is also responsible for issuing the appropriate criteria and standards to assure that the repository is constructed and operated in a safe and environmentally acceptable manner.

Status -- ERDA plans to ask the independent NRC to subject the repository to a licensing procedure before the first wastes are shipped. NRC will produce criteria and standards governing the construction and operation of the repository by 1978, prior to the time the site is finally determined and construction begins.

. Construction and operation of a repository.

ERDA has the responsibility to construct and operate the repository, including:

- finding an acceptable site.
- acquiring the land.
- designing the repository.
- construction, operation and sealing of the repository.

Status - 1977 Appropriations Budget increased funding for this program to \$66 million, up from \$12 million in FY 1976.

- ERDA is expected to assure the small scale demonstration of they process technology by 1978 (such as waste solidification, transuramic volume reduction, cannister design, etc), and have the repository in operation by 1985.

E. Timetable for Actions

The Office of Management and Budget (OMB) has led an interagency task force composed of ERDA, NRC, CEQ, EPA, USGS (Interior) and NSF which has detailed the key engineering, environmental and regulatory actions and dates required to enable a repository to be operated by 1985. The work of this Task Force provided the basis for the President's decision on plans and schedules.

The principal actions and the dates for their accomplishment are listed below and shown in chart form at Appendix C.

1976 - ERDA issued for public review the Technical Alternatives Document for waste management which explains the current state of the technology.

1977 - ERDA issues generic environmental impact statement on waste management no later than the end of the year and begins extensive program to identify, test and select a site.

- EPA proposes draft generally applicalbe standards for permanent storage of high level wastes.
- NRC publishes draft standards for solidified high level wastes and draft siting, engineering and operating criteria for repositories for high level wastes. Each element will include the appropriate draft EIS statements.

- USGS will begin preliminary hydrologic work in conjunction with ERDA.
- 1978 - ERDA will complete demonstration work on cannister design, waste solidification, and preliminary repository design, and continue site selection process.
  - NRC finalizes proposed site selection, solidification, waste definitions and operating criteria and regulations.
  - EPA issues final general ambient standards for high level waste disposal.
- 1979 - ERDA selects a particular site, issues a draft site specific EIS, and begins intensive site and design work.
  - NRC performs early site review of ERDA repository; issues next phase of draft regulations for cannister design, transportation, etc.
- 1980 - ERDA completes site and design studies, submits preliminary safety analysis and environmental report to NRC in support of construction permit.
- 1981 - ERDA begins construction with approval of NRC.
- 1984 - Construction completed, repository tested with "cold" wastes.
- 1985 - NRC issues repository license.
  - Repository begins initial commercial-scale operations.

## I. BUDGET AND LEGISLATIVE PROPOSALS

The President is expected to propose early in the new year the budget requests and proposed legislation necessary to implement the policy and programs announced in his statement.

Budget and/or legislative proposals will be needed to:

- . Authorize the domestic reprocessing and safeguards activities.
- . Authorize R&D on alternative technologies to reprocessing.

- . Authorize work on the expansion of the Portsmouth uranium enrichment plant and authorize ERDA to enter into cooperative agreements with private firms wishing to finance, build, own and operate uranium enrichment plants.
- . Support evaluation of energy requirements and alternative energy systems for developing countries.
- . Authorize support for IAEA action leading to the establishment of an international plutonium and spent fuel storage.
- . Buyback spent fuel.
- . Strengthen the safeguards capability of the IAEA.
- . Continue work necessary to provide a waste management repository.
- . Establish criteria for exports of nuclear reactors and fuel.

IX. ACTIONS PREVIOUSLY TAKEN BY THE PRESIDENT ON NUCLEAR ENERGY

In addition to the actions described above with respect to exports, proliferation, reprocessing and waste management, the President has taken a number of actions to assure the continued safety, reliability, and environmental acceptability of nuclear power; to maintain the U.S. role as a reliable supplier of nuclear fuel and equipment for peaceful purposes; and to control the spread of proliferation abroad. These actions have included:

- A. Uranium Resources. The President's 1977 Budget provides for \$30 million in outlays (an increase of \$15 million over the FY 1976 Budget) to expand the ERDA program to provide more complete information on the extent of the Nation's uranium resources and \$5 million for the Department of Interior's uranium assessment program. Even without this more complete information, domestic uranium resources known to be available plus those projected with a high degree of certainty, are sufficient to provide fuel for all reactors that are expected to be on line by 1990 over their entire lifetime. Uranium resources, together with the future market for nuclear energy, provide the basis for significant investment by industry in expanded capacity for mining, milling, and uranium conversion.

- B. Uranium Enrichment. In June 1975, the President proposed legislation needed to increase capacity in the U.S. for enriching uranium and to provide the basis for moving to a private, competitive uranium enrichment industry. The additional capacity is needed to provide fuel for nuclear power plants domestically and to permit the U.S. to maintain its role as a major supplier of uranium enrichment services abroad. The legislation passed the House but not the Senate.

When he proposed the legislation, the President reiterated the intention of the United States to be a major supplier of uranium enrichment services, and pledged the U.S. Government to assure the delivery when needed of uranium enrichment services covered by orders with private firms in the U.S.

ERDA has proposals from four firms wishing to finance, build, own and operate uranium enrichment plants. One would use the gaseous diffusion technology; the others propose to use the gas centrifuge process.

- C. Regulation of Nuclear Power. In October 1974, the President signed the bill creating the Nuclear Regulatory Commission (NRC), an independent regulatory agency with the full-time responsibility for assuring the safety, and environmental acceptability of commercial nuclear power in the U.S.
- D. Reactor Safety. The President's FY 1977 Budget provides \$87 million in outlays in NRC and ERDA (an increase of 47% over FY 1976) to assure the safety of commercial light water reactor nuclear power plants even beyond their present levels of safety.
- E. Improved Licensing

- . The President urged passage of legislation to reform the nuclear facilities licensing process by providing for early site review and approval, and encouraging nuclear facilities design standardization.
- . The Nuclear Regulatory Commission (NRC) has taken a number of steps to reduce regulatory delays, including issuing standardized review procedures for license applications so that applicants can have available detailed information on how NRC requirements can be met, and developing procedures to coordinate environmental siting reviews by other Federal agencies and the States.



F. Availability of Commercial Nuclear Power Plants.

Increasing the on-line availability of commercial nuclear power plants and reducing the time required to construct these plants can lower significantly electric generating costs. Primary responsibility for reliability improvements rest with industry which spends about \$100 million per year to improve nuclear plant technologies. The President's 1977 Budget for ERDA provides \$10 million in outlays for research on basic technologies to be used by industry in its program to improve plant reliability.

G. Plutonium and Uranium Recovery and Recycle R&D.

The President's FY 1977 Budget provides \$31 million for ERDA for R&D and design work on the recovery and reuse of plutonium and uranium from spent nuclear fuel elements used in commercial nuclear power plants. It will provide additional data useful for licensing reprocessing plants.

H. Commercial Nuclear Waste Management

The Fiscal Year 1977 appropriations provide \$66 million in outlays for ERDA (an increase of \$54 million over 1976 funding levels of \$12 million) for greatly accelerating research and development on, and for investigating the suitability of several sites for long-term storage of radioactive wastes. The research and development will also focus upon improved methods for processing and packaging wastes for transportation and storage.

I. Domestic Safeguards

- . The FY 1977 appropriation contains \$27 million for ERDA (an increase of 80% over the FY 1976 funding level of \$15 million) for further development of technology to prevent the theft and misuse of nuclear materials in future years. These funds will be used to design and test overall security systems and to develop the more comprehensive methods of accounting for nuclear materials that will be needed as the amounts of these materials in use increase substantially in the future.
- . The President's 1977 Budget also contains \$26 million in outlays (an increase of \$12 million over FY 1976 Budget) for NRC to accelerate efforts to develop more integrated material control and accounting measures, and physical protection measures.



J. International Safeguards and Non-Proliferation

The President proposed that the U.S. make a special contribution of up to \$5 million in the next five years to the International Atomic Energy Agency (IAEA) to strengthen its safeguards program, by providing training or personnel, research and development of improved techniques and services of expert consultants, specialized equipment and other appropriate support.

K. Advanced Nuclear Energy R&D

- . Fission Reactors: The FY 1977 appropriations provide \$684 million for ERDA (an increase of 31% over FY 1976 levels of \$522 million) for research and development on improved nuclear power reactors. Most of the funds (85% in FY 1977) are for development of the Liquid Metal Fast Breeder Reactor (LMFBR), which could greatly extend supplies of fuel for nuclear power plants. The increase in FY 1977 is primarily for the continued construction of the \$2 billion LMFBR demonstration project near Oak Ridge, Tennessee.
- . Fusion: The FY 1977 appropriations provides \$304 million of outlays for ERDA (an increase of 36% over FY 1976 level of \$224 million in outlays) for research on determining the scientific feasibility of obtaining a virtually inexhaustible source of energy for the long-term (beyond the year 2000) from controlled thermonuclear fusion reaction. The budget permits the continued construction of the \$228 million Tokamak Fusion Test Reactor, near Princeton, New Jersey, which will represent a major milestone for the fusion development program.

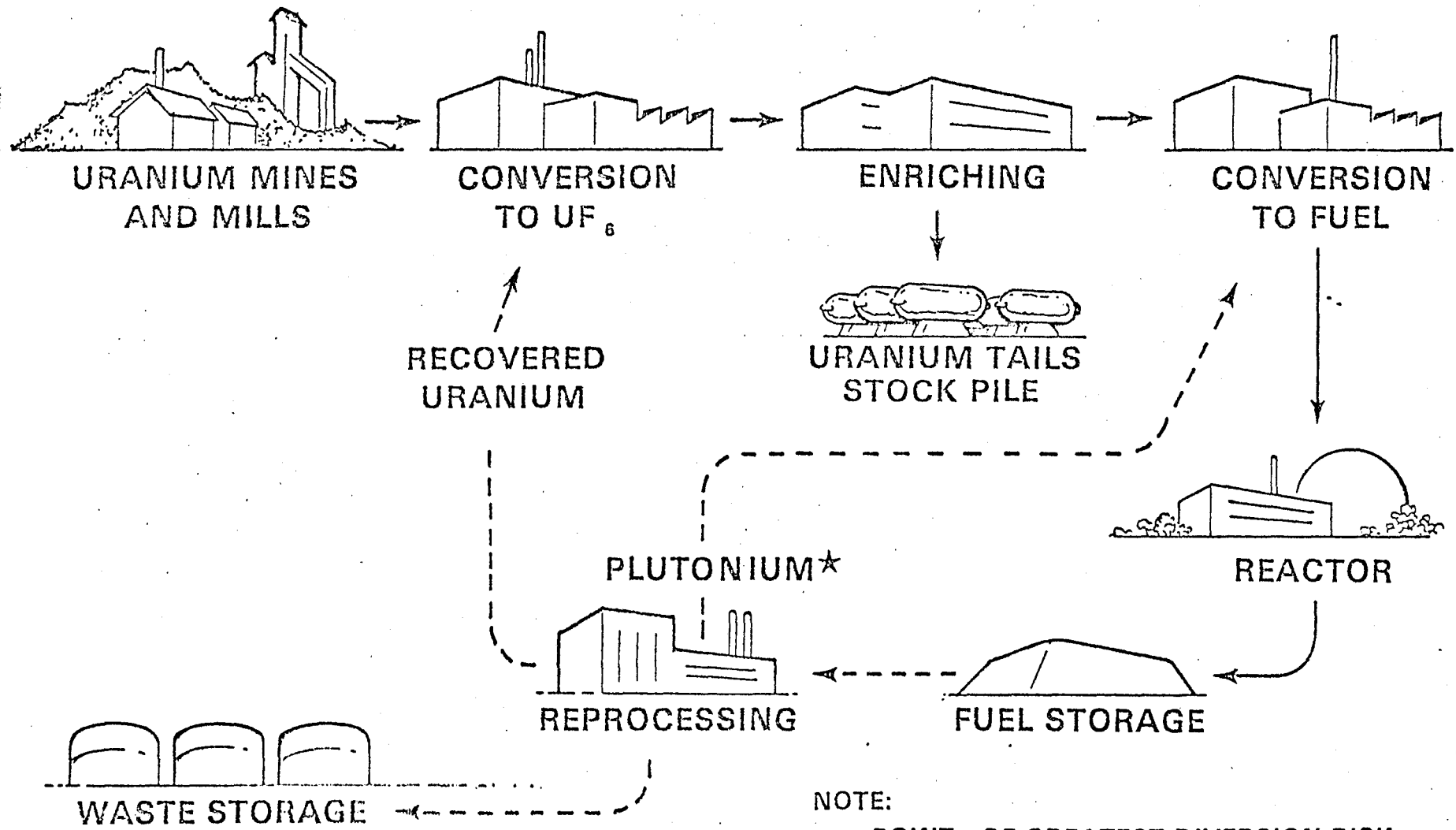
# STATUS OF NUCLEAR POWER PLANTS — SEPT. 30, 1976

<u>Number Of Units</u>	<u>Rated Capacity (MWe)</u>
* 62 LICENSED TO OPERATE .....	45,000
* * 72 CONSTRUCTION PERMIT GRANTED .....	76,000
20 Under Operating License Review.....	20,000
52 Operating License Not Yet Applied For .....	56,000
68 UNDER CONSTRUCTION PERMIT REVIEW .....	75,000
* * 21 Site Work Authorized, Safety Review in Process.....	22,000
47 Other Units Under CP Review .....	53,000
16 ORDERED .....	18,000
19 PUBLICLY ANNOUNCED .....	23,000
237 TOTAL .....	237,000

\*Includes 3 plants with fuel loading and low-power testing licenses only. Not included are two operable ERDA-owned reactors with a combined capacity of 940 MWe.

\*\*Total of units authorized construction (Construction Permit Granted plus Site Work Authorized): 93 units, 98,000 MWe.

# THE LIGHT WATER REACTOR NUCLEAR FUEL CYCLE



NOTE:  
★ POINT OF GREATEST DIVERSION RISK

Major Elements of Commercial Nuclear Waste Management Program

