The original documents are located in Box 42, folder "Uranium Enrichment - Message to Congress (1)" of the John Marsh Files at the Gerald R. Ford Presidential Library.

JUN 18 1975

June 17, 1975

MEMORANDUM FOR: JIM CANNON
JIM CONNOR

THRU: MAX FRIEDERSDORF

FROM: PAT O'DONNELL

SUBJECT: URANIUM ENRICHMENT

Pursuant to the President's recent meeting with Senator Pastore, the Senator has arranged to have our spokesmen informally brief the Joint Committee on Atomic Energy on 3 P.M., Thursday, June 19, 1975 in Room H403 in the Capitol.

Please furnish me with a list of any staff people who will be accompanying us for the session.

Thanks.

cc: Jack Marsh
Bill Kendall

JUN 17 1975

due: 6/18 noon

THE WHITE HOUSE

WASHINGTON

June 17, 1975

called in comments 6-18 - 6:20 pm

MEMORANDUM FOR: PHIL BUCHEN
JIM CONNOR
MAX FRIEDERSDORF
ALAN GREENSPAN
ROD HILLS
JIM LYNN
JACK MARSH
JIM MITCHELL
BRENT SCOWCROFT
BILL SEIDMAN

THROUGH: JIM CAVANAUGH

FROM: GLENN SCHLEEDE

SUBJECT: Uranium Enrichment - Message, Bill, Economic Impact Statement

Enclosed are draft materials received from ERDA, including:

- Draft bill
- Transmittal letter
- Draft economic impact statement
- Rough Draft Presidential Statement

The draft bill does not yet take into account the questions and problems raised over the past few days by Rod Hills. OMB (Loweth) is developing a paper on the Congressional approval issue for early discussion.

OMB is circulating the draft bill and transmittal letter through the regular legislative clearance system.

Note also that the ERDA package assumes the bill would be transmitted by Seamans rather than the President, a question we have not yet addressed.

With respect to the draft message, would you please let me have your recommendations by noon, Wednesday, June 18, on any basic changes that should be made before the draft is turned over to Messrs. Hartmann and Theis.

Attachment

cc: Jim Cannon

UNITED STATES
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
WASHINGTON, D.C. 20545

JUN 16 1975

Honorable James T. Lynn, Director
Office of Management and Budget

Dear Mr. Lynn:

Transmitted herewith is an Energy Research and Development Administration legislative proposal to carry out the decision of the President to provide necessary government assistance to establish a competitive private industry to provide additional increments of enriched uranium needed for commercial nuclear reactors in this country and abroad.

The proposed legislation would amend Section 161 of the Atomic Energy Act of 1954, as amended, to authorize cooperative arrangements with private enterprise for the provision of facilities for the production and enrichment of uranium enriched in the isotope 235.

Although the impact of the enactment of the proposed legislation upon the Federal budget is not at this time susceptible to precise estimate, it is believed that with the assistance provided under this legislation private capital can provide the funds necessary to the establishment of a competitive private enrichment industry.

We would appreciate your advice as to whether the proposed legislation is in accord with the program of the President.

Sincerely,

R. Robert Seamans

Robert C. Seamans, Jr.
Administrator

Enclosures:
As stated

Honorable Nelson A. Rockefeller
President of the Senate
U. S. Senate

Honorable Carl B. Albert
Speaker of the House
House of Representatives

The Energy Research and Development Administration is pleased to submit for the consideration of the Congress the enclosed draft bill to amend Section 161 of the Atomic Energy Act of 1954, as amended, to authorize cooperative arrangements with private enterprise for the provision of facilities for the production and enrichment of uranium enriched in the isotope 235.

This proposal would carry out the President's policy stated in his message to the Congress on June __, 1975, to foster, through limited forms of Government assistance, the creation of a competitive private industry to supply enriched uranium for the new nuclear power reactors which will be needed in the 1980's and beyond to help meet both domestic and foreign requirements for energy. The purposes underlying this policy are stated fully in the President's message and will not be repeated here.

The Energy Research and Development Administration, and its predecessor, the Atomic Energy Commission, have been conducting discussions over the past several years with private companies interested in entering the uranium enrichment business. These discussions indicated that various forms of Government assistance

were prerequisites to private companies undertaking to design, construct, own and operate such facilities, whether or not the technology employed was that of the gas centrifuge or gaseous diffusion process. Thus, all prospective entrants into the private enrichment industry perceived a need for the Government to furnish certain technical assistance, classified information, and equipment which are not available from sources other than the Government. They indicated a need for facility performance assurances, materials and equipment warranties. Many indicated a need for Government purchase, for a limited period and amount, of enriching services during initial operations in order to service their debt and provide a return on equity should they not have sufficient customer demand during the initial period. All stated the need for Government provision of enriching services from the Government stockpile to meet their commitments to supply their customers requirements should their facilities fail to commence operations as scheduled or for a limited period suffer interruptions in operation.

The basic characteristics of the uranium enrichment business include high capital intensity; long lead times for planning, engineering and construction; an economic environment involving many uncertainties; a technology which has been developed by the Government on a classified basis, is subject to rapid improvement, and has not yet been proven on a commercial basis; customers (electric power companies) which are regulated as to price, have a capital structure designed for minimal risk, and which face unprecedented capital commitments. Under these

circumstances, many prospective entrants asserted the need for Government assurances against certain risks to enable securing the large amounts of capital, both debt and equity, that would be required for such undertaking. For this purpose they sought various forms of undertakings by the Government to acquire their equity interest in and to assume their obligations, liabilities and debt arising out of their undertaking the design, construction, ownership or initial operation of an enrichment facility in the event they could not complete the enrichment facility or bring it into commercial operation. Assurance of such undertakings would, it was believed, be essential to attract sufficient private investment and orders from enrichment customers.

The proposed amendment would enable the Energy Research and Development Administration to provide such assistance as is determined to be necessary and in the best interests of the Government after detailed negotiation with selected individual proposers of enrichment services. It would be the Government's intention in such negotiations to make the most advantageous agreement for the Government and to place the largest risk on the private proposer consistent with the need to create several viable private enterprises to provide enrichment services. For this purpose there would be negotiated suitable and effective incentives to the private proposer to build and operate an enrichment facility under specific costs and schedules. In this way, there would be established a competitive private domestic enrichment industry essential to support the manifold growth in nuclear

power which is expected to take place over the next several decades. Appropriate Congressional oversight of each arrangement would be provided by requiring that the proposed basis for any arrangement be submitted to the Joint Committee on Atomic Energy and a period of forty-five days elapse prior to execution of any such arrangement.

Inherent in the authorization which would be provided by this legislation is assumption of an obligation to provide enrichment services. However, it would not necessarily be required in every case that the Government complete or operate the facility if other provision can be made to meet the obligation, including, for example, transfers from the Government stockpile or transfer to other enrichment plants capable of meeting contract requirements. Should it be desirable for the Government to modify, complete, operate or dispose of and enrichment facility, a plan therefor would be submitted to the Joint Committee on Atomic Energy for a period of forty-five days prior to implementation. Appropriations would be authorized to carry out the obligations and plans undertaken under the authority of this legislation.

United States enrichment capacity must be increased to meet the growing needs for nuclear power of the United States and the free world. Should we not achieve the transition of responsibility for provision of enrichment services from Government monopoly to private industry, the Government will have to provide the needed increments of additional enrichment capacity costing several billions of dollars.

Although the impact of the enactment of the proposed legislation upon the Federal budget is not at this time susceptible to precise estimate, it is anticipated that private capital can provide the funds necessary

to the establishment of a competive private enrichment industry and it will not be necessary to exercise the obligations to complete and operate individual plants.

In accordance with Executive Order No. 11821, there is also enclosed an inflation impact assessment, which concludes that the effects of the proposed legislation will be to minimize inflationary pressures as the economy and possibly to lead to lower costs than the alternatives of increased use of fossil fuels or expansion of Government enrichment facilities.

In accordance with the National Environmental Policy Act, a draft environmental impact statement on Additional Uranium Enrichment Capacity has been prepared as a part of the planning process leading to thie legislative proposal. This statement will be submitted to the Congress in the near future and also released for public comment under expedited procedures approved by the Council on Environmental Quality. In connection with any particular plant which may be built by private industry under the authority of this legislation, specific environmental impact statements for the plant concerned will be submitted and considered in the licensing process conducted by the Nuclear Regulatory Commission.

The Energy Research and Development Administration urges the Congress to consider and enact this legislation promptly. We are prepared to appear before the appropriate Committee or Committees at their

earliest convenience and to furnish any information relating to this proposal which may be desired.

The Office of Management and Budget has advised that enactment of this legislation would be in accord with the program of the President.

Sincerely,

Robert C. Seamans, Jr.
Administrator

Enclosures as stated

1. Draft Bill

DRAFT BILL

To amend the Atomic Energy Act of 1954, as amended, to authorize cooperative arrangements with private enterprise for the provision of facilities for the production and enrichment of uranium enriched in the isotope 235, and for other purposes.

Be it enacted by the Senate and the House of Representatives of the United States of America in Congress assembled, That Section 161 of the Atomic Energy Act of 1954, as amended, is amended by adding at the end thereof the following subsection:

"x.(1). Without regard to the provisions of Section 3679 of the Revised Statutes, as amended, and Section 169 of this Act, enter into cooperative arrangements with any person or persons for such periods of time as the Administrator of the Energy Research and Development Administration may deem necessary or desirable for the purpose of providing such assistance as the Administrator may deem appropriate and necessary to encourage and facilitate the design, construction, ownership and operation by private enterprise of facilities for the production and enrichment of uranium enriched in the isotope 235 in such amounts as will assure the common defense and security and encourage widespread development and utilization of atomic energy to the maximum extent consistent with the common defense and security and with the health and safety of the public; including specifically, in the discretion of the Administrator,

furnishing technical assistance, information, enriching services materials, and equipment on the basis of recovery of costs;

providing warranties for materials and equipment furnished;

providing facility performance assurances;

purchasing enriching services;

undertaking to acquire the interest of such person or persons in, and to assume the obligations and liabilities (including debt) of, such person or persons arising out of the design, construction, ownership, or operation for a defined period of an enrichment facility in the event such person or persons cannot complete that enrichment facility or bring it into commercial operation; and

determining to modify, complete and operate that enrichment facility as a Government facility or to dispose of the facility at any time, as the interest of the Government may appear, subject to the other provisions of this Act and to the provision of appropriations (which are hereby authorized) to fulfill the obligations undertaken under the authority of this subsection.

(2) Before the Administrator enters into any arrangement or amendment thereto under the authority of this subsection, or before the Administrator acquires the interest of any person or determines to modify, or complete and operate any facility or to dispose thereof, the basis for the proposed arrangement or amendment thereto which the Administrator proposes to execute (including the name of the proposed participating person or persons with whom the arrangement is to be made, a general description of the proposed facility, the estimated amount of cost to be incurred by the participating person or persons, the incentives imposed by the agreement on the person or persons to complete the facility as planned and operate it successfully for a defined period, and the general features of the

proposed arrangement or amendment), or the plan for such acquisition, modification, completion, operation or disposal by the Administrator, as appropriate, shall be submitted to the Joint Committee on Atomic Energy, and a period of forty-five days shall elapse while Congress is in session (in computing such forty-five days, there shall be excluded the days on which either House is not in session because of adjournment for more than three days) unless the Joint Committee by resolution in writing waives the conditions of, or all or any portion of, such forty-five day period: Provided, however, that any such arrangement or amendment thereto, or such plan, shall be entered into in accordance with the basis for the arrangement or plan, as appropriate, submitted as provided herein."

EVALUATION OF INFLATIONARY IMPACT OF LEGISLATION AUTHORIZING COOPERATIVE ARRANGEMENTS WITH PRIVATE ENTERPRISE FOR THE PROVISION OF FACILITIES FOR PRODUCTION AND ENRICHMENT OF URANIUM

In accordance with the provisions of (1) Executive Order 11821 requiring a statement which certifies that the inflationary impact of major proposals for legislation has been evaluated, (2) OMB Circular A-107 which implements Executive Order 11821, and (3) the draft regulations of the ERDA, the undersigned hereby certifies that an evaluation of the inflationary impact of the proposed legislation to authorize cooperative arrangements with private enterprise for the provision of facilities for the production and enrichment of uranium enriched in the isotope 235 has been made.

If the objectives of the legislation are fully realized, we foresee the establishment of a competitive private industry providing enrichment services on reasonable terms. This would facilitate the fullest exercise of the nuclear option and result in a larger domestic energy supply at lower cost to the public. If the legislation does not meet with this measure of success, the alternatives are either to continue our heavy dependence on domestic and imports fossil fuels, or to continue, and expand, the monopoly role of the Government in the provision of enrichment services. Clearly, the need to rely more heavily on fossil fuels, foreign or domestic, will result in a higher total energy

cost for the American consumer. If the Government were to expand its enrichment operations to provide the additional services required, the costs of services might appear lower if no provision is made for the taxes, insurance, risk, and other normal costs of private business operations. Assuming that capital costs of new enrichment plants would be the same in the private or public sector and given the expectations of increasing efficiency in privately-operated competitive facilities, we conclude that the effects of this legislation will be to minimize inflationary pressures on the economy and possibly to lead to substantially lower costs than under any other alternative.

signed original signed by

Date: 6/13/75 Signature: R. W. LeGassie

DRAFT PRESIDENTIAL STATEMENT

To the Congress:

For the past two decades, the Federal Government has supplied all the fuel needed to power nuclear reactors in this country and for many commercial reactors elsewhere in the world. But the demand for nuclear fuel both here and abroad has grown so vast that all our capacity is now fully committed. Yet our needs and those of other nations for reliable electric energy sources will continue to rise sharply. Because it takes many years to bring new power plants and fuel sources into operation, we must plan now to provide the means to be able to meet those needs. In my judgment, it is time to turn to American private enterprise to build and operate, under necessary safeguards, the nuclear fuel supply plants which will be essential in the future. If the Government helps--in the right way--competitive private industry can do the job--and without significant costs to the Federal budget. I call upon the Congress today to give us the necessary authorization to get started.

This nation is now engaged in a major effort to achieve a greater degree of self-sufficiency in the critical field of energy supply. We also are working vigorously with the other oil consuming nations to reduce our alarming and growing dependence on imports of foreign petroleum products. Few areas of effort are of more vital importance to the health and prosperity of the Free World. Together with other nations, we are engaged in major efforts to conserve and better utilize our energy resources, and develop near and long-term alternatives to imported fuels.

Energy self-sufficiency will require us to explore many roads, and we cannot afford to overlook any of them. In the longer term, we must develop and apply new technologies based on virtually inexhaustible resources, such as solar electric energy, the harnessing

of nuclear fusion, and breeder reactors which are safe, environmentally sound, and reliable. We have developmental programs in all these areas, but until we know whether these promising technologies can in fact provide us with the energy we will need--and it will be a long time before we know--we must exploit other technologies to carry us through. Conservation in all forms, solar heating and cooling of buildings, greatly increased use of coal in solid, liquid and gaseous forms, improved methods of extracting more gas and oil from our existing fields--all are going to be necessary.

But it takes time for promising technologies to become widely used in our society. As we work to accelerate technological development, we need also to make sure our existing domestic energy supplies continue to grow to meet the demands placed on them. This means that, among other things, we must assure the continued growth of nuclear power.

If we are to preserve the nuclear option, then we must move aggressively on a number of fronts. We need to accelerate our efforts to find new reserves of uranium that can be economically mined. We need to stabilize reactor technology so we can design and build plants more quickly and economically. We need to improve our utilization of reactor capacity. And we need to manage more effectively the nuclear fuel cycle, from safeguarding the plutonium products of reactor operation to disposing of reactor wastes safely and forever.

The Energy Research and Development Administration has programs in all these areas and is going to intensify them as integral parts of the comprehensive energy R&D plan it will shortly report to the Congress.

We must take the steps now to make nuclear energy available for greater use over the next 25 years. Based on the past 10 years of experience, commercial nuclear power has had an unparalleled record of safe operation. Nuclear power now costs between 25 to 50 percent less than electricity produced from fossil fuels. Nuclear power is not vulnerable to the whims or price decrees of foreign energy

suppliers. While plainly not the only source of energy, it is nevertheless an essential element of the total mix of energy sources necessary to meet the goal of greater self-sufficiency in the near term.

This is a perception that is shared not only by the United States but by many other nations as well. With this in mind, Secretary Kissinger at the Ministerial meeting of the International Energy Agency last month, highlighted the importance of moving urgently and decisively to ensure that nuclear power will indeed contribute to greater reliability of energy sources for major energy consumers and help all nations husband the world's supply of oil.

An essential first step in fostering the continued safe growth of nuclear power is to ensure we have adequate supplies of nuclear fuel. Nuclear reactors run on uranium that has been slightly enriched from the concentrations that occur in nature. And we in the United States have run out of capacity to produce this essential fuel.

For over 20 years the United States Government has been the exclusive supplier, through its three enrichment plants, of the enriched uranium that is necessary to fuel nuclear power stations here and in many foreign countries. This fact is of considerable importance to our foreign friends, and accordingly we have consistently endeavored to be an attractive and reliable supplier. We have felt a responsibility towards enabling other nations to utilize the benefits of nuclear power under secure and prudent conditions. We also have felt that our role as an enriched uranium supplier has been extremely important in inducing other nations to accept international safeguards and to forswear nuclear weapons. Moreover, foreign sales have returned hundreds of millions of dollars to the United States.

Uranium enrichment is an area in which we have been the world leader, and our technology is the most proven and advanced in the

world. Our gaseous diffusion plants have run reliably for more than a quarter of a century and have seen many improvements in their efficiency. We have under way two major improvement and uprating programs costing over $1 billion to increase their capacity over 50 percent. A new process, which separates fissionable from non-fissionable uranium through the use of centrifuges, has been under intensive development for more than a decade and is now also ready to be scaled up, demonstrated, and brought into commercial use.

Although the U.S. is now committed to supply the fuel needs of several hundred nuclear power plants coming on the line by the early 1980's, we have, since August 1974, been unable to accept new orders for enriched uranium because our capacity--even with the projected increases--is fully committed. As a practical matter, plans cannot be made for private financing of new domestic reactors without a reasonably assured source of enriched uranium. Potential foreign customers have the same problem. And, since it takes at least 7-8 years to provide new enrichment plants, it is essential that the United States begin immediately to construct new capacity if we are to preserve our ability to meet our total domestic goals in energy and our ability to meet our foreign responsibilities as a reliable supplier.

For a number of years it has been the stated objective of the Executive Branch that new enriching capacity should be provided by the private sector, since electric utilities are served by these plants and since uranium enrichment is a function that is clearly industrial in nature. Furthermore, if new enrichment plants can be provided by the private rather than public sector, this will reduce the pressures on the Federal budget for new construction monies amounting to billions of dollars.

The development of a competitive, broadly based, private enrichment industry, which is our objective, also will provide an increased measure of assurance to all customers that the growth of nuclear power will not be inhibited by inadequate enriching

capacity. It is one of the strengths of the American free enterprise system that it is able to consider and respond to unusual challenges and opportunities with ingenuity and vigor. This is what is now happening with respect to uranium enrichment.

The technology of uranium enrichment is secret and shall remain subject to continued classification, safeguards and export controls. However, for several years a number of qualified U.S. companies have been granted access to the Government's work under carefully controlled conditions in order to make their own assessment of the commercial potential for private enriching plants. One group has chosen the well-demonstrated gaseous diffusion production process. Several others are interested in the potential of the newer gas centrifuge process which, though it is not yet in large production operation, is believed to possess advantages and to be ready for commercial application.

The centrifuge process, which uses substantially less power than the older process, appears to be well suited to the creation of competitive industry, both because the individual plants can be smaller and more flexibly adopted to market demands, and because there is a continuing need for replacement components which can be made by many manufacturers. While Government work is going on to develop other enrichment processes which may have some future applications, they are a long way from practical realization, and diffusion and the centrifuge now provide the only solid technological bases for meeting our near-term commitments.

Because centrifuge technology cannot be implemented quickly enough to close the immediate gap in enrichment capacity, our next plant must be of the gaseous diffusion type. One industry group, Uranium Enrichment Associates (UEA), has presented a proposal to construct a $3 billion, privately financed gaseous diffusion enrichment plant, capable of serving about 90 large nuclear power reactors both here and abroad, when it becomes operational in the early 1980's. This project, if successful, would meet the need for

early new capacity. We also have highly promising expressions of interest by several other companies in the construction of privately financed commercial centrifuge enrichment plants. We are confident that there will be more than adequate market demand for the output from these plants including Government purchases as necessary for stockpile purposes.

I believe we must move now on both fronts to encourage private entry into the enrichment business. We should build a private gaseous diffusion plant to provide the urgently needed first increment of capacity, and we should simultaneously embark on building a centrifuge industry with several suppliers. Only in this way can we open the U.S. order book promptly, reassert our position as the world's major supplier of enriched uranium, and develop a competitive private enrichment industry.

Nevertheless, there are some difficult hurdles to be overcome that will require a unique kind of cooperative arrangement between Government and industry during a transitional period. This is required because of the very large capital requirements and long payouts for plants of such large size and complexity. It also is needed because the technology is and must remain secret, and because the process "know-how" presently rests within the Government. Moreover, the Government has a vital interest in assuring that these projects do, in fact, perform as expected and are able to meet their commitments to domestic and foreign customers on a timely basis.

Accordingly, at my direction, the Energy Research and Development Administration will, within the next few days, submit to the Congress proposed new legislation that will permit the necessary degree of Government support to private enriching projects. On the basis of the proposed legislation, the Energy Research and Development Administration will enter into immediate detailed negotiations with Uranium Enrichment Associates, and with prospective centrifuge enrichers after more definitive proposals are received in response

to a Request for Proposals issued today. It is my desire that several centrifuge projects proceed in parallel as rapidly as selection of companies can be made and details negotiated.

Although enactment of the legislation is necessary now as a clear signal of our national intent, details of the finally negotiated packages would be subject to Congressional scrutiny in the next session of Congress. I anticipate minimal budgetary impact during FY 1976 and, although future years cannot yet be predicted with absolute assurance, it appears likely that our involvement can be achieved without significant future demands for federal funds.

Under our proposed arrangements significant opportunities for foreign investments in U.S. private plants will be welcomed, although the plants will remain firmly under U.S. control, and there will be limitations on the amount of capacity each plant can commit to foreign customers. Also, all exports of the plant products will, as in the past, have to take place pursuant to Agreements for Cooperation with other Nations and will be subjected to appropriate safeguards to preclude use for other than agreed peaceful purposes. Foreign investors and customers would not have access to secret technology. In addition, the fuel produced would be suitable only for commercial power reactors, and no weapons grade material could be produced without substantial modification to the plant, which would be readily apparent to any monitor.

We believe the factors I have mentioned underscore the urgency of prompt action in this area. They also highlight the need for a Government contingency backup to the private plants that are contemplated. There is only a minimal possibility that the proposed private plants, starting with the initial gaseous diffusion plant, will not come on stream. After all, we have more than 25 years' experience with the U.S. diffusion process, and it is the most proven enrichment process in the world. We also feel confident that U.S. centrifuge technology will prove to be commercially

reliable and economic. And we believe that when submitted for necessary review, the potential suppliers will meet all licensing, anti-trust, and environmental requirements.

However, in the remote event that the proposed private plants cannot be properly initiated or completed, our legislative package would enable the Government to stand fully behind the private fuel assurances that will be given to domestic and foreign customers.

I am confident that the U.S. private sector is equal to the challenge I am laying before it today. But lest there be any doubt that potential purchasers of enriched uranium can begin to deal today with U.S. industry for assured sources of supply, I offer these additional assurances.

First, I have instructed ERDA to continue design of a Government enrichment plant, in the remote event that industry falters. This Government backup will ensure the U.S. has new plant capacity by the 1980's.

Second, as part of its design work, ERDA will purchase from UEA services for the design of components common to both the private and Government plants. This action will help ensure that work on the private plant can begin promptly.

Third, I pledge to anyone that places orders with our private suppliers that the USG will--in the unlikely event that the private venture fails--assure that these orders will be filled. Those who are first in line with our private sources will be first in line to receive supplies under this assurance.

Finally, I will shortly propose to the Congress that prices for Government-supplied enriched uranium be set to recover our full costs on an unsubsidized basis. This step will, I believe, underscore the essentially commercial nature of producing enriched uranium.

The program I have proposed takes maximum advantage of the strength and resourcefulness of industry and Government in the United States and the world leadership we now enjoy in a new and

increasingly significant technology. It builds upon that base in a way which promises to maintain that leadership in the face of vigorous competition brom abroad. I ask the Congress for early authorization of the program to meet our urgent needs and to demonstrate to the world our determination to pursue energy self-sufficiency. This action is urgent if we are to maintain our position of world leadership in enriching technology, if we are to remain a responsible and reliable supplier of enriching services, and if we are to closely collaborate with the other major oil consumers as well as with all nations seeking to develop alternative energy sources.

uranium
enrichment

FACT SHEET

DRAFT
6/19/75

FACT SHEET

URANIUM ENRICHMENT

6/19/75
DRAFT

FACT SHEET

URANIUM ENRICHMENT

The President today announced administrative actions and a legislative proposal to (a) increase the United States' capacity to produce enriched uranium to fuel domestic and foreign nuclear power plants, (b) retain U.S. leadership as a world supplier of uranium enrichment services and technology for the peaceful use of nuclear power, and (c) assure the creation, under appropriate controls of a private, competitive uranium enrichment industry in the U.S. -- ending the current Government monopoly.

BACKGROUND

- Natural uranium from U.S. and foreign mines must be refined or "enriched" before it can be used to make fuel for nuclear power plants which are used in the United States and in many foreign nations to generate electricity.

- U.S. capacity for enriching uranium, which now supplies all domestic and most free world needs, consists of three Government-owned plants, located at Oak Ridge, Tennessee; Paducah, Kentucky; and Portsmouth, Ohio.

- Since June 1974, the entire capacity of the three plants has been fully committed under long-term contracts. New enrichment capacity must be "on-line" beginning in about 1983 to meet the growing domestic and foreign demand for nuclear fuel.

- The potential U.S. market abroad has begun to erode as some potential foreign customers have started looking to sources such as the U.S.S.R., France and a West European consortium for uranium enrichment.

- Since 1971, the Executive Branch has followed policies and programs directed toward assuring that private industry -- rather than the Federal Government -- builds the next increments of U.S. uranium enrichment capacity.

- Several industrial firms have sought to enter the uranium enrichment field but all have found that some type of Government assistance is needed to overcome the initial obstacles to private industry involvement.

PLAN ANNOUNCED BY THE PRESIDENT

Objectives. The plan announced by the President is designed to meet the objectives of assuring that:

- The next increments of U.S. uranium enrichment capacity will be available when needed to meet the growing demand for fuel for nuclear powered generating plants in the U.S. and in other nations.

- The U.S. maintains its role as the principal world supplier of uranium enrichment services and nuclear power plants --

  - Our economy and our world trade position.
  - Our ability to return to the position of a major world supplier of energy for the future.
  - Our efforts to obtain the commitment of additional nations to principles of nuclear non-proliferation.
  - Our cooperation with other major oil consuming nations which are looking to nuclear power to help reduce their dependence on foreign oil imports.

- All future increments of capacity will be built, financed and operated by private industry -- rather than by the Federal Government -- so that a competitive industry will exist at the earliest possible date and with little or no cost to taxpayers.

- All necessary domestic and international controls over nuclear materials and classified technology will be maintained, as they would be if the Government were to own the new plants.

Principal Elements of the Plan.

- Legislative Authority for Cooperative Arrangements with Private Firms. The President is asking the Congress to enact promptly the additional legislative authority needed to enable the Energy Research and Development Administration (ERDA) to enter into cooperative arrangements with private industrial organizations that wish to build, own and operate uranium enrichment plants.

  - These arrangements would provide for certain types of assistance found to be necessary after detailed negotiations with firms submitting proposals.
  - Negotiations would be directed toward the agreements most advantageous to the Government and the public interest and with the largest risk to the private firm that is consistent with the objective of creating a private, competitive uranium enrichment industry.

. Arrangements could include:

- Assuming of assets and liabilities of a private uranium enrichment project if the venture threatened to fail -- at the call of the private venture or the Government, and with compensation to the private venture ranging from full reimbursement to total loss of its equity interest, depending upon the circumstances leading to the threat of failure.
- Assuming the delivery of uranium enrichment services to customers placing orders with private enrichment firms that enter into the proposed contracts with the Government.
- Supplying Government-owned technology and warrant that technology -- for which the Government will receive royalty payments.
- Selling certain materials and supplies which, because of their classified nature, are available only from the Federal Government.
- Buying enriching services from or providing enriching services to private producers from the Government stockpile to accommodate an earlier or later than planned plant start-up date.

The arrangements would be spelled out in a detailed contract which would be subject to Congressional review.

The arrangements would end after one full year of commercial operation.

The Government would monitor progress carefully to be sure that the project continued on time and within cost estimates so that the Government could exercise its right to take over the project if necessary without any significant loss of time in getting the plant on line.

Assurances for Customers. The President announced his pledge to domestic and foreign customers who place orders with private U.S. suppliers that the Government will assure that the orders will be filled as services are needed.

. Arrangements contemplated with private industry would assure that additional capacity will be on line when needed, with the Government taking over projects and completing them, if necessary.

. Orders placed with private firms will be filled in the order in which they are placed, with the Government providing the enrichment services in the unexpected event that a private venture failed.

Controls and Safeguards. The President announced that all necessary controls and safeguards will be maintained in all arrangements with private firms. Such controls and safeguards include:

- Preventing the Diversion of Nuclear Materials. The domestic and international safeguard requirements will be observed including:

  - Restrictions on foreign access to classified technology.
  - Export controls to assure that uranium enrichment services are provided only to customers in foreign nations that have signed the Non-Proliferation Treaty.
  - Plant physical security measures.

- Foreign Investment. Foreign investment in private uranium enrichment ventures will be encouraged but control and domination of the venture must remain with U.S. interests.

- Environmental Impact, Safety and Anti-Trust. Private ventures wishing to build plants will have to obtain from the Nuclear Regulatory Commission (NRC) a construction permit and an operating license. As a part of its review, the NRC must evaluate environmental, safety and anti-trust considerations as well as assure the safeguarding of nuclear materials and that control of firms remain in the U.S. -- as now required by the Atomic Energy Act. The Justice Department participates in the review of anti-trust considerations.

IMPLEMENTING ACTIONS

The President announced several administrative actions that are being taken now:

- Negotiations for a Diffusion Plant. ERDA is responding formally to a proposal from the Uranium Enrichment Associates (UEA) offering to enter into negotiations which could lead to the construction by UEA of a $3.5 billion plant which would make use of gaseous diffusion technology and which would be on line by 1983.

- Request for Proposal for Centrifuge Plants. ERDA is issuing a new request for proposals from industrial firms interested in constructing enrichment facilities making use of centrifuge technology.

. Environmental Impact Statement. ERDA will on June 30 issue for public review and comment a draft environmental impact statement covering its actions concerned with the expansion of uranium enrichment capacity.

. Contingency Planning. ERDA will continue with backup contingency measures to help assure capacity will be ready in the unlikely event that industrial efforts falter. These measures include continuation of Government plant conceptual design activities, research and development on enrichment technologies, and technological assistance to the private sector on a cost recovery basis.

. Diffusion Plant Design Work. ERDA will seek an initial agreement to purchase from UEA design work on components for the private diffusion plant that could be used in a Government plant -- if the private venture were unable to proceed.

SPECIFICS OF THE LEGISLATIVE PROPOSAL

The Congressional actions necessary to allow the private industry plan to proceed would involve several steps:

Authorizing Legislation. The legislation proposed today by the President includes:

. Basic Enabling Authority which:

- Would allow for ERDA to enter into cooperative arrangements outlined earlier with firms that wish to build, own and operate uranium enrichment facilities -- subject to the availability of appropriation authorization.
- Provide authorization for appropriation for amounts up to $4.2 billion -- which is an estimate of the total funding expenses in the unexpected event that all expected diffusion and centrifuge ventures failed and it were necessary for the Government to assume assets and liabilities of these ventures and takeover those plants. The Administration's expectation is that none of these funds would have to be expended, but the authorization is necessary under the recently enacted Budget Reform Act and to provide assurance to customers and to potential producers of the Federal Government's commitment.

. Contract Authority-Appropriations Request. This portion of the bill, which would be handled by Appropriations Committees, would provide the contract authority for

appropriations in an amount up to $1.2 billion which is the maximum Federal Government exposure in the event that it were necessary to assume assets and liabilities for the proposed $3.5 billion diffusion plant. Again, expenditure of these funds is not considered likely.

Review of the Contracts. Once contracts were negotiated pursuant to the legislation outlined above, the Joint Committee on Atomic Energy would be notified and a period of 45 days would have to elapse before the contract would be valid -- to allow an opportunity for Congressional review of the results of ERDA's negotiations with private firms.

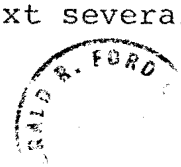
DEVELOPMENTS LEADING TO THE PRESIDENT'S PLAN

U.S. Leadership in Uranium Enrichment Technology. The United States is the recognized leader in technology for refining or "enriching" natural uranium to a form that can be used to make fuel for nuclear power reactors was developed and is owned by the Federal Government. Natural uranium contains only a small amount (approximately .7%) of the fissionable isotope U-235. In order to be useful to make fuel for nuclear reactors, the concentration of U-235 must be increased to about 3-4% through a process of separating off other isotopes. The technology was developed and is owned by the Federal Government. Certain details of the technology are classified. Principal U.S. technologies are:

- Gaseous Diffusion. This technology which is now used in the three existing government-owned enrichment plants was developed in the 1940's. Over 30 years of large scale operating experience and process improvements has made the technology the most reliable and economical now available for commercial scale operations. There is general agreement that the next increment of capacity should make use of this technology.

- Gas centrifuge. The gas centrifuge process of uranium enrichment provides an alternative to gaseous diffusion. If the projected economics of the process are realized, gas centrifuge may be a preferable process for the future. Full operation of a Government pilot plant is scheduled for early 1976. This technology probably will be used as subsequent increments of commercial capacity are added.

- Laser Separation. ERDA is conducting a basic research program to determine whether this technology is technically or commercially feasible. It is too early to make judgments, and in any event, the technology would not be available in time to be used for the next several increments of needed enrichment capacity.



Existing U.S. Capacity. The three Government-owned uranium enrichment plants will, when currently authorized expansion is completed, have the capacity to produce enriched uranium needed to fuel about 320 large nuclear-powered electric generating plants in the U.S. and foreign countries.

The Growing Market. Current estimates are that the U.S. will require added enrichment capacity equal to 3 to 5 plants the size of any one of the three existing plants and that added capacity for total free world demands will equal 5 to 7 existing plants.

Potential Foreign Suppliers. The principal existing capacity for enriching uranium outside the U.S. is in the Soviet Union. A French diffusion plant (Eurodif) is expected to begin production in 1979 and its capacity is reported to be fully committed. A British-German-Dutch consortium (Urenco) plant will also begin operation in 1979. Additional plants are being discussed by France, Canada, South Africa and Australia.

The Program to Develop a Competitive Industry. The Atomic Energy Act of 1946 provides that "the development, use and control of atomic energy would be directed to ... strengthen free competition in private enterprise". An Executive Branch policy and program to encourage private industry to build the next increments of uranium enrichment capacity was announced in June 1971. Beginning in 1973, the Atomic Energy Commission (AEC) asked private firms to consider building, owning and operating enrichment plants and granted qualified U.S. firms access to classified aspects of the Government's work, under carefully controlled security conditions, in order that they might make their own assessment of the commercial potential for private enriching plants. A number of firms responded to the invitation from which several consortia have emerged which are interested in pursuing the possibility of building enrichment plants.

- Diffusion Plant. One consortium -- the Uranium Enrichment Associates (UEA) -- is interested in constructing a $3 billion gaseous diffusion plant equivalent to the expanded capacity of one of the 3 existing Government-owned plants.

- Centrifuge Plant. Other firms and consortia -- Centar, Exxon Nuclear and Garrett Corporation -- have expressed interest in cooperative arrangements with the Federal

Government which would lead to demonstration gas centrifuge plants which could be expanded in the future to commercial scale plants. The AEC (predecessor to ERDA) requested proposals from industry to advance the demonstration of centrifuge technology. A modified request for proposals is being issued today.

Obstacles to Privatization. All firms interested in building, owning and operating a private plant have concluded that some form of Government assistance is essential to begin the transition to a private competitive industry. Among the factors that have contributed to this conclusion are:

- The complexity of the undertaking, including the Federal ownership and the classification of the technology.
- The large financial commitment required.
- The inherent difficulties of ending a Government monopoly.
- The recent financial situation of U.S. electrical utilities which are the customers for a plant. (Their long term contracts for uranium enrichment services must provide part of the security for the long term financing required.)
- Some uncertainty as to the Government's commitment to achieve privatization.

Alternatives to Privatization. The principal alternatives to an immediate effort to acheive privatization include:

- All future additions to capacity financed, built and owned by the Federal Government, thus continuing indefinitely the existing monopoly.
- Government financing and ownership of one or more additional increments of capacity, followed by another attempt to achieve privatization.

A thorough review indicated that many of the concerns that had been expressed about one alternative or another applied to and can be dealt with almost equally for all alternatives. These include:

- The ability to have the next increment of capacity on line when needed (now estimated about 1983).
- Controls and safeguards involving classified technology and non-proliferation of nuclear materials.

- Customers for the next increment, which are expected to be primarily foreign.

- The ability to accommodate foreign investments in an enrichment plant.

This review led to the conclusion that the task of explaining and implementing the plan for achieving a private industry would be difficult and that a substantial effort would be required by both the Congress and the Executive Branch, but that the benefits of privatization justified the effort. The benefits of privatization include:

- Little or no cost to taxpayers - compared to Federal funding of $10 to $15 billion for the next 3 to 5 plants -- which funds would not be recovered to the Treasury for many years. Under the President's plan, revenue of about $90 to $100 million per plant per year would flow to the Federal Treasury from industry, principally from royalty payments and taxes.

- An early end to the Government monopoly in a type of commercial activity that is typically performed by private industry.

- The growth associated with this industry will be in the private sector rather than the Federal Government.

The Proposal from Uranium Enrichment Associations (UEA). Uranium Enrichment Associates is a consortium currently consisting of Bechtel Corporation and the Goodyear Tire and Rubber Company. On May 30, 1975, UEA submitted a proposal to ERDA calling for cooperative arrangements with the Federal Government. The principal features of the UEA proposal are summarized in Attachment #1. Details of a cooperative agreement would be negotiated between UEA and ERDA prior to signing a contract.

Centrifuge Enriching Projects -- Request for Proposals.

- In August of 1974 the Government announced a program expected to lead to several relatively small industry constructed demonstration projects.

- Gas centrifuge technology has not yet been applied on a production scale sufficient to permit full industry commitment to large plants. At least three companies are interested in undertaking private centrifuge enriching projects now which would be scaled up progressively from small demonstration modules to projects of 2-3 million units per year capacity at which point the economies of scale for centrifuge enriching are expected to be largely realized.

- A government-industry cooperative arrangement similar to that required for the UEA diffusion project may be required.

- A Request for Proposals for this program which extends and elaborates upon the earlier program was issued today:

  - Proposals will be due on September 2 and it is the Government expectation that several proposals could be accepted to proceed more or less in parallel with each other and with the UEA project.
  - Proposers will describe their proposed project in detail, including plant design, size, location and schedules and specify the type and magnitude of Government support necessary to proceed.
  - Small initial modules, perhaps 200-300 thousand units per year could be in operation in the early 1980's with 2-3 million unit commercial scale plants achieved in the mid-1980's on a time frame consistent with the growth of the market.

- Centrifuge technology permits adding small capacity increments as required to closely follow market needs.

- The simultaneous development of several centrifuge enriching projects in the same time frame as installation of gaseous diffusion capacity helps assure development of a private, competitive enriching industry and of the maintenance of U.S. world leadership in this field.

OTHER ACTIONS RELATED TO URANIUM ENRICHMENT CAPACITY

Increasing ERDA's Charge for Uranium Enrichment Services.

- The President announced in his 1976 Budget his intention to submit legislation to the Congress to raise the price of enrichment services from ERDA-owned plants. The new price would be established to not only recover the Government's costs, but to place the pricing of Government enriching services on a more business-like basis and thus to encourage private sector interest in building enrichment facilities. This new price would be calculated using a rate of return on investment more appropriate of the private sector than the Government's rate of return and would account for the loss of corporate income taxes.

- This legislation was submitted to the Congress by ERDA on _____.

. The current price charged by ERDA for uranium enrichment is based on a statutory formula which says that ERDA's charge must be established on the basis of the recovery of the Government's costs over a reasonable period of time. Application of the formula has resulted in a present charge of between $42 and $48 per separative work unit (SWU) depending on the type of contract a customer has with ERDA. This price will rise by the end of 1975 to $53 and $60 per unit. These prices reflect the low cost during the 1940's and 1950's primarily for military purposes. These prices are much lower than the quoted world market prices of enrichment services of between $75 to $100 per unit.

Contract Relief for Current ERDA Enrichment Customers

. Present ERDA enrichment contracts require customers to commit to a fixed delivery schedule and to make pre-payments amounting to $3 million several years prior to the first delivery of enriched fuel. Since these contracts were signed, many nuclear power plants whose fuel was covered by these contracts have been slipped or cancelled.

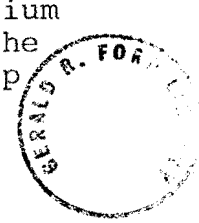
. As a result of this slippage, utilities now face the prospect of having to pay for uranium enrichment services well in advance of the revised completion dates for the reactors.

. In order to free both ERDA and the enrichment customers from unrealistic commitments, ERDA, with the concurrence of the Joint Committee on Atomic Energy (JCAE), intends to announce that it will:

  - Grant customers the right within a 60-day period to serve notice that they wish to terminate their contract in whole with no cancellation fee and with refund of any payments.
  - Permit for those not wishing to terminate in whole a one-time adjustment of contract commitments, without cost of charges for partial termination.
  - Permit a similar one-time adjustment of the rate at which uranium feed should be sent to the enriching plants to coincide in part with the slipped enrichment requirements.

. These actions would:

  - Achieve a larger U.S. stockpile of enriched uranium to be used as an inventory which would support the new private uranium enrichment plants with backup



enriched material, should any delays occur in their operation.

- Establish a more realistic data base for evaluating future domestic and foreign enrichment requirements.
- Grant short-term financial relief to the utility industry.

SUMMARY OF THE URANIUM ENRICHMENT ASSOCIATES (UEA) PLAN AND PROPOSAL TO ERDA FOR A COOPERATIVE ARRANGEMENT

Physical Description of the Project.

- A 9 million separative work unit per year gaseous diffusion plant would be built near Dothan, Alabama on a 1720 acre site on the Chattahoochee River.
- When in full operation the plant could provide enriching services for about 90 large nuclear power reactors.
- The plant will require about 2500 megawatts of electrical power which will be supplied from a dedicated nuclear power facility located nearby.
- Project cost estimate (exclusive of the power project) has been estimated by UEA to be $3.5 billion in 1976 dollars.
- UEA projects continuation of design work now underway on the project during the next several years with construction scheduled to commence in 1977.
- Full production from the plant is projected in 1983 with limited porduction starting in 1981.
- Nearly 50 million construction manhours are estimated for the project. A peak construction labor force of about 7000 workers will be reached in 1979-80 and the permanent operating staff of the project is expected to be about 1100.
- The plant will be processing and upgrading natural uranium and thus will have essentially no radiation hazard. It will be similar to a large chemical and materials handling plant except that the product material will be much more valuable.

Financial Structure of UEA Project.

- UEA expects that two to six companies in addition to Bechtel and Goodyear will comprise the consortium that will undertake the project. These companies are expected to be identified within the next few months.

- Based upon marketing efforts to date, UEA projects about 40 percent of plant capacity will be taken by U.S. domestic utilities and the balance by non-U.S. organizations in countries with which the United States has Agreements for Cooperation permitting the transfer or disposition of enriched uranium. (Under the Atomic Energy Act voting control for such a project must remain in the hands of the United States investors at all times and the project is so structured. The secrecy of the process will be protected and foreign customers or investors will not have access to classified technology or information.)

- Project financing using an 85 percent debt, 15 percent equity ration is contemplated for the project.

- The equity corresponding to the domestic portion of plant output will be supplied by UEA and the debt financing will be raised in the commercial market primarily on the basis of the security of long-term (25 year) non-cancelable enrichment service contracts with domestic utilties.

- Both equity and debt for the foreign share of plant output must be supplied from the foreign customers' own sources of capital.

- Pricing of product from the plant is based upon the recovery of all operating costs, servicing of debt and an after-tax return of approximately 15 percent on equity.

- A 3 percent royalty on gross sales would accrue to the Government for use of taxpayer-developed technology.

Customers.

- A number of United States' utilities have executed contingent letters of intent with UEA to purchase uranium enriching services from the new plant and a number of additional utilities are now evaluating their requirement for services.

- UEA has made extensive marketing contacts overseas and anticipates that foreign commitments will be forthcoming from Iran, Japan, West Germany, France, Spain, Taiwan and other countries.

Cooperative Arrangements.

. Due to the unique nature of the project, the very large capital requirements, and long payout periods, UEA has concluded that it would not be possible to move ahead without certain forms of Government backup assistance.

. UEA has proposed that the Government:

- Supply, at cost, essential components presently produced exclusively by the Government.
- Supply the Government's gaseous diffusion technology and warrant its satisfactory operation.
- Provide during first years of operation limited access to and from USG's stockpile of enriched material to balance significant start-up loading problems.

. UEA has also proposed that:

- The Government provide standby financial backup assistance lasting for the critical construction period plus one year to offset the current weak credit position of the U.S. utility industry and the Government to provide such financial backup if UEA cannot complete the plant or bring it into commercial operation, but such a call is at the risk of loss to UEA of its equity interest. In this event, the Government has the right to acquire UEA's domestic equity position and the obligation to assume UEA's liabilities and debt.
- The Government may also require UEA to release the project to the Government if the Government's interest so demands. In this event, the Government would be obligated to assume UEA's liabilities and debt.
- The consideration for acquisition of UEA's domestic equity position in either case can range from loss of equity for uncorrected gross mismanagement of UEA to full fair compensation for causative events outside UEA's reasonable control.

. All of the above forms of backup assistance would be subject to detailed contract negotiations and would require extensive Government rights and responsibilities with respect to the character of the project design and construction. Though certain contingent forms of Government financial support to the project could be required, UEA believes that this is unlikely and that the project can be completed within the private sector. Under these conditions there would be no net expenditure of Government funds.

Uranium Enrichment as Part of the Nuclear Fuel Cycle

The attached chart depicts the nuclear fuel cycle for Light Water Reactors, (the type of reactors mostly commonly used in the U.S.). About 97% of the reactors obtaining enrichment services from the ERDA gasious diffusion plants are Light Water Reactors; a similar fuel cycle exists for the other present reactor type -- the High Temperature Gas Cooled Reactor.

Prior to the enrichment step, uranium is mined from the earth's crust and sent to a mill where uranium concentrate is produced. This concentrate is often referred to as yellowcake, or by its chemical symbol, U_3O_8. There are 14 mills presently operating in the U.S. The uranium concentrate is then sent to a converter where it is converted to uranium hexafluoride, or UF_6. This is the only simple form of uranium that can be gaseous at conditions near room temperatures and pressures. There are two UF_6 conversion plants operating in the U.S.

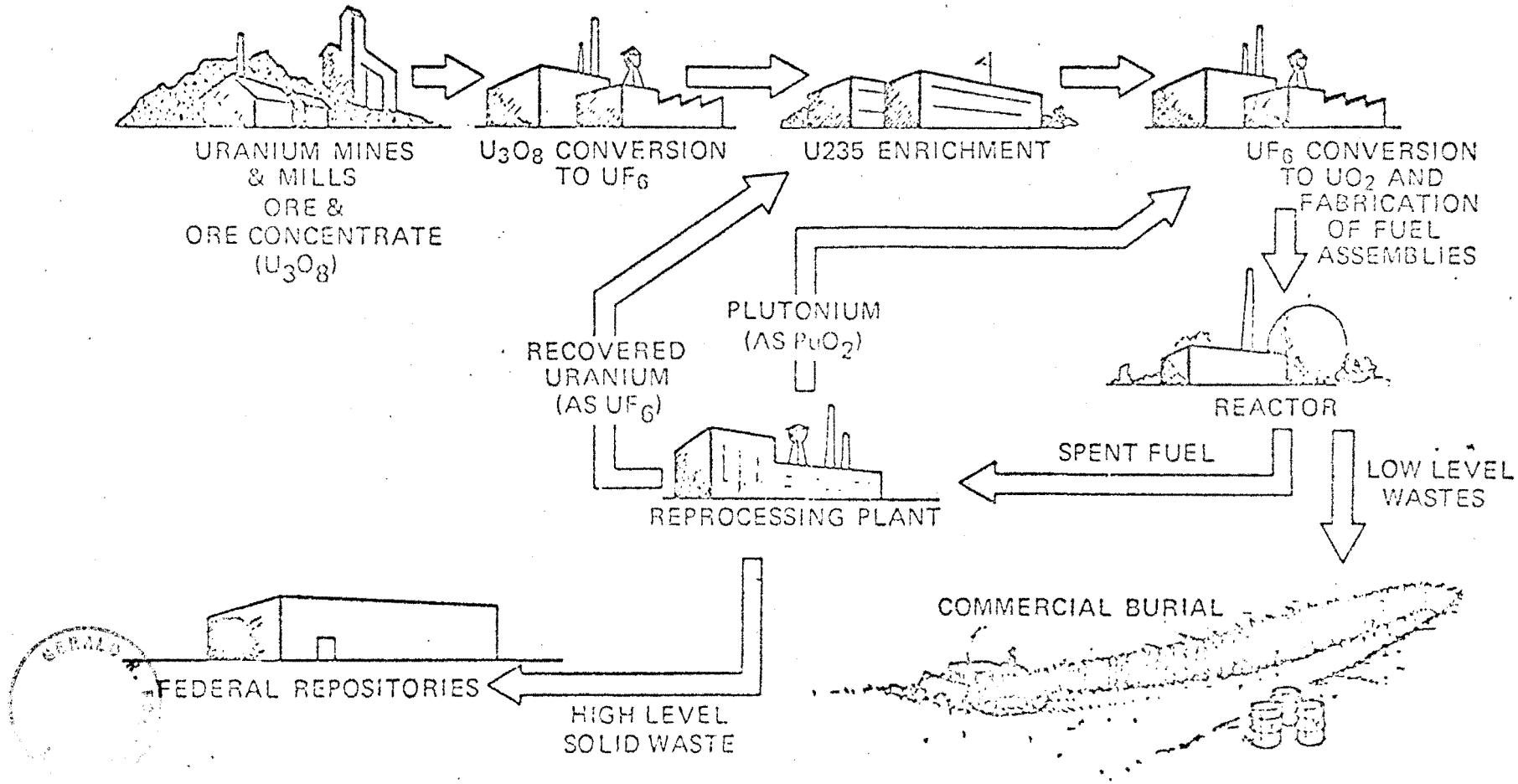
The uranium hexafluoride is then sent to an uranium enrichment plant. There are two processes under consideration for commercial use in the U.S. -- the established gaseous diffusion process, used in the ERDA plants, and the newer gas centrifuge process. The UEA will use the gaseous diffusion process. In the process, the uranium hexafluoride gas is pumped through a semipermeable membrane. The desirable fissionable isotope, U-235, diffuses through the membrane more readily than the nonfissionable isotope, U-238. A stream depleted in U-235 is collected from the plant and sent to storage. A stream enriched in U-235 is collected from the plant and sent to a fuel fabrication plant. In this plant, the uranium is converted to pellets of uranium dioxide, UO_2, and placed in zirconium tubes. The tubes are assembled into bundles and sent to nuclear power plants. Seven U.S. companies are involved in the fabrication of nuclear fuel.

After the fuel is used in the nuclear power plant, it is discharged and allowed to cool in a large water basin at the plant. The spent fuel will then be sent to a chemical reprocessing plant. In this step, the uranium and reactor-produced plutonium will be separated from the highly radioactive products generated while the fuel is in the

nuclear power plant. The radioactive wastes in proper form will be sent to a repository. The recovered uranium will be converted again to the hexafluoride and reinserted into the enrichment plants for reenrichment. Plutonium is also a fissionable material that can be used as fuel in a nuclear power plant. If use of the plutonium is granted by the Nuclear Regulatory Commission, it would be sent to the fuel fabrication plants; there it would be mixed with the uranium and formed into pellets for nuclear power plant fuel. There are currently no commercial chemical reprocessing plants operating in the U.S; one plant is shut down for modification and another is under construction.

Nuclear power plants require nearly a fixed amount of fissionable material in order to operate. If the capacity of an uranium enrichment plant is completely utilized under a set of operating conditions, and more power plants and thus more fuel is needed, more uranium could be mined, milled, converted, and pumped through the enrichment plant. However, if the necessary uranium could not be found in the earth's crust, additional uranium enrichment capacity would need to be built. Similarly, if nuclear power plants had planned on using plutonium to satisfy part of their fuel needs and it was not possible to use the plutonium, additional enriched uranium fuel would have to be obtained. This fuel could be obtained by mining, milling, converting, and pumping more uranium through an enrichment plant. Or, as above, if the necessary uranium could not be found, additional uranium capacity could be built.

THE NUCLEAR FUEL CYCLE
FOR LIGHT WATER REACTORS



Q & A's

URANIUM ENRICHMENT

QUESTIONS AND ANSWERS

1. Why Privatization?
2. Why Privatization Now?
3. Why Government Assistance?
4. Cut Off Date?
5. Did the President Overrule Kissinger and Seamans?
6. Unanswered Safety and Environmental Questions
7. NRC Safeguards and Safety Controls
8. Foreign Investment Without Foreign Control
9. Foreign Customer Conditional Contracts with ERDA
10. U.S. Share of the Free World Market
11. Payments by Industry for Government-owned Technology
12. What Happens if a Private Plant Isn't Licensed?
13. What Happens if a Private Plant Doesn't Work?
14. Does UEA have Customers?

WHY PRIVATIZATION?

Question:

ERDA (and AEC before it) is doing a good job of supplying uranium enrichment services. Why not simply continue the present arrangements and build new Government facilities rather than set up a complicated new arrangement?

Answer:

First, the provision of uranium enrichment services is now essentially a commercial/industrial activity, not inherently a Government type of activity. There are many activities which only the Government can properly perform, but uranium enrichment is not one of them. We should not continue to expand these Governmental responsibilities within our economic system when private industry is able and willing, under appropriate Government licensing, to provide the service. Indeed, the Atomic Energy Act, which is also applicalbe to ERDA, declares in its statement of policy in Section 1 that

> "The development, use and control of atomic energy shall be directed to ...strengthen free competition in private enterprise."

Second, involving major U.S. firms and based on competition, should display the initiatives which will best meet national goals in terms of assuring innovation, continued growth of the industry to meet domestic needs, and maintaining a dominant position for the U.S. in international supply. Also, the private venture will generate substantial revenues to the Treasury through payment of Federal income taxes and royalties for Government-owned technology.

Third, within the next 15-20 years, the U.S. must quadruple its present enrichment capacity. The new capacity could cost well over $30 billion in capital costs alone. This is without any allowance for inflation (which could raise the cost to $45-60 billion by the end of the period). Even though these costs would be recovered over a period of 30 years, this is an avoidable financial burden which the Government should not be expected to bear when private industry is willing to assume the responsibility.

WHY PRIVATIZATION NOW?

Question:

Private involvement seems like a good idea in the longer term, but why not build another Government plant now and bring private industry in for subsequent increments of capacity when the new gas centrifuge technology is ready for use?

Answer:

There are several reasons for moving to private entry immediately:

First, private enterprise has already demonstrated its capability to do the job in that the present Government plants were build and are operated by private companies under contract to the Government.

Second, a substantial preparatory effort, funded by private industry, to undertake the job of constructing the next increments of U.S. capacity has been underway for the last several years.

> --The UEA venture, based on the diffusion technology, is the first of these to reach the stage of industrial commitment to construction and contracting. UEA has lined up numerous potential customers, both foreign and domestic, and it has made detailed plans to proceed, including options on land and electric power.
>
> --Additional private efforts based on the newer centrifuge technology are being put together by other private companies in concert with interested U.S. utility companies. Substantial momentum has been generated and it is time to get started in order to realize the benefits of this industrial initiative.

Third, the above private activities and financial investments were the result of an invitation to industry at large issued by the Executive Branch, beginning in 1971 and reemphasized in 1973. If the Government does not move now to support the first outcome of this present round of activity, it is likely that future private ventures called for by the Government in the energy field

will be substantially discouraged. The UEA venture will not only fulfill immediate needs but will also serve to "break trail" for subsequent ventures using a less proven technology.

Fourth, support by the Government of subsequent private increments of centrifuge capacity is an essential and integral part of the Administration's plan. When responses to the current Request for Proposals are received on the centrifuge approach in _____ it is expected that a number of such projects would also be selected to proceed, essentially in parallel to UEA. Approval of the UEA approach will, however, provide firm assurance now of future U.S. capacity involving the minimum degree of technological risk and allowing firm contracting with domestic and foreign customers to proceed promptly.

WHY GOVERNMENT ASSISTANCE?

Question:

Why should it be necessary for the Government to provide any assistance to get private industry to get involved in uranium enrichment? Why not just "unleash" industry and let them move ahead?

Answer:

Despite many years of successful operation of Government-owned plants, uranium enrichment has no commercial private-sector history. Many process details must remain classified. Under these present conditions, commercial lenders are unwilling to consider risking the large amounts required for this capital-intensive activity, without credible assurances that the plant will perform.

First, the technology is owned by the Government and a substantial royalty will be paid for its use by the private sector. It is reasonable that the Government should warrant that the technology will work and be prepared to back this warranty up with assistance in the unlikely event that problems are encountered.

Second, the Government would actually supply, on a cost recovery basis for the UEA venture (and may be asked to supply for the expected centrifuge ventures) key pieces of classified equipment upon which the plant performance depends.

Third, foreign governments and domestic and foreign appropriate Government measures are needed to assure electric utility customers that their orders for nuclear fuels will be filled. This in turn is essential to meeting the growing domestic demand for electricity, a substantial part of which must be met from nuclear power if we are to reduce our dependence on foreign oil, and to assuring that the U.S. maintains its leadership role in the supply of enrichments services abroad in the rapidly growing international market.

Fourth, the only present source of back up supplies of enriched uranium large enough to back-stop the initial period of operation of new plants is the existing Government stockpile of this material, produced in the existing Government plants, and in part accumulated to serve exactly this type of contingency support purpose.

CUT OFF-DATE?

Question:

Is there a specified "cut-off" date when, if the UEA project seemed to falter, the Government would decide to seek authorization and appropriations for an add-on diffusion plant at Portsmouth?

Answer:

First, the risk of UEA failure is considered very small. Second, there is no one specified, pre-set date for such a decision. The approach that has been selected by the President calls for a major committment to assure privatization of the next increment of capacity, and the full efforts of the Executive Branch will be devoted to assure the success of the approach.

The approach contemplates very close monitoring by the Government at all stages to assure that the Government could step in if the privatization effort threatened to fail -- an event that is considered very unlikely. This close monitoring will prevent any significant loss of time, if something were to go wrong, and thus assure that additional capacity can be brought on line by the time it is needed in the 1983-84 time period.

If the Government had to step in, the question of the plant that would be built (5 million unit add-on plant, or a 9 million unit free-standing plant) would depend on when intervention proved necessary. Some examples will illustrate the point:

> If Congress failed to pass the authorizing legislation needed for the private enrichment industry approach and instead, passed authorization and appropriations for a Government plant, it probably would be desirable to proceed with the add-on plant approach.
>
> UEA will be proceeding with all necessary arrangements for its planned plant (including design, power supply, etc.) while the Congress acts on the President's proposal. If at some time prior to March 1976 when UEA

is expected to complete financial, customer and power supply arrangements, UEA found that it could not proceed, the Government would need to determine whether it would be best to proceed with a 5 million unit add-on plant or with the 9-million unit free-standing plant.

If at some later time, UEA finds its way blocked or the Government finds it necessary to step in and assume UEA assets and liabilities, the Government would have to decide the best step. At some point it be more advantageous for the Goverument to proceed with the free-standing plant than to revert to an add-on plant.

DID THE PRESIDENT OVERULE KISSINGER AND SEAMANS?

Question:

Was ERDA overruled on its proposal to build an add-on gaseous diffusion plant? Was Kissinger also opposed to the UEA proposal?

Answer:

The views of all key participants were considered by the President. There were no disagreements as to the desirability of supporting the development of a private U.S. enrichment industry, a concensus that this could be done with imperiling considerations of national security, safeguards or safety, or with the basic reasonableness of the UEA proposal. Some of the key judgmental questions which were considered related to the degree of assurance that the project would be completed successfully, that potential customers and the Congress would be satisfied as to the viability of the project, and that, as a result, the U.S. would be able to resume contracting for firm supply of enrichment services on a timely basis.

Following a thorough review of these and other matters, the benefits of early private sector involvement and in the establishment of an industry, together with the steps taken to reduce risks and increase assurances, made the present approach appear as the most desirable course of action.

UNANSWERED SAFETY AND ENVIRONMENTAL QUESTIONS

Question:

Why is the Ford Administration supporting the development of nuclear power in this country and abroad by making the supply of nuclear fuel readily available when there are still significant unanswered questions regarding the safety and environmental impact of nuclear power plants.

Answer:

All commercial nuclear power plants in this country are licensed by the Nuclear Regulatory Commission (NRC) after a full review, including the opportunity for public participation, of safety and environmental questions. While there continue to be issues requiring a greater degree of resolution, the NRC applies conservative criteria to ensure safe performance. The resulting safety record of commercial nuclear power plants has been excellent. There has been no member of the public killed or injured by any accident or occurence at a nuclear power plant in this country. For this reason and because the overwhelming majority of technical experts in the field are satisfied with the level of safety of these plants we conclude that nuclear power plants are adequately safe. However, we are pursuing every opportunity to improve even further the safety of these power plants. Our safety research programs will spend over $80 Million in FY 1976 in the Nuclear Regulatory Commission. Within ERDA our expenditures aimed at assuring environmentally sound fuel waste disposal amounts to $36 million in FY 1976.

NRC SAFEGUARDS AND SAFETY CONTROLS

Question:

What types of domestic safeguards and safety controls will NRC apply to the UEA and private centrifuge ventures?

Answer:

NRC is expected to require essentially the same types of safeguards and safety procedures as are now successfully employed in Government-owned facilities. In the case of the UEA plant, safeguards problems will not be as severe as in Government plants since the UEA plant will be incapable of producing highly enriched U-235. Safety problems, in a nuclear radiation sense, are minimal.

FOREIGN INVESTMENT WITHOUT FOREIGN CONTROL

Question:

You have indicated that htere will be substantial foreign investment in the proposed project -- including investment from OPEC nations. What safeguards do we have to protect us against potential abuses of foreign investors?

Answer:

Let me first address the general issue of the desirability of foreign investment in this type of project. As you know, one of the reasons why private industry has not moved forward faster in the uranium enrichment field has been its inability to obtain needed capital. Substantial foreign participation would not only help ease this problem but would provide an excellent example of international cooperation in developing alternative energy sources. Furthermore, to the extent that funds from OPEC countries are involved, this is precisely the type of constructive use of OPEC money that we would like to encourage.

As a target, the UEA plan contemplates 60% foreign investment, and centrifuge ventures could also involve foreign contributions. These foreign investments result in access, as customers, to an equivalent degree of the product output of the plant. The product is made available under Government Agreements for Cooperation and Government export licenses are required. The investments do not result in access to the classified U.S. technology or in a majority voting right in project management.

With respect to avoiding any potential for abuse resulting from foreign control or dominance, this is required by U.S. law and will be a necessary condition of being able to obtain a license from the Nuclear Regulatory Commission. Foreign participation in the UEA project is designed to assure both that no single foreign investor will have a dominant voice in the project, and also that no group of foreign investors, voting as a bloc, can impose their views on U.S. investors, voting as a bloc.

FOREIGN CUSTOMER CONDITIONAL CONTRACTS WITH ERDA

Question:

What happens to these foreign customers who have contracts with ERDA that are conditional on plutonium recycle and will therefore be terminated on June 30?

Answer:

Holders of such contracts have a Presidential assurance that they will be able to obtain their fuel needs from a U.S. source of supply. The existence of a viable UEA project will afford this opportunity. Indeed, a number of countries currently holding conditional contracts are already prospective investors in UEA.

U.S. SHARE OF THE FREE WORLD MARKET

Question:

How much of the foreign enrichment market might the U.S. expect to capture?

Answer:

The informal objective set by planning within the U.S. Government is to retain in the long term approximately 50% of the Free World market for uranium enrichment services.

PAYMENTS BY INDUSTRY FOR GOVERNMENT-OWNED TECHNOLOGY

Question:

Given the heavy investments made by the U.S. taxpayers in the U.S. enrichment program, what compensation is the Government likely to receive for the technology?

Answer:

It is expected that, as a royalty, the U.S. Government will charge 3% of the gross revenues of private producers for the use of its diffusion and centrifuge technologies. For example, should UEA generate gross revenues of one billion dollars per year , the Government would receive royalties of about $30 million per year. Such a level would, of course, be increased as the centrifuge plants came into being. The Government would also collect taxes and license fees from the private operations.

WHAT HAPPENS IF A PRIVATE PLANT ISN'T LICENSED?

Question:

What happens if the plant isn't licensed?

Answer:

There is little reason to believe that the plant would not be licensed. From a health safety and environmental standpoint the project is expected to be much simpler to license than a nuclear power reactor. Licensability of the project will, however, be a key consideration from the outset and should any difficulties appear they will be recognized early. Under proposed terms the Government would take over the project if a license were not granted.

WHAT HAPPENS IF A PRIVATE PLANT DOESN'T WORK?

Question:

What happens if the plant doesn't work?

Answer:

The plant will use a process that has been proven and perfected over a quarter century of large scale Government operation. Governmental specialists will be involved in the details of the project and the Government will supply key components. The project will work.

DOES UEA HAVE CUSTOMERS?

Question:

Does the project have all the customers it needs to go forward?

Answer:

Letters of intent from domestic utilities cover about 15% of plant output. Several foreign governments have expressed reasonably firm interest in significant amounts of plant output. As the project is accepted as the next United States enriching plant, assuming that the requested authorizing legislation is approved, it is believed that customers will full subscribe to the available plant output.

JUN 20 1975
11.30 al

due 6/20 COB

THE WHITE HOUSE

WASHINGTON

June 19, 1975

MEMORANDUM FOR: PHIL BUCHEN
JIM CONNOR
MIKE DUNN
MAX FRIEDERSDORF
ALAN GREENSPAN
ROD HILLS
JIM LYNN
JACK MARSH
JIM MITCHELL
ROG MORTON
DIXY LEE RAY
BRENT SCOWCROFT
ROBERT SEAMANS
FRANK ZARB

THROUGH: JIM CAVANAUGH

FROM: GLENN SCHLEEDE

SUBJECT: URANIUM ENRICHMENT - DRAFT FACT SHEET AND Q&A's

Enclosed are a revised fact sheet and a set of 14 of the more important questions and answers. We have attempted to take into account the excellent suggestions and contributions received from members of your staff who have commented on earlier drafts.

Would you please let me have your comments and corrections on this package by close of business, Friday, June 20. Additional Q&A's will be needed and suggestions are welcome. Thanks.

Attachment

cc: Jim Cannon
Ron Nessen
Bill Baroody
Paul Theis

called 6-21 1:00 al

JUN 25 1975

due: 6/25
2:00

THE WHITE HOUSE

WASHINGTON

June 24, 1975

MEMORANDUM FOR: PHIL BUCHEN
JIM CONNOR
MIKE DUNN
MAX FRIEDERSDORF
ALAN GREENSPAN
ROD HILLS
JIM LYNN
JACK MARSH
JIM MITCHELL
BRENT SCOWCROFT
ROBERT SEAMANS
BILL SEIDMAN
FRANK ZARB

FROM: JIM CANNON

SUBJECT: Draft Message to the Congress on Uranium Enrichment

Attached is the latest draft message to the Congress describing the plan for involving private industry in the expansion of U.S. capacity for enriching uranium.

The draft includes material contributed by ERDA, FEA, State Department, OMB, CEA and others on the Senior Staff. We are continuing to work on an improved version for the President's final consideration. Accordingly, we would like to request your comments by 2:00 p.m., Wednesday, June 25th, as the President wishes to transmit this Message to Congress early Thursday afternoon.

cc: Robert T. Hartmann
Paul Theis

6/24/75
7:00 p.m.

The Nation has an opportunity to take a major step now that will contribute significantly in the 1980's and beyond to our energy independence goals.

As our supplies of oil and natural gas run low, nuclear power grows in importance, year by year, as a source of electrical energy. Nuclear power is one of the most reliable, ecnomical and safe forms of energy for America's future.

The enrichment of uranium -- concentrating the amount of U-235 in uranium that is used for reactor fuel -- is an essential step in nuclear power production. As the use of nuclear power becomes more wide-spread, the demand for enriched uranium is growing as well.

For the past 20 years, the United States Government has supplied the enrichment services for every nuclear reactor in America, and for many others throughout the world. Our leadership in this important field has enabled other nations to enjoy the benefits of nuclear power under secure and prudent conditions. At the same time, this effort has been helpful in persuading other nations to accept international safeguards and forgo development of nuclear weapons. In addition, the sale of our enrichment services in foreign countries has returned hundreds of millions of dollars to the United States.

Our ability to provide uranium enrichment services can be an important part of our energy cooperation with other oil consuming nations.

These services have been provided by enrichment plants--owned by the Government and operated by private industry--in Oak Ridge, Portsmouth, Ohio, and Paducah, Kentucky. A $1-billion improvement program is now underway to increase the production capacity of these plants by 60 percent. But this expanded capacity will not meet all the anticipated needs of the next 25 years.

The United States is now committed to supply the fuel needs for several hundred nuclear power plants scheduled to begin operation by the early 1980's. Since mid-1974, we have been unable to accept new orders for enriched uranium because our plant capacity--including the $1-billion improvement--is fully committed.

Further increases in enrichment capacity therefore depend on construction of additional enrichment plants, with seven or eight years required for each plant to become fully operational.

Clearly, decisions must be made and actions taken today if we are to insure an adequate supply of enriched uranium for the nuclear power needs of the future.

It is my opinion that American private enterprise is best suited to meet those needs. Already, private industry has demonstrated its willingness to pursue the major responsibilities involved in this effort. I believe that with proper licensing, safeguards, cooperation and temporary assurances from the Federal Government, the private sector can do the job effectively and efficiently--and at great savings for the American taxpayer.

Accordingly, I am proposing legislation to the Congress to authorize the Government assistance necessary for private enterprise to make its entry into this vital field.

A number of compelling reasons argue for private ownership, as well as operation, of uranium enrichment plants. The market for nuclear fuel is predominantly in the private sector. The process of uranium enrichment is clearly industrial in nature.

The uranium enrichment process has the making of a new industry for the private sector in much the same tradition

as the process for synthetic rubber--with early Government development eventually being replaced by private enterprise.

One of the strengths of America's free enterprise system is its ability to respond to unusual challenges and opportunities with ingenuity, vigor and flexibility. A significant opportunity may be in store for many firms--old and new--to participate in the growth of the uranium enrichment industry. Just as coal and fuel oil are supplied to electric utilities by private firms on a competitive basis, enriched uranium should be supplied to them in the same fashion in the future.

The energy consumer also stands to benefit. Nuclear power now costs between 25 and 50 percent less than electricity produced from fossil fuels. It is not vulnerable to the supply whims or unwarranted price decrees of foreign energy suppliers. And based on the past fifteen years of experience, commercial nuclear power has had an unparalleled record of safe operation.

The key technology of the uranium enrichment process is secret and will remain subject to continued classification, safeguards and export controls.

But for several years, a number of qualified American companies have been granted access to the Government's technology under carefully controlled conditions to enable them to assess the commercial potential for private enriching plants.

The Government-owned gaseous diffusion enriching plants have run reliably and with ever-improving efficiency for more than a quarter of a century. One private group has chosen this well-demonstrated process as part of its $3.5 billion proposal to build an enrichment plant serving 90 nuclear reactors here and abroad in the 1980's. Others are studying the potential of the newer gas centrifuge process. Though not yet in large-scale operation, the centrifuge process--which uses much less power than the older process--is almost ready for commercial application.

I believe we must move forward with both technologies and encourage competitive private entry into the enrichment business with both methods. A private gaseous diffusion plant should be built first to provide the most urgently needed increase in capacity, but we should proceed simultaneously with commercial development of the centrifuge process.

With this comprehensive approach, the United States can reopen its uranium enrichment "order book," reassert its supremacy as the world's major supplier of enriched uranium, and develop a strong private enrichment industry to help bolster the national economy.

For a number of reasons, a certain amount of governmental involvement is necessary to make private entry into the uranium enrichment industry successful.

The initial investment requirements for such massive projects are huge. The technology involved is presently owned by the Government. There are safeguards that must be rigidly enforced. The Government has a responsibility to help ensure that these private ventures perform as expected, providing timely and reliable service to both domestic and foreign customers.

Under the legislation I am proposing today, the Energy Research and Development Administration would be authorized to negotiate and enter into contracts with private groups interested in building, owning and operating a gaseous diffusion uranium enrichment plant.

ERDA would also be authorized to negotiate for construction of several centrifuge enrichment plants when more definitive proposals for such projects are made by the private sector.

Contract authority in the amount of $8 billion will be needed, but we expect almost no actual government expenditures to be involved. In fact, the creation of a private enrichment industry will generate substantial revenues for the United States Treasury through payment of Federal income taxes and compensation for use of Government-owned technology.

Under our proposed arrangements, significant opportunities for foreign investment in these plants will be presented, although the plants will remain firmly under U.S. control. In addition, there will be limitations on the amount of capacity each plant can commit to foreign customers.

Also, all exports of plant products will continue to be made pursuant to Agreements for Cooperation with other Nations, and will be subject to appropriate safeguards to preclude use for other than agreed peaceful purposes.

Foreign investors and customers would not have access to sensitive classified technology. Proposals from American enrichers to share technology would be evaluated separately, and would be subject to careful Government review and approval.

Finally, low enriched fuel produced in the gaseous diffusion plant would be suitable only for commercial power reactors--not for nuclear explosives.

In the remote event that a proposed private venture did not succeed, this legislation would enable the Government to take actions necessary to assure that plants will be brought on line in time to supply domestic and foreign customers when uranium enrichment services are needed.

I have instructed the Energy Research and Development Administration to implement backup contingency measures, including continuation of conceptual design activities, research and development, and technology assistance to the private sector on a cost recovery basis.

ERDA would also be able to purchase from a private firm design work on components that could be used in a Government plant in the unlikely event that a venture fails.

Finally, I pledge to all customers--domestic and foreign--who place orders with our private suppliers that the United States Government will guarantee that these orders are filled as needed. Those who are first in line with our private sources will be first in line to receive supplies under this assurance. All contracted obligations will be honored.

The program I have proposed takes maximum advantage of the strength and resourcefulness of industry and Government,

and it will reinforce the world leadership we now enjoy in uranium enrichment technology. It will also help insure the continued availability of reliable energy for America.

Our program to assure development of a competitive nuclear fuel industry is an important part of our overall energy strategy. But we must continue our efforts to conserve the more traditional energy resources on which we have relied for generations. And we must accelerate our exploration of new sources of energy for the future--including solar power, the harnessing of nuclear fusion and development of nuclear breeder reactors which are safe, environmentally sound, and reliable. To move the United States one step nearer to our objective of energy independence, I ask the Congress for early authorization of the program I have proposed.