The original documents are located in Box 36, folder "Uranium Enrichment (1)" of the James M. Cannon Files at the Gerald R. Ford Presidential Library.

Opening Statement
by Chairman Dixy Lee Ray
U. S. Atomic Energy Commission
before the Joint Committee on Atomic Energy
Hearings on Uranium Enrichment
June 25, 1974

Introductory Remarks

Mr. Chairman. I am here today before the Joint Committee to testify on the Committee's Phase III hearings on the future structure of the enrichment industry.

With me are Mr. John Erlewine, General Manager; Mr. Mark Rowden, General Counsel; Mr. Victor Corso, Deputy Controller; Mr. George Quinn, Assistant General Manager for Production and Management of Nuclear Materials; Mr. Roger LeGassie, Deputy Director, Office of Planning and Analysis; and Mr. L. Manning Muntzing, Director of Regulation. Mr. Quinn, Mr. LeGassie and Mr. Muntzing will be testifying later on various aspects of the AEC's uranium enrichment program.

During the Phase I and II segments of these hearings last year, both the AEC and industry witnesses testified on the status of Government and private sector planning to create a private uranium enrichment industry in this country. We believe that the emergence of a private and competitive industry is essential to support the many fold growth in nuclear power which is expected to take place over the next several decades. Some

6 million units of new enrichment capacity are expected to be required each year in the United States, beginning in the mid 1980's, to serve expanding domestic and foreign needs. This may be contrasted with the 27 million units of AEC capacity which will exist in our improved, fully powered plants at that time.

President Nixon, in his 1971 Energy Message, noted that the responsibility for a future uranium enrichment industry should reside with the private sector. He reiterated this point in his 1973 Energy Message. He stated that the Government's capacity, even after expansion,

> "... will not fully meet our needs in the 1980's; the Government now looks to private industry to provide the additional capacity that will be required".

Following the President's 1971 message the AEC began to implement the Administration policy through a program whereby private U. S. companies were allowed access to the Government's classified enrichment technologies for the purpose of engaging in privately funded research and development. Subsequently, in May, 1973, a companion program with identical access to classified information was established, in a regulation known as 10 CFR 25, for companies seeking to determine their interest

in entering the private enrichment business. Additional companies have been granted classified access under this program.

In this connection, the 1973 report of the Joint Committee on Atomic Energy on authorizing appropriations for the AEC's fiscal 1974 budget noted:

> "As in the past, the Joint Committee supports changing the Commission's sole source position in providing uranium enrichment services so that the private domestic sector may participate also in this segment of the nuclear fuel cycle. The committee notes that domestic sharing of technology with industry for research and development purposes, under conditions which will protect sensitive information, is now underway. The committee urges the Commission to proceed expeditiously with the program so that an early decision could be forthcoming on the role private industry will play in the design, construction and operation of new enriching plants. The Commission should not delay in its efforts to provide additional capacity in the event the private sector is not ready to provide the needed capacity on time."

It is the AEC's objective, of course, to assist the industry in being prepared to make a timely determination to provide the needed new capacity. A competitive industry with multiple sources of domestic supply, achieved under the free enterprise system, will provide the necessary broad base and assurance of capability for future expansion. We believe that this objective, and the Commission's programs to achieve it, merit the strongest possible private and Congressional support.

Status of Contracting

We have now reached a major milestone in the evolution of Governmental and private planning.

In the Phase I hearings before the Joint Committee, last July, AEC witnesses testified that the limit of AEC's legal capability to enter into further long-term fixed commitment contracts would be reached between the spring and fall of this year. It was also estimated that the 27 million units of AEC enrichment capacity, as improved and fully powered, could meet the long term needs, on a sustaining basis, of between 275 and 382 thousand electrical megawatts of nuclear power. This limit, as finally determined by the AEC, would represent the maximum number of plants with which AEC could enter into long-term enriching services contracts in accordance with the Uranium Enrichment Services Criteria. The precise level could not be defined last year because its selection required consideration of several matters. These include the utility decisions, reflected in contracts, on its projected use of plutonium recycle, projected operating capacity factor, reactor type etc.; and on the AEC's selection of a projected future operating tails assay.

The most significant of the above factors are the degree of use of plutonium recycle and the AEC operating tails assay. A generic finding of a regulatory nature as to the acceptability of plutonium recycle has not yet been made. The AEC cannot prejudge the nature of that finding. Accordingly we have determined that our enrichment contracting capability at this time must be based on the assumption of no recycle. With respect to operating tails assay, we are now reaffirming our previous projection of a future level of 0.3% U-235, the present operating tails assay.

The result of these determinations is to establish our present contracting capability, under the Criteria, at approximately 290 thousand electrical megawatts of nuclear power plants to be served.

Last July, we had signed contracts for 107 thousand megawatts -- 81 thousand domestic and 26 thousand foreign. We were then in transition to our new fixed-commitment type of contract, requiring both a firm statement of need for an initial 10 year period, and a contracting action 8 years in advance. The purpose of the latter feature was to permit planning for additional capacity, whether Government or private, to be based on assured need as opposed to simply a projection of need.

We have now signed some 163 thousand megawatts of these new long-term fixed commitment contracts -- 124 thousand domestic and 39 thousand foreign, covering reactors requiring initial enriching services through June 30, 1982. Thus a total of 270 thousand megawatts has been placed under contract to date within our capability of approximately 290 thousand megawatts. Within the remaining contractual capability we have, we now anticipate being able to complete contracting with all the remaining domestic utilities having needs to be met within this time frame. In addition, we will be able to meet current Presidential commitments and any deliveries required under historic supply obligations previously entered into by the U. S. Government through treaty or Agreement for Cooperation. There will remain, however, a substantial number of requests for contracts submitted by foreign sources which we will be unable to consummate at the present time.

In this regard, we note the possibility that when a generic regulatory finding is made on plutonium recycle, that finding may result in a reduction of our obligations under some contracts which would then automatically convert their demands to a plutonium recycle basis. We would then have an increased degree of contracting capability and would

expect to resume contracting up to a new limit of capability. Resolution of this matter may occur within the next six to nine months.

We have reached our present contracting capacity limitation rapidly, especially considering that our new rigorous contractual terms and conditions were implemented only last September. Dire predictions were made at that time that these more commercial contracts would reduce the attractiveness of the nuclear power option at home and drive away potential customers abroad. But today, both at home and abroad, there has been no relaxation in the industry turning to nuclear power. Indeed, the rate of orders achieved has exceeded our expectations and appear to reflect an expansion of demand that probably exceeds the present capability of industry and utilities to actually bring nuclear power plants on line in the near term.

On the domestic side, contracts in hand imply utility expectations of bringing plants on line some 19 months in advance of recent reference projections of our Office of Planning and Analysis and some 10 months in advance of a high forecast case of that Office.

On the foreign side, requests for contracts are nearly at the same level as projected a year ago even though, in the interim, a substantial firming of plans for new enrichment capacity abroad has occurred. Indeed, some of our most recent inquiries on contracts have been from countries participating in these specific foreign enrichment projects. Further, this past year has also seen the vigorous entry of the Soviet Union into the international enrichment supply market.

What does all this mean? Let me suggest a few explanations. Enrichment services from the U. S. Government, under current prices and contractual terms, represent an extraordinary and unique bargain. Worldwide, the quality and dependability of U. S. supply on a long-term basis is unsurpassed. Our prices currently reflect bargain basement construction costs from the 1940's and 1950's. By Congressional mandate we are limited to Government cost recovery principles that do not reflect elements of cost associated with a fully commercial activity nor current costs of construction of new enriching capacity. Our inplace production capacity dwarfs that available anywhere else in the world and results in economies of scale not initially achievable in new increments of capacity. The real, unsubsudized cost of enriching services from any new capacity, regardless of ownership, is likely to be significantly higher than current AEC charges.

Enriched uranium is a storable energy commodity of proven value. It does not deteriorate. In the present period of worldwide monetary fluctuations, it represents an extraordinarily secure investment.

Utilities, concerned with surety of supply at any price apparently have not overlooked the attractiveness of AEC's current contract and basis for charges which guarantee surety of supply at prices which are far lower than can be expected from any other future source.

We question whether this is an appropriate basis on which to continue to seek foreign sales. I see little value to the United States in seeking foreign trade at any price. Let it be a fair price, fairly arrived at in an open competitive market. If we cannot meet foreign competition on that basis, with our superior reliability and technology, then we do not deserve to make foreign sales.

The above discussion suggests the possibility that both domestic and foreign customers may have overstated, to some extent, the timing of their needs in order to achieve the assurance of current AEC contract offerings. We cannot assert that this is so. To the extent it may have occurred, there could be an excess of enriched uranium in private hands in the early 1980's.

Nevertheless, there remain customers whose needs are presently neither satisfied nor even announced. How are these needs to be met?

We believe it essential to afford the emerging United States enriching services industry an opportunity to meet those needs. To assess this approach we must next discuss the current status of private enrichment planning.

Status of Private Enrichment

During these hearings, the Committee will hear direct reports from private companies, concerning their current activities and plans for providing new enrichment capability. We will report here, however, those particular matters which, based on our understanding, lead us to believe that significant and timely private commitments can occur over the course of the next year. Such a statement of course assumes that our domestic utility industry is seriously prepared to play its part in supporting its announced commitment to a private enrichment industry.

One group of private companies exists which appears to be prepared to make the earliest commitment to private capacity. This group, Uranium Enrichment Associates (UEA), is currently a joint venture of Bechtel, Union Carbide and Westinghouse.

UEA has advised the AEC that it is prepared to reach a decision by the end of this calendar year on proceeding to construct a new 9 million unit gaseous diffusion plant. This plant would be operating in the early 1980's. UEA advised us that they have an option on the necessary electrical power supply and site to permit them to proceed promptly on that schedule if utility customer support can be obtained. UEA has provided us and prospective customers a copy of a proposed letter agreement outlining the terms of long-term contracts under which UEA proposes to supply enriching services. Based on our understanding of UEA's planning, we believe that both their schedule and their general approach are realistic. We believe it inappropriate to comment on their draft contract terms since we understand that these are open for comment by potential customers and, we presume, to further negotiations between UEA and its potential customers.

This project, if it proceeds, would greatly enhance the surety of U. S. supply, a matter which the utility industry has often indicated as being of prime importance to it.

We are also pleased to note that there would be an opportunity for foreign participation in the UEA project and that UEA has actively been seeking orders from potential foreign customers.

UEA, however, is not the only possible private domestic source of enriching services. The Commission approved in principle, and Commissioner Larson announced at a recent Atomic Industrial Forum meeting in Reston, Virginia, a new program to assist the entry of private companies desirous of adopting the centrifuge enrichment technology. Under this program, private enrichers and utility customers would commit to the construction of private centrifuge demonstration facilities. Their initial capacity could be as high as 300 thousand units. If several such facilities proceeded the total capacity could be 1 to 1.5 million units. These plants would be operating in the late 1970's. Their output would be used to fuel actual power plants, with assurance of supply being backstopped for an initial period by the AEC preproduction stockpile.

The output of each demonstration facility, as with all demonstration facilities, would clearly not initially be economic. Within some reasonably short time period after initial operation (e.g. 3 years), it is visualized that each such facility would become a productive module of a larger plant thus leading to a number of competitive suppliers, each with capacity in the 3 million unit range in the mid-1980's.

During the initial period of uneconomic operation, it is anticipated that both the supplier and customers would make significant contributions to the support of the project. Some portion of the supplier's costs would be put at risk and deferred for later recovery from large plant operation. The utility customers would pay more than the then-current rate for enrichment as their contribution in order to enhance the surety of future supply and, perhaps, to obtain a later "favored customer" position for output from the anticipated production plant. The assurance of value to be received from the output of the facility could aid in obtaining the needed financing for the activity.

However, after the supplier and utilities agree as to the reimbursement per enrichment unit delivered which is required on the one hand, and is willing to be paid, on the other hand, it is likely that a differential will remain. The Government would anticipate being requested to assist in the reduction or elimination of this differential through a payment in terms of dollars per enrichment unit delivered. Such a Government commitment would be limited to a defined unit amount for a defined quantity per year for a defined number of years. The cost of this assistance would be recovered in the AEC charge for separative work in the same manner that R&D on new products in the private sector must be paid for by the existing product lines of a company's business.

The overall approach to the project is not unlike some joint ventures in the field of nuclear power which have received government support in the past. The concept of non-economic demonstration projects with government support is well understood to be a key step in assuring establishment of industrial commercialization of new technologies. Historically, within AEC, it has been emphasized that such projects must include significant utility customer and supplier participation to ensure success.

Commission planning is to formalize this concept through the release of a request for proposals in July of this year, calling for proposals to be received in the early spring of 1975. All proposals would be subject to Congressional authorization which would be sought next year based upon our review of the proposals received. Thus, through this program, the commitment of other suppliers who exist as alternative domestic sources for private enrichment could be obtained within the year.

Indeed, subsequent to our first public discussion of this concept, and prior to a formal request for proposals, there has already been substantial private activity to develop such arrangements. Utilities have already met with potential suppliers. Those companies expected to be represented in the

program of providing enriching services include a General Electric-Exxon joint venture, Goodyear, Garrett, Westinghouse, and Electro Nucleonics. The latter company has already issued a public announcement of a joint study of this concept including participation by Burns and Roe, and the Tennessee Valley Authority.

We believe, therefore, that the opportunity exists for any utility desirous of contracting for fuel to select from among a number of viable options and to play an important role in the structuring of the future enrichment industry.

Use of AEC Preproduction Stock

The private initiatives described above should, in our view, be given every opportunity to come to fruition. If successful they can result in announced private commitments over the next year to proceed with new capacity construction, both diffusion and centrifuge. During this same time period, the AEC will further review its planning for the appropriate size and use of its preproduction stockpile. As Mr. Quinn's testimony will indicate, this stockpile, if required, could be further increased over its present projected levels by additional government actions to acquire additional natural uranium feed and electric power supplies. Whether such actions will be necessary will depend on the timing of future requirements for enriched uranium and the timing and magnitude

of the anticipated private actions on new capacity. We also need to consider further the appropriate levels of contingency supplies of enriched uranium and the appropriate level of government stocks to be made available as back-up material for the initial period of operation of private plants.

There are government preproductions stocks still uncommitted -- quantities anticipated to be in the range of 20 to 40 million units -- capable of providing substantial fuel needs beyond those covered in AEC's long-term contracts, if necessary. The existence of these stocks provides, in our judgment, time to allow for private actions to proceed without introducing the risk of an actual shortfall of needed nuclear fuel. If private actions do not proceed over the course of the next year in accordance with our expectations, we would review the situation then -- or sooner, if appropriate -- and take any necessary actions.

If a return to further government contracting should appear necessary at that time, we believe that it should not automatically be a return to the present contractual arrangements and prices for government services. Consideration should be given to a substantially more commercial approach if the government must assume a continuing burden of providing the

large amount of enrichment capacity needed for the future. We hope that it will not be necessary to consider these questions, however, and that potential suppliers, customers and financing sources will cooperate to make the private activity a reality.

Conclusions

The AEC has reached the present limit of our contracting authority. We are terminating further long-term contracting and will issue a Federal Register Notice to this effect in a few days. This does not mean that future enrichment needs will not be met. A future increase in AEC contracting capability will occur should there be a favorable Regulatory finding on plutonium recycle. Independently of that situation, private plans exist which could, over the course of the coming year, lead to commitments to new enrichment capacity. Government planning can be reviewed at the end of that period should actions not match expectations. In the interim, private decision-making should be given an opportunity to proceed in an orderly way without unnecessary government involvement. Additional uncommitted material will be available in AEC preproduction stocks to ease the transition to a private supply industry and meet contingency needs. The existence

of these stocks provides assurance that actual shortfalls of enriched material to meet needs are not in prospect.

The totality of potential private initiatives, both diffusion and centrifuge, can proceed simultaneously. This offers an opportunity both for competitive approaches and for expressions of customer preference.

The successful assumption of responsibility by private industry for the future provision of enriching services will eliminate the necessity of adding billions of near-term dollars to the Federal budget for construction of new government capacity. It will also result in royalty payments to the U. S. Treasury and payment of local, State and Federal taxes amounting to billions of dollars between now and the end of this century.

Far more importantly, however, this country needs the private enterprise base to ensure our ability to implement the nuclear option down stream, not at just the 200 thousand megawatt levels, but at a thousand megawatts by the end of this century. The time to establish that basis for the future is now.

DRAFT

Apr. 1975

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

Current ERDA position
Page 3

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

Dear Jim:

As agreed at our meeting of April 15, 1975, on the UEA proposal and alternative approaches to providing new enrichment capacity, I am supplying additional information in response to your specific questions and those of your staff.

We have continued to examine several aspects of this matter and have determined that the centrifuge approach to commercial enrichment is potentially more attractive than I had earlier believed.

- in the past several weeks, ERDA staff met with eight organizations interested in private centrifuge enriching and/or manufacturing. The consensus is that the present Government centrifuge program (DCEF) is overly modest and that pilot plants -- expandable to large-scale modules -- are necessary for successful commercialization;

- several asserted that centrifuge technology is at a stage worthy of capital investment and equity risk;

- the Centar and EXXON centrifuge enriching proposals, which I have reviewed personally, are more attractive in many ways than UEA's diffusion proposal.

After further consideration, I have concluded that it is unlikely that the Government will need to build the first large centrifuge plant, or even pay for it; that at least three centrifuge proposers offer real competition to the UEA proposal; and that it is conceivable that 9 million SWUs centrifuge capacity can be on line in the 1984-86 time frame, provided chiefly by three competitive private enrichers.

At the same time, I conclude that the Government must commit to building an "add-on" plant.

- re-opens the "order book" sooner and thus clears up domestic uncertainty over future capacity while moving to retain our share of the expanding foreign market;

- affords flexibility in gauging the size and timing of the centrifuge plants; an increasingly valuable asset given the uncertain demand picture;

- maximizes the opportunity for hand-off of Government contracts to centrifuge enrichers; this is not possible under the UEA proposal alone;

- offers a good hedge against the uncertainties in feed availability and plutonium recycle which could increase needed SW capacity by several million units.

It has also become more apparent that the size needed for the proposed Government "add-on" diffusion plant, if any is built, is less certain now than earlier.

- the growing evidence of centrifuge commercialization potential, alluded to above, will affect the size and timing of any diffusion plant;

- the demand picture in general is changing substantially and we are proposing an open season to reassess the demand situation for the 1980's.

- Government stockpile buildup and uncertainties of the War Reserve will also affect the rate of growth of needed capacity.

- Uncertainties surrounding plutonium recycle have cast doubt on ERDA's ability to meet commitments of contracts contingent on recycling;

In light of these considerations, I now believe that ERDA's alternative plan should be accelerated by dropping the previously proposed Government demonstration centrifuge plant and moving instead directly into assistance for establishment of a competitive centrifuge industry.

In summary form, therefore, ERDA's recommendation is:

-- Rejection of the UEA plan;

-- Initiation of private enriching capacity on a competitive basis using centrifuge rather than gaseous diffusion separation methods. This advanced technology has much greater energy efficiency; and is more flexible in terms of meeting shifting demand.

-- Commitment to take orders, both foreign and domestic, as soon as Congress permits; commitment to construct and operate a government add-on facility to serve such orders while the centrifuge industry gets underway; adjust the size of the add-on plant to the minimum needed to give private industry time to get established.

I believe that this approach constitutes better policy and is a more defensible proposal particularly because it applies government guarantees more appropriately in support of the establishment of a competitive enrichment industry rather than a single, sole-source supplier, such as UEA, and thus buys a better result.

On the basis of current estimates, our proposed add-on plant is expected to have a net budget impact of not more than $100 million total before the higher enrichment charges already planned will begin to off-set new plant costs in 1978 with breakeven occurring in 1980.

The UEA approach is not the best alternative available to the government.

-- As it now stands, the UEA plan represents both a sole source procurement and such a high Federal liability and low private risk that it

would set an undesirable precedent for future commercial ventures. For this reason, Congressional support will be most difficult to achieve and, even if such authorization is achieved, 9-12 months will have passed without an assured program for meeting demand for enriched uranium.

-- Negotiations with UEA would require a number of months and -- even if their position proved more acceptable -- would still not of itself speed the re-opening of the "order book" nor establish enrichment on a competitive basis.

Altogether I believe these measures will provide additional capacity when needed in the 1980's, and do so by a judicious and politically salable mixture of Government and private programs, retain a large share of the expanding foreign market, and give birth to a private centrifuge industry -- all with acceptable risk to the Government, reasonable implications for Federal outlays, and a good precedent for future commercialization ventures of this type.

The answers to your specific questions are contained in the enclosure. My staff and I would be glad to discuss these responses in more detail.

Sincerely,

Robert C. Seamans, Jr.
Administrator

Enclosure:
As stated

Additional Uranium Enrichment Capacity

Note: The following information is provided in response to specific questions from OMB. Occasional redundancy is necessary for completeness in responding to each question. Also, for the sake of clarity, question No. 3 has been addressed prior to question No. 2.

QUESTION NO. 1

How much time is needed for, and available for, the following:

a. negotiation of ERDA contract with UEA?
b. drafting of enabling legislation?
c. UEA negotiations with other potential equity partners?
d. UEA negotiations with foreign and domestic customers for 75% of plant capacity?

To what extent could these actions be accomplished concurrently? Please provide a graphic display -- critical path analysis.

A graphic display and accompanying information is attached in Tab A. Briefly, however,

a. 2-3 months are needed to agree on the features of the UEA - ERDA contract and an additional 2-3 months to agree on the detailed terms;

b. 2-3 months are required for drafting the legislation;

c. 2-3 months are necessary to locate UEA's foreign equity partners; followed by 4-6 months of contract negotiations.

d. 3-4 months needed for locating foreign and domestic customers, 6-12 more to complete negotiations and reach 75% commitment.

Enclosure

Altogether, 8-12 months would be required to complete the steps leading to the UEA project's startup. This time frame

- assumes concurrent action on all key steps and necessarily runs the risk of serious delay if setbacks occur in one or more of the steps;

- assumes that Congress approves whatever is negotiated and does so "on time." Congressional action and timing may be problematical given the uncertainties of the UEA proposal and the emergence of the centrifuge alternatives, such as Centar, EXXON, Garrett et al that will also seek Congressional attention. It should be noted that Congressional action on LMFBR took 18 months -- a proposal that enjoyed the vigorous support of several key members of the JCAE. UEA's plan has thus far drawn fire from the Chairman of the House Appropriations Subcommittee on Public works (Evins) and the Chairman of the JCAE Subcommittee on Agreements for Cooperation (Montoya), among others;

- assumes that negotiations with UEA go well and also that UEA will accept what Congress passes;

- assumes no antitrust or regulatory problems including high foreign participation.

As to the time available for securing passage of the UEA proposal, the situation seems to be worsening. While the decision with respect to size and timing of new capacity can wait for several months, the decision with respect to the basic approach for providing new capacity must be made in a matter of weeks.

- The absence of a credible decision is creating uncertainty among domestic utilities, thus casting doubt on the future of nuclear power expansion in this country;

- Our large lead in centrifuge technology is diminishing due to our continuing indecision; the Germans and Japanese, particularly, are catching up;

- The recent NRC decision on exporting procedures has complicated foreign access to U. S. nuclear materials; a credible source of capacity will encourage them to keep looking to the U.S. as a supplier and thus permit us to retain a healthy share of the expanding foreign market.

- The UEA negotiation route is less credible now than a month ago because the NRC action on exports of nuclear materials will complicate UEA's bid for foreign customers; and because the very existence of several centrifuge proposals raise questions as to desirability of commercializing a diffusion plant.

QUESTION NO. 3

What are the pros and cons (or the risks and benefits) of going to Congress with an enabling legislative package for UEA versus enabling legislation for assistance programs for private entry in the future.

UEA Approach

A. Benefits from our standpoint of going to Congress with UEA include:

1. probability of being able to send legislative package to Congress faster than any approach except direct Government construction; and

2. Could be seen by Congress as less complex since only UEA is involved whereas the alternative approach is a mixed Government-private package with several corporate entitites involved.

B. Risks from our standpoint include:

1. Loss of more time since the UEA proposal is fraught with uncertainties that will invite close Congressional scrutiny. Some members of Congress have already expressed hostility to the UEA plan (lack of sufficient UEA equity risk, lack of identity of equity partners, lack of firm contractual arrangements for domestic and foreign customers, etc.);

2. Loss of control over the nature of the legislation which, if a strong push cannot be mounted or maintained, could be completely rewritten into an undesirable but mandatory course of action, e.g., a semi-independent Government corporation for enrichment; and

3. Discouragement of future commercialization efforts if the first proposal fails for whatever reason. The first proposal, must be good enough to withstand strong Congressional cross-currents.

Alternative Approach

A. Benefits from standpoint of going to Congress with the Alternative Plan include:

1. Greater Congressional receptivity since the plan could be presented as "transitional" to commercial enrichment. It contains both a Government plant and several private pilot plants, as well as the other advantages. In short, more salable; and

2. Political base would be broader and more supportive since several corporations from several states would be involved (the President should capitalize on this before Congress does).

B. Risks include:

1. As with the UEA approach, possible outright rejection of the commercialization concept and rewriting of the bill in an undesirable manner; however, this is believed to be less risky than the UEA route since the Alternative Plan appears more defensible.

2. Present Congressional antipathy toward the big oil companies may have some negative effect on the centrifuge proposal inasmuch as EXXON and Atlantic-Richfield are involved.

QUESTION NO. 2

Comparison of advantages to the Government of going UEA vs. alternative route(s).

A brief comparative analysis follows based on certain key criteria such as relative cost, impact on eventual centrifuge commercialization, flexibility, etc. Tab B contains a summary comparison of the UEA Centar, EXXON and Garrett plans.

A. Cost - UEA would avoid substantial Federal outlays -- assuming Government guarantees are not involved. Liabilities amount to as much as $3.8 billion.

- ERDA's Alternative Plan means initial net outlays, however, our preliminary projections indicate that, with pricing changes in separative work now being recommended, net outlays can be held to less than $100 million before total annual outlays can be offset by revenues beginning in 1978. Cumulative outlay breakeven would occur in 1980 followed by rapidly mounting net revenues thereafter. And, if the demonstration centrifuge is not Government-financed, the picture will be even brighter. This projection is based on the $75-80 per SWU range and is calculated based on full costs to the Government. At $75.21, maximum enrichment drain would be $636 cumulative million in 1977, but most of that includes CIP/CUP; net new plant drawdown in 1978 is about $85 million with breakeven in 1980.

B. Centrifuge Commercialization

- UEA route, if successful, could conceivably give some momentum to later centrifuge commercialization; but if the UEA concept were rejected, it almost certainly would discourage future commercialization ventures.

- UEA also offers greater assured capacity than do the centrifuge plants, but the relative inflexibility of GDP capacity is a drawback.

- The ERDA Alternative Plan offers the following advantages from the standpoint of centrifuge commercialization:

  1. less power to operate (about 1/10th of that needed for diffusion; or 300 MWe as opposed to 3,000 MWe);

  2. inherently greater "add-on" flexibility, a valuable factor given the current uncertainty of demand; UEA's total plant size must be committed early while the centrifuge process can be incrementally expanded as demand develops.

  3. with the add-on plant, less capital to construct (about $1 billion less than a comparable 9 million SWU diffusion plant); eases drain on hard-pressed capitalization market;

4. less of an antitrust problem since several suppliers would be involved; and

5. establishes a whole competitive industry, including competitive procurement, using a new, more efficient technology, rather than simply a single additional supplier utilizing an aging technology that offers virtually no future economic or technological advantages.

C. Construction of an add-on gaseous diffusion plant

UEA agrees that a privately constructed and operated add-on plant is not a realistic option. ERDA's Government add-on plant:

- removes all doubt that additional capacity will be available in mid-1980's, thus encouraging continued expansion of nuclear light water reactor power plants;

- takes advantage of potential available power at Portsmouth;

- small enough to avoid large-scale Government outlays;

- believed to be more salable to the Congress than the UEA plan; and

- hedges the risk that centrifuge technology may possibly encounter some unforeseen engineering obstacle that would delay bringing capacity on line when needed.

D. Decisive Action

- UEA is less credible as a decisive action than ERDA's Alternative Plan which contains the add-on feature combined with a strong centrifuge commercialization push.

E. Flexibility

- UEA proposes a 9 million SWU plant the demand for which is less certain now than earlier.

- The Alternative Plan affords greater flexibility by providing some assured capacity via the add-on GDP leaving more time to adjust the size and scheduling of the private centrifuge to market conditions as they clarify.

F. Competition

- UEA is a sole source supplier and thus runs counter to Government interface policies with the private sector.

- The Alternative Plan provides healthy competition resulting in the establishment of an industry.

QUESTION NO. 4

What is specifically unacceptable about the UEA proposal? What kind of package could ERDA recommend?

Our recommendations are not predicated on specific problems with the UEA plan although they do constitute an important consideration. Rather, we are mainly concerned with the broader implications of going the UEA route -- namely the undesirable policy precedent that would be set by providing assistance on a sole source basis to establish a single supplier; the difficulty in defending such a proposal before the Congress in a timely manner; and, even if successful, the establishment of a single last-of-its-kind diffusion plant, rather than a competitive future-oriented centrifuge enrichment industry. Therefore, even if the UEA package could be made "acceptable," the desirability of proceeding the UEA route remains highly questionable.

With specific regard to the UEA plan, a basic weakness is its incompleteness as a proposal. Important gaps exist in such areas as specific equity partners, corporate base, and source of power for the GDP. It is difficult to comment on the acceptability of elements of a proposal that have been only vaguely developed or omitted altogether. Much of the UEA plan has emerged only after intensive probing on ERDA's part.

Another problem is that several features of the proposal are unconventional to say the least. For example, the lack of risk to UEA, the "hell or high water" provisions in UEA-customer contracts, and the open-ended cost overrun concept. Such features are controversial and difficult to judge with any assurance.

We also believe that as a matter of desirable and defensible policy, Government assistance for any commercialization venture should be commensurate with the amount of risk involved on the part of the private sector. Since diffusion technology is fully developed on commercial

scale, we therefore think that the amount of risk to UEA should be higher than the risk assumed by a prospective centrifuge plant operator. Of course, the degree of Government assistance for centrifuge will be honed by competition.

Taking the foregoing into account, we cannot say precisely what UEA plan would be "acceptable". But it would appear that adjustments to the existing UEA plan would have to be made in the following areas:

1. Require greater UEA equity (probably more than 25%).

2. Require greater UEA risk such as defaulting utilities.

3. Eliminate open-ended project cost overrun concept.

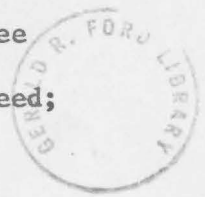
4. Assure strong U.S. participation in decision role if ERDA is to provide a performance guarantee.

5. Except for major licensing changes by NRC, UEA should be committed to completion of the facility.

6. Develop and enforce firm time schedule for UEA commitment/milestones.

7. Limit terms of Government obligation to purchase SWUs from UEA.

Also, in the area of UEA-customer contracts, we would like to see the removal of pricing concepts which may be discriminatory or inequitable (e.g., payment over contract period regardless of need; and "hell or high water" provisions).



As to what kind of package ERDA would recommend, the following summarizes our total proposed plan of action for development of additional enrichment capacity in the mid-1980's.

1. Draft and transmit legislation ASAP designed to authorize ERDA construction of a 4-5 million SWU gaseous diffusion add-on plant at Portsmouth; also seek authorization for entering into government-assistance contracts with 3-5 private corporations to construct and operate several 200-300 thousand SWU centrifuge pilot plants, expandable to 1-3 million SWUs by 1985; and concurrently issue Requests For Proposals on centrifuge enrichment.

2. Firm up estimates of demand for enriching services by announcing an open season for fixed commitment customers; and also open the "order book" for enrichment services from the new add-on diffusion plant as soon as permitted by Congress. Based on the firmed up estimates, decide within one year on the size and timing of the capacity to be met via add-on plant and the private centrifuge route. Assuming passage on the legislation in the meantime, complete arrangements and let contracts.

3. Place the Government's enriching operation on a paying basis to relieve pressure on the Federal budget. This would be done as follows:

   a. Raise the price of SWUs closer to a commercial level based on Government costs, risks, and subsidies;

   b. Attract foreign investment to the add-on diffusion plant as well as to the centrifuge plants; and

   c. Organize ERDA's enrichment operation into a more self-contained, accountable unit. This could also help de-fuse interest in establishing a Government enrichment corporation.

APR 1 1975

TO: Honorable James T. Lynn

FROM: Robert C. Seamans, Jr.

SUBJECT: ADDITIONAL URANIUM ENRICHMENT CAPACITY

In December 1974, Uranium Enrichment Associates (UEA) presented a plan for Government assistance in bringing on line UEA's proposed 9 million separative work unit (SWU) gaseous diffusion uranium enrichment plant. Following a briefing from UEA on the plan, which I attended shortly after assuming office, I established a Board of ERDA specialists to provide me a prompt but thorough review of the UEA proposals.

The Board has conducted several weeks of clarifying discussions with UEA, and has now reported to me; the Board's summary report, in which I concur, is attached. In addition, I have reviewed the report and the issues it raises with senior ERDA staff, and my Deputy and others have met with the UEA leadership to confirm at a high level our understanding of the UEA proposal.

Throughout our study, I have been sensitive to the need for the Government to establish a firm position on additional uranium enrichment, and to do so quickly. Our expanding domestic power industry needs a known source of additional U.S. enrichment capacity, now that our existing capacity is fully committed. As importantly, foreign competitors are now signing up customers for enriching services, and the U.S. should be able to retain a strong position in the foreign market if we move quickly. Finally, decisive Government action is becoming increasingly critical in this time of growing uncertainty in our domestic utilities industry.

In light of these objectives, my continuing support for private entry in the uranium enrichment market, and the deliberations we have conducted, I have concluded that the UEA plan should be rejected, and that an alternative, more promising approach to providing a competitive uranium enrichment capacity should be adopted.

Background

The UEA concept began about two years ago with Bechtel, Westinghouse, and Union Carbide as partners. Since then, Westinghouse and Union Carbide have dropped out. Goodyear has associated itself with Bechtel in the UEA venture, although Goodyear's formal commitment appears to extend only to a few months of study. At this point, there are no other partners in UEA, no firm financing, and no definitive customer contracts.

UEA is properly convinced that other partners, the financial markets, and prospective customers -- foreign as well as domestic -- are looking to the U.S. Government for assurance that UEA is a viable operation. Hence, UEA has proposed a general plan for providing such assurances. UEA concurs in the following summary of its proposal.

1. Performance assurances by ERDA that the plant will perform technically and achieve design productivity; this assurance will provide one form of protection desired by the financial backers and the participating utilities.

   To provide the assurance, ERDA would supply certain essential components and materials and technical expertise and assistance, UEA would accept Government overview of design, construction and startup. UEA, as a matter of principle, agrees to reimburse ERDA during the construction period for all costs of this assistance, including "insurance" cost to the Government to enable it to warrant its products and the productivity of the UEA enrichment plant.

2. A "completion guarantee" by ERDA to assure the financing of the project. This would include a contingent Government loan guarantee feature, Government assistance to meet cost overrun and Government "takeout" in the event of "economic frustration" of the project.

   UEA's proposed financial plan is structured on the basis of 85 percent debt - 15 percent equity. ERDA could be called upon to assume major financial obligations should the plant be unacceptably delayed or result in cost overruns, although UEA feels that the probability of this is low.

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Another unique feature of the plan is a contingent loan guarantee by ERDA to assure UEA's ability to sell securities at an interest rate equivalent to an A rating or better; there is a significant risk of the guarantee being required for all or most domestic debt.

Foreign participation is a significant feature of UEA's plan; 60 percent of the project costs, both debt and equity, are to be financed with foreign capital (including the same share of cost overruns).

3. To meet UEA delivery commitments, in the event of project startup delays and/or interruptions, ERDA would make available, by lease from its stockpile up to nine million SWU's from startup through the first year of operation, and then decreasing during the next four years to zero. UEA would replace on a best efforts basis, or otherwise pay ERDA within ten years for, any SWU's leased on a deferred basis. ERDA would also commit to purchase from UEA up to a total of six million SWU's of excess UEA production, or to lease to UEA up to two million SWU's to "levelize" UEA's operations during a four to five year period after startup.

4. In order to assure that the UEA plant would be fully and contractually committed, UEA proposes that ERDA terminate enough of its existing contracts to provide an adequate demand for the plant.

5. To protect UEA against a defaulting or bankrupt customer, ERDA would agree to assume that liability -- limited to 50 percent of the domestic utilities' share of the plant output -- when other remedies could not be obtained.

UEA characterizes its proposal as "flexible." I have not attempted to negotiate with UEA, however, but only to understand as clearly as possible what they propose at this time.

Evaluation of the UEA Plan

I have evaluated the UEA plan to determine whether it is likely to be successful, whether its adoption is the best policy for the Government, and whether the UEA plan is the best vehicle for meeting the Government's objectives in the uranium enrichment area. It should be noted that our participation would require Congressional authorization.

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It would be difficult to show that the UEA facility will be unworkable, since by definition the Government would guarantee to make it work. With Government guarantees of performance and other assistance, I am confident that the UEA plant could be made to operate effectively, even with some of the attendant encumbrances such as dual project management responsibilities. Similarly, Government completion and overrun funding guarantees are likely to attract the necessary partners, domestic customers, and financing for the 40 percent domestic share of the project. In short, with the Government as its guarantor, there is no reason to think that a UEA enrichment plant would be much different from a Government enrichment plant in meeting the domestic demand for enriched uranium.

It is somewhat less certain, however, that the same situation prevails with respect to foreign customers and financing for the 60 percent foreign share of the project. UEA's ability to sign up foreign partners is somewhat less certain than its ability to sign up domestic partners, because of the novel financial arrangements of the UEA proposal and because foreign customers have other sources of supply. My staff, for example, is less confident than UEA that the Japanese, the French, and the West Germans will sign with UEA without substantial and potentially unsuccessful negotiations. There is also major concern over having a preponderant share of the project under foreign financing and the consequent effect of these arrangements on the independence of our future enriching capacity. Despite these questions, however, it is not altogether unreasonable to assume that, with USG backing and influence, UEA could pull together the 60 percent foreign participation that it seeks.

My primary concern, however, is not that UEA would fail if it had adequate Government support but rather how much Government assistance is reasonable, how acceptable that assistance is to the Congress, and how long it will take to consummate the arrangements.

I believe that the UEA situation has gone unresolved for so long -- and that the UEA proposal is still so "flexible" and imprecise -- that none of our options for backing UEA is particularly attractive given the increasingly critical need for a firm program to develop additional enriching capacity. More specifically, we are presented with two broad options in support of UEA.

1. Undertake negotiations with UEA to firm up its offer, but without making any specific commitments until negotiations are complete. I agree with UEA that it would take about a year to wrap up negotiations and establish a corporate capability, in order to seek the final Congressional clearances. However, with a Government commitment only to negotiate, the decision on the next increment of uranium enrichment capacity is effectively postponed for at least a year even if the negotiations proceed smoothly. The course of negotiation is certainly prudent, however, since it would help limit the Government's liability and maximize our chance of gaining Congressional approval. However, it is a temporizing act that does little to restore confidence to the domestic power industry or to attract foreign customers in the meantime.

2. Commit ourselves promptly and irrevocably to providing whatever support UEA needs, and conduct negotiations within the framework of this commitment. This option would probably be decisive enough to solve the timing problem. However, it would also give away any negotiating position we might have had with UEA and thereby tend to increase the Government's liability in the final arrangements. For this and other reasons I do not believe we would find Congress receptive to the early commitment approach, and I believe that we could not in fact implement this option.

As a matter of Government policy, I am also concerned with the UEA plan as a precedent for Government assistance in commercializing Government-owned technology. Within the UEA framework we are providing substantial guarantees, and risking a multi-billion dollar liability, in order to commercialize a 30-year old technology; establish a single supplier (with attendant antitrust problems), not a competitive industry; and virtually guarantee a 15% return to the equity investors. None of these seems to be the proper objective of a Government commercialization program, and were it not for the unusual circumstances surrounding this case, I would not entertain a commercialization venture on this basis.

In summary, I believe the UEA plan can be made to work if we want to put enough effort into it. However, I do not think

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we can complete negotiations with UEA and gain the necessary Congressional approval in anything less than a year, and I believe that delay to be unacceptable. I do not think it is a good commercialization venture and it may set an adverse precedent for future ventures of this type. Finally, as I will describe in the next section, I do not believe that the UEA plan is the best alternative open to the Government.

For these reasons, I recommend against accepting the UEA plan.

Recommendations for an Alternate Approach

The Government's effort in supporting the next increment of enriching capacity, through UEA or by any other means, is necessarily substantial. I believe there is an alternative approach to the UEA proposal in which this effort can be invested, with a minimal net impact on the Federal budget, and which will yield greater benefit in the long run. It is to realize this larger return that I make the following recommendations.

First, the Government should announce as soon as possible its firm intention to construct a 5 million SWU gaseous diffusion enrichment plant, and a commercial size (but not more than 4 million SWU) centrifuge enrichment demonstration plant, coupled with measures to encourage the development of a private centrifuge enriching industry. I believe this is the most decisive and credible action we could take to resolve quickly the uncertainty surrounding future increments of enrichment capacity.

1. Although this action -- as with the UEA plan -- would require Congressional authorization, our announcement of new Government enrichment capacity is likely to be received with greater receptivity in Congress and credibility in the industry than an immediate, irrevocable commitment to negotiate with UEA. Therefore, there would be a less uncertainty created by announcing our intention to build the next enrichment capacity in the Government.

2. By committing ourselves to commercialization of centrifuge technology for future enrichment plants, we will greatly improve our long-term position in the foreign market.

- Our technology appears to be superior to Urenco centrifuge technology and our public commitment to commercialize our centrifuge technology will, we are confident, make serious inroads on the markets now sought by Urenco and Eurodif and force a reevaluation of their current investment plans.

3. Important economies would accrue from:

   a. Integrating a new Government-owned gaseous diffusion plant into an existing Government enrichment facility (an economy that would not be available in the UEA proposal)

   b. Reduced power consumption of the proposed centrifuge demonstration plant and smaller gaseous diffusion plant.

   c. Avoidance of dual project management responsibility.

Second, the centrifuge project should be designed from the outset to encourage commercialization and a competitive industry. I believe this could be done in several ways.

1. We should qualify several competing suppliers of centrifuges in order to establish a manufacturing industry. By carefully surveying the field before we issue a formal Request For Proposals, we can develop a procurement package to create this competitive manufacturing base.

2. A medium-size centrifuge plant will most likely be small enough to overcome major financial and technological obstacles but large enough to significantly add to enrichment capacity at the time needed while providing sufficient incentive to the establishment of a centrifuge manufacturing industry -- a key step in commercializing the centrifuge technology. To be competitive with the gaseous diffusion industry, the centrifuge suppliers and sub-suppliers must eventually have a large market -- this market will be started with the demonstration plant.

3. In addition to the medium-size ERDA demonstration centrifuge facility, we plan to proceed with the previously approved

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Demonstration Centrifuge Enrichment Facility (DCEF) program in which small pilot plants (about 300,000 SWUs) would be constructed and operated by private industry -- namely EXXON, ENI-Atlantic Richfield, and Garrett Corporation. The DCEF program will be particularly useful in developing the necessary commercial relationships between utilities, private enrichers, and centrifuge manufacturers. Both the ERDA demonstration centrifuge facility and the DCEF program will provide the combination of sufficient size and commercial expertise that are the necessary ingredients for the critical step to full-scale centrifuge plants and the emergence of a competitive industry.

4. A centrifuge industry will be manifested in followon increments of enriching capacity which we should continue to encourage through DCEF and through the development of an even broader base of potential enrichers. Several U.S. companies -- in addition to those interested in a DCEF program -- are already interested in the centrifuge technology (only UEA prpposes to pursue gaseous diffusion technology), and we believe we have realistic prospects of establishing a commercial centrifuge industry.

   We have the time and the tactics to develop the necessary assistance package and to set up Government participation and liabilities on a more orderly and acceptable basis than we have been able to do with UEA. At worst, our participation and liabilities could not exceed that requested by UEA; thus, with the same or less liability, we would buy the commercialization of a new technology which appears inherently better adapted to the participation of competing operators and suppliers.

Third, we should take steps to firm up our estimates of demand for enriching services during the next year. The demand picture is not clear, largely as a result of the reactor deferrals we have experienced in recent months. We would therefore intend to:

1. Propose a new relief option (open season) for our present fixed commitment customers in order to remove from our present capacity any separative work that is excess to

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their demand. This action would tend to eliminate possible overseas sales of excess separative work units, a practice in which some utilities are already indulging.

2. Simultaneously announce that ERDA will prepare new contracts for enrichment services from the new plant. We can begin immediately to seek expressions of interest from potential domestic and foreign customers on contracting for services from the new capacity.

Fourth, we should decide on the final size and timing of the new centrifuge plant based on the results of our steps to firm up demand. The gaseous diffusion plant would provide for timely addition of assured capacity, thereby permitting the scheduling of the gas centrifuge plant to be controlled partly by the time required to qualify centrifuge manufacturers, and partly by the firmed up demand for enrichment capacity. The final decision on both size of the next increment of capacity and the timing of followon increments could also be made with a better understanding of how we intend to proceed on the plutonium recycle problem and how we expect industry to respond to achieving projected higher levels of feed. To resolve uncertainties associated with future enriched uranium availability, we will also attempt to obtain more specific commitments from the Department of Defense concerning War Reserve requirements and retirements which are anticipated for the early 1980's.

Fifth, we should put the Government's enrichment operation on a paying basis to relieve pressure on the Federal budget. I believe we can minimize the impact on the budget in three ways.

1. Modify our charges for all Government enrichment services with the objective of:

   a. Increasing the cash flow needed to construct, maintain, and operate all Government enrichment plants.

   b. Eliminating any subsidies inherent in our present pricing mechanism.

   c. Accounting for the risk and contingencies incident to a Government operation.

These objectives can be largely achieved by increases in the current charges for separative work in line with higher power and labor costs; and the establishment of a commercial basis for separative work charges.

2. Attempt to attract larger dollar advances from foreign sources in the next Government enrichment plant. If some governments are prepared to invest in the UEA proposal, I think it is reasonable to expect that we can attract foreign money to a USG plant. If we can, it will of course be extremely useful in minimizing the front end capital loading on the Federal budget.

3. Organize our Government operation into a more self-contained, accountable, and responsive unit.

I will shortly forward you an FY 1976 budget amendment to implement these actions, including the changes in pricing policy which your staff has previously requested. I propose, however, to integrate my pricing recommendation into the overall recommendations I am making here. In addition, I will soon be forwarding the new relief option for our present fixed commitment customers, as explained earlier.

I believe the foregoing recommendations provide a better prospect than the UEA proposal toward eliminating uncertainty in the nuclear power industry, improving our export earnings through strong competition in the overseas market, limiting both liabilities and cost to the Government, and providing for private entry on a more competitive and reasonable basis.

I would appreciate the opportunity to discuss these matters with you in further detail.

Enclosure:
Summary Report

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