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THE WHITE HOUSE

WASHINGTON

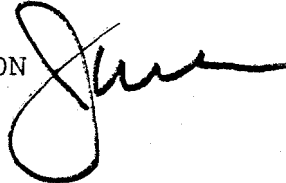
MEETING ON URANIUM ENRICHMENT

Saturday, May 24, 1975

The Cabinet Room

8:45 a.m. (60 minutes)

FROM: JIM CANNON



I. PURPOSE

For you to hear the key points on this problem before making your final decisions.

II. BACKGROUND, PARTICIPANTS, AND PRESS PLAN

A. Background:

The immediate issue is how Secretary Kissinger can, at the May 27 Ministerial Meeting of the International Energy Agency, demonstrate that the United States is committed to maintaining United States leadership as the free world's supplier of enriched uranium and United States' dominance in nuclear affairs.

The long-term issue is whether enriched uranium, the fuel for the atomic energy utility plants that are expected to be built by the hundreds from now until 2000, will be produced by the United States government, by private enterprise or by a combination of the two.

B. PARTICIPANTS:

The Secretary of State
Brent Scowcroft
Bill Seidman
Jack Marsh
Jim Cannon
Glenn Schleede
Bob Fri

Jim Lynn
Phil Buchen
Frank Zarb
Jim Connor
Jim Cavanaugh

C, PRESS PLAN: To be announced as the President is meeting with staff on energy related issues.

III. TALKING POINTS:

1. This is a major issue and before making my decision I wanted to hear the views of the supporters of the various options.
2. Henry, I'm told you have a few views on this subject.

NOTE: After calling on Henry, you might ask Jim Lynn to present his side of the case.

THE WHITE HOUSE

WASHINGTON

May 27, 1975

MEMORANDUM FOR: MAX FRIEDERSDORF
FROM: BOB WOLTHUIS *RW*
SUBJECT: Uranium Enrichment Discussions with
Chet Holifield and Craig Hosmer

I talked with both men this afternoon and they were delighted that the President is moving ahead in the nuclear power field. They both think it's the only answer on an interim basis until something like solar energy takes its place several decades hence. On approach and organization both felt that the President should rely primarily on the private sector. Although this will require some form of government financing, Hosmer made the recommendation that perhaps the Iranian government would like to pick up part of our financing tab and then have a right in the mid 1980's to draw on the U.S. uranium stockpile.

Holifield and Hosmer are going to get together in the next week and then be back in touch with me.

I have also asked Kyl, Cyr, Sparling, and Cantus to check their jurisdictional committees. George Murphy indicated to John Guthrie, Cantus' aid at ERDA, that a quasi-Federal private approach would not be productive in the short run. He felt it would require Federal effort initially.

THE WHITE HOUSE

WASHINGTON

May 27, 1975

MEMORANDUM FOR: MAX FRIEDERSDORF
FROM: VERN LOEN *VL*
SUBJECT: Congressional Notifications on Energy,
Crime and Uranium - May 27, 1975.

- Speaker - Out of office, left word with Joel Jankowsky
- O'Neill - Out of town, no answer at office. No answer at 5:30.
- Michel - In Illinois. All for taking Congress to task on its failure to act on energy. People want to see President be a strong national leader, building on the Mayaguez performance.
On compensation for crime victims, has real doubts about it.
Will miss the Bi-Partisan Leadership meeting on June 4th because of commitment in Charlotte, North Carolina.
- John Anderson - In Bali enroute back from Japan. Left word with Don Wolfensberger of his staff.
- Edwards - Enroute to Alabama. All for the President's energy proposals. As for crime victims, is disturbed about such a provision. Feels it puts a premium on crime.
- Lou Frey - In Bogota, Columbia. Left word with Toby Harder of his staff.
- Ed Hutchinson - Energy problems can be solved better in the free market than by any federal agency program. On compensation to crime victims, feels it would reward the criminal vicariously. Money could be better spent to beef up law enforcement. Never favored concept of federal government being "insurer." Can imagine people setting themselves up for beatings just for financial compensation. Understands that Chief Justice Burger talked to Chairman Rodino, telling him to go

slow on criminal code revisions because some suggested changes are pretty revolutionary. Courts, already overburdened, could face chaos. Rodino agrees. Hungate's proposed Rules of Criminal Procedure (H. R. 6700) is scheduled for House floor consideration next week.

McCormack

- Reached in Seattle. Open-minded on uranium enrichment questions. Wants to meet with Jim Cannon next week. Wants to cooperate. He will have basic jurisdiction in House Science and Astronautics Subcommittee. Is working on breeder legislation right now with nuclear plant siting his next priority. Believes legislation can be developed in July and August with hearings in September and passage in October. Agrees with objective of increased production as rapidly as possible.

Devine

- Reached in Ohio. Pointed out that Democrats' plan would increase prices at pump also. Would limit compensation of crime victims to dependents of law enforcement officers only. Need tougher judges instead.

Henry T. Simmons,
1052A National Press Bldg.,
Washington, D.C. 20045
Tel. 202-347-1337

28 May 1975



Mr. James Cannon,
Executive Director,
Domestic Council,
White House

Uranium Enrichment

The U.S. presently has three government-owned plants with a total annual uranium isotopic enrichment capacity of about 17 million separative work units (SWU). Presently under way are the Cascade Improvement Program (CIP) and the Cascade Upgrading Program (CUP) to expand total capacity to 27.6 million SWU by about 1981.

The SWU is an arbitrary unit relating the amount ~~of uranium~~ ~~input~~ and assay of uranium feedstock to the enrichment cascades, the electrical power requirement to run the process, the degree of U-235 enrichment in the ~~product~~ product and the amount of U-235 left in the depleted feedstock or "tails." One SWU is the equivalent of one kilogram of separative work.

To get some idea of what this represents, about 116,000 kg of separative work is required to support a single light water reactor of 1,000 megawatts electrical capacity for one year. Thus if all the present U.S. separative capacity were devoted to civil power needs, it could carry about 146 of these baseline reactors. After the capacity expansion program is completed, the three U.S. gaseous diffusion plants could carry 232 such reactors if their total output were devoted to this purpose. Of course, the assumption that all SWUs will be devoted to civil power is unrealistic; there is now and will be a continuing military requirement for enriched uranium to fuel nuclear carriers,

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frigates and submarines, and for the manufacture of tritium and ~~subin~~ other weapons ingredients.

At present, U.S. separative capacity is more than adequate to cover all U.S. military and civil power reactor needs -- as well as ~~all~~ foreign requirements. But projections in the growth in the numbers, electrical power generating capacity and enriched uranium requirements of light water reactors indicate that at some point in the future, even the vast present and planned U.S. separative capacity will be inadequate to meet these demands.

Thus the critical question is, when must we put new separative capacity on line if we are to avoid pinching off the future growth of nuclear power?

The last full-scale treatment of this question is contained in an AEC study, "Nuclear Power Growth 1974 - 2000" (WASH-1139 (74)), published in February, 1974. This document forecasts a 1980 U.S. domestic nuclear generating capacity in the range of 85,000 to 112,000 megawatts, with the most likely figure standing at about 100,000 megawatts. (As of 31 Dec. 1974, U.S. nuclear capacity stood at just under 40,000 megawatts from 55 reactors in full operation.)

Translating this projection to the question of timing the addition of new separative capacity, WASH-1139 (74) observed:

"Significant shifts in one or more of these variables (total U.S. and foreign nuclear power capacity, foreign demand for enrichment services, the extent of plutonium recycle, the capacity factor of nuclear plants, etc.) can dramatically affect the date at which new enrichment capacity is required. For example, the range of the timing of this need is from 1982 to 1990. (Italics supplied.) The earlier date will follow from high U.S. and foreign nuclear power with low foreign enriching ~~capamintun~~ capability. The latter date follows from low





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nuclear growth with high foreign enriching capability..."

To my knowledge, ERDA has not undertaken an update of WASH-1139 despite the fact that events of the past year have been devastating for the nuclear power outlook over the medium term. ERDA on 14 May did issue a study entitled "Nuclear Fuel Cycle: A Report by the Fuel Cycle Task Force" (ERDA-33) which came to some important conclusions in the area of separative capacity. The task force found, among other things, "insufficient existing enrichment capacity to support the projected growth of the industry beyond 1983 (italics supplied)" and it called specifically for a U.S. "commitment to new enrichment capacity by the end of ~~the end of~~ FY 1975" -- i.e., by 30 June.

There are several things that are troubling about this early deadline for a national commitment to a huge and costly addition to U.S. enrichment capacity, either public or private:

dbt. The Atomic Energy Commission has been consistently over-optimistic in its projections of the growth of nuclear power. In 1971, for example, it projected 151,000 megawatts of U.S. nuclear generating capacity by the end of 1980. In 1973, it lowered that projection to 132,000 megawatts, and a little more than a year ago (in WASH-1139 (74)) it ~~cut~~ cut it back again to about 100,000 megawatts. Environmental lawsuits, regulatory delays, construction slippages and manufacturing bottlenecks were principally responsible for these earlier disappointments.)

dbt. Within the past year, a new factor has emerged: a severe utility financial crunch because of rate lag, a deterioration in utility credit ratings and borrowing ability, and (until late 1974) sky-high interest rates and spiraling construction



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wage and manufacturing costs because of inflation. The effect of these forces was to run the cost of nuclear capacity from about \$400 per installed kilowatt to \$600 or \$700, compared with about \$300/kw for new oil-fired generating capacity and perhaps \$500/kw for coal. The inevitable result of this collision between soaring costs and reduced ability to pay was a tremendous contraction in the number of reactors which U.S. utilities had been planning. ERDA has acknowledged that while utilities announced plans for 36 new reactors in 1974, during that year they also deferred 126 large reactors previously ordered or announced. These deferments range from six months to "indefinite" in time, and economic reasons were given for the postponement or cancellation of two-thirds of them. The question must be asked, what impact does this catastrophic shakeout in nuclear plant construction have on ERDA's projections for the growth of domestic nuclear capacity? There is no evidence that ERDA-33 attempts to update WASH-1139 (74) by taking the 1974 shakeout into account. Just how reliable is ERDA-33 as a basis for a major Presidential policy decision? It insists on a decision by 30 June to move ahead with a major new increment of U.S. enrichment capacity, yet AEC only one year earlier, when things looked far brighter for ~~the~~ nuclear power, could not pin down any closer than eight years (1982 to 1990) the time when the new capacity would have to be in place.

dbt. If U.S. utilities are finding it necessary to slow down the pace of their nuclear plant construction, isn't it possible that foreign utilities -- although mostly government-owned --



are going to have to cut back some of their ambitious plans? Just how firm are foreign plans for new plants requiring enriched uranium? To what extent are foreign orders for forward U.S. enrichment services "precautionary" in character? The present lack of alternative sources for enriched uranium, uncertainties over competing European efforts like URENCO and EURODIF, and uncertainties over the ability of U.S. enrichment capacity to meet future orders may combine to attract such orders. If this sort of bow wave effect is operative, at least some of these foreign orders may turn out to be spongy and not the stuff on which to rest a major U.S. undertaking just now. So we have to ask the question, how much of this foreign interest is of a "hedging" character? Aren't we in a situation structured to encourage a queueing-up of foreign nuclear operators anxious to assure a future ~~supply~~ supply of enriched uranium at a cost significantly less than the nuclear plants they propose to build, and which they may not be at all certain to build on the timetables they have indicated?

One or two other points deserve mention. One is that the foregoing questions are almost certainly the ones that trouble the UEA consortium and compel it to ask for such a staggering array of gold-plated guarantees. In a ~~short~~ conversation with an official of the Atomic Industrial Forum, the trade association of the nuclear industry, I was advised that AIF is now preparing a study of its own on the effects of the 1974 shakeout in nuclear plant orders, but that the preliminary evidence suggests that this has postponed by about two years the previous projections (including WASH-1139 (74)) for the growth in nuclear



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generating capacity in the U.S., and consequently the time when we get to a hard crunch on nuclear enrichment capacity. Purely aside from the problem of the firmness of foreign demand, a two-year stretchout in domestic capacity would mean that a huge new increment of enrichment capacity coming on line in the U.S. in the 1982-83 period might find orders rather few and far between in its first years of operation when its financing charges would be the most burdensome.

A second consideration is the role of non-proliferation in making a decision to expand U.S. separative capacity. Countries like India, Israel and Argentina (not to mention Canada) are pursuing the heavy water/natural uranium route for at least some of their needs precisely because they do not want to become dependent on enriched uranium from the U.S. and all the strings that we would attach to its use. Similarly, Brazil obviously wants to cut a deal with the FRG for reactor technology and the relatively inefficient "jet nozzle" separation process precisely because it doesn't want to be "safeguarded" by IAEA or anyone else. Even if the U.S. were to announce an infinite expansion of enrichment capacity, and a willingness to accept firm orders to enrich every last scrap of uranium in the world, it would probably not deter any of these particular countries from the course they are following because, not to put too fine a point on it, cheap and reliable nuclear power for civil use ~~is~~ is not the sum total of their nuclear aspirations.

A third consideration in any decision is the fact that the light water reactor burning enriched uranium is by no means the only option we have for assuring a significant nuclear contribution to our future energy needs. There is also the thorium fuel cycle, and ERDA is pursuing two promising initiatives in this area -- the High Temperature Gas Reactor and the Light Water Breeder Reactor. The first could



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sharply reduce lifetime requirements for natural and enriched uranium while the second has the potential of supporting its own fuel cycle entirely after its first 10 years of operation. Both must be "subsidized" initially with ~~a~~ highly enriched uranium, but in operation they convert ~~from~~ fertile thorium-232 to fissile uranium-233 which they can burn up in subsequent ~~changes~~ fuel charges. Mastery of the thorium fuel cycle would approximately double our fissile fuel base without the necessity of laying on any new enrichment capacity.

Conclusion

The two options which appear to be under consideration boil down to just one: plunge ahead with another large-scale increment of U.S. uranium enrichment capacity. The only question seems to be whether this new capacity should be government-owned or privately owned. A genuine second option would be the following:

1. Because of uncertainty over when the U.S. must have the new capacity on line to meet hard domestic and foreign demand, forego for at least one year a major expansion of U.S. gaseous diffusion enrichment capacity, either by the government or private industry.
2. Order a new study to update WASH-1139 and Project Independence insofar as they relate to future requirements for enrichment capacity.
3. Proceed or even accelerate the present ERDA program to secure industry proposals to build one or more gas centrifuge demonstration plants in the 100,000 - 300,000 SWU range. These plants have the advantage that they can be built in far smaller increments than gaseous diffusion plants so that their construction can be geared more closely to actual demand trends and exposure to risk is therefore more limited. Such plants can probably be built with shorter leadtimes than diffusion facilities and they have the further important advantage that they use only about 10% to 20% as much power to do the same work.

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(From the standpoint of the public ~~versus~~ versus private power issue, such small plants with appropriate government purchase commitments and other assistance would be far more saleable to Congress than any attempt to bulldoze through the 9 million SWU \$3 billion UEA plant. Politically, the centrifuges should be much easier to defend against "giveaway" charges than the UEA proposal. Government assistance to launch a privately-owned centrifuge program would be analogous to the assistance which the Eisenhower Administration provided to launch the "Partnership" program which built the first small privately-owned power reactors 20 years ago. As in that case, one would expect that government assistance to the ~~the~~ centrifuge industry would gradually taper to zero. A new industry would ultimately stand on its own feet -- and would probably pay royalties to the government for many years in return for commercial use of centrifuge technology originally financed by U.S. taxpayers.)

4. If the new study shows that interest in LWRs has hardened again over the coming year, and that enriched uranium requirements will indeed climb strongly, then a decision can be made by mid-1976 on how to meet that demand. The gaseous diffusion option would be available, whether government or private. Perhaps there might be sufficient confidence to go all out on centrifugation. And there is also a remarkable laser/UV separation process now under development which may be more elegant and efficient than either of these two alternatives.



May 28, 1975

WORKING PAPER RE URANIUM ENRICHMENT ASSOCIATES

Uranium Enrichment Associates ^(UEA) has been formed in response to the expressed policy of the United States Government ^(USG) to develop the first private enrichment plant in the United States following the CIP/CUP programs of ERDA. UEA is confident this can be accomplished with financing based upon long-term non-cancellable contracts with United States and foreign utilities who require enrichment services. Recent months, however, have demonstrated that the credit position of U. S. utilities has deteriorated. To provide for investor confidence, back-up assurances will be required from the United States Government. Such assurances would seem to be compatible with the commitment of this country to be a continuing and reliable source of enrichment services.

The general plan for proceeding with a private uranium enrichment venture involves the construction and operation of a large gaseous diffusion enriching plant located on the Chattahoochee River in southeastern Alabama, where a site has been optioned.

~~Planning has assumed~~ A plant of 9 million SWU per year capacity, ^{planned,} but if actual firm orders fall short of full load, a plant of proportionally smaller size will be built capable of future expansion to the full 9 million SWU size. A preliminary estimate of the cost of ~~construction~~ the 9 million SWU plant is \$2,750,000,000 in 1974 dollars, with full operation to be attained in 1983. Power in the amount of about 2500 MWe is expected to be supplied from a dedicated nuclear power ~~plant facility~~ ^{to be separately financed.}

Based on marketing efforts undertaken to date about 40% of the plant capacity will be taken by domestic utilities, and the balance by non-US utility organizations. For both domestic and foreign customers UEA will supply toll enrichment service under long-term (25 year) contract.

Each customer will be charged for his percentage of the total cost of operation of the facility on a "take or pay" basis and will supply and retain title to the required feed material.

Project financing utilizing an 85% debt, 15% equity ratio is contemplated both for the non-US share of the plant and for the domestic share of the plant.

As now foreseen, about 60% of the project will be contracted to foreign reactor needs. In avoidance of the problems of political change, currency modifications, and other possible modifying events, the UEA contracts with foreign customers will require that each such customer provide, on a firm basis, all of the capital investment proportional to each customer's subscription to the output from the enrichment plant. Such capital investments will include equity and debt and must be provided by the customer from his own sources of capital and the obligation of repayment rests with the customer. Prospective foreign customers understand these conditions and also understand that voting control (55%) will be in the hands of the United States investors.

The United States portion of the equity will be supplied by US investors who are expected to be a group of substantial industrial concerns. U.S. debt financing during the construction period will be by interim loans from commercial banks with final take-out financing from the U.S. ^{commercial} bond market. The security for debt will be the firm contracts from the purchasers of the enrichment services.

Uranium Enrichment ^{back on arrangements} Associates proposes to use all reasonable commercial ~~safeguards~~ within the private sector in support of the project. A program of insurance has been developed which will provide substantial coverage from the risks of physical damage, business interruption, and general liability. Extended risk coverage to the limit of \$1 billion, business interruption with limit of \$1 billion and general liability insurance up to \$50 million now have been assured.

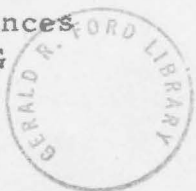
It is also proposed to establish a contingency reserve fund which will accumulate from an addition to the unit cost of separative work performed for customers of the plant. The reserve fund is intended to provide protection against unforeseen financial requirements during the operation of the enrichment facility. Amounts unused in the reserve fund for such purpose will ultimately serve to offset debt service through the latter years of debt obligation. Sufficient funds are expected to accumulate to permit this reserve fund to pay for debt service during the last 10 to 12 years of the debt obligation. At that point, the customer's cost of separative work would be reduced by elimination of payments to the reserve fund as well as of charges for debt service.

Under the contracts with the customers of the plant, the cost of separative work will provide full recovery of the total costs of owning, financing, operating, and maintaining the project, including provision for an after tax return on equity computed at 15% of initial equity investment with provisions for future ~~(escalation)~~. likely at 15%

The above basic terms have been discussed at length with interested U.S. utilities and foreign customers, and they are in general agreement. These terms coupled with the following areas of government assistance will produce conditions which in our ~~opinion~~ opinion, will allow private entry into uranium enrichment.

It must be recognized that the technology and the key components of the gaseous diffusion process are classified government information not generally accessible to either the private investor or to the utility customer. Accordingly, the UEA plant will be founded on confidence in government supply of key components, government processes and government knowhow. USG will charge a royalty during the first 17 years of operation of the UEA plant. Consequently, it will be essential that certain government assurances be provided to support the transition to private industry. Requested USG assurances are as follows:

1. The supply by USG to UEA at cost of essential mechanical components of the plant such as barriers and seals which, for security reasons, are presently produced exclusively by USG;



2. To cushion against possible start-up delays and/or interruption of plant operation, and to assist UEA in matching plant capacity with customer's requirements during the first few years of operation, UEA proposes that there be a full year's equivalent production of its plant (9 million SWU's equivalent) available in the Government's stockpile to be leased to UEA during the plant start-up period. Starting after a year of successful operation, the quantity available would be steadily decreased, being eliminated altogether after five years of normal operation.

Pro

If it develops that there is a temporary over-capacity of the UEA plant, UEA proposes that USG purchase from UEA enriching service not to exceed 6 million SWU. Terms and conditions for these transfers, sales or leases will be subject to negotiation of mutually acceptable provisions.

In addition to these transactions, UEA and ERDA will work out mutually acceptable arrangements for the exchange of SWU's to permit UEA to serve customers requiring highly enriched HTGR fuel, and to assist an economical plant start-up.

3. The supply at cost of technical assistance and knowhow for the installation and operation of USG's diffusion process. USG will guarantee that the manufactured items and process technology will operate as expected and will accept the obligation to complete or cause completion of the plant if UEA is unable to satisfactorily complete. Such obligation shall continue for one year after demonstration of full scale steady commercial operation.
4. An undertaking by USG to provide backup support with respect to the financing of the plant and the obligations to complete and operate the plant. It should be noted costs incurred by the Government in continuing the program should such become necessary are anticipated to be included in the costs of plant financing or operation and thus become a part of the cost of service to customers under contract. The manner in which USG would exercise its protective position within this area is anticipated to be through transferring ownership from UEA to USG.

This would provide the needed assurance from a credit worthy source that additional capital can be available to provide for completion of the project or that the investors have opportunity to recover their investment if the project can not



reasonably be brought into commercial operation.

Transfer of ownership would involve the acquisition by US of the controlling owners rights of UEA's direct and indirect domestic debt. Either UEA or USG could require a transfer of ownership; UEA, if it were unable for any reason to physically complete the plant otherwise or bring it into commercial operation despite its best efforts; or USG for the same reasons or if UEA has defaulted in meeting specified and agreed conditions. The right to require a transfer and the obligation to accept would terminate one year after the plant had achieved full scale steady commercial operation.

The consideration to be paid by USG for the acquisition of UEA's domestic equity would be determined by reference to whether the reason for the transfer fell within one of three categories but the consideration would in any event include assumption of liabilities. The three categories are:

First, events caused by USG or otherwise beyond the reasonable control of UEA. If the request for transfer of ownership were attributable to such an event UEA's equity holders would be entitled to full compensation, that is, return of their original investment and such additional compensation, as determined by USG, to reflect the results achieved to the date of transfer.

Among the type of events which would fall within the first category are:

- A. Failure of warranted USG technology to operate so as to permit the plant to achieve commercial operation within the agreed-upon time period and costs, despite reasonable efforts of both UEA and USG;
- B. Delays or frustrations of governmental licensing, or enactment of law or regulation, which would prevent the plant from achieving commercial operation within the agreed-upon time period and costs, despite reasonable efforts of both UEA and USG;
- C. Interposition by USG for reasons of national interest in the matter contractual relationships between UEA and previously approved customers to a degree which significantly threatens the economic viability of the project;



D. The inability of UEA to raise capital for construction or long-term financing despite reasonable efforts of UEA to do so.

Second, events involving gross ^{completion} mismanagement, willful misconduct, or gross negligence by which UEA significantly threatens satisfactory operation and capacity of the project and for which UEA, after formal written request from USG, does not take reasonable steps toward correction. In such an event, no cash compensation would be paid for UEA's domestic equity rights.

Third, events which do not fall within the first two categories. In such an event the appropriate degree of compensation would be determined utilizing agreed formulas for the recognition of the efforts of UEA and the degree of fault, if any, in foreseeing and dealing with the particular situation. In any event, the preliminary determination of compensation shall be made by USG and the basis thereof reviewed with UEA. If the parties agree on an amount, the determination shall be submitted by USG to the JCAE for a 90 day period during which Congress is in session and there shall become final unless JCAE should dissent from such determination. If the parties cannot agree on the appropriate compensation, recourse shall be had to an agreed impartial body for determination.

As noted, UEA's direct and indirect domestic debt would be assumed by the USG in the event of a transfer of ownership. In order to obtain the full benefit of such an assumption, it must invoke the full faith and credit of the United States. UEA will use its best efforts to provide that all its domestic debt will be callable, without premium, in case of a transfer of ownership.

UEA has proceeded on the basis that there will be a firm and continuing policy of the United States Government with reference to the participation of foreign investors in enrichment facilities located in the United States and in the sale of enriching services to foreign customers. It has been taken that the policy of the Government has been to encourage such international relationships and it is expected that the present areas of doubt will be clarified with a strong and positive statement reexpressing the United States policy.



UEA intends in all respects to operate as a private industry venture using high quality standards of commercial procedure, practice and control.

In recognition of USG interests and because of the USG support of the financial position of the project UEA will arrange to have its procedures, practices and controls reviewed by an independent audit firm of recognized competence and secure and file with the USG their opinion of the adequacy of these elements.

In recognition of the USG guarantee of equipment, process and the like, UEA will develop the design of the plant in full cooperation with USG and permit USG full opportunity to be aware of, have access to and approval of the manner in which the process is engineered, installed in the plant and operated.



THE WHITE HOUSE
WASHINGTON

May 29, 1975

JMC:

Glenn Schleede would like to pass this draft memo out at the 11:00 a.m. Uranium Meeting.

If you would like to discuss with him prior to that meeting he will be willing to come over and discuss with you.

P



THE WHITE HOUSE

WASHINGTON

NOTE FOR: JIM CANNON
FROM: GLENN SCHLEEDE
SUBJECT: URANIUM ENRICHMENT

Attached is a rough draft-outline of a decision paper. I put this together following your note of yesterday and a long meeting with the ERDA-FEA-OMB-NSC-Connor task group.

Bob Fri attended part of it and expressed the strong desire to have a draft like this available for the llAM meeting to be used:

to help focus discussion.

to try to get principals' agreement that the right facts and criteria are being presented.

I will have multiple copies of this ready for the llAM meeting -- to be used only if you agree that it should be passed out.

We are meeting at 10AM with UEA.



5/29

Attached is a very rough draft of a potential decision memorandum. It is based on only preliminary information and discussions with the task group. It is far from complete and, as it stands:

- does not necessarily reflect anyone's views.
- has noone's approval
- contains unnecessary information and omits other information that will have to be added.

Therefore, at this point, it is furnished only as a rough outline to get senior advisers' views as to whether the right issue, alternatives, considerations and facts are being assembled.

DECISION

MEMORANDUM FOR:

FROM:

SUBJECT: PROVIDING ADDITIONAL U.S. URANIUM
ENRICHMENT CAPACITY

The Issue

The issue for your decision is whether to propose legislation which contemplates construction of the next increment of U.S. uranium enrichment capacity (a) by the Uranium Enrichment Associates (UEA) in a privately owned plant backed up by the potential for Federal by-out prior to completion, or (b) by a Government owned plant.

Both alternatives contemplate that construction of succeeding enrichment plants would be by private industry, probably with the initial plants subject to the same kind of conditions now proposed for UEA.

None of your advisers believe that you should consider proposing that all future enrichment capacity be in plants owned by the Government or a Government corporation. However, this alternative needs to be kept in mind because (a) it undoubtedly will be considered by the Congress, and (b) such an alternative provides a useful baseline for evaluating the two alternatives presented for your decision.

Developments since your May 23 Meeting.

Since your last meeting with senior advisers on this subject:

- . Negotiations have been conducted with UEA officials and their financial advisers -- which have resulted in a substantially different proposal from that previously discussed by UEA and ERDA. It is discussed under Alt. #1, below.
- . The alternatives have been refined further and evaluated.

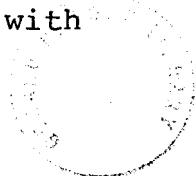


- . More data have been assembled to respond to questions you have raised, including:
 - . A comparison of the relative status of diffusion and centrifuge technology. (Tab A)
 - . Projected world supply of enriched uranium (Tab B)
 - . Projected world demand for enriched uranium (Tab C)
 - . Extent of private industry interest in proceeding with centrifuge demonstration plants (Tab D) (To be supplied by ERDA).
- . The Congressional Relations staff has assessed the attitudes of Congressional leaders (Tab E - to be supplied by Congressional Relations staff). Potential Congressional acceptance is one of the considerations discussed below in evaluating the alternatives.

The Alternatives

The principal features of the two alternatives are as follows:

- . Alt. #1. UEA construction of a free standing 6.5 to 9 million unit diffusion plant. This would be followed by industry construction of succeeding plants (using either diffusion or centrifuge technology, as determined by industry. The arrangement would work as follows:
 - UEA and future enrichment firms would:
 - . provide the organization, management, financing, plant site, power, customers.
 - . Design, build and operate the plant.
 - ERDA:
 - . transfers information on diffusion technology to the enrichers and receives a royalty payment (no new authority needed).
 - . supplies and gives warranty for those materials for plant which are available only from the government. Enricher pays for these.
 - . reviews and approves design of plant.
 - . oversees construction and management, much as it would now if ERDA were going to own the plant.
 - New legislation would be needed to authorize the transfer of ownership of assets and liabilities of the enrichment firm to the Federal Government at any time prior to completion of the plant, with:
 - either the enrichment firm or the Government able to request the transfer.
 - with amount of payment depending upon the circumstances -- varying from essentially full repayment of U.S. equity investors funds to no repayment (total loss of equity).
 - ownership then resting with the Federal government just as it would if the enterprise began with the intent of Federal ownership.



This alternative is described in more detail at Tab F, to which is appended the specific wording of the UEA proposal. (To be supplied by ERDA)

Alt. #2. ERDA would construct an add-on diffusion plant of up to 5 million units adjacent to its existing 9 million unit plant at Portsmouth, Ohio. This would be followed by private industry construction of centrifuge plants, starting with competitive proposals from firms that would be prepared to build 1 million unit demonstration plants which are capable of being expanded to 3 million units. Depending upon the speed with which these plants could be built and production begun, it may be possible to reduce the size of the add-on ERDA-owned diffusion plant--perhaps even to zero. This approach would work as follows:

- Legislation and appropriations would be requested to permit ERDA to proceed with design, long-lead time procurement, and if necessary, construction of the add-on plant.
- For the centrifuge followon plants, the overall approach would be much the same as that outlined for private enrichers under alternative #1.
- Legislation would be needed to authorize the transfer of ownership.

This alternative is discussed in more detail at Tab G (to be supplied by ERDA).

Considerations bearing upon your Decision

A number of considerations are essentially equal with respect to either alternative and need not be considered further here. These include:

- The date when the next increment of capacity must be on line (now estimated at 1983).
- Nuclear materials safeguards (non-proliferation) in terms of both the physical security of the plant and Federal control over exports.
- Impact on the Government's stockpile of enriched uranium.
- Customers for the next increment of capacity which are expected to be predominantly foreign.
- Risk of not having the next increment of capacity on line when needed.
- Opposition from nuclear power opponents -- who may try to prevent any new increment of capacity as another way of slowing nuclear power (but who will be vulnerable to the answer that failure to build means dependence on foreign sources of enriched uranium).

Other considerations are important and the relationship to each alternative is discussed below:

1. Date when the U.S. will be perceived by potential foreign customers as a reliable supplier of uranium enrichment services. An early date is important to the nation's ability to obtain a large share (target 50%) of the foreign market. There are some differences between the two proposals for the next increment--in terms of when all arrangements will be firm. In the case of alternative #1, the foreign perception would depend heavily on how it was explained. The steps necessary and probable completion dates for the two alternatives are as follows:

	Alt #1 <u>UEA</u>	Alt #2 <u>ERDA</u>
. Propose legislation	6/30	6/30
. Congressional authorization		
. UEA obtain equity partners		na
. UEA obtain foreign equity and customers		na
. Obtain committment for electrical power		
. UEA obtain domestic orders		
. Plant design completed		
. NRC construction license		na
. Construction begins		
. NRC operating license		na
. Production begins		

In summary,

- . Under alternative 1,.....
- . Under alternative 2,.....

2. Impact on the ability to achieve (and the timing) the objective of having industry build and operate succeeding increments of enrichment capacity.

Under alternative 1,.....

Under alternative 2,.....

3. Federal Budgetary impact (Budget authority and outlays).
Tab H (to be supplied by OMB and ERDA) contrasts the budgetary impact of the two proposals over the next ___ years. Briefly,

Under alternative 1,.....

Under alternative 2,.....

4. Chances of Congressional acceptance of the proposal, and the probable impact of the timing of approval.

Under alternative 1,.....

Under alternative 2,.....

*to be supplied
by Dr. Fisher et al.*

5. Ability to accommodate commitments to foreign nations to permit non-discriminatory participation in the financing of enrichment capacity.

Under alternative 1,.....

Under alternative 2,.....

6. The risks and how they are shared from the viewpoint of:
- Domestic utility customers...
 - Foreign customers...
 - Domestic equity partners...
 - Potential financiers for debt...
 - Potential enrichers....

(These considerations may be worked in at other points in the memo)

7. Other Foreign Policy Considerations (if any -- to be identified by NSC staff by 5/29)

Other Actions Affecting Uranium Enrichment that must be taken by the Administration

- . Submission of Commercial charge legislation...
- . Decision on "open season" and conditions for escaping from enrichment contracts with ERDA.

Recommendations

_____, _____, _____ and _____ recommend Alternative 1 because.....

_____, _____, _____ and _____ recommend Alternative 2 because.....

Decision

_____ Alt #1.

_____ Alt #2.

TABS

- A - Comparison of status of technology centrifuge and diffusion (attached)
- B - Projected world supply of enriched uranium (attached)
- C - Projected world demand for enriched uranium (attached)
- D - Extent of private industry interest in proceeding with centrifuge demonstration plants now (to be supplied by ERDA)
- E - Assessment of Congressional situation (to be supplied by Max Friedersdorf)
- F - Description of Alternative #1 - UEA builds next increment, private industry succeeding units. (to be supplied by ERDA)
Addendum to "F" - UEA's specific proposal
- G - Description of Alternative #2 - ERDA builds next increment, private industry succeeding units. (to be supplied by ERDA)
- H. Federal Budgetary Impact (to be supplied by OMB and ERDA)

TABA

1. Question

Compare the status of gas centrifuge technology to gaseous diffusion insofar as its present commercialization potential is concerned.

Answer

With over 30 years of large-scale operating experience and development, the gaseous diffusion process has proved to be a highly reliable and economical method of enriching uranium. The gas centrifuge process which has been under development for 15 years and is now approaching production capability appears to be economically competitive and has been shown to have certain advantages in commercialization potential.

Plant Size

Gas centrifuge plants can be economically built in smaller capacities than gaseous diffusion. This results from a higher degree of separation inherent in individual gas centrifuge equipment and the ability to more readily scale the plant to desired size. Gaseous diffusion, on the other hand, requires many stages to achieve enrichment and is dependent on large equipment to achieve economy. The scaling of gas centrifuge plant size permits consideration of many smaller regional gas centrifuge enrichment plants providing greater flexibility. Provided that a sound centrifuge sub-supplier industry has been established, construction of small increments of capacity may permit "tracking" the enriching service demand.

Power Requirements

The gas centrifuge process is shown to use about 10 percent of the electric power consumed by the same capacity gaseous diffusion enrichment plants. This results from the fact that the gas centrifuge process is inherently more energy efficient. The lower electric power requirement allows locating gas centrifuge enrichment plants without major dependence on large electric power systems and sources. Projections of operating costs indicate that gas centrifuge plant operating costs will be largely under the control of the operator. Because of high power consumption, a large portion of gaseous diffusion plant operating cost will be dependent on utility control.

Technology Potential

The capacity and performance of gas centrifuge equipment is currently limited by materials, fabrication techniques and the understanding of gas centrifuge theory. Further developments are expected to increase the capacity and performance of individual centrifuges. These improvements could be incorporated in operating enrichment plants during normal replacement of centrifuges. Gaseous diffusion technology, although not exhausted, is more mature and by its nature is more difficult and expensive to incorporate into operating plants.

Patent and Proprietary Incentive

Since the gas centrifuge process is new and has large potential for improvements, patent and proprietary opportunities are great. These opportunities are part of the reasons that industry participants are considering gas centrifuge for uranium enriching and serve to encourage further industrial entry into the field of gas centrifuge fabrication. In the gaseous diffusion process, the Government has developed to a highly sophisticated level and is the sole fabricator of key elements of the process. Therefore, the patent and proprietary opportunities in gaseous diffusion enriching are limited.

Reliability and Demonstrated Performance

Adequate reliability and performance of production type gas centrifuges has been demonstrated in test facilities. These tests will continue with current and advanced centrifuges in support of new enrichment plants. The gaseous diffusion process with 30 years of operating experience has demonstrated high reliability and performance. A significant part of the operating cost of gas centrifuge enriching plants is the replacement and repair of the high speed centrifuges, thus the cost of enrichment in these plants is sensitive to the centrifuge operating life. Operation of gas centrifuge enriching plants would assure a manufacturing market for centrifuge component suppliers. The projected gas centrifuge enriching plant economics are based on short operating life centrifuges. If the plant operator can increase the life by reasonable operating changes or improved centrifuges, the economics would improve.

Risk

The overall risks associated with new enrichment plants are higher with the gas centrifuge process since industry has never been called upon to supply large quantities of equipment and materials used in manufacturing gas centrifuges. On-going ERDA programs are providing industry with the technology that has been developed and assisting in promoting the expansion of necessary supporting industries until the market is established. The gas centrifuge process cost projections assume conservative operating life for centrifuges tending to minimize the risk of higher operating costs. More ERDA effort is currently directed toward gas centrifuge manufacture consistent with the development program. For a new, large gaseous diffusion enrichment plant, ERDA assistance would be provided to minimize the risk.

General

Considering the major advantages, it appears that the gas centrifuge process provides a more likely ability to achieve a competitive industry by permitting more entrants, more regional participation, more industrial involvement (including more labor), with reduced electric power constraints. The "spin-off" of new technologies such as high speed rotating components, balancing procedures and special fabrication techniques associated with the gas centrifuge can be of significant benefit to industry. The availability of this technology can serve to encourage industrial entry as a supplier. The use of the technology without compromising security can serve to upgrade the Nation's overall industrial capability.

2. Question

What is ERDA's current estimate of the foreign and domestic enrichment services market?

Answer

Based on the April 1975 IEA forecast of world-wide demand, the requirements for enrichment services in millions of SWU with plutonium recycle and a 0.25% tails assay are given below. The U.S. requirements and the foreign market currently under ERDA enrichment services contracts are also shown, resulting in a net foreign requirement.

<u>Requirements</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
World-wide	10	12	14	19	25	28	31	34	38	41	47	52	58	64
U.S.	5	7	7	9	11	12	13	16	19	21	24	26	29	34
Foreign Supplied by ERDA	<u>4</u>	<u>4</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>9</u>	<u>11</u>	<u>10</u>	<u>10</u>	<u>11</u>	<u>11</u>	<u>10</u>	<u>10</u>	<u>10</u>
Net Foreign	<u>1</u>	<u>1</u>	<u>3</u>	<u>4</u>	<u>6</u>	<u>7</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>9</u>	<u>12</u>	<u>16</u>	<u>19</u>	<u>20</u>

The U.S. requirements for enrichment services from new domestic enrichment capacity in millions of SWU with plutonium recycle and a 0.30% tails assay is given below.

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
U.S. Requirements	--	--	--	--	--	--	--	0.2	0.7	3.2	5.0	8.3	11.6	15.6

708-B

3. Question

What is the present status of foreign enrichment supply? What information do we have on foreign customer preferring U.S. versus foreign supply sources?

Answer

Based on the April 1975 IEA forecast, the projected enrichment services from foreign plants in millions of SWU are given below. The U.S.S.R. capacity under contract is also included in the totals. The net foreign requirements from Question 2 are deducted from the total foreign capacity, resulting in a projected excess capacity. Additional foreign capacity is then included, resulting in a total projected excess capacity.

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
U.K.	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
URENCO	--	--	0.2	0.5	0.8	1.2	1.8	2.7	4.5	7.0	10.0	10.0	10.0	10.0
Eurodif-I	--	--	--	--	3.1	6.5	8.4	10.8	10.8	10.8	10.8	10.8	10.8	10.8
U.S.S.R.	<u>0.5</u>	<u>2.2</u>	<u>2.6</u>	<u>3.1</u>	<u>4.1</u>	<u>4.1</u>	<u>3.1</u>	<u>3.1</u>	<u>3.1</u>	<u>2.1</u>	<u>2.1</u>	<u>2.1</u>	<u>2.1</u>	<u>2.1</u>
Subtotal	<u>0.9</u>	<u>2.6</u>	<u>3.2</u>	<u>4.0</u>	<u>8.4</u>	<u>12.2</u>	<u>13.7</u>	<u>17.0</u>	<u>18.8</u>	<u>20.3</u>	<u>23.3</u>	<u>23.3</u>	<u>23.3</u>	<u>23.3</u>
Net Foreign Requirements	<u>1</u>	<u>1</u>	<u>3</u>	<u>4</u>	<u>6</u>	<u>7</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>9</u>	<u>12</u>	<u>16</u>	<u>19</u>	<u>20</u>
Excess Capacity	--	--	--	--	2	5	7	9	10	11	11	7	4	3
<u>Additional Foreign Capacity</u>														
Eurodif-II	--	--	--	--	--	--	--	--	3.0	6.5	8.5	10.0	10.0	10.0
South Africa	--	--	--	--	--	--	--	--	--	--	--	5.0	5.0	5.0
Japan	--	--	--	--	--	--	--	--	--	--	5.0	5.0	5.0	5.0
Total Excess Capacity	--	--	--	--	2	5	7	9	13	17	24	27	24	23

The foreign demand for enrichment services could increase due to lack of plutonium recycle, a reduced enrichment plant tails assay or a growth in the foreign demand for nuclear power. Moreover, working inventories and stockpiles of enriched uranium to backup the operation of the foreign enrichment plants are unknown; these inventories and stockpiles could add to foreign requirements.

TWBC

A domestic private enricher must compete with foreign suppliers by offering more competitive contract terms and assured reliable supply of enrichment services. Since the U.S. technology, particularly for the gaseous diffusion process, is well advanced and proven, it should have a tendency for lower costs, other factors being equal. The U.S. has also been nondiscriminatory in the treatment of all customers, which has assisted in promoting sales of U.S. enrichment services throughout the world. A similar policy for domestic private enrichers may be assumed for the future.

Only about 2.7 million SWU of the capacity of the URENCO plant is committed. An attractive feature claimed by the owners of the plant is that only five years are needed to expand the capacity, so that demand may be closely tracked. The Eurodif-I plant is fully committed. The Eurodif-II plant has not begun to be committed; it is beginning to go through the French political process. A domestic private enricher could affect this plant more than the URENCO or Eurodif-I plants. The South African plant is tied to the South African supply of feed. Since feed may be in short supply on the world market, the South African plant may penetrate the enriched uranium market. It is unknown what further market penetration the U.S.S.R. will make.

Addendum to
TAB E

Lawth

5/28/75

(the Gessie)

A "transfer of ownership" involves assumption by the USG of the assets and liabilities of UEA and the controlling rights of UEA's domestic equity holders. This event may be triggered by the request of either UEA or the USG at any time prior to the enrichment plant achieving commercial operation. In the event of a "transfer of ownership," the following basis shall be employed to determine the appropriate degree of payment for USG assumption of such domestic UEA equity rights:

Fair compensation (as later defined) shall be paid by the USG for such rights in the event, as determined by the USG, that the proximate cause of the request for transfer of ownership was

1. failure of warranted USG technology to operate so as to permit the plant to achieve commercial operation within the agreed-upon time period and costs despite the best efforts of both UEA and the USG.
2. failure of necessary governmental licenses to be obtained in a timely manner so as to permit the plant to achieve commercial operation within the agreed-upon time period and costs despite the best efforts of both UEA and the USG.
3. interposition by the USG for national security reasons in the matter of contractual relationships between UEA and previously approved customers so

as to prevent the service of such customers to a degree which significantly threatens the economic viability of the project.

4. a matter of similar character as determined by the USG.

No compensation shall be paid by the USG for such rights in the event, as determined by the USG, that the proximate cause of the request for transfer of ownership was

1. gross mismanagement, or arbitrary and capricious action by UEA which significantly threatens the economic viability of the project or the reasonable reliability or assurance of supply to the customers, and following failure to correct the situation upon request by the USG.

2. a matter of similar character as determined by the USG.

In all other cases, the USG shall determine the appropriate degree of compensation for such rights recognizing the degree or lack thereof of UEA to reasonably foresee or deal with the particular situation.

In any event, the preliminary determination (for fair, modified or no compensation) shall be made by ERDA and the basis thereof reviewed with UEA. Before becoming final, the determination shall be submitted by ERDA to the JCAE for a 90-day period during which Congress is in session.

The determination shall then become final unless, during such period, the JCAE shall dissent from such preliminary determination by recommending an alternative basis for such settlements to the Congress in the form of a joint resolution shall be affirmatively acted upon by the Congress during the then current session of the Congress.

~~Seawood~~
OMB

THE WHITE HOUSE

WASHINGTON

May 31, 1975

MEMORANDUM FOR:

PHIL BUCHEN
JIM CONNOR
MAX FRIEDERSDORF
ALAN GREENSPAN
BOB HARTMANN
HENRY KISSINGER
JIM LYNN
JACK MARSH
BRENT SCOWCROFT
BOB SEAMANS
BILL SEIDMAN
FRANK ZARB

FROM:

JIM CANNON 

SUBJECT:

DRAFT DECISION MEMORANDUM ON
URANIUM ENRICHMENT

Enclosed at Tab I is the draft of a decision memorandum on the uranium enrichment issue. We are committed to have the memorandum ready for the President upon his return on Tuesday. Accordingly, would you please provide your comments, suggested changes, and position on the alternatives by 12 noon, Monday, June 2 so that we may make necessary revisions and prepare the final version.

Enclosed at Tab II are background papers which provide information that may be useful to you in reviewing the draft. These provide information on:

- . The market for enriched uranium
- . Status of centrifuge technology
- . Private industry interest in building centrifuge plants

cc: Donald Rumsfeld

DECISION

MEMORANDUM FOR:

FROM:

SUBJECT: PROVIDING ADDITIONAL U.S. URANIUM
ENRICHMENT CAPACITY

The Issue

The issue for your decision is whether to propose that the plant to provide the next increment of U.S. uranium enrichment capacity be:

1. A ^{a U.S. consortium,} privately-owned plant financed, built and operated by ~~the~~ Uranium Enrichment Associates (UEA), backed up by a Federal committment to ^{buy out} [take over] the plant, if necessary and under stated conditions, prior to its commerial operation; or
2. A government-owned plant ^{built} [financed] by ERDA ^{with appropriated funds.}

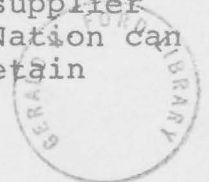
The next increment must use diffusion technology. Future increments are expected to use centrifuge technology.

Developments Since Your May 23rd Meeting

During your May 23rd meeting, you directed that discussions be held immediately with the UEA and that alternatives for a firm Administration committment by June 30 for the next increment of enrichment capacity be presented to you for decision by June 3. This memorandum completes those actions. Since May 23:

^{thousand} UEA has submitted a substantially modified proposal for back-up Government support for their venture which appears to provide an acceptable basis for a legislative proposal covering future increments of capacity. This proposal (outlined below as Alternative #1) goes a long way toward meeting the major objectives on which Zarb, Seamans, Connor, K, and your other advisers all agree:

- An early committment to build ^{especially abroad,} additional capacity so that the U.S. will be perceived as a reliable supplier of uranium enrichment services -- so that the Nation can obtain a large share of the world market and retain leadership in the nuclear field.



- Early private commercial involvement in the expanding market for uranium enrichment services -- ending the current Government monopoly.
- ^{min}Minimized Federal budgetary impact, short and long term.
- Adequate Federal control over the export of uranium enrichment services to satisfy national security and international energy policy objectives.

There are risks connected with the new UEA proposal, involving principally:

- The question of [Congressional] acceptability by Congress.
- Some uncertainty that UEA can complete the necessary arrangements.
- Some delay, compared to a government plant.

However, the UEA proposal itself and additional steps developed by ERDA are designed to minimize these risks.

In view of the risks, there is also presented for your consideration the Alternative (#2, below) of a Government add-on diffusion plant -- which reduces the risks but which also reduces the chances of early private enrichment or land minimum Federal budget impact on the]

Your advisers have also agreed that:

- the Administration should not consider proposing that all future enrichment [capacity ^{be} in] plants owned by the Government or a Government corporation; but this alternative needs to be kept in mind because it undoubtedly will be considered by the Congress, and it provides a useful baseline for evaluating the two alternatives presented for your decision.
- the legislative proposal ^{facilitate the provision of} covering the next increment of capacity should also ~~provide for follow-on increments built by~~ industry, probably with Federal backup arrangements similar to those proposed for UEA.
- ^{ERDA's} the program to establish a competitive industry should be intensified to assure that several firms will be ready to build subsequent plants using centrifuge, and should also be announced on June 30.
- ^{in an} the legislative proposal ~~should also~~ authorize increasing in the price of ERDA's government-subsidized enrichment services to a level more nearly comparable to a commercial rate (from current \$53 per unit to approximately \$75) ^{should be sent immediately to the Congress.}

Considerations Bearing Upon Your Decision

A number of considerations are essentially equal with respect to either alternative and need not be considered further



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[increases]

private

3

here. These include:

- The date when the next increment of capacity must be on line (now estimated at 1983).
- Nuclear materials safeguards (non-proliferation) in terms of both the physical security of the plant and continued Federal control over exports.
- Impact on the government's stockpile of enriched uranium.
- Customers for the next increment of capacity, which are expected to be predominately foreign.
- Risk of not having the next increment of capacity on line when needed.
- Opposition from nuclear power opponents -- who may try to prevent any new increment of capacity as another way of slowing nuclear power (but who will be vulnerable to the counter argument that failure to build means dependence on foreign sources of uranium enriched services).
- The commitment to permit foreign investment in an enrichment plant on a non-discriminatory basis.

Alternatives

The principal features of the two alternatives are:

- Alt. #1. UEA would construct a free-standing 7 to 10 million unit (measured in separative work units - SWUs - per year) diffusion plant in Alabama. Both this alternative and Alt #2 would be followed by industry construction of succeeding plants, using centrifuge technology, and with backup Government arrangements similar to those now proposed by UEA. Details of the alternative, including the new UEA proposal, are at Tab A.

Briefly:

- UEA intends to build the plant at a cost of \$2.75 billion (1974 dollars) with full operation attained in 1983; sell 40% of the output to domestic utilities and 60% to foreign organizations on long term contracts; and finance the venture on an 85%-15% debt-equity ratio. Investment will be 40% domestic and 60% foreign, but U.S. owners will have, under law, 55% of the voting rights.
control, *through*
- The Government would sell to UEA essential components which are produced exclusively by the Government;



what?

in the event of initial shortages of U.S. uranium

help over some

supply diffusion technology and warrant its operation; and provide access to the Government stockpile of enriched uranium to [balance against] potential start-up problems. The Government would be paid at cost for components and technical assistance and receive a royalty for the technology.

- UEA proposes that, prior to commercial operation, there be available authority for the Government to buy out UEA if the venture threatened to fail -- at the call of UEA or the Government, and with compensation to UEA ranging from full reimbursement to total loss of its equity interest, depending upon circumstances leading to the threat of [potential] failure.
- If it became necessary to buy out UEA, control of this multinational [corporation] ^{project} would then rest with the Federal government, much as it would if the enterprise had been launched as a Federal project.

To minimize ^(a) the risks of delays in UEA's completion of its organizational, financial and design steps, and ^(b) inadequate national commitment to new capacity in the eyes of foreign customers (because Congress may be slow to approve such a novel approach), ERDA proposes to make:

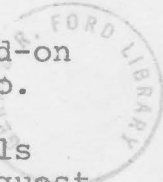
- A letter agreement with UEA, under existing authority, to permit UEA to proceed about July 1 with preliminary design and with financial and other arrangements.
- Assurances (perhaps a Presidential statement) ^{to these} to domestic and foreign customers that orders placed with U.S. suppliers would result in assured U.S. supply -- either through a successful UEA project or through the U.S. Government ^{if necessary.}
- # These steps be implemented only after [consultation and] ERDA ~~[exchange of letters with]~~ the Joint Committee on Atomic Energy.

*would
? inform*

ERDA will look for additional steps that might be announced on June 30 to help assure ~~industry~~ ^{UEA} an adequate market, so that the private centrifuge program moves ahead quickly.

follow on

Alt. #2. ERDA would construct a \$1.2 billion diffusion plant with a capacity of up to 5 million units as an add-on to its existing 9 million unit plant at Portsmouth, Ohio. This would be followed by private industry construction of centrifuge plants, starting with competitive proposals from 3 or 4 firms. This alternative would involve a request to Congress for:



- authorization and appropriations (beginning in FY 76) for construction of the add-on diffusion plant.
- authorization for [Federal] ^{similar to} Government back-up arrangements for centrifuge plants [like] those proposed by UEA for the diffusion plant. (This facet would parallel the succeeding centrifuge plant ^{phase} [aspects] of Alternative #1.)

This alternative is presented in more detail at Tab B.

Arguments

• Alternative #1: (Immediate privatization)

- For

- Maintains momentum built up over the past 3 years under an Executive Branch policy committed to having industry build the next increments of capacity.
- Takes the major step necessary toward achieving the objective of a private, competitive enrichment industry; in effect "breaks trail" for subsequent private plants.
- Minimizes the Federal budget impact in the next few years by avoiding a Government plant -- assuming buy-out alternatives are summarized at Tab C.
- Provides an adequate signal to foreign customers of U.S. commitment to be a reliable supplier, and adequate control over exports to meet national security and international energy goals.
- Constitutes a bold step, demonstrating innovative leadership.

- Against

- If UEA fails, the Government would end up with a ^{large (but} useful) free-standing enrichment plant, whereas without the privatization attempt we would have built a smaller add-on plant.
- If buy-out were required because UEA cannot obtain necessary licenses (e.g., because of environmental or safety) -- an event which is considered unlikely -- it is conceivable that the Government would choose not to override the objections and not to proceed to operate the plant.
- Congressional approval will be more difficult to obtain than for a government-owned plant, and will take longer (probably by 2 to 3 months).
- We will not know for another 7 months whether UEA will be successful in putting its deal together (getting foreign and domestic equity partners, debt financing and customers); ^{conditions}
- It ~~may be viewed as~~ favored treatment for one firm.

• Alternative #2 (Government Plant)

- For

- Better chance of early Congressional approval.
- Better chance of being perceived as a firm U.S. commitment to be a reliable supplier, and at an earlier date.
- Smaller diffusion plant will reduce the likelihood of taking up some of the market that could otherwise be available for early starts on centrifuge plants.

multi-firm

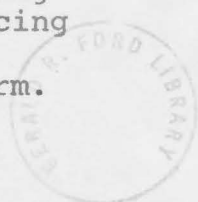
multi-firm

financing abroad.

problems ?

finally

abroad



possibility

but UEA's plant design and ERDA's contingency planning would meanwhile proceed.

Somewhat easier to assure export controls necessary to achieve safeguards and international energy strategies.

- Against

- The major step that must be taken to achieve commercialization would be deferred and the policy of the past three years reversed, leaving doubts in industry as to whether any future attempts would be considered credible.
- Loss of momentum (UEA would fold). The present opportunity for private entry would be lost.
- Most obstacles and objections now being raised may reappear when the next [opportunity] emerges. Further, at that time, private entry will be even more difficult because of the need to use new technology (centrifuge).
- There is no assurance that a 5 million unit diffusion plant would be adequate to get us to the stage of centrifuge demonstration plants, thus requiring a larger government diffusion plant add-on.
- Domestic electric utilities have profited ^{benefited} from the existing Government monopoly, [and would prefer to have it continue.] Commitment now to another Government plant would strengthen their hopes that the present Government monopoly can be perpetuated.
- Federal budget impact, particularly through 1981 (Details at Tab C).

effort for private entry

a "FOR"

quester

Assessment of Congressional Outlook

Tab D (to be provided Monday by the Congressional Relations Staff) summarizes the assessment of the Congressional Relations staff of the outlook for the alternatives. We expect it to show that Congressional leaders in the nuclear area are prepared to support expansion of the nation's uranium enrichment capacity. Whether they will support a private approach as contrasted with a government approach is thus far unclear. What is clear is ^{pro-} that the major disagreement will be between the nuclear versus the non-nuclear forces, rather than the public versus private issue.

Recommendations and Decision

- _____ Alt #1. UEA proposal.
- _____ Alt #2. Government plant.

FEDERAL BUDGETARY IMPACT OF THE TWO ALTERNATIVES

The attached table contrasts the budgetary impact of the two proposals over the next 15 years. Briefly,

ment services)

- Under alternative #1 (UEA plant), net ERDA outlays through 1990 would be \$245 million, but ERDA would hold resalable assets (in the form of enriched uranium) with an acquisition cost of \$300 million which would be sold around 1990. These figures exclude revenues to the U.S. from 1984 through 1990 in the form of:
 - income tax payments by UEA of about \$430 million.
 - royalty payments on technology of about \$140 million.

The contingent "buy out" feature might ~~require~~ require ^{about} \$1.4 billion of contract authority (BA) initially, but the outlay projection would be expected to be zero. (In addition, a ~~takeover~~ takeover of UEA would involve an additional obligation for two nuclear power plants at a value of \$1.2 billion.)

buy out

- Under alternative #2 (Government plant), net ERDA outlays through FY 1990 would be about \$508 million, but net ERDA outlays would be \$761 million in the short term (through 1981). (There would also be an obligation to provide for electric power supplies for the add-on diffusion plant which is not shown on the table.)

The short-term (through 1981) budget impact would be \$19 million of revenues, i.e., negative outlays.



DECISION

GMB Director's comments

MEMORANDUM FOR:

FROM:

SUBJECT: PROVIDING ADDITIONAL U.S. URANIUM
ENRICHMENT CAPACITY

The Issue

The issue for your decision is whether to propose that the plant to provide the next increment of U.S. uranium enrichment capacity be:

1. A privately-owned plant financed, built and operated by the Uranium Enrichment Associates (UEA), backed up by a Federal commitment to take over the plant, if necessary and under stated conditions, prior to its commercial operation; or
2. A government-owned plant financed by ERDA.

The next increment must use diffusion technology. Future increments are expected to use centrifuge technology.

Developments Since Your May 23rd Meeting

During your May 23rd meeting, you directed that discussions be held immediately with the UEA and that alternatives for a firm Administration commitment by June 30 for the next increment of enrichment capacity be presented to you for decision by June 3. This memorandum completes those actions. Since May 23:

- UEA has submitted a substantially modified proposal for back-up Government support for their venture which appears to provide an acceptable basis for a legislative proposal covering future increments of capacity. This proposal (outlined below as Alternative #1) goes a long way toward meeting the major objectives on which Zarb, Seamans, Connor, and your other advisers all agree:
 - An early commitment to build additional capacity so that the U.S. will be perceived as a reliable supplier of uranium enrichment services -- so that the Nation can obtain a large share of the world market and retain leadership in the nuclear field.



- Early private commercial involvement in the expanding market for uranium enrichment services -- ending the current Government monopoly.
- Minimized Federal budgetary impact, short and long term.
- Adequate Federal control over the export of uranium enrichment services to satisfy national security and international energy policy objectives.

There are risks connected with the new UEA proposal, involving principally:

- The question of Congressional acceptability.
- Some uncertainty that UEA can complete the necessary arrangements.
- Some delay, compared to a government plant.

However, the UEA proposal itself and additional steps developed by ERDA are designed to minimize these risks.

In view of the risks, there is also presented for your consideration the Alternative (#2, below) of a Government add-on diffusion plant -- which reduces the risks but which also reduces the chances of early private enrichment or minimum Federal budget impact.

Your advisers have also agreed that:

- the Administration should not consider proposing that all future enrichment capacity be in plants owned by the Government or a Government corporation, but this alternative needs to be kept in mind because it undoubtedly will be considered by the Congress, and it provides a useful baseline for evaluating the two alternatives presented for your decision.
- the legislative proposal covering the next increment of capacity should also provide for follow-on increments built by industry, probably with Federal backup arrangements similar to those proposed for UEA.
- the program to establish a competitive industry should be intensified to assure that several firms will be ready to build subsequent plants using centrifuge, and should also be announced on June 30.
- the legislative proposal should also authorize increasing the price of ERDA's government subsidized enrichment services to a level more nearly comparable to a commercial rate (from current \$53 per unit to approximately \$75)

Considerations Bearing Upon Your Decision

A number of considerations are essentially equal with respect to either alternative and need not be considered further

Remember have to spell out what legis. would be sought under each alternative.

Really, expect to Congress?

Shouldn't legis. also allow govt. to do the heavy lifting if turns out UEA isn't back it?



here. These include:

- The date when the next increment of capacity must be on line (now estimated at 1983).
- Nuclear materials safeguards (non-proliferation) in terms of both the physical security of the plant and continued Federal control over exports.
- Impact on the government's stockpile of enriched uranium.
- Customers for the next increment of capacity which are expected to be predominately foreign.
- Risk of not having the next increment of capacity on line when needed.
- Opposition from nuclear power opponents -- who may try to prevent any new increment of capacity as another way of slowing nuclear power (but who will be vulnerable to the counter argument that failure to build means dependence on foreign sources of uranium enriched services).
- The commitment to permit foreign investment in an enrichment plant on a non-discriminatory basis.

Alternatives

The principal features of the two alternatives are:

- . Alt. #1. UEA would construct a free-standing 7 to 10 million unit (measured in separative work units - SWU's - per year) diffusion plant in Alabama. Both this alternative and Alt #2 would be followed by industry construction of succeeding plants, using centrifuge technology, and with backup Government arrangements similar to those now proposed by UEA. Details of the alternative, including the new UEA proposal are at Tab A.

Briefly:

- UEA intends to build the plant at a cost of \$2.75 billion (1974 dollars) with full operation attained in 1983; sell 40% of the output to domestic utilities and 60% to foreign organizations on long term contracts; and finance the venture on an 85%-15% debt-equity ratio. Investment will be 40% domestic and 60% foreign but U.S. owners will have, under law, 55% of the voting rights.
- The Government would sell to UEA essential components which are produced exclusively by the Government;

Do not have "to be considered"?

probably?



supply diffusion technology and warrant its operation; and provide access to the Government stockpile of enriched uranium to balance against potential start-up problems. The Government would be paid at cost for components and technical assistance and receive a royalty for the technology.

- UEA proposes that, prior to commercial operation, there be available authority for the Government to buy out UEA if the venture threatened to fail -- at the call of UEA or the Government, and with compensation to UEA ranging from full reimbursement to total loss of its equity interest, depending upon circumstances leading to the potential failure.
- If it became necessary to buy out UEA, control of this multinational corporation would then rest with the Federal government, much as it would if the enterprise had been launched as a Federal project.

To minimize the risks of delays in UEA's completion of its organizational, financial and design steps, and inadequate national commitment to new capacity in the eyes of foreign customers (because Congress may be slow to approve such a novel approach), ERDA proposes:

- A letter agreement with UEA, under existing authority, to permit UEA to proceed about July 1 with preliminary design and with financial and other arrangements.
- Assurances (perhaps a Presidential statement) to domestic and foreign customers that orders placed with U.S. suppliers would result in assured U.S. supply -- either through a successful UEA project or through the U.S. Government.
- These steps be implemented only after consultation and ERDA exchange of letters with the Joint Committee on Atomic Energy.

ERDA will look for additional steps that might be announced on June 30 to help assure industry an adequate market, so that the private centrifuge program moves ahead quickly.

Alt. #2. ERDA would construct a \$1.2 billion diffusion plant with a capacity of up to 5 million units as an add-on to its existing 9 million unit plant at Portsmouth, Ohio. This would be followed by private industry construction of centrifuge plants, starting with competitive proposals from 3 or 4 firms. This alternative would involve a request to Congress for:

- authorization and appropriations (beginning in FY 76) for construction of the add-on diffusion plant.
- authorization for Federal Government back-up arrangements for centrifuge plants like those proposed by UEA for the diffusion plant. (This facet would parallel the succeeding centrifuge plant aspects of Alternative #1.)

This alternative is presented in more detail at Tab B.

Arguments

Alternative #1: (Immediate privatization)

aa

- For

- Maintains momentum built up over the past 3 years under an Executive Branch policy committed to having industry build the next increments of capacity.
- Takes the major step necessary toward achieving the objective of a private, competitive enrichment industry; in effect "breaks trail" for subsequent private plants.
- Minimizes the Federal budget impact in the next few years by avoiding a Government plant -- assuming buy-out alternatives are summarized at Tab C.
- Provides an adequate signal to foreign customers of U.S. commitment to be a reliable supplier, and adequate control over exports to meet national security and international energy goals.
- Constitutes a bold step, demonstrating innovative leadership.

participating

as special preferred or common

- Against

- If UEA fails, the Government would end up with a useful free-standing enrichment plant whereas without the privatization attempt we would have built a smaller add-on plant.
- If buy-out were required because UEA cannot obtain necessary licenses (e.g., because of environmental or safety) -- an event which is considered unlikely -- it is conceivable that the Government would choose not to override the objections and not to proceed to operate the plant. *- What then?*
- Congressional approval will be more difficult to obtain than for a government-owned plant, and will take longer (probably by 2 to 3 months).
- We will not know for another 7 months whether UEA will be successful in putting its deal together (getting foreign and domestic equity partners, debt financing and customers).
- It ~~may~~ *will* be viewed as favored treatment for one firm.

Removal

But as the understanding is, this would not result in a plant.

Alternative #2 (Government Plant)

- For

- Better chance of early Congressional approval.
- Better chance of being perceived as a firm U.S. commitment to be a reliable supplier, and at an earlier date.
- Smaller diffusion plant will reduce the likelihood of taking up some of the market that could otherwise be available for early starts on centrifuge plants.

that part of the domestic debt publicly offered could be converted into

being delayed -- ERDA would still be "showing" either on UEA plant or add-on?

Is there any way that part of the publicly placed equity could be "publicly offered"?

. Somewhat easier to assure export controls necessary to achieve safeguards and international energy strategies.

- Against

- . The major step that must be taken to achieve commercialization would be deferred and the policy of the past three years reversed, leaves doubts in industry as to whether any future attempts would be considered credible.
- . Loss of momentum (UEA would fold). The present opportunity for private entry would be lost.
- . Most obstacles and objections now being raised may reappear when the next opportunity emerges. Further, at that time, private entry will be even more difficult because of the need to use new technology (centrifuge).
- . There is no assurance that a 5 million unit diffusion plant would be adequate to get us to the stage of centrifuge demonstration plants, thus requiring a larger government diffusion plant add-on.
- . Domestic electric utilities have profited from the existing Government monopoly and would prefer to have it continue. Commitment now to another Government plant would strengthen their hopes that the present Government monopoly can be perpetuated.
- . Federal budget impact, particularly through 1981 (Details at Tab C).

*9/2 by [unclear]
ERDA the
average 577
5M.*

Assessment of Congressional Outlook

Tab D (to be provided Monday by the Congressional Relations Staff) summarizes the assessment of the Congressional Relations staff of the outlook for the alternatives. We expect it to show that Congressional leaders in the nuclear areas are prepared to support expansion of the nation's uranium enrichment capacity.

Whether they will support a private approach as contrasted with a government approach is thus far unclear. What is clear is that the major disagreement will be between the nuclear versus the non-nuclear forces rather than the public versus private issue.

Recommendations and Decision

Alt #1. UEA proposal.

Alt #2. Government plant.

This is too good. They could be for the centrifuge competition without being for the UEA plant. This has to be expanded.

